Research in Developmental Disabilities 158 (2025) 104945

Contents lists available at ScienceDirect

Research in Developmental Disabilities

journal homepage: www.elsevier.com/locate/redevdis

Assessing childhood impact: Virtual and in-person counseling for children's language development challenges

Alba Ayuso-Lanchares [a,*,1], Inés Ruiz-Requies [b,2], Rosa Belén Santiago-Pardo [c,3]

[a] University of Valladolid, Faculty of Medicine, Department of Pedagogy, Valladolid, Spain
[b] University of Valladolid, Faculty of Education and Social Work, Departament of Pedagogy, Valladolid, Spain
[c] University of Valladolid, Faculty of Medicine, Department of Pedagogy, Valladolid, Spain

ARTICLE INFO

Keywords:
Language disorder: childhood
Intervention
Speech therapy
Family counseling

ABSTRACT

In recent years, family counseling programs have grown significantly. Therefore, this study aims to evaluate the effectiveness of a counseling program designed for Late Talkers (LT) or children with Development Language Disorder (DLD) aged 3–6. It also seeks to analyze the differences between its implementation in virtual and in-person settings and to gather the opinions of speech therapists and families about the program. A quasi-experimental pretest-posttest design was employed with two groups, each consisting of 17 children, totaling 34 children: one in an in-person setting and the other in a virtual setting. The results reveal significant differences in both approaches, with no relevant disparities between them. The conclusions highlight the program's effectiveness, with benefits in all dimensions. In the in-person modality, proximity to families is emphasized as a primary advantage. In contrast, the virtual modality offers flexibility in terms of intervention schedules and locations but presents technological challenges. Overall, this study supports the effectiveness of both counseling modalities

1. Introduction

Developmental Language Disorder (DLD), also referred to as Specific Language Impairment (SLI) (Bishop et al., 2016; Campos & Halliday, 2020), is typically identified around the age of 4, affecting 7.58 % of the population and showing a higher prevalence in males than females (Norbury et al., 2016). However, a recent study conducted in a large region of Spain (Andalusia) determined a prevalence rate of 8.27 per thousand (‰) (Lirola, 2022). DLD is characterized by limited vocabulary, grammatical difficulties, and significant impairments in discourse, resulting in substantial challenges insocial interaction, communication, and academic performance. It is essential to rule out cognitive, sensory, psychomotor, or neurological problems as explanations for these difficulties (Aguilar-Mediavilla et al., 2019; Andreu-Barrachina et al., 2014).

Intervention studies often include participants with both Developmental Language Disorder (DLD), Late Talkers (LT) due to their similar symptomatology (Bahamonde et al., 2021). Late Talkers, children aged 18–42 months (Cable & Domsch, 2011; DeVeney et al., 2017; Hawa & Spanoudis, 2014), exhibit a delay of six months or more in expressive or receptive language development.

* Corresponding author.
E-mail addresses: alba.ayuso@uva.es (A. Ayuso-Lanchares), inesrure@uva.es (I. Ruiz-Requies), rosabelen.santiago@uva.es (R.B. Santiago-Pardo).
[1] https://orcid.org/0000-0002-0740-7212
[2] https://orcid.org/0000-0001-5785-1795
[3] https://orcid.org/0000-0002-3317-503X

https://doi.org/10.1016/j.ridd.2025.104945
Received 15 July 2024; Received in revised form 7 January 2025; Accepted 3 February 2025
Available online 20 February 2025

Approximately 10 %-20 % of children over 24 months of age experience this delay (Carson et al., 2022; Collisson et al., 2016). Like children with DLD, this difficulty cannot be attributed to any other concurrent issues (Arzaga & Jackson-Maldonado, 2021).

1.1. Language intervention for children with DLD and LT

There are various approaches to language intervention for these children. The three approaches outlined by DeVeney et al. (2017) are: (a) general language stimulation; (b) focused language stimulation, which can complement the former but involves concentrating on identification; and (c) context-centered or child-interest-centered stimulation, which entails instructing individuals in the child's proximity, primarily within their family circle, to modify their expressions. Ebbels et al. (2019) present another categorization: Level 1, which involves training other professionals and conducting parent education programs for children without language difficulties to promote speech and general communication development; Level 2, 3 A, and 3B focus on intervention for children with language difficulties or disorders. Level 2 focuses on individual family training, while Level 3 A involves direct intervention by a speech therapist or clinician. However, it is known that families tend to prefer training programs when children are younger (Law et al., 2019).

Training programs at Levels 2 and 3 A can be categorized into three types: a) child-directed approach; b) adult-directed approach; and c) hybrid approach (Tukiran et al., 2023). This article evaluates a hybrid parent coaching program, as it combines parent modeling and other tools to improve their interactions in a natural environment, while also providing a structured program led by adults. Four publications have been found in the literature explaining two programs of this type, one called Enhanced Milieu Teaching (Robert & Kaiser, 2012, 2015; Roberts et al., 2014) and the Home-Based Treatment (Whitehurst et al., 1991). Both programs achieved significant improvements (Roberts et al., 2014; Whitehurst et al., 1991), although neither of them has been conducted in a Spanish-speaking context (Tukiran et al., 2023).

In the systematic review conducted by Bahamonde et al. (2021), it was highlighted that there is a lower number of research studies on language interventions for children with DLD conducted in Spanish-speaking contexts compared to other countries. Moreover, there are even fewer interventions related to family counseling in comparison to other types of interventions. On the other hand, Carson et al. (2022), in another systematic review on language intervention in children with language delay, noted that studies related to indirect intervention with family training yielded variable results. Specifically, two studies in this review concluded that participants improved in vocabulary comprehension (Fong et al., 2012; Hancock et al., 2002), while in another study, one participant improved while the other did not (Delaney & Kaiser, 2001). Finally, another study reported no significant differences when the intervention was applied to all seven participants in the study (Ciccone et al., 2012).

The review focused on parent-implemented interventions (Tukiran et al., 2023) identified only 15 articles that met the inclusion criteria (articles published between 1980 and 2018), indicating a scarcity of articles considering the selected time frame. None of these reviews (Bahamonde et al., 2021; Carson et al., 2022; Tukiran et al., 2023) specify whether any of the interventions they reviewed were conducted online or in a hybrid format. However, since the emergence of COVID-19, virtual interventions for children with DLD and LT have become more widespread (Bhat, 2021; Raffaele et al., 2021). A study by Bhat (2021) found that parents of children with significant LT believed they derived fewer benefits from virtual services during the pandemic and felt less confident about benefiting from these services in the future. Nevertheless, virtual therapy undeniably offers numerous benefits and is a viable option for children with these difficulties, although the quality of available computer resources is crucial for achieving positive results (Lee, 2019).

Therefore, this study has three objectives: a) to assess the effectiveness of a family counseling program aimed at children aged 3–6 with DLD and LT; b) to analyze the differences observed based on whether this intervention is conducted online or in-person; c) to gather feedback on the program from speech therapists and families.

2. Methodology

This research employs a mixed-methods approach, collecting both quantitative and qualitative data (Dawadi et al., 2021). It follows a quasi-experimental pretest-posttest design. The participants consist of 17 children with LT or DLD who undergo the program in-person and another 17 children with LT or DLD who participate in the program virtually. The six speech therapists responsible for implementing this intervention have received training in using the program both in-person and online. This research has received approval from the Research Ethics Committee for Medicine at Health Area East of the University of Valladolid with protocol number PI 23–3066 NO HCUV.

2.1. Participants

A total of 34 children with LT or DLD participated in this study, ranging in age from 3 to 5 years at the time of their initial assessment. The selection criteria for the sample were as follows:

- Ages between 3 and 6 years.
- Children diagnosed with LT or DLD. Both diagnoses were considered as a requirement of the counseling program based on the PELEO program (Ayuso-Lanchares et al., 2022), which was specifically designed for this population.
- "Delayed" result on the Navarra-Revised Oral Language Test (PLON-R) (Aguinaga et al., 2004).
- No other additional disabilities. A thorough review of the children's medical history was conducted to exclude those with hearing loss, intellectual disabilities, recurrent respiratory infections, and recurrent otitis media, as these factors could influence the problem.

- Informed consent from families for their participation in the study.

After selecting the participants, they were divided into two groups: one that would conduct the sessions in person and another that would participate virtually. Assignment to each group was based on the preferences expressed by the participants and their families. This approach was chosen to ensure that families felt comfortable and motivated to engage fully with the program, as Biel et al. (2020) have highlighted the importance of participant adherence in family-centered interventions. Thus, the In-Person Group (IPG) included 17 participants with LT or DLD (70.6 % males and 29.4 % females) aged between 3 and 5 years (mean age 3.94, standard deviation 0.899). The Virtual Group (VG) included 17 participants with LT or DLD (58.8 % males and 41.2 % females) aged between 3 and 5 years (mean age 3.94, standard deviation 0.899). It is worth noting that the similarity in mean and standard deviation measures in both groups is due to the nature of the sample, as the selection of children for both groups was incidental, prioritizing uniform participation across different age groups to ensure maximum homogeneity between sets.

The study also involved 6 speech therapists, all of whom were women with an average work experience of 14.63 years (σ=5.70), and 34 families (76.47 % mothers and 23.53 % fathers), with an average age of 32.15 (σ=5.23).

2.2. Techniques and instruments

At the beginning and end of the intervention, the following standardized tests were employed:

- Induced Phonological Register (RFI) (Juárez and Monfort, 1996) This test evaluates the phonological abilities of the child, focusing on their capacity to articulate phonemes and identify deficits in sound production, which are commonly affected in children with LT or DLD.
- Peabody Picture Vocabulary Test (Dunn et al., 2006), this test assesses receptive vocabulary, allowing us to measure the child's ability to understand and recognize words, a fundamental skill targeted in the intervention.
- Navarra Revised Oral Language Test (PLON-R) (Aguinaga et al., 2004), this tool provides a assessment of oral language, including phonology, syntax, semantics, and pragmatics, enabling a global evaluation of the child's language development.

In addition, a questionnaire was designed using Microsoft Forms for both families and speech therapists who used the counseling program. The questions are open-ended and aim to gather opinions on the use and effectiveness of the counseling program, as detailed in Table 1.

2.3. Procedure

The intervention used is based on the Program for Linguistic Stimulation of Oral Expression (PELEO, in Spanish) (Ayuso-Lanchares et al., 2022). Some modifications have been made to the program, which had been previously published (Ayuso-Lanchares et al., 2022), and it has been adapted for use by families.

The same procedure has been designed for both modalities: In an initial contact, families are informed about the program's needs and basic concepts. Their role in the process and the program based on PELEO (Ayuso-Lanchares et al., 2022) are explained, informed consent is obtained, and an initial evaluation of the child is conducted. An initial and final in-person evaluation is performed for both groups. The following standardized tests are administered in these initial and final evaluations: Registro Fonológico Inducido (RFI) (Juárez & Monfort, 1996), Peabody Picture Vocabulary Test (Dunn et al., 2006), and the Navarra Revised Oral Language Test (PLON-R) (Aguinaga et al., 2004).

The procedure for both the Presencial Group (PG) and the Virtual Group (VG) involves a six-session family intervention program over 20 weeks, with sessions conducted approximately every three to four weeks (Fig. 1). Sessions for the PG are conducted in a multidisciplinary office (psychology, speech therapy, physiotherapy, etc.), while sessions for the VG are conducted via Microsoft Teams. Families in the VG are provided with a guide explaining the tasks they need to perform at home to prepare for the video call (Pozniak et al., 2023), such as preparing the physical and virtual environment for therapy, managing the child's behavior, and conducting various practices at home after the video call. All sessions are conducted individually with each family.

In the first session of the intervention program, families attend without the child, receive materials, and evidence-based recommendations for stimulating language, such as limiting screen time, increasing child-directed speech, avoiding providing incorrect

Table 1
Questions asked in the Microsoft Forms questionnaire.

Questions to families	Questions to Speech Therapists
Do you consider that your child has improved since the program started being used with them?	Do you believe that the use of this program, both in the in-person and online modalities, has been beneficial for your patient? Why?
Has the number of words your child says increased?	How would you describe the motivation of the families and their therapeutic adherence to this program in both modalities (online and in-person)?
Has your child's articulation improved?	What difficulties have you encountered in the implementation of the program in both modalities (online and in-person)?
Are you satisfied with the program conducted? Do you have any suggestions and/or comments?	

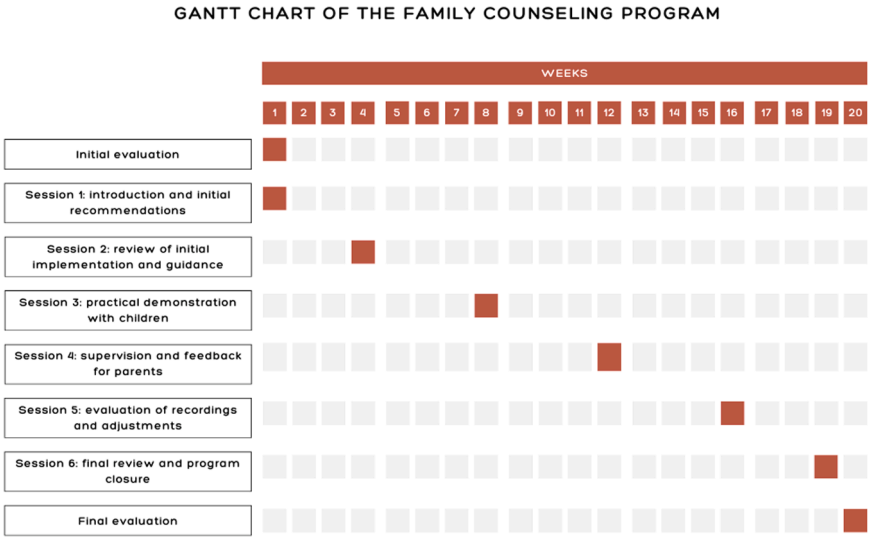

Fig. 1. Gantt chart of the family counseling program.

models and telegraphic speech, and using dialogic reading with children (Acosta et al., 2011; Jones et al., 2023; Kerai et al., 2022; Manolson, 1992; Carvalho et al., 2016,; Weisleder & Fernald, 2013; Venker et al., 2020). Additionally, in this first session, parents are taught how to incorporate modeling, provide feedback, and use scaffolding to improve their child's language (Biel et al., 2020).

In a second session, families attend without the child, and the guidelines provided on the first day are reviewed. Parents are asked to provide examples of how they have incorporated these guidelines, and any difficulties encountered are discussed. Additionally, the PELEO-based program (Ayuso-Lanchares et al., 2022) is explained step by step so that families know how to implement it at home, although they do not start implementing it at this point.

In the third session, children also attend the intervention, and the speech therapist performs the exercises based on PELEO (Ayuso-Lanchares et al., 2022) in front of the families, which were explained to the families in the second session. The process is as follows: a PowerPoint presentation is used, repeated throughout the week, where the child has to say the words displayed, and any unknown words are noted. Subsequently, games with these words are played to reinforce learning, such as memory games and word searches. Families are instructed to repeat the PowerPoint presentation at the end of the week to ensure that the child knows all the words. If there are any unfamiliar words, they continue working on them in the following week.

In the fourth session, potential difficulties are discussed, and families are asked to implement PELEO in front of the speech therapist to receive feedback on their performance. In this session, families are also requested to record a session at home for subsequent review.

In the fifth session, families attend without the child, show the recording to the speech therapist, and any issues that have arisen are resolved. If necessary, families are asked to record another video applying PELEO at home to ensure they are doing it correctly. In all cases, families are requested to record themselves during a family interaction at home (such as reading a book or playing with the child) to observe how they are implementing modeling, scaffolding, and other guidelines provided.

In the sixth session, families show the corresponding video, difficulties are discussed, and possible solutions to the problems raised are provided. Families are reminded that the complete treatment lasts a total of 20 weeks to be carried out at home, and a final assessment is scheduled. Fig. 1 provides a visual representation of the timeline and the placement of the sessions and evaluations throughout the 20-week program.

2.4. Data analysis

Once the entire process is completed, a detailed analysis of the results is conducted using SPSS Statistics 29 software for Windows. The collected data is analyzed, and the Shapiro-Wilk normality test is performed to assess whether the data follows a normal distribution. The results confirm that the sample follows a normal distribution, supporting the use of statistical methods. The analysis is divided into two main approaches:

First, an intergroup analysis is conducted to detect differences in the results between the Presencial Group (PG) and the Virtual Group (VG) in the pretest, ensuring the initial homogeneity of the groups. This evaluation is replicated in the posttest to identify changes over the course of treatment.

Second, an intragroup analysis is performed to examine the differences between the pretest and posttest in each experimental group, both PG and VG. For these analyses, specific parametric statistical tests are chosen. For the intergroup analysis, the independent samples *t*-test is selected, which is ideal for comparing means between two different groups. In parallel, for the intragroup analysis, the paired samples *t*-test is used, which is useful for comparing the means of the same group at different time points. In addition, Cohen's d is calculated to analyze the effect size.

Following this analysis, a content analysis (Lindgren et al., 2020) of the questionnaires is conducted using Atlas.ti Version 25.0.0 software. To structure the information, six predetermined codes based on a literature review are used, as shown in Table 2. Relevant sources include studies on the advantages and disadvantages of online and in-person interventions (Bayati & Ayatollahi, 2023; Lee, 2019) and research addressing family adherence and perceived outcomes (Biel et al., 2020). Additionally, the coding process adhered to the content analysis framework outlined by Lindgren et al. (2020).

After separately analyzing the data, the information is compared, contrasted, and integrated into a network of codes to examine the relationship between them and their frequency of occurrence in the questionnaires from speech therapists and families.

3. Results

The presentation of results is divided into two subsections: a first subsection that shows the results of the participants' tests, providing a firsthand view of the effectiveness of the counseling program in both modalities, and another subsection presenting the results obtained from the questionnaires administered to families and speech therapists who conducted the intervention program in-person and virtually.

3.1. Evaluation of the effectiveness of the counseling program

In Figs. 2 and 3, the data obtained from the PLON-R are displayed. The PLON-R provides scores categorized as "Delay," "Needs Improvement," and "Normal." It is evident that neither of the groups achieves a substantial improvement significant enough to transition from the "Delay" category to the "Normal" category in any of the variables. This suggests that, with this counseling program, participants were able to make improvements up to the "Needs Improvement" level but did not reach a state that the test classifies as "Normal."

In Table 3, a descriptive analysis of the variables for each group, both PG and VG, is presented. It is evident that in all variables, the mean shows improvement after the implementation of the family counseling program in both groups. For a better understanding of Table 3, it is necessary to explain that the phonemes recorded in the RFI encompass those phonemes that participants are unable to pronounce during the entire test. "RFI words" refers to the number of words participants cannot articulate. The decrease in this figure between the pretest and posttest reflects an improvement in both groups. The Intellectual Quotient (IQ) according to the Peabody test shows an increase, which is a positive indicator. Additionally, the Typical Score of the PLON-R is displayed, which also provides a qualitative result: delay, need for improvement, and normal (as observed in Figs. 2 and 3).

Furthermore, in Table 3, intergroup analysis conducted with independent samples T-Student is observed, and it is noted that Sig (two-tailed) is greater than 0.05 in all cases, indicating that there are no differences in either the pretest (indicating that both groups were similar at the start of the intervention) or the posttest, meaning that there are no differences between receiving virtual or in-person counseling in the results.

Table 4 presents the T-Student Test for Related Samples. On one hand, the analysis of PG has been conducted, and on the other hand, the analysis of VG has been performed. In all results, there is a significance value less than 0.05 in Sig (two-tailed), suggesting a significant difference between the pretest and posttest in all variables in both groups. Likewise, all Cohen's D values are around 1, indicating a significant and relevant difference, as the effect size is large, except for the results of the Peabody where the effect size is moderate. This means that there is a significant difference and a large difference in all variables, affirming that the program is effective, as there is a difference in the following variables: RFI and PLON form (Phonetics, Phonology, and Morphosyntax); PLON content (Semantics), PLON use (Pragmatics). At the same time, the result of the Peabody is moderate (Semantics), indicating that there is also a significant difference, although the size of that difference is smaller.

3.2. Perceptions of families and speech therapists about the program

With the purpose of exploring the perceptions of both families and speech therapists regarding the counseling program, the

Table 2
Description of the Codes Used in the Qualitative Analysis.

Code	Description
Advantages of Online Mode	It refers to the positive aspects identified regarding the virtual counseling mode. This includes comments and observations that highlight the specific benefits of participating in the program virtually.
Advantages of In-Person Mode	These encompass comments and observations that highlight the advantages and positive aspects of the in-person counseling mode. This includes experiences and perceptions related to in-person sessions.
Disadvantages or Challenges in Online Mode	It encompasses the difficulties and obstacles mentioned in relation to the virtual counseling mode. Here, comments that indicate the challenges that arose when participating in the program virtually are compiled.
Disadvantages or Challenges in In-Person Mode	Specific difficulties and obstacles identified in the face-to-face counseling mode are grouped together. Comments indicating the challenges experienced in in-person sessions are compiled.
Perceived Positive Results	It encompasses perceptions and observations related to the positive results that participants noticed in the children after participating in the counseling program. It includes comments expressing improvements in language and communication.
Perceived Negative Results	Observations and perceptions related to the negative results or lack of improvement that some participants identified in their children after participating in the counseling program are compiled. Comments expressing concerns or dissatisfaction with the results are included.

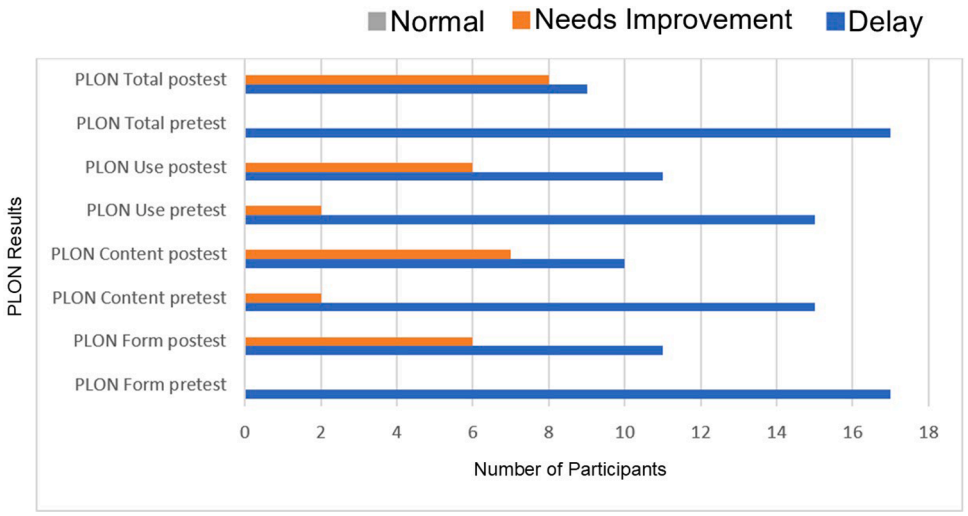

Fig. 2. PLON-R Results for the In-Person Group.

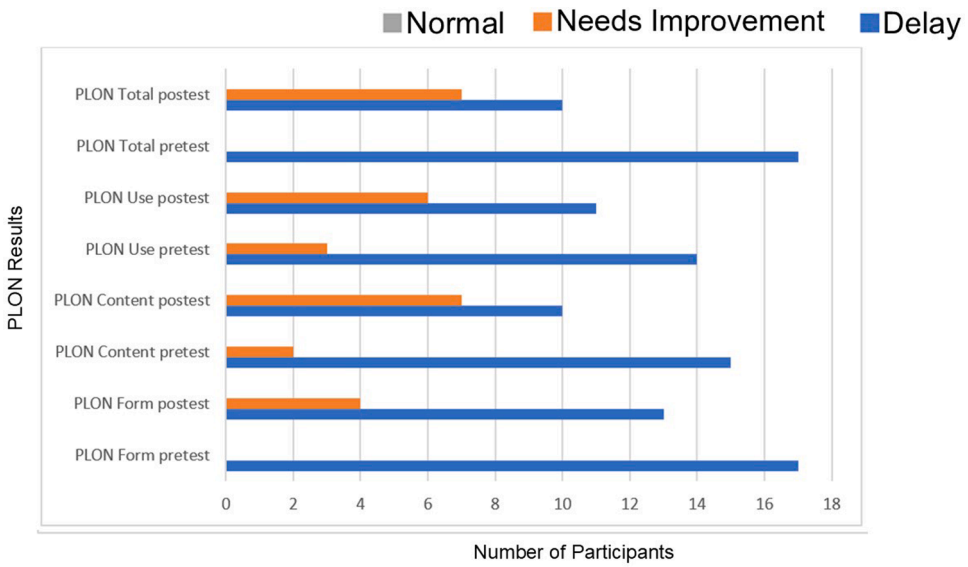

Fig. 3. PLON-R Results for the Virtual Group.

questionnaire questions have been analyzed and coded.

Fig. 4 shows the relationship scheme between different codes. In this context, "G" denotes the number of citations associated with each code, while "D" represents the density, i.e., the number of codes related to a specific code. For example, "Advantages of in-person mode" has a density (D) of 1, as it is linked only to "Perceived positive results." In contrast, "Perceived positive results" has a density (D) of 2, as it is related to both "Advantages of in-person mode" and "Advantages of online mode."

It is relevant to note that the number of citations coded as "Perceived positive results" (G=60) exceeds those coded as "Perceived negative results" (G=21). Regarding perceived negative aspects, there is a balance between the disadvantages of in-person mode (G=17) and online mode (G=17).

Here are some of the opinions expressed by families and speech therapists regarding "perceived positive aspects":

- "We have noticed that our child is using more words. Now, he tells us about his daily activities and names some things he didn't do before." (Excerpt 1_Family Questionnaire).
- "Before the program, our daughter had a lot of trouble speaking. Now, she uses more gestures and words to communicate. For example, when she wants water, she points to the bottle and says 'water,' which is a significant improvement." (Excerpt 2_Family Questionnaire).

Table 3
Descriptive analysis of the variables for each group and Independent Samples T-Test.

Variables	Presencial Group (PG)		Virtual Group (VG)		Independent Samples T-Test		
	Mean	Standard Deviation	Mean	Standard Deviation	T	Sig (Two-tailed)	Mean Differences
RFI Phonemes pretest	115.47	71.684	99.12	65.084	0.696	0.491	16.353
RFI Phonemes postest	70.82	36.007	62.53	43.704	0.604	0.550	8.294
RFI Words pretest	42.41	11.609	39.18	11.923	0.802	0.429	3.294
RFI Words postest	33.35	13.304	32.29	14.831	0.219	0.828	1.059
Peabody IQ pretest	78.18	27.686	75.65	27.906	0.265	0.792	2.529
Peabody IQ postest	93.47	18.961	93.94	17.690	−0.75	0.941	−0.471
PLON (PT) Form pretest	11.94	8.430	12.12	7.415	−0.065	0.949	−0.176
PLON (PT) Form postest	25.76	9.947	22.65	10.012	0.911	0.369	3.118
PLON (PT) Content pretest	16.29	12.444	19.12	13.874	−0.625	0.537	−2.824
PLON (PT) Content postest	26.41	15.054	29.35	10.908	−0.652	0.519	−2.941
PLON (PT) Use pretest	19.76	12.906	19.12	15.779	0.131	0.897	0.647
PLON (PT) Use postest	32.18	10.442	30.65	15.870	0.332	0.742	1.529
PLON (PT) Total pretest	9.82	7.359	12.41	8.078	−0.977	0.336	−2.588
PLON (PT) Total postest	29.71	8.153	28.71	10.030	0.319	0.752	1.000

Table 4
Prueba *T student* para muestras relacionadas y D de Cohen para ambos grupos.

	Presencial Group (PG)			Virtual Group (VG)		
	Paired Samples T-Test		Cohen's D	Paired Samples T-Test		Cohen's D
	T	Sig (two-tailed)	Value	T	Sig (two-tailed)	Value
RFI Phonemes pretest-postest	4.28	0.001	1.03	5.26	0.000	1.275
RFI Words pretest-postest	6.37	0.000	1.54	7.07	0.000	1.71
Peabody IQ pretest-postest	−2.50	0.024	0.605	−3.00	0.008	0.728
PLON (PT) Form pretest-postest	−5.71	0.000	1.384	−4.77	0.000	0.986
PLON (PT) Content pretest-postest	−4.07	0.001	0.986	−3.76	0.002	0.912
PLON (PT) Use pretest-postest	−4.29	0.001	1.04	−4.99	0.000	1.20
PLON (PT) Total pretest-postest	−9.13	0.000	2.25	−8.05	0.000	1.95

The above code is related to "advantages in the in-person mode," and here are some quotes:

- "Seeing them face to face allows you to adapt more from the very beginning to each family. Because seeing the children in person helps perceive things that might go unnoticed online." (Excerpt 3_Therapist Questionnaire).
- "In-person mode allowed for close interaction with parents and children." (Excerpt 4_Therapist Questionnaire).

There are also various "advantages in the online mode," as can be observed:

- "Families connected from their homes, which made the children more relaxed during our video calls because they were at home, as opposed to when they come to the clinic." (Excerpt 5_Therapist Questionnaire).
- "The biggest advantage of videoconferences is how we manage time and schedule appointments with families. It's easier for us. You call them, and if you have an opening because someone didn't show up, if they are at home, they can easily say yes, whereas if you ask them to come in, they might not be able to due to the travel time." (Excerpt 6_Therapist Questionnaire).

In contrast, there are "perceived negative aspects" such as:

- "So far, we haven't experienced significant improvements in her language, although we have done everything we were instructed to do, and we have taken into account what was explained to us. However, the child didn't make eye contact when we spoke, and she didn't show interest. It has been challenging." (Excerpt 7_Family Questionnaire).
- "No, he is still quite reserved. My husband did the program in the mornings, but there hasn't been much improvement." (Excerpt 8_Family Questionnaire).

These relate to "Disadvantages or difficulties in the in-person mode":

- "One of the difficulties I encountered was that families demanded more direct interaction time with the child. They asked me to do it over and over again, making it more challenging to fit within the time allocated for counseling." (Excerpt 9_Therapist Questionnaire).

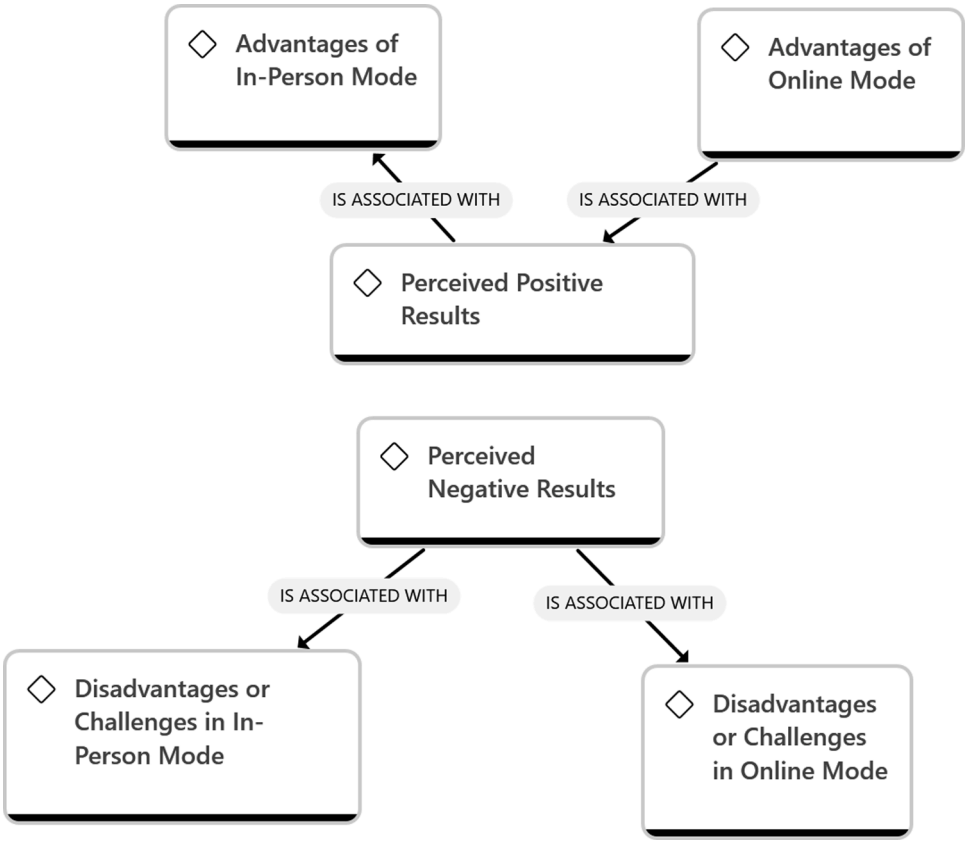

Fig. 4. Code network of perceptions and opinions of families and speech therapists about the program.

– "Some families found it hard to schedule appointments to come to the clinic. Some would say they were coming and then not show up, so we had to reschedule." (Excerpt 10_Therapist Questionnaire).

And with "Disadvantages or difficulties in the online mode":

– "The use of the computer and distractions at home were challenging at times, especially during the session where families had to do activities in front of the computer for me to see. It was often hard to see clearly, sometimes the audio quality wasn't good, sometimes the child didn't cooperate, and it was more complicated to identify what was going wrong or provide advice when viewing from the screen." (Excerpt 11_Therapist Questionnaire).
– "In the online version, we had a little issue with internet quality in some families. Sometimes, it made online sessions more challenging." (Excerpt 12_Therapist Questionnaire).

4. Discussion

4.1. Effectiveness of the family counseling program

The main objective of this research was to verify the effectiveness of the family counseling program, and it has been proven to be highly effective since there has been a significant improvement in all variables. These promising results are also found in other programs such as Enhanced Milieu Teaching (Robert & Kaiser, 2012, 2015; Roberts et al., 2014) and Home-Based Treatment (Whitehurst et al., 1991). However, these programs were not designed for Spanish-speaking children. Although the improvement is significant, the PELEO family counseling program does not achieve such a substantial improvement as to move from a result of significant difficulty to a normotypic result in the PLON-R test. Instead, it advances to the "needs improvement" category, indicating the necessity for continued treatment. This observation is consistent with previous findings suggesting that caregiver-implemented interventions can improve children's receptive language skills but have limited effects on expressive language skills (Roberts & Kaiser, 2015). Future program adaptations could focus on increasing the frequency of therapist-family interactions and integrating technology-based tools for ongoing support could help achieve further advancements in language outcomes.

Nevertheless, the result obtained in this study is greater than the results reported in other programs where speech therapists focus on language stimulation, as also noted by DeVeney, Hagaman, Bjornsen (2017), and as seen in results published using this same

program from this perspective (Ayuso-Lanchares et al., 2022). Furthermore, it is observed that the differences found in the pretest and posttest of both groups are significant for all variables, except for the vocabulary variable, measured with the Peabody test, which shows a moderate result. Other programs have focused on improving vocabulary (Axpe-Caballero et al., 2017; Fong et al., 2012; Hancock et al., 2002), but not many have aimed to improve overall language in such a successful manner (Bahamonde et al., 2021; Carson et al., 2022; Tukiran et al., 2023) or if it was carried out it was not done with a completely standardized intervention program (Verbeek et al., 2023).

4.2. In-person vs. virtual intervention

The other objective of this research was to analyze the differences between conducting this intervention in a virtual and in-person mode. At a quantitative level, no significant differences were found, meaning that in terms of participant outcomes, there is not a significant difference between conducting the family counseling program in-person or virtually. While the use of virtual sessions is not as common with children with LT and DLD, it is a viable option with significant benefits (Ben-Aharon, 2019; Lee, 2019). Since no quantitative differences were found, it is important to look at qualitative results to identify the differences between both interventions. In this regard, it is observed that the number of advantages and disadvantages is similar in both modalities, but the type of comments made by families is different.

The final objective was to understand the opinions of speech therapists and families about the program. On one hand, speech therapists indicated that some of the advantages of the in-person mode included direct interaction with the child and the proximity in the intervention. For speech therapists, the advantages of the virtual mode mainly revolved around scheduling flexibility. This advantage has already been confirmed in the study by Bayati and Ayatollahi (2023), which pointed out that this type of therapy can be considered a beneficial alternative approach, especially for patients who cannot attend clinics in person.

Disadvantages of the in-person mode include scheduling difficulties and family demand for more interaction time between the speech therapist and the child. This may be because families often find it challenging to decide on a counseling-based program in which they have to perform the majority of actions (Tukiran et al., 2023). To mitigate these difficulties, future implementations could incorporate strategies to enhance family adherence and reduce barriers. Such measures might include providing families with clearer, step-by-step guidance, establishing regular follow-ups to address questions and sustain motivation (Morin, 2014; Offenbacher, 2013), and offering practical resources tailored to their home environments (Fan et al., 2024; Pickstone et al., 2009). These strategies could not only improve adherence but also optimize the overall effectiveness of the program in both in-person and virtual modalities

For the virtual mode, distractions at home were the main issue, despite families following guidelines provided by Pozniak et al. (2023), such as preparing the physical and virtual environment and managing the child's behavior. Additionally, technological difficulties were observed, as Lee (2019) predicted; the quality of information technology resources is crucial for achieving good results.

Finally, regarding families' perceptions of the program, when expected results are not achieved, they often justify it with phrases such as "we have done everything we were instructed to do" or "we have taken into account what was explained to us," attempting to demonstrate that they have followed the program's instructions. These responses may be due to the emphasis placed on family fidelity and therapeutic adherence in such treatments (Biel et al., 2020).

5. Limitations and future research

It is important to consider the study's limitations, such as the limited number of participants and the absence of a control group that does not undergo any intervention. Additionally, the assignment of participants to the intervention groups was based on their preferences, which, while beneficial for ensuring adherence and engagement, introduces the possibility of selection bias. This could potentially impact the generalizability of the findings. Future studies should explore the feasibility of using randomized group assignments while maintaining participant engagement to strengthen the robustness of the study design.

Furthermore, it would be necessary to continue this line of work by designing an instrument to assess family fidelity to the program. As explained at the end of the discussion section, some families for whom expected results were not achieved express that they have completed the activities but have not achieved the expected results. Therefore, it would be advisable to quantitatively measure or assess this situation with an instrument, analyze it correctly, and consider it as a variable within the study.

6. Conclusions

It is important to emphasize the effectiveness of this counseling program in both modalities, with significant benefits in all aspects of the work. There are no significant differences in the results obtained in the in-person and virtual modalities, but differences are found in the perceptions of families and speech therapists in both modalities. Although there are roughly the same number of advantages and disadvantages in the program, their content differs. The main advantage of the in-person program is the closeness to families, while in the virtual mode, the flexibility in scheduling interventions in terms of both timing and location (at home) is the primary advantage. The main disadvantage of the in-person mode has been a focus on family counseling without tending to carry out child-centered activities, while in the virtual mode, technological difficulties have been a challenge.

The findings of this study suggest several practical implications for educational settings: First, this family counseling program based on the PELEO model can be effectively utilized both virtually and in-person. This provides flexibility for educational institutions to choose the mode of delivery that best suits their logistical constraints and the needs of the families they serve. Additionally, the significant improvements observed across all variables indicate that incorporating this program into educational settings can

substantially enhance language development in children with LT and DLD. Schools and educational centers can leverage this program to support children's language acquisition, regardless of the mode of delivery.

Moreover, the qualitative differences in family feedback highlight the need for educational professionals to provide tailored support based on the chosen modality. For in-person settings, ensuring sufficient interaction time between speech therapists and children is crucial, while for virtual settings, addressing technological barriers and creating distraction-free environments is essential. The flexibility offered by virtual sessions can be particularly beneficial for families with tight schedules or those living in remote areas, making it easier to engage in consistent and effective interventions.

This research provides valuable insights into the application of family counseling programs for language development within the Spanish-speaking context. By demonstrating the program's versatility and effectiveness, it sets a precedent for future interventions aimed at supporting children with developmental language challenges. Educational institutions can adopt this program to enhance their support services, ensuring that more children receive the necessary interventions to improve their language skills and overall development.

Funding sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Alba Ayuso-Lanchares: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Conceptualization. **Inés Ruiz-Requies:** Writing – review & editing, Methodology, Investigation. **Rosa Belén Santiago-Pardo:** Writing – review & editing, Investigation, Formal analysis.

Data availability

Data will be made available on request.

References

Acosta, V., Moreno, A., & Axpe, Á. (2011). Análisis de las prácticas de lenguaje oral y de lectura inicial en escolares con Trastorno Específico del Lenguaje en contextos de familia y aula. [Analysis of oral language and initial reading practices in schoolchildren with Specific Language Disorder in family and classroom contexts]. *Cultura York EducaciÓN, 23*(1), 43–56. https://doi.org/10.1174/113564011794728579

Aguilar-Mediavilla, E. M., Buil-Legaz, L., Esteller-Cano, Á., & Pérez-Castelló, J. A. (2019). Del trastorn específic del llenguatge (TEL) al trastorn del desenvolupament del llenguatge (TDL): un canvi de concepció sobre els trastorns del llenguatge. [From specific language disorder (SLI) to development language disorder (DLL): a change of conception about language disorders.] *Llengua, societat i comunicación. Revista Dèlelőtt sociolingüística Délelőtt Louisiana Universitat Délelőtt Barcelona*, (17), 64–79. https://doi.org/10.1344/LSC-2019.17.7

Aguinaga, G. L., Armentia, M. A., Fraile, A., Olangua, P., y, & Uriz, N. (2004). *Prueba de Lenguaje Oral de Navarra-Revisada (PLON-R). [Navarra Oral Language Test-Revised (PLON-R)*. Fondo de Publicaciones del Gobierno de Navarra.

Andreu-Barrachina, L., Gerardo-Aguado, M., Cardona-Pera, M.C. y Sanz-Torrent, M., 2014. El trastorno específico del lenguaje: diagnóstico e intervención, [Specific language disorder: diagnosis and intervention] Vol. 294. UOC.

Arzaga, A. A., & Jackson-Maldonado, D. (2021). La relación de gestos y lenguaje en niños con retraso inicial del lenguaje: un estudio en dos tiempos. *[The Relationship between gestures and Language in Children with Initial Language delay: a two-Stage Study] Signos Lingüísticos, 17*, 33.

Axpe-Caballero, M.Á., Acosta-Rodríguez, V. M., Moreno-Santana, A. M., & Ramírez-Santana, G. M. (2017). Aplicación de un programa de intervención léxico-semántica en alumnado con Trastorno Específico del Lenguaje. [Application of a lexical-semantic intervention program in students with Specific Language Disorder]. *Cultura York EducaciÓN, 29*(2), 324–349. https://doi.org/10.1080/11356405.2017.1305073

Ayuso-Lanchares, A., Santiago Pardo, R. B., & Ruiz Requies, I. (2022). Aplicación de un programa de estimulación lingüística en niños con retraso del lenguaje o trastorno del desarrollo del lenguaje. *Revista Española de Orientación Psicopedagógica, 33*(33), 22–39. https://doi.org/10.5944/reop.vol.33.num.3.2022.36459

Bahamonde, C., Serrat, E., & Vilá, M. (2021). Intervención en Trastorno del Desarrollo del Lenguaje (TDL). Una revisión sistemática (2000-2020). [Intervention in Developmental Language Disorder (DLD). A systematic review (2000-2020).]. *Revista Délelőtt InvestigaciÓN Enõsis Logopedia, 11*(1), 21–38. https://doi.org/10.5209/rlog.71975

Bayati, B., & Ayatollahi, H. (2023). Speech therapists' perspectives about using tele-speech therapy: a qualitative study. *Disability and Rehabilitation: Assistive Technology, 18*(5), 621–626. https://doi.org/10.1080/17483107.2021.1900933

Ben-Aharon, A. (2019). A practical guide to establishing an online speech therapy private practice. *Perspectives of the ASHA Special Interest Groups, 4*(4), 712–718. https://doi.org/10.1044/2019_PERS-SIG18-2018-0022

Bhat, A. (2021). Analysis of the SPARK study COVID-19 parent survey: Early impact of the pandemic on access to services, child/parent mental health, and benefits of online services. *Autism Research, 14*(11), 2454–2470.

Biel, C. H., Buzhardt, J., Brown, J. A., Romano, M. K., Lorio, C. M., Windsor, K. S., & Goldstein, H. (2020). Language interventions taught to caregivers in homes and classrooms: A review of intervention and implementation fidelity. *Early Childhood Research Quarterly, 50*, 140–156. https://doi.org/10.1016/j.ecresq.2018.12.002

Bishop, D., Snowling, M., Thompson, P., & Greenhalgh, T. (2016). CATALISE: A multinational and multidisciplinary Delphi consensus study. Identifying language impairments in children. *PLOS One, 11*(7). https://doi.org/10.1371/journal.pone.0158753

Cable, A. L., & Domsch, C. (2011). Systematic review of the literature on the treatment of children with late language emergence. *International Journal of Language Communication Disorders, 46*(2), 138–154. https://doi.org/10.3109/13682822.2010.487883

Campos, A., & Halliday, L. F. (2020). Implicancias del cambio terminológico: de "Trastorno específico del lenguaje" a "Trastorno del desarrollo del lenguaje" [Implications of the terminological change: from "Specific language disorder" to "Developmental language disorder"]. *Revista Digital EOS Perú, 8*(2), 79–90.

Carson, L., Baker, E., & Munro, N. (2022). A systematic review of interventions for late talkers: intervention approaches, elements, and vocabulary outcomes. *American Journal of Speech-Language Pathology, 31*(6), 2861–2874. https://doi.org/10.1044/2022_AJSLP-21-00168

A.J.A. Carvalho S.M.A. Lemos L.M.H.F. Goulart Language development and its relation to social behavior and family and school environments: a systematic review In Codas 28 2016 470 479.Sociedade Brasileira de Fonoaudiologia.

Ciccone, N., Hennessey, N., & Stokes, S. F. (2012). Community based early intervention for language delay: A preliminary investigation. *International Journal of Language Communication Disorders, 47*(4), 467–470. https://doi.org/10.1111/j.1460-6984.2012.00149.x

Collisson, B. A., Graham, S. A., Preston, J. L., Rose, M. S., McDonald, S., & Tough, S. (2016). Risk and protective factors for late talking: An epidemiologic investigation. *The Journal of Pediatrics, 172*, 168–174. https://doi.org/10.1016/j.jpeds.2016.02.020

Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-methods research: a discussion on its types, challenges, and criticisms. *Journal of Practical Studies in Education, 2* (2), 25–36. https://doi.org/10.46809/jpse.v2i2.20

Delaney, E. M., & Kaiser, A. P. (2001). The effects of teaching parents blended communication and behavior support strategies. *Behavioral Disorders, 26*(2), 93–116. https://doi.org/10.1177/019874290102600201

DeVeney, S. L., Hagaman, J. L., & Bjornsen, A. L. (2017). Parentimplemented versus clinician-directed interventions for latetalking toddlers: a systematic review of the literature. *Communication Disorders Quarterly, 39*(1), 293–302. https://doi.org/10.1177/1525740117705116

Dunn, L.M., Dunn, L.M. & Arribas, D. (2006). Peabody, test de vocabulario en imágenes. [Peabody, picture vocabulary test.] TEA ediciones.

Ebbels, S. H., McCartney, E., Slonims, V., Dockrell, J. E., & Norbury, C. F. (2019). Evidence-based pathways to intervention for children with language disorders. *International Journal of Language Communication Disorders, 54*(1), 3–19. https://doi.org/10.1111/1460-6984.12387

Fan, Q., Yu, X., Cheng, W., Su, L., Zhang, Y., Liu, Q., & Wu, Z. (2024). The effectiveness of therapist-led family-centered language intervention for children with language delay. *Translational Pediatrics, 13*(10), 1720. https://doi.org/10.21037/tp-24-225

Fong, N., Ho, S., So, B., & Lian, W. (2012). Evaluation of the Hanen it takes two to talk intervention programme. *Proceedings of Singapore Healthcare, 21*(4), 251–256. https://doi.org/10.1177/201010581202100406

Hancock, T. B., Kaiser, A. P., & Delaney, E. M. (2002). Teaching parents of preschoolers at high risk. *Topics in Early Childhood Special Education, 22*(4), 191–212. https://doi.org/10.1177/027112140202200402

Hawa, V. V., & Spanoudis, G. (2014). Toddlers with delayed expressive language: An overview of the characteristics, risk factors and language outcomes. *Research in Developmental Disabilities, 35*(2), 400–407. https://doi.org/10.1016/j.ridd.2013.10.027

Jones, J. C., McDonnell, A. P., Johnston, S. S., Blue, C. W., & Tolbert, M. (2023). Coaching parents to support oral language skills during shared reading. *Early Childhood Education Journal, 51*(4), 651–664. https://doi.org/10.1007/s10643-022-01327-0

Juárez, A. y Monfort, M. (1996). Registro fonológico inducido. [Induced phonological record] CEPE.

Kerai, S., Almas, A., Guhn, M., Forer, B., & Oberle, E. (2022). Screen time and developmental health: results from an early childhood study in Canada. *BMC Public Health, 22*(1), 1–9. https://doi.org/10.1186/s12889-022-12701-3

Law, J., Levickis, P., Rodríguez-Ortiz, I. R., Matić, A., Lyons, R., Messarra, C., & Stankova, M. (2019). Working with the parents and families of children with developmental language disorders: An international perspective. *Journal of Communication Disorders, 82*, Article 105922. https://doi.org/10.1016/j.jcomdis.2019.105922

Lee, S. A. S. (2019). Virtual speech-language therapy for individuals with communication disorders: Current evidence, limitations, and benefits. *Current Developmental Disorders Reports, 6*, 119–125. https://doi.org/10.1007/s40474-019-00169-7

Lindgren, B. M., Lundman, B., & Graneheim, U. H. (2020). Abstraction and interpretation during the qualitative content analysis process. *International Journal of Nursing Studies, 108*, 1–6. https://doi.org/10.1016/j.ijnurstu.2020.103632

Lirola, F. V. (2022). Trastorno específico del lenguaje en Andalucía, España: prevalencia en función del subtipo y del género. *Revista Dèlelőtt logopedia, foniatría York Audiología, 42*(3), 147–157. https://doi.org/10.1016/j.rlfa.2021.09.003

Manolson, A. (1992). *It Takes Two to Talk. A Parent's Guide to Helping Children Communicate*. Hanen Centre.

Morin, A. (2014). *The Everyting Parent's Guide to Special Education: A Complete Step-by-Step Guide to Advocating for Your Child with Special Needs*. Simon and Schuster.

Norbury, C. F., Gooch, D., Wray, C., Baird, G., Charman, T., Simonoff, E., … Pickles, A. (2016). The impact of nonverbal ability on prevalence and clinical presentation of language disorder: Evidence from a population study. *Journal of Child Psychology and Psychiatry, 57*(11), 1247–1257. https://doi.org/10.1111/jcpp.12573

Offenbacher, B. L. (2013). *First Words: A Parent's Step-by-step Guide to Helping a Child with Speech and Language Delays*. Rowman & Littlefield Publishers.

Pickstone, C., Goldbart, J., Marshall, J., Rees, A., & Roulstone, S. (2009). A systematic review of environmental interventions to improve child language outcomes for children with or at risk of primary language impairment. *Journal of Research in Special Educational Needs, 9*(2), 66–79. https://doi.org/10.1111/j.1471-3802.2009.01119.x

Pozniak, K., Rosenbaum, P., & Kwok, E. Y. L. (2023). Tasks performed by parents to enable telepractice for children with communication disorders: an interview study with clinicians and parents. *Disability and Rehabilitation*, 1–12.

Raffaele, C. T., Khosravi, P., Parker, A., Godovich, S., Rich, B., & Adleman, N. (2021). Social–emotional attention in school-age children: a call for school-based intervention during COVID-19 and distance learning. *Children Schools, 43*(2), 107–117.

Roberts, M. Y., & Kaiser, A. P. (2012). Assessing the effects of a parent-implemented language intervention for children with language impairments using empirical benchmarks: A pilot study. *Journal of Speech, Language, and Hearing Research, 55*(6), 1655–1670. https://doi.org/10.1044/1092-4388(2012/11-0236)

Roberts, M. Y., & Kaiser, A. P. (2015). Early intervention for toddlers with language delays: A randomized controlled trial. *Pediatrics, 135*(4), 686–693. https://doi.org/10.1016/j.jcomdis.2019.105922, 686-693.82, 105922.

Roberts, M. Y., Kaiser, A. P., Wolfe, C. E., Bryant, J. D., & Spidalieri, A. M. (2014). Effects of the teach-model-coach-review instructional approach on caregiver use of language support strategies and children's expressive language skills. *Journal of Speech, Language, and Hearing Research, 57*(5), 1851–1869. https://doi.org/10.1044/2014_JSLHR-L-13-0113

Tukiran, N. H., Zain, N. A. M., Nordin, N. A., & Basri, N. A. (2023). Parent-implemented language intervention for late talkers: a scoping review. *Malaysian Journal of Health Sciences/Jurnal Sains Kesihatan Malaysia, 21*(1). https://doi.org/10.17576/JSKM-2023-2101-04

Venker, C. E., McDaniel, J., & Yasick, M. (2020). Speech-language pathologists' ratings of telegraphic versus grammatical utterances: *a survey study*. *Journal of Speech, Language, and Hearing Research, 63*(7), 2271–2280. https://doi.org/10.1044/2020_JSLHR-19-00132

Verbeek, L., Vissers, C., Kleemans, T., Scheper, A., & Verhoeven, L. (2023). Early intervention of language and behavior in monolingual and bilingual preschoolers with Developmental Language Disorders. *Early Childhood Research Quarterly, 64*, 106–118. https://doi.org/10.1016/j.ecresq.2023.02.007

Weisleder, A., & Fernald, A. (2013). Talking to children matters: early language experience strengthens processing and builds vocabulary. *Psychological Science, 24* (11), 2143–2152. https://doi.org/10.1177/0956797613488145

Whitehurst, G. J., Fischel, J. E., Lonigan, C. J., Valdez-Menchaca, M. C., Arnold, D. S., & Smith, M. (1991). Treatment of early expressive language delay: if, when, and how. *Topics in Language Disorders, 11*(4), 55–68.