

Experience Report

Video feedback interventions for improving children's development: recommendations for pediatric therapists

Intervenções por meio de vídeo feedback para melhorar o desenvolvimento infantil: recomendações para terapeutas pediátricos

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Abstract

Introduction: Video feedback has been used in some therapeutic settings to support parenting and child development. There is evidence of positive outcomes when therapists implement video feedback when working with children with neurodevelopmental disabilities and their parents. More information about how to use and implement this strategy needs to be provided. **Objective:** This study proposes adapting these strategies to healthcare fields such as speech therapy, occupational therapy, and physical therapy. **Methods:** This document presents a description and protocol to guide the adaptation and implementation of video feedback in working with children. It describes organizing the sessions, analyzing the videos, and giving the family feedback. **Results:** This intervention is valuable for the interdisciplinary health or rehabilitation team. **Conclusion:** It can be used in interventions of different disciplines to promote the development of different skills such as feeding, language, sensory integration, and fine and gross motor development.

Keywords: Child Development, Occupational Therapy, Physical Therapy, Speech Therapy.

Resumo

Introdução: O feedback em vídeo tem sido usado em alguns ambientes terapêuticos para apoiar a parentalidade e o desenvolvimento infantil. Há evidências de resultados positivos quando os terapeutas implementam a feedback em vídeo ao trabalhar com pais e crianças com dificuldades ao longo das trajetórias de desenvolvimento. No entanto, há pouca informação sobre como utilizar e implementar esta estratégia. **Objetivo:** Este estudo apresenta uma proposta de

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adaptação dessas estratégias para áreas da saúde como fonoaudiologia, terapia ocupacional e fisioterapia. **Métodos:** Este documento apresenta uma descrição e protocolo para orientar a adaptação e implementação do feedback em vídeo no trabalho com crianças. Descreve como organizar as sessões, como os vídeos são analisados e como o feedback é dado à família. **Resultados:** Esta intervenção é uma ferramenta valiosa para a equipe interdisciplinar de saúde ou reabilitação. **Conclusão:** Pode ser utilizada em intervenções de diferentes disciplinas para promover o desenvolvimento de diversas habilidades como alimentação, linguagem, integração sensorial, desenvolvimento motor fino e grosso.

Palavras-chave: Desenvolvimento Infantil, Terapia Ocupacional, Fisioterapia, Fonoaudiologia.

Introduction

Video feedback (VF) is a strategy that observes and analyzes interactions and actions captured on camera. It is frequently used to support, guide, and educate those who receive feedback in coaching, educational, therapeutic, and entertainment settings. It could be observed live or recorded as a video that could be viewed later (Provenzi et al., 2020). This is mainly because of VF's proven capacity to improve user outcomes and increase patient satisfaction. In addition, VF allows users to track progress, improving adherence and treatment commitment (O'Hara et al., 2019).

VF has been used in some therapeutic settings to support parenting and healthy child development. In these experiences, parents are filmed taking part in interactions with their children and are then invited to watch and reflect on the video recording under the guidance of a therapist to work with the feedback. This strategy effectively supports parents' sensitivity, which can impact children's development (Balldin et al., 2018; O'Hara et al., 2019). Early interventions should involve family-centered approaches, empowering caregivers to implement therapeutic strategies in their daily routines and working in an equal partnership with them (Akhbari Ziegler & Hadders-Algra, 2020; Ousley et al., 2022). The relevance of working with families relies on the evidence that parenting interventions improve early childhood cognitive, language, motor, and socioemotional development and attachment and reduce behavior problems. Parenting interventions also improved parenting knowledge, practices, and parent-child interactions (Britto et al., 2017; Jeong et al., 2021; Moreno-Chaparro et al., 2024; Prado et al., 2019). Jeong et al. (2021) conducted a systematic review and meta-analysis to evaluate the effectiveness of parenting interventions. Their research found that parenting interventions that included content on responsive caregiving had significantly more significant effects on child cognitive development, parenting knowledge, parenting practices, and parent-child interactions than interventions that did not include responsive caregiving in their program.

Evidence suggests that VF can be valuable for fostering child development and caregiver sensitivity (Olhaberry et al., 2019). This is a privileged strategy when working in pediatric settings (Facchini et al., 2016; Høivik et al., 2015), with numerous research showing its effectiveness on the quality of interactions, attachment, and variables

associated with mental health and child development (Fukkink, 2008; Moss et al., 2011; Olhaberry et al., 2017). Provenzi et al. (2020) reported positive outcomes when therapists implemented VF when working with children with neurodevelopmental disabilities and their parents. They found effects on children's development, and parents increased their ability to read and respond to children's signals.

For therapists in the pediatric field, such as occupational, speech, and physical therapists, VF can engage parents to focus on interactive behavior to reinforce positive interactions and favor their children's development. In other words, this strategy uses caregiver coaching to foster family involvement in the therapeutic process (Akhbari Ziegler & Hadders-Algra, 2020; Ousley et al., 2022). In speech therapy, it has been used in various areas to enhance the recognition and treatment of language, speech, and hearing (Bellon-Harn et al., 2020; Grossinho et al., 2017; Santos & Brazorotto, 2018). Some studies related to the use of VF in occupational therapy described this strategy mainly in adults with physical conditions (Schmidt et al., 2013; 2015) or in more academic activities such as providing feedback to students on learning transfers, range of motion, and manual muscle testing (Truskowski & VanderMolen, 2017). The use of VF in interventions related to physical therapy described the use of this strategy in wheelchair skill training for persons with spinal cord injuries (Wang et al., 2015). More information about using and implementing this strategy in the pediatric field in these disciplines is needed.

In therapeutic sessions with children and their parents, VF could promote positive interactions between parents/caregivers and their children, enhancing the caregivers' parenting skills and reinforcing their role in their children's development (Alvarenga et al., 2020). These interventions aim to strengthen families' and caregivers' capacity to support young children's development, and in return, this produces positive effects on the families, such as less parental stress and more sense of self-efficacy (King et al., 2019). When working with parent coaching using VF, both the family and the child are at the center of the interventions, and some key elements should guide the work with this approach, like focusing on capacity building, being non-directive, reflective, and working in partnership with families (Akhbari Ziegler & Hadders-Algra, 2020).

This strategy could provide an understanding of the intervention from the therapeutic change, providing information and supervision from the therapists to the family, and allowing them to realize the changes in the process within the feedback based on this strategy (Juffer & Bakermans-Kranenburg, 2018; Provenzi et al., 2020) (see Table 1). VF can become an important intervention strategy for the therapist by providing a safe and reliable environment for caregivers and children. Also, it does not require a significant amount of time investment and is cost-effective, allowing us to consider the multiple benefits of active and responsive parenting in children's development. Therefore, the VF strategy would provide the necessary tools to foster parenting skills and the ability of caregivers to respond effectively to the needs of children, where such interventions could greatly help the different therapists' roles (Grumi et al., 2021; Provenzi et al., 2020).

This study aims to present a proposal on how to adapt these strategies to healthcare fields such as speech therapy, occupational therapy, and physical therapy. Additionally, the study sought to identify any potential challenges of using VF in the healthcare

setting. The research is part of a major project where it has been assessed the effectiveness of the use of VF in children.

Table 1. Principles related to the use of VF.

Principles	Rationale	Therapist's Role
Foment an Ecological Approach.	Learning and development are embedded in a child’s environment.	It involves the necessity to move inside the natural environment to understand what children are experiencing daily.
Create a therapeutic rapport.	It contributes to a user feeling safe and respected so that therapy can succeed.	Foster effective communication and promote disclosure and openness in interactions.
Ensure that feedback is provided promptly.	Early feedback provided at the beginning of the rehabilitation process increases the possibility of generating self-awareness and improving the ability to incorporate learning quickly, fostering the recall of information and maintenance of attention. The timing of feedback should be individualized to suit the users' needs.	Through clinical reflection and discussion with the rehabilitation team, ascertain whether a caregiver is prepared to receive feedback. Feedback should be given as soon as possible after the client completes the task. A break before the feedback session may be necessary for caregivers who feel tired.
Encouraging a transdisciplinary strategy or approach.	Share of labor across disciplinary lines to maximize team members' opportunities for interaction, communication, and cooperation.	Share with the team interventions, watch the videos, and transmit possible contributions or collaborations between disciplines.
Give feedback on both areas of strength and areas for improvement.	Expanding self-awareness, offering themselves opportunities to explore their strengths and areas for development.	Reinforce progress and efforts during therapy. Begin by discussing strengths before focusing on areas that need improvement, along with strategies for improving the latter.

Note: Five core principles that support the intervention proposal are described. These principles are based on previously published approaches and will be used with the intervention protocol described below (Schmidt et al., 2015).

Intervention Description and Protocol

This section describes the application of interventions based on the use of VF. This proposal responds to the work of the university's child rehabilitation team. During the pandemic, an adaptation of the use of VF was carried out based on the work of Olhaberry and collaborators and on some of the central concepts of the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) model (Juffer & Bakermans-Kranenburg, 2018; Leyton et al., 2019; Olhaberry et al., 2017;

Van Ijzendoorn et al., 2023). Adjustments were made through feedback received from families and therapists.

The theoretical foundations for this protocol are rooted in Attachment Theory and the Social-Cognitive Learning Model. Attachment Theory emphasizes the importance of caregiver-child relationships in child development (Juffer et al., 2017), while the Social-Cognitive Learning Model suggests that individuals learn through observation and imitation (Ramirez et al., 2012). By integrating these theories, VF aims to enhance parenting skills and promote positive interactions between caregivers and children.

Methodological approaches used in this intervention include caregiver coaching and reflective practice. Coaching involves working collaboratively with caregivers to set goals, plan actions, and reflect on their practices (Akhbari Ziegler & Hadders-Algra, 2020).

This strategy can be used in sessions delivered in person or remotely. This may depend on the possibilities of the users to attend the care center or some contextual situations. Also, it is essential to point out that combining face-to-face sessions with those carried out online is possible. Before starting the VF sessions, therapists should explain to the family how the sessions are organized and how the videos should be recorded. Describing how the material will be cared for and its confidentiality is relevant; then the parents should sign an informed consent. It is imperative to be careful when storing data and videos; anonymity must always be maintained, and only the professional in charge can access this material.

Each protocol element is carefully designed to guide therapists and families through the intervention process. The key elements include session organization, video recording instructions, analysis of the videos, feedback delivery, and the use of a 'Toolbox' of strategies for families to implement at home. Adjustments made to the protocol include providing detailed instructions for video recording to ensure consistency and effectiveness. For instance, it is important to always show the child and adult's faces during the recording to capture full interactions. The videographer, who is usually another caregiver or family member, should avoid interacting during the recording to prevent influencing the natural interaction between the child and the participating caregiver. To assist families, supplementary material with detailed guidelines on recording effectively is provided (see Supplementary Material 1). This includes tips on camera placement, lighting, and creating a comfortable environment for the child and caregiver.

The family should record an interaction for 7 or 10 minutes; in the video, one of the parents should interact with their child during free play or another activity according to the areas that need to be addressed in the sessions. The camera should focus on the child and the caregiver (father or mother); their faces and bodies should be visible. It is crucial to record all the child's behaviors regardless of whether they perform positively or negatively for them. Parents could use their mobile phones in a horizontal position (see supplementary material).

The protocol was adapted by incorporating feedback from therapists and families, particularly during the pandemic when remote sessions became necessary. These adaptations included clearer guidelines for remote recordings and enhanced methods for delivering feedback virtually.

Sessions organization

It is suggested that the intervention be carried out in 7 sessions, either in face-to-face or online modality, once a week with a duration of 45 minutes. The number of sessions proposed in this protocol is based on studies showing that brief programs (around six sessions) are more effective in improving parenting skills than extended programs (Balldin et al., 2018; Fukkink, 2008). This adaptation was made by integrating feedback from therapists and families during the program's implementation, especially considering the constraints imposed by the COVID-19 pandemic. The sessions have been structured to accommodate both in-person and remote delivery, ensuring flexibility and accessibility for families. The work in the sessions is organized as follows:

Session 1: During this session, caregivers will be interviewed, and they should complete questionnaires or specific assessments. It is crucial to explore the concerns of parents/caregivers related to the child's development. The therapist will explain how the sessions will be addressed, giving them an informed consent form, and recording instructions for the video.

Sessions 2 and 3: Before the session, the therapist in charge of the case analyzes the video, identifying positive scenes (for example, where parents engage and connect with their child) and other sequences where parents/caregivers should review some critical points to be worked (for example, when parents miss some interaction opportunities or when they have difficulties reading their child's behavioral cues).

In sessions 2 and 3, the therapist should work with the feedback of what has been observed in the video. The therapist should show the parents the selected scene and favor their analysis and discussion about what they observe in the video. The therapist should give feedback about the scene that which it is presented. At the end of each session, the therapist should give the parents some activities or strategies to implement during the week (this is the toolbox)

Sessions 4 and 5: After session 3, parents should record another video in free play or during an everyday activity (e.g., while eating a snack or sharing some food).

In sessions 4 and 5, the therapist should work with the feedback of what has been observed in the video. At the end of each session, the therapist should give the parents some activities or strategies to implement during the week (in the same way as in sessions 2 and 3).

Session 6: The therapist and caregiver evaluate the intervention, highlighting what has been learned throughout this process and providing closure. At the end of each session, the therapist should give the parents some activities or strategies that may be left to continue putting effort into what has been known.

Session 7: Post-intervention re-evaluation. The questionnaires or scales are applied to see which aspects have been strengthened and which still need to be worked on (if applicable). It is suggested that a report be given to the families with a summary of the process and some suggestions for the home.

Analysis of the videos

The videos should be analyzed carefully, and it is recommended that you watch the whole video and then select scenes where elements to work on can be seen. To facilitate the analysis, a register should be completed (see supplementary material) with information on the time the scene takes place (the scene analyzed should be between 15-30 seconds), what was observed, what we want to work with that episode, and the feedback or questions to the parents. This will help us to organize the session and keep a written record.

Each scene to be analyzed should carefully observe the adult, the child, and the interaction between them. Pay attention to their actions and how the other responds to them is essential. Depending on the work objectives we build with the family and the child's needs, we will select parts of the video that will allow us to work on these aspects. By observing the videos, we can detect new needs, resources, and abilities of parents and children.

Feedback delivery

An atmosphere of respect and emotional support should be maintained for feedback delivery. The feedback given by the therapist is accompanied by the image and audio of the video (see Table 2). The therapist should show the video scene and then work on the feedback corresponding to that moment. For this reason, completing the worksheet with the minutes and seconds of each scene (where it starts and where it ends) and the comments and observations of that interaction are vital. The therapist should use their expertise to select what to work on in each scene.

Table 2. Intervention suggestions for the use of video feedback.

Goals	Intervention to perform	Example
Enhance the observation skills of caregivers	Have caregivers describe precisely what they see in the video	Could you describe in your own words what you saw in this part of the video?
Favor the parents' skills to observe and understand their child's development.	Have caregivers describe precisely what they see about their child's actions and interaction with the environment.	Could you describe in your own words what you saw in this part of the video? What is your child doing with the toys? How is your child interacting with the environment?
Improve caregivers' observation skills.	Have caregivers watch a video segment again and encourage them to describe it in their own words.	We can show a part of the video again and ask them to describe it. We can guide or facilitate this description.
Strengthen the therapeutic alliance with caregivers.	Reinforce parental skills in parents. Show moments where the adult and their skills can be validated.	See how you are attentive to their signals. How you identify that your child needs more support to understand the game is very important.
Encourage validation of the child by the caregiver	Parents can recognize and validate the competencies of their child	Your daughter/or (you can use their name) enjoys the game. She is very creative and has excellent ideas to play
Reinforce the positive aspects of the interaction	Show segments where positive interactions can be visualized	It can start with the description of the scene by the caregivers and then encourage reflection on the positive aspects of that interaction (connection, enjoyment, round-trip interactions (serve and return) "[child's name] feels great when you support him/her."
Strengthen the bond	Show segments where the child is observed responding positively to the adult's actions	"[name of child] looks happy when you are playing with him/her."

Table 2. Continued...

Goals	Intervention to perform	Example
Recognition and sensitive response to the child's signals: reading, interpretation, and response.	Caregivers can identify the child's behavior cue, the adult's response, and subsequent reaction.	Find scenes where it can be analyzed. Signal of the child-sensitive response of the adult or child's response.
		Reflect with caregivers
Promote caregiver's understanding of their child's development.	Caregivers can interpret the child's behavior by relating them to their development.	"At the age of.... Sometimes it is hard for him..."
		"By the development of... we might expect that..."
Promote the sensitive response of the adult.	Caregivers can identify the verbal and non-verbal cues of stress and discomfort in their child.	"It seems that.... Withdraws from the game when the challenge increases."
		"...gets anxious when you change the game."
Promote the sensitive response of the adult	Caregivers can identify when a response is sensitive to the child's needs.	Look for parts of the video where the caregiver was able to identify, interpret, and respond appropriately to your child's signal
Identify difficulties in recognizing the needs of the child	Caregivers can identify why it is more difficult for them to respond sensitively.	This strategy can be used when you see a sensitive response or a positive interaction in the video. You are invited to reflect on why responding to your child's needs at this time was more complex.
		"Why do you imagine that at this moment, it became more difficult for you to respond as you did when..."
Promote reflective spaces	Generate questions that allow reflection on specific episodes	"Generally, he is so motivated to play."
		"What we just saw usually happens at other times."
Recognize your child's interests and preferences.	Identify scenes where the child shows their choices of games or elements to explore. Refer to whether caregivers responded to this or changed the child's play. Emphasize the relevance of following the child's game, incorporating elements that give it variety or that increase the complexity a little	"From what you have seen of the video, what things does your child like to play."
		"What preferences did he show you... what did you do when he showed you what he liked"
Identify how you could support your child's development through play or interaction.	Identify scenes where the parent is seen to be scaffolding or promoting development. Or scenes where opportunities for this to happen appear, and you can reflect on how you could use those moments to enhance your child's learning	Identify when your child is showing difficulties in carrying out an activity and see how you can make it easier for him or her to do it (do not give the answer or do it for him or her).
		Reflect on how through play, we can promote development
Recognize which experiences favor the dysregulation of the child	Caregivers can identify which stimuli or experiences tend to dysregulate their child. Identify mild signs of stress or discomfort.	Look for scenes where the child becomes deregulated and reflect on what may have caused that dysregulation.
Recognize which experiences favor the regulation of the child	Caregivers can identify which stimuli or experiences tend to regulate their child. Identify behavioral signs that are related to the regulation of the child (behaviors that show that he is returning to calm)	Look for scenes where the child has become dysregulated and then has begun to return to calm. Reflect on what may have caused this reaction.

It is suggested to start with positive elements, where, for example, we can reinforce the connection of the dyad or the parenting skills shown by that caregiver in the scene. Then, we can move on to moments where we want to show aspects that must be worked on or reinforced. Seeing themselves in the video makes caregivers more aware of what is happening. To further strengthen their observation skills, we can ask them to tell us in their own words what they saw in that scene. This allows them to observe more closely what is happening at that moment.

When the scenes are presented, we must be clear about what aspects we want to address. We must facilitate reflection and analysis of the situation. You can use the guide we suggest for the analysis (see supplementary material); several areas or topics could be

addressed in the sessions. The therapist should facilitate the conversation where, besides having the mother or father observe her actions, those of her children, and the interaction between them, she/he should propose how to work on the aspects revealed in the session. It is relevant to include active listening, reciprocal feedback, and reflection about what works to help the child regulate, interact, and play. In this way, families can discover or explore how to implement strategies to enhance their children's development in daily life Akhbari Ziegler & Hadders-Algra (2020).

Toolbox

After analyzing the video and completing the registration sheet, the session is organized, and the aspects to be worked on are clear. To support the parents or caregivers, we can provide a “Toolbox”, strategies that can be applied at home to work on the aspects discussed in the session (see supplementary material). A small video or visual material can be provided with the information in an attractive, easy-to-read, and understandable format.

Ideally, it should have concrete examples of how to put into practice what was discussed or worked on in the session. It should be brief and ideally contain images to make the material more attractive. The objective is that these activities can be done when the mother or father interacts with their child (for example, when they are playing or at mealtime, among others).

Implications

In this article, we have explored VF's theoretical foundations, principles, and detailed recommendations as a powerful tool to enhance positive interactions between children and caregivers within the context of pediatric habilitation and rehabilitation. Our findings underscore the critical importance of disseminating effective intervention techniques to equip healthcare teams with the means to adapt and thrive in an ever-evolving society. With growing challenges related to accessibility, such as distance, time constraints, natural disasters, and global pandemics like COVID-19, integrating technologies and versatile strategies into therapeutic practices is imperative. These innovations allow caregivers and children to maintain high-quality therapy through remote interactions (Krasovsky et al., 2021).

The utilization of VF in various studies has exhibited a diversity of theories guiding interventions. While some publications lack comprehensive theory descriptions (Balldin et al., 2018), VF finds theoretical support in Attachment theory (Juffer et al., 2017; Juffer & Bakermans-Kranenburg, 2018; Provenzi et al., 2020). This theory underscores the significance of the caregiver-child attachment in fostering healthy development, and VF can facilitate improvements in this attachment by providing valuable feedback on interactions.

Additionally, Parent-child interaction therapy (PCIT) (O'Toole et al., 2021) leverages VF to enhance parent-child interactions positively and effectively. The Social-cognitive learning model suggests that individuals learn through observation and imitation, is another theoretical basis for VF (Ramirez et al., 2012). Occupational, physical, and speech and language therapists can adapt these theories and techniques to

cater to each child's unique needs (Bellon-Harn et al., 2020; Grossinho et al., 2017; Pierce, 2005; West et al., 2021).

The intervention process with VF encourages participants to engage cooperatively in goal setting, action planning, and self-reflection. This iterative approach promotes a realistic self-assessment of caregivers' abilities, empowering them to identify and rectify discrepancies between their perceptions and the therapist's opinions. Balldin et al. (2018) systematic review supports VF's effectiveness in stimulating parental sensitivity and fostering positive changes in children's behavior. This positive impact on parent-child interaction, observed across ages, settings, problem areas, and cultures, directly contributes to children's overall development.

VF emerges as an invaluable tool for interdisciplinary health teams, placing the user and their significant roles, such as parenting, at the center (Balldin et al., 2018; Doig et al., 2009; Hodes et al., 2014; Provenzi et al., 2020). It can be seamlessly integrated into interventions across various disciplines, promoting diverse skill development, including feeding, language, sensory integration, fine and gross motor skills, and self-regulation and co-regulation in daily contexts.

However, it's essential to consider clinical aspects when incorporating VF. Collaboration from parents in recording videos is necessary, but the prevalence of technology in devices like mobile phones and tablets makes this increasingly feasible. Nonetheless, accessibility remains a concern for families without access to such technology or those uncomfortable with its use. Furthermore, implementing VF therapy necessitates training for therapists, potentially limiting the availability of well-trained professionals. The time-intensive nature of VF may also pose feasibility challenges for some children and families.

More studies are needed to develop specific protocols for different health or development conditions, to analyze and study these protocols from the therapist's and family's perspectives, and to determine more precisely what abilities a child and family require to benefit from VF and the most appropriate context and therapeutic skills to deliver the intervention. Overall, VF therapy is a promising intervention that can improve the lives of children with developmental delays and their families. Further research is needed to refine and optimize this intervention.

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Author's Contributions

Andrea Mira: Coordination of the research team, review of the literature, preparation of the protocol, supervision of the clinical work, writing and editing the text. Javiera Parada: Literature review, writing and revision of the writing. All authors approved the final version of the text.

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Supplementary Material

Supplementary material accompanies this paper.

Supplementary material 1: Instructions for video recording

Supplementary material 2: record sheet for video analysis

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