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Video feedback for families of hearing impaired children

Intervenção guiada por videofeedback a famílias de crianças com deficiência auditiva

Keywords

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Descritores

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ABSTRACT

In order to improve speech-language development in children with hearing impairment, in addition to speech-language therapy, the family should be the modifying agent for a satisfactory therapeutic response. Studies that analyze the effectiveness of speech-language pathology (SLP) intervention programs through video feedback are important, given the positive effects of this tool on the modification of behaviors with families of children with disabilities. Therefore, it is believed that video feedback interventions contribute to improve the communicative interactions between the families and children assisted by auditory rehabilitation services. The objectives of this study were to investigate the interaction between families and children with hearing loss and analyze the self-esteem and satisfaction of families before and after the intervention program. This is a non-randomized, clinical trial with case report in two groups: Experimental (n=5) and Control (n=5). The intervention was supported by family-child interaction videos and adapted instruments. Pre- and post-intervention protocols were applied. In the EG, improvement was observed in the interaction between the families and children with hearing loss and in the self-esteem of participants. The EG showed satisfaction with the intervention. We conclude that the SLP intervention program based on video feedback has positive effects on the family/child interaction and on parent self-esteem. Further studies with stricter methodological controls should be conducted to prove the efficacy of video feedback intervention for families of children with hearing loss.

RESUMO

Para melhoria do desenvolvimento das habilidades auditivas e da linguagem na criança com deficiência auditiva, além da terapia fonoaudiológica, a família deve ser o agente modificador para uma resposta terapêutica satisfatória. Estudos que analisem a efetividade de programas de intervenção fonoaudiológica por meio de *videofeedback* são importantes, dados os efeitos positivos desta ferramenta para a modificação de comportamentos com famílias de crianças com deficiência. Acredita-se, assim, que a intervenção por meio do *videofeedback* contribuirá para a melhoria das interações comunicativas entre as famílias e crianças atendidas pelos serviços de reabilitação auditiva. Os objetivos deste estudo foram investigar a interação entre as famílias e as crianças com deficiência auditiva, analisar a autoestima e a satisfação das famílias antes e após um programa de intervenção por meio do *videofeedback*. Ensaio clínico não randomizado, com estudo de casos em dois grupos, experimental (n=5) e controle (n=5). A intervenção contou com o apoio do vídeo de interação e de instrumentos adaptados. Protocolos pré e pós-intervenção foram aplicados. Observou-se melhora nas interações entre as famílias e crianças com deficiência auditiva nos casos do grupo experimental, bem como melhora na autoestima dos participantes deste grupo. O grupo experimental demonstrou satisfação com a intervenção realizada. Concluiu-se que o programa de intervenção fonoaudiológica baseado no *videofeedback* teve efeitos positivos na interação entre a família e criança e na autoestima dos pais. Estudos com controles metodológicos rigorosos deverão ser realizados para a comprovação de sua eficácia para famílias de crianças com deficiência auditiva.

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INTRODUCTION

As science and technology evolve, more and more infants and young children with hearing impairment have access to hearing aids, which favor the reception of linguistic information in their environment, essential for the healthy acquisition and development of language. Due to early intervention and the potential of this technology it is expected that the results obtained with hearing impaired children of this new generation be better than those reported in studies and experienced by children of previous generations⁽¹⁾.

However, research has indicated that despite the exploitation of brain plasticity provided by early intervention and the technological advent of hearing devices, quite variable language development results are still observed for this age group regarding hearing impairment. Nevertheless, it should be noted that studies have sought to identify the variables that interfere with these results⁽¹⁾.

An important factor for the prognosis of language development in children with hearing loss highlighted in the literature is the quality of the linguistic input offered by families to compensate for the barriers imposed to them by this impairment, even with the support of hearing technology. Therefore, specific intervention with families of hearing impaired children is necessary to improve the quality of the language input offered, creating a protection cycle for healthy language development in this population. It should be considered that exposure to linguistic stimuli alone is not sufficient for the appropriate development of language for a specific age group. Children should also be able to access and process the linguistic input to which they are exposed, and this depends on the ability of family members to favor the language environment of their children⁽²⁾.

In clinical practice, speech-language pathologists may ask themselves: How can we access the families and promote meaningful behavioral changes and reflections on the hearing-impaired child/family interaction?

First, speech-language therapists should remember that hearing loss can negatively influence a child's ability to communicate with other individuals, including their own family, thereby interfering with the quality of family interactions and self-esteem, putting the child's socio-emotional development at risk as well. Thus, hearing loss in children is commonly associated with difficulties in interacting with their family. Although a growing number of studies on access to early intervention indicate improved language outcomes in samples of children with hearing loss, there is still a gap in the communicative understanding and quality of parent/child interactions in this population^(3,4).

The contingent of hard-of-hearing children presents a series of distinct needs and characteristics, and the intervention to be selected by the speech-language therapist still lacks support of scientific evidence. However, there is consensus that the relationship between the children and their families should be considered for speech-language pathology (SLP) therapeutic planning⁽⁵⁾. In this context, speech-language therapists should act as guides and mediators not only between language and child, but also between parents and child⁽⁶⁾.

It is worth noting that mothers who respond not only to their children's attempts to affection, but also to those to communication provide them with a basis to begin to understand the systematization of a conversation. Within these interactions or dyads, the synchronicity of parental responses should increase the children's responses. However, when a child is born with significant hearing loss, the nature of the social exchanges between the hearing parents and their hearing-impaired child is altered^(3,4). In a study with mothers of hard-of-hearing children, increased maternal stress was observed, negatively influencing the quality of life of the families because of the decrease in the children's communication capacity and the consequent increase in behavioral problems. This relationship may occur because of the discrepancy between parental expectations and the language that is actually presented by the child^(7,8).

Therefore, guidance for parents is fundamental so that they can prepare a more elaborate diagnosis of hearing loss, enabling situations favorable to the development of the child. The period during and immediately after diagnosis provides opportunities for the professionals involved in the child's enrollment in habilitation or rehabilitation programs to clarify the possibilities of the child and the appropriate behaviors to be followed, aiming at the development expected by the parents. Video Interaction Guidance (VIG) or intervention through video feedback is a widely used method to support behavioral changes especially associated with human interactions⁽³⁾. This tool has the potential to optimize SLP interventions with families of children with hearing loss.

VIG or video feedback is an intervention that involves changes in individuals with the purpose of improving situations of engagement and communication, and it can target personal or professional relationships. This intervention was shape around 1980, based on a model developed by Harrie Biemans, originally called Video Home Training (VHT), inspired by the studies of Professor Colwyn Trevarthen, who devoted much of his research to the relationships between children and their families⁽⁹⁾. The intervention initially includes a video recording of the interaction between the parents and the child in a natural situation and lasts ten minutes. Although families are aware of the video recording, they often adapt well to the technique. The guide or interventionist then edits the filming, selecting the most successful moments of interaction, even if the parent-child attunement at that moment was an exception to the usual pattern of behavior. At another moment, the parents and the interventionist watch the pre-selected video interaction together and the family reflects on what actions before the child would make that moment a successful interaction. Before the end of the session, the parents should reflect and discuss points that could be improved. In this way, a new cycle of video recording and shared review begins. This cycle is repeated until a positive pattern of interaction is established, with three to four intervention sessions being required to observe some progress^(9,10). The use of video feedback to trigger the family's ability for reflective functioning may provide immediate and long-term benefits for the child and the parent-child relationship⁽¹¹⁾. The promoted

reflection encompasses positive moments in parent-child interaction: the adults correspond to the children's actions or their communicative initiative using the so-called "contact principles"⁷⁽¹²⁾, such as turn-taking, eye-gaze, and other aspects of communication that deepen the relationship.

It is important to emphasize that VIG does not propose that professionals teach parents how to interact with their children, but rather how to learn from their own experience, leading them to reflection. Video recording the interaction between parents and their hearing-impaired children in natural situations allows the speech-language therapist to be more objective in the intervention, and watching them together encourages families to self-assess and visualize, from a different perspective, how their behaviors have a direct effect on the hearing and communication development of their children. In addition to these benefits, the literature reports that, after video feedback, there is also improvement in the self-esteem of parents who were initially negatively affected by the diagnosis of hearing loss⁽³⁾.

Therefore, considering the extreme importance of this theme for SLP intervention with the population of hearing-impaired children and their families, the objectives of the present study were to investigate the interaction between families and children with hearing loss and analyze the self-esteem and satisfaction of families after a video-feedback intervention program.

CASE REPORT

This is a longitudinal, non-randomized, clinical trial with individuals divided into two groups: Control (CG) and Experimental (EG). The CG (n=5) and EG (n=5) were composed of families of children with hearing loss (caregivers, parents, and/or grandparents).

Individuals in both groups (EG and CG) belonged to similar economic classes and socioeducational contexts (Table 1). The sessions were recorded on video for qualitative analysis and the protocols were classified after video analysis and interviews with the families. It is worth mentioning that the participating families were already used to situations of video recordings, considering that this procedure occasionally occurs in speech-language therapy for analysis and discussion of cases.

All of the participating children, aged five to eleven, were diagnosed with mild to profound sensorineural hearing loss (Table 2). Inclusion criteria comprised acceptance and signing of an informed consent by the families of children with hearing loss of any type or grade, users of individual hearing aids (IHA) or cochlear implants (CI), of any age group, undergoing rehabilitation at the *Centro SUVAG* (Guberina's Universal Verbotonal Auditory System) *do RN*, enrolled in the hearing and language program. Families of children not enrolled in the

Table 1. Characterization of the families participating in the study

Group	Family	Age (years)	EL	Occupation	Monthly income	Government Assistance
CG	C1	29	CI	Housewife	Social security	<i>Bolsa Família</i> Program
	C2	29	HSI	Housewife	1 minimum wage	<i>Bolsa Família</i> Program
	C3	41	HSC	Housewife	1 minimum wage	<i>Bolsa Família</i> Program
	C4	48	ESC	Driver	1 minimum wage	<i>Bolsa Família</i> Program
	C5	27	HSC	Housewife	1 minimum wage/Pension	-
SG	E1	53	HSC	Housewife	2.3 minimum wages	-
	E2	55	ESC	Housewife	1 minimum wage	-
	E3	34	ESI	Housewife	1 minimum wage	-
	E4	40	HSC	Housewife	2.6 minimum wages	-
	E5	52	HSC	Military servant on leave	4.5 minimum wages	-

Caption: CG: Control group; SG: Study group; EL: Educational level; CI: College - Incomplete; HSI: High School - Incomplete; HSC: High School - Complete; ESC: Elementary School - Complete; ESI: Elementary School - Incomplete

Table 2. Characterization of the children participating in the study

Group	Child	Chronological age (years/months)	HA (years/months)	Degree of SNHL ⁽¹³⁾		Etiology of HL	Adaptation	Hearing aid	
				RE	LE			RE	LE
CG	C1	11y8m	6y4m	Moderate	Severe	Idiopathic	Bilateral	IHA	IHA
	C2	7y5m	1y2m	Severe	Severe	Idiopathic	Bilateral	IHA	IHA
	C3	11y9m	3y2m	Severe	Moderate	Idiopathic	Bilateral	IHA	IHA
	C4	10y11m	2m	Mild	Normal	Idiopathic	Unilateral	IHA	-
	C5	5y6m	2y0m	Profound	Profound	Idiopathic	Bilateral	IHA	CI
EG	E1	8y6m	2y1m	Mild	Moderate	Idiopathic	Bilateral	IHA	IHA
	E2	7y0m	2y1m	Severe	Profound	Prematurity	Bilateral	IHA	CI
	E3	9y9m	4y4m	Severe	Profound	Idiopathic	Bilateral	IHA	IHA
	E4	8y2m	2y2m	Moderate	Moderate	Hereditary	Bilateral	IHA	IHA
	E5	5y3m	3y8m	Profound	Profound	Idiopathic	Bilateral	IHA	CI

Caption: CG: Control Group; EG: Experimental Group; HA: Hearing age; y: years; m: months; RE: Right ear; LE: Left ear; SNHL: Sensorineural hearing loss; HL: Hearing loss; IHA: Individual hearing aid; CI: Cochlear implant

Centro SUVAG/RN or families of children with other special needs associated with hearing impairment were excluded from the study. Individuals in the CG were submitted to traditional speech-language therapy, whereas participants in the EG underwent video feedback intervention concurrently with the traditional therapy offered by the hearing health service. The study was approved by the Research Ethics Committee of the Universidade Federal do Rio Grande do Norte under process no. 1.144.295.

All participants were clearly informed about the procedures and signed an Informed Consent Form (IFC) prior to study commencement.

The following pre- and post-intervention assessment instruments were used:

1. Listening and Talking: a guide to promoting spoken language in young hearing-impaired children, developed by Cole⁽¹⁴⁾, which consists of a scale of observation of communicative behaviors in the interaction of hearing parents with their hard-of-hearing children for analysis of family/child interactions⁽¹⁵⁾;
2. Rosenberg Self-Esteem Scale (RSES), developed by sociologist Morris Rosenberg⁽¹⁶⁾ and revised by Hutz and Zanon⁽¹⁷⁾, which proposes a one-dimensional measure with 10 items designed to globally evaluate the positive or negative attitude of individuals towards themselves.

In addition to the pre- and post-intervention analysis instruments, a satisfaction questionnaire on the intervention was prepared through video feedback and applied to the families of the EG.

The data were analyzed quantitatively and qualitatively comparing the pre- and post-intervention measures of each instrument. Five video feedback sessions lasting at least forty minutes were conducted with each family in the EG.

Figure 1 depicts the analyses of the interaction situations of the families and children in the EG and CG at two moments: pre- and post-intervention. For the families in the EG (E1, E3, E4, and E5), a positive change in interaction was observed in the scale of communicative behavior, which was not noticed for the families in the CG (C1, C2, C3, C4, and C5).

Qualitative analysis of the observation scale of communicative behavior in family-child interaction showed that several aspects were improved in the E1, E3, E4, and E5, namely, following the interest of the children, calling them preferentially by the name; greater use of communication strategies; naming of objects; expansion of children's semantic production; attention solicitation; encouraging the child in the activity using melody and positive reinforcement; use of strategies that maximize the use of hearing, such as acoustic highlights and approximation of hearing aids. Family E2 presented a slight increase in the indices throughout the filming sessions. The use of gestures, orofacial reading, distance to the hearing aids, and the little intention to initiate/maintain a dialogue with the child were characteristics constantly present in the videos of family E2. This family was

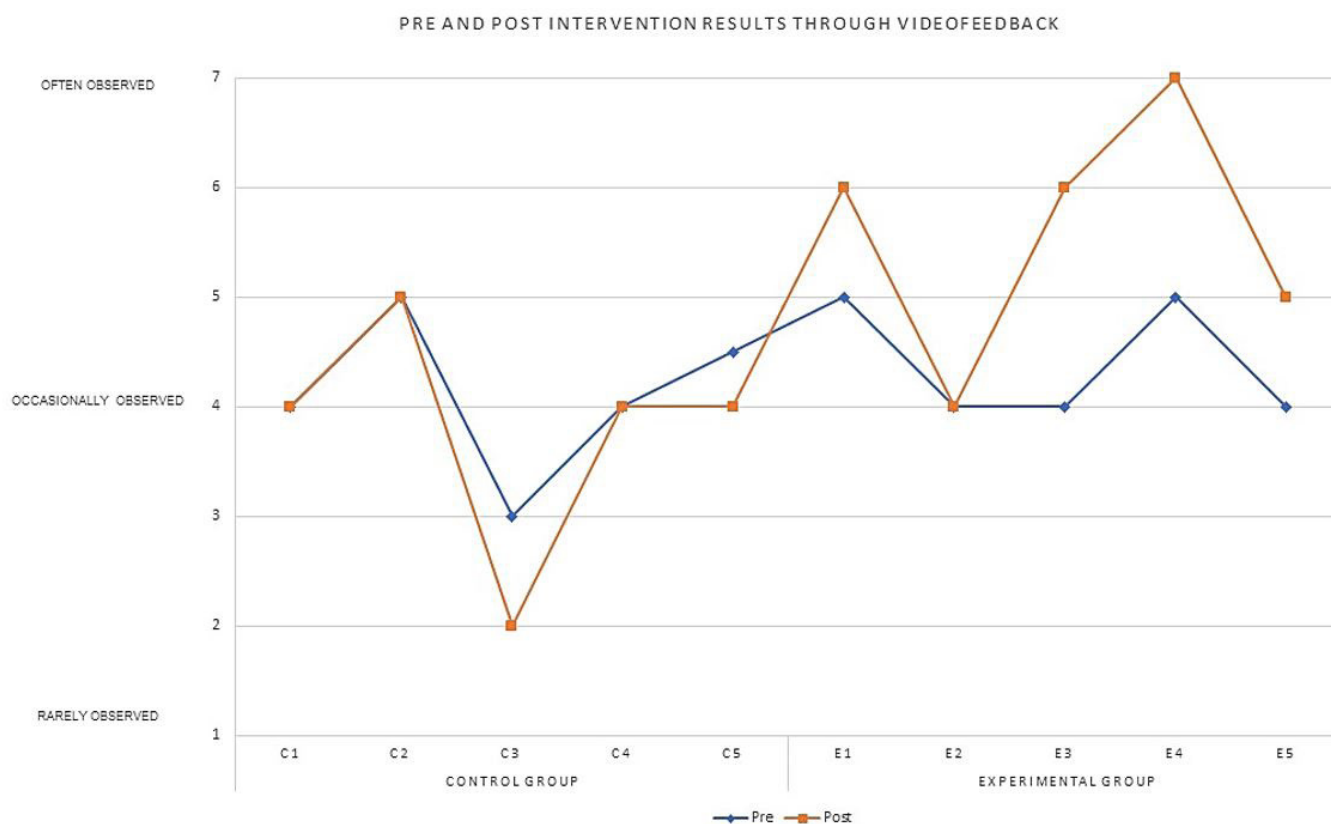


Figure 1. Pre- and post-intervention results through video feedback regarding communicative interaction

undecided on the choice of the communication approach with the child, frequently using the Brazilian Sign Language (LIBRAS) and oral communication in the communicative interactions with the child.

Analysis of the interaction videos of family E5 showed excessive stimulus, non-functional repetitions, increased speech rate of the parent, demand of a response from the child without following their interest, and moments of hesitation. Such behavior decreased slightly throughout the sessions.

Regarding self-esteem of the participants, the responses of the two groups presented differences. Minimal variability between the pre- and post-evaluation assessments was observed in the CG. As for the families in the EG, difference between the pre- and post-intervention scores was remarkable (Figure 2).

Concerning satisfaction with the video-feedback sessions, all families in the EG were satisfied with this intervention tool (Figure 3).

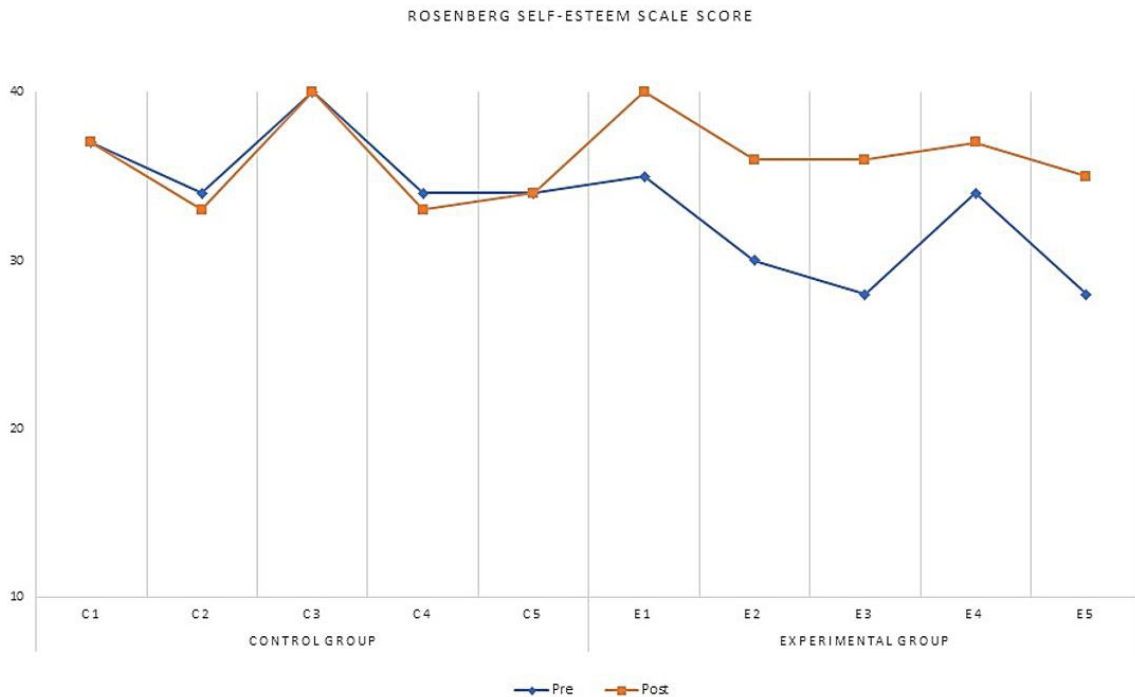


Figure 2. Pre- and post-intervention results of the self-esteem scale for families in the Control and Experimental groups

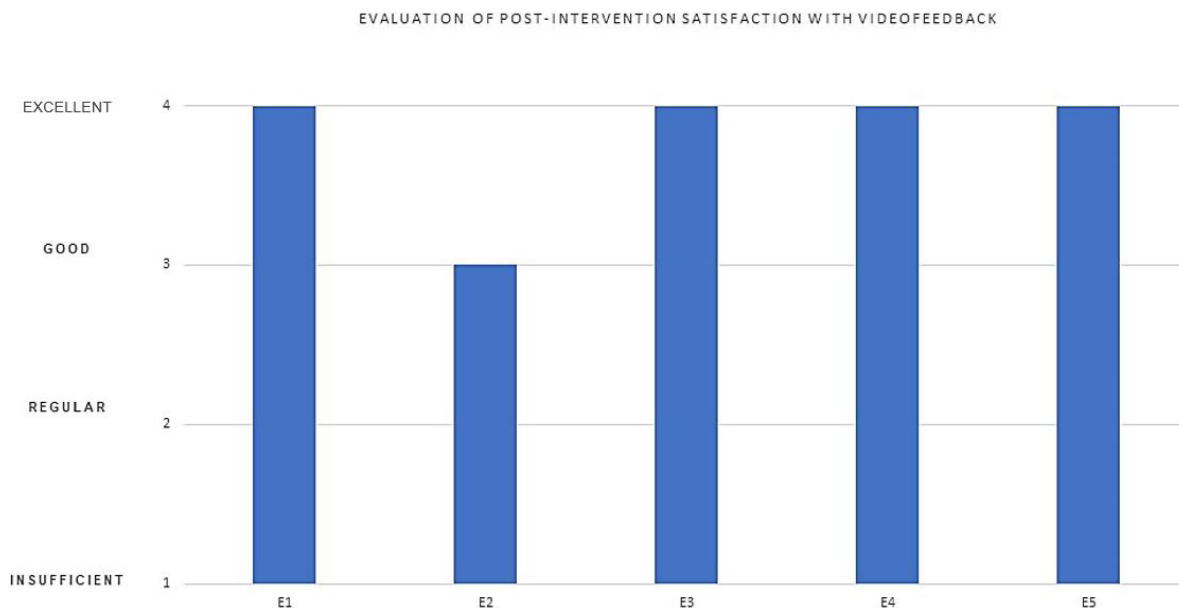


Figure 3. Results of satisfaction with the intervention through video feedback for the families in the Experimental Group

DISCUSSION

The results of this case report corroborate the literature, which reports positive effects of intervention through video feedback, with changes in the communication interactions between parents and children observed for families E1, E3, E4, and E5 compared with those of the families in the control group (CG)^(3,9,12), indicating that, even with few sessions, the families incorporated the guidance received through video feedback to the interactions, thus improving their children's access to linguistic input.

In addition to the direct benefit to communication, in the case of hearing-impaired children, intervention through video feedback showed a positive effect on parents' self-esteem even after only a few sessions⁽³⁾.

The researchers observed a new behavior: families sought to participate more actively in their children's speech-language therapy (as reported by the families themselves), showing knowledge about the fact that playing an active role to improve their children's language development transcends taking them to speech-language therapy. When families observe the positive results of their improvement on the communicative interaction with their children, they find motivation for such changes in themselves⁽¹⁸⁾.

It was possible to notice that factors such as anxiety (observed throughout the filming sessions in family E5) directly influenced the interaction. From the results of family E5, the need for interdisciplinary interventions, with the possibility of using video feedback, is evidenced in an extended approach to the needs of each family.

The speech-language therapist that makes a choice of developing interventions with families of children with hearing loss through video feedback may cope with the various needs presented by these families, both with respect to information about hearing loss, communication strategies, and child motivation, as well as regarding aspects of interpersonal relationships. In this study, in addition to the factors related to communication between families and their children with hearing impairment, the video-feedback sessions conducted were permeated by themes raised by the families, namely, information on hearing loss, care with electronic devices, use of the frequency modulation (FM) system by schoolteachers, and learning difficulties.

Video feedback proposes, through practice and self-reflection, to support families not only strictly in communication, but also in the interaction with their children and other necessities^(9,19). When watching the video, many may be the emotional responses: surprise, fear, pride, doubt, or shame. This capacity of the video to influence families makes video feedback a powerful tool⁽¹¹⁾.

Mostly, video-feedback programs involve goals that compose a change behavior (family sensitivity, attachment, behavior, parenting skills). However, many published studies do not describe the particularities of these programs, their structure and method, hindering standardization and creation of parameters to measure the effectiveness and efficacy of the intervention performed between studies. In this research, the VIG methodology was used⁽⁹⁾ with adaptation of family/child interaction analysis protocols⁽¹⁸⁾.

Therefore, further studies with larger samples and robust methodologies are required for the generalization of results and the use of these clinical research data for the incorporation of evidence-based practices in speech-language pathology (SLP) with families of children with hearing loss. Still on the results of this study, two families (E2 and E5) evolved less in the intragroup comparison, being necessary a possible adjustment in the number of filming sessions, a redefinition of the goals to be reached during video feedback, and, especially, an adjustment in the approach in order to enhance their interaction with their children. The literature reports that the number of filming sessions and their effectiveness in changing family behavior varies from one to seven or from eight to fourteen sessions⁽¹⁹⁾, a fact that should be considered when planning interventions with families. Most likely, families with important social-emotional components will need more sessions to achieve communicative behaviors more favorable for the development of their hearing-impaired children, a fact observed for the participants in families E2 and E5. Thus provision of intervention through video feedback needs to be personalized, and each case may elicit different ways in approaching families for guidance, as well as a variable number of filming sessions.

Therefore, continuity of this study is justified, as well as of others that may contribute to scientific knowledge that supports the clinical practice in auditory habilitation and rehabilitation, specifically in the work with families - agents that modify the reality of children with hearing impairment⁽¹²⁾.

FINAL COMMENTS

- In conclusion, video-feedback intervention for the cases of the families of children with hearing loss analyzed in this study showed positive effects for four of the five families of the experimental group (EG) compared with the control group (CG), with a minimum of three filming sessions required to observe the first improvements;
- Positive effects were observed with respect to the self-esteem of the families in the EG, an issue to be considered in programs of auditory habilitation and rehabilitation;
- The families investigated were satisfied with the speech-language pathology intervention through video feedback;
- Further research with larger samples, monitoring, and greater methodological robustness (randomized and double-blind studies) should be conducted in order to generalize results with a view to recommendation for practices based on scientific evidence for intervention for families of children with hearing loss.

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Author contributions

IRDS was responsible for the literature review, data collection, and writing of the manuscript; JSB was the study advisor, in charge of data collection and writing of the manuscript.