

Puppet Art Therapy Programme for Deafblind Individuals: Exploring Body Perception and Non-verbal Communication

Juliette Masson¹, Miguel Ranilla Rodríguez¹, Victoria Martínez-Vérez², Paula Gil-Ruiz³

¹ Complutense University of Madrid, Spain

² University of Valladolid, Spain

³ CES Don Bosco, Spain

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CORRESPONDING AUTHOR:

Paula Gil-Ruiz;
pgil@cesdonbosco.com

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ABSTRACT:

This study examines the effectiveness of an art therapy program focusing on puppet construction to enhance body and spatial awareness, non-verbal communication, and interpersonal relationships in individuals with deaf-blindness. Through tailored sessions, participants experienced significant improvements in their bodily and spatial awareness, facilitated by the tactile use of puppets. Additionally, there were notable advancements in non-verbal communication skills, particularly through touch and adapted sign language. Creativity and originality were evident in the variety of techniques employed and the personalization of the puppets, allowing for a rich and diverse artistic expression. However, challenges were identified, including the energy required for non-verbal communication and activities to meet individual needs. This study highlights the importance of integrating art therapy programs in specialized settings to promote well-being and self-expression in individuals with sensory disabilities.

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INTRODUCTION

Art therapy has emerged as a therapeutic practice that uses the creative process to promote physical, mental, and emotional well-being (Gibson, 2018). In the context of deafblind individuals, this therapy provides an alternative avenue for communication and self-expression, overcoming sensory limitations through adapted and personalized methods. One specific technique within art therapy is creating puppets, which effectively improves body and spatial perception and fosters nonverbal communication and interpersonal relationships (King et al., 2019).

In the European Union, several organizations, such as the association Teatro Accesible de España and Fundación Signos España, together with Riksteatern Crea in Sweden and Souffleur d'Images in France, promote access to culture and the participation of people with visual and hearing impairments in the performing arts. In Colombia, Gamboa Lozano (2018) directed a play with deafblind participants and their companions. These organizations argue that there is a limited supply of sign language stage productions performed by deaf artists in collaboration with cultural workers, underscoring the need for innovative solutions to improve universal accessibility in theater. In addition, there is a deficit in research on the topic (O'Dowd & Werner, 2024).

Associations linked to people with sensory disabilities underline the importance of the participation of deaf and/or blind people in the performing arts. The scarcity of works in sign language performed jointly by deaf artists and cultural workers is a notable problem, highlighting the need to promote universal accessibility in the performing arts through innovative solutions. This facilitates communication and representation and promotes corporeality and spatial perception.

LITERATURE REVIEW

The construction of puppets has been used as an effective technique to improve body and spatial perception in people with various disabilities, allowing them to manipulate and represent body parts in a detailed way, facilitating greater body and spatial awareness. In addition, it promotes creativity and originality, exploring different materials and methods (Timm-Bottos, 2016). It also fosters social interaction and interpersonal relationships, as group art activities allow participants to interact more effectively (Anand et al., 2019; Chilton et al., 2009). This interaction contributes to greater group cohesion and mutual support (Gibson, 2018; Thong, 2007), fa-

cilitating nonverbal communication and personalization of therapeutic techniques (Anand et al., 2019; Choe & Carlton, 2019).

Previous research has shown that art therapy facilitates more effective and meaningful communication through nonverbal methods, allowing for expressing feelings and emotions (Belkofer & McNutt, 2011). Potash (2020) highlights the importance of tactile and kinesthetic perception, which helps participants better understand their bodies and environment through physical interaction.

Historical Progression and Applications of Puppet Art Therapy for Deaf and/or Blind Individuals. Regarding the progression and applications of puppet art therapy for deafblind individuals, it is important to note that, due to the challenges faced by this group, experiences are more limited and tend to occur in specific residential and therapeutic contexts designed for individuals with sensory disabilities and a high level of dependency, such as the *Foyer Claire Fontaine* (hereafter, FCF). Nevertheless, the following experiences are noteworthy:

Early Experiments in Japan (1999). In Japan, Soi, Komoto, and Nakata (1999) implemented puppets as therapeutic tools in educational settings for individuals with disabilities, including deafness and blindness. This approach demonstrated that puppets facilitated non-verbal communication and improved environmental perception. Practical case studies in their research revealed that this technique allowed participants to “make sense” of their surroundings through tactile and visual stimuli.

Integration of Accessible Theater in Europe. In the European Union, organizations such as *Riksteatern Crea* in Sweden and *Souffleurs d'Images* in France have promoted the use of puppets in performing arts as an inclusion tool for deaf and blind individuals. These initiatives not only aim to improve cultural accessibility but also employ puppets to foster inclusive interaction in the performing arts, enabling greater sensory and social participation. This approach highlights the importance of integrating adapted artistic tools as a means of self-expression and communication.

Innovations in Latin America: Colombia and Inclusive Theater (2018). In Colombia, Gamboa Lozano (2018) directed a theater production involving deafblind individuals and their companions. Using puppets as a central tool, this initiative addressed challenges related to non-verbal communication and fostered shared experiences in theatrical contexts. This innovative application contributed to developing therapeutic approaches within drama therapy in Latin America.

Systemic Puppet Therapy in Rehabilitation (2020). Lanberg et al. (2020) described the development of systemic puppet therapy as a methodology adapted to various levels of intelligence and physical contexts, particularly for sensory disabilities. This technique combines static approaches (puppet design) and dynamic ones (puppet performances) to facilitate introspection, emotional expression, and social interaction. Although not exclusively applied to deafblind individuals, this research laid the groundwork for designing specific programs tailored to this group.

FCF Implementation of Puppet Art Therapy (2023). Building on these advancements, in 2023, FCF implemented an art therapy program based on puppet creation, hypothesizing that constructing puppets positively influences participants' perception of their bodies and their position in space. Additionally, the step-by-step construction process, guided by the art therapist, enhances communicative efficacy, creativity, and interpersonal relationships among deafblind individuals.

The *Foyer Claire Fontaine* association, established in 1859 and based in Lyon, provides accommodation and access to adapted education for deaf individuals and services for those with additional disabilities, such as visual impairments, motor difficulties, and autism spectrum disorders (ASD). Currently, the FCF serves sixty-five adults with deafness and associated disabilities, fourteen of whom are deafblind.

The Intensive Program at Foyer Claire Fontaine (FCF). The intensive program implemented at FCF in France represents one of the most advanced cases of puppet art therapy designed explicitly for deafblind individuals. The program was developed in five main stages:

1. Participant Identification: Selecting participants and identifying their strengths and needs.
2. Program Introduction through Puppets: Presenting various types of puppets to introduce participants to the concept.
3. Group Bodywork: Exploring proprioception and spatial perception.
4. Puppet Construction: Guided creation of tactile representations based on participants' bodies. Figure 1 illustrates the model of the puppet created.
5. Group Performance: Using puppets as a medium for artistic and social expression.

During the initial phase, exercises were aimed at individually engaging the 16 deafblind participants while exploring body and spatial awareness through activities such as massages, movements, and drawing. Participants were also gradually introduced to puppet theater and its dynamics.



Figure 1. Puppet model

In the second phase, puppet construction was introduced using recycled materials, linking this process to the previous bodywork exercises. Group workshops began, establishing a gradual process that addressed participants' perceptions of their bodies (Figure 2) and culminated in another body. This progression justified the name of a methodology and explicitly created for this project, titled "*Creation Process Leading to Puppet Construction*" (Figure 3). Finally, the aspects explored in the earlier workshops were integrated into performance activities in the third phase.

This intensive program integrated a series of exercises designed to guide participants from perceiving their own body to elaborating an external representation. The methodology used was based on the work of Slovak dancer, choreographer, and pedagogue Rudolf Laban (1879-1959) and dancer Anna Halprin (2009), who proposed the participants' bodies to improve their capacity for expression and well-being.

Given the deficit detected in research on this topic (O'Dowd & Werner, 2024), the aim of the study is to explore how the process of building a puppet can influence body and spatial perception (Alders et al., 2011), as well as, the communicative and relational skills of people with deafblindness.

The research questions are structured around two main themes:



Figure 2. Drawing the body



Figure 3. Other Body

1. The impact of puppet art therapy on proprioceptive skills, non-verbal communication, and body expression.
2. The adaptation of deafblind individuals to puppet art therapy.

These themes are further specified into two research questions:

- RQ1: How does puppet art therapy influence body perception, non-verbal communication, and emotional expression in deafblind individuals?
- RQ2: In what ways do deafblind individuals adapt to the process of puppet art therapy, and what changes are observed in their relational skills?

METHODS

Study design

Given the research questions, we opted for an interpretative approach through the use of qualitative techniques (1- interviews with FCF specialized staff, 2- a questionnaire of open-ended questions to FCF communication mediators, and 3- the field diary where the process of construction of the puppets, the photographs of the art therapist and the drawings made by the participants are collected), triangulating the instruments and the participants in the program (Hsieh & Shannon, 2005).

Content analysis has been chosen to systematically interpret and categorize the qualitative data collected through verbal interactions obtained from the interviews. This approach involves the identification of thematic patterns, recurrent concepts, and underlying meanings in the participants' responses. The inductive analysis allowed themes to emerge naturally from the data. Verbal information is coded and categorized to capture the essence of shared perceptions, opinions, and experiences. This approach aims to gain a comprehensive and in-depth understanding of the topics discussed in the talks and interviews. In order to maintain the anonymity of the participants, the following identification keys were used (see Table 1).

The results recorded in the field diary were categorized and then analyzed using ATLAS.ti 23 software. In addition, in the diary, and the art therapist evaluated the participants' progress in each variable using a numerical score assigned to each session. These variables included: 1) Proprioception, 2) Nonverbal communica-

tion, 3) Creative process and emotional expression, and 4) Social interaction.

Various data collection techniques and instruments were used, the results of which were compared with each other to strengthen the analysis and detect possible differences in the evolution of the participants.

Instruments

A field diary was used to facilitate the systematic recording of the puppet construction process, which included photographic records, drawings of the participants, and a numerical assessment of the evolution of each participant in relation to the variables.

To describe the performance levels for the four evaluated factors (body and spatial perception, non-verbal communication, creative process, and emotional expression), Tables 2, 3, and 4 are presented below. These tables outline the values of the observational instrument on a scale of **1 to 5** in terms of the extent of the analyzed skills.

Table 1. Identification keys for interviews and questionnaires.

Participants	Code
Coordinator Claire Fontaine	C1
Psychomotrician Claire Fontaine	P1
Sign Language Interpreter Claire Fontaine	I1
Sign Language Interpreter Claire Fontaine	I2
Communication Mediator Claire Fontaine	MC1
Communication Mediator Claire Fontaine	MC2
Communication Mediator Claire Fontaine	MC3
Communication Mediator Claire Fontaine	MC4
Communication Mediator Claire Fontaine	MC5
Art therapist	A

Table 2. Body and Spatial Perception

Level	Description
Level 1 - Significant Deficit	Great difficulty perceiving their body and position in space; total dependence on external aids for orientation and basic movements.
Level 2 - Moderate Difficulty	Limited ability to perceive their body, with frequent orientation and movement errors; frequent need for external support.
Level 3 - Basic Competence	They perceive their body and spatial position in simple contexts and achieve basic movements independently but struggle with complex tasks.
Level 4 - Advanced Competence	A clear perception of body and space; performs movements and spatial tasks independently, though not automatically, in complex environments.
Level 5 - Outstanding Mastery	Total autonomy in body and spatial perception; fluid, precise, and adaptive movements, even in challenging environments.

Table 3. **Non-Verbal Communication**

Level	Description
Level 1 - Significant Deficit	Inability to use gestures, facial expressions, or body language; non-verbal communication is almost non-existent.
Level 2 - Moderate Difficulty	Uses gestures or facial expressions occasionally but inconsistently or ineffectively.
Level 3 - Basic Competence	Able to communicate through gestures or facial expressions in basic situations, though limited in nuances and complex contexts.
Level 4 - Advanced Competence	Uses gestures and body language effectively in most contexts but may require additional time to adapt to new interlocutors or environments.
Level 5 - Outstanding Mastery	Fluent, clear, and adaptive non-verbal communication in any context; demonstrates the ability to interpret and respond to others' non-verbal signals.

Table 4. **Social Interaction Skills**

Level	Description
Level 1 - Significant Deficit	The participant does not show initiative in interacting with others. Isolation is observed, with no responses to social stimuli and significant difficulty engaging in group activities. Non-verbal communication and teamwork are practically non-existent.
Level 2 - Moderate Difficulty	The participant makes sporadic attempts to interact but inconsistently. Responds minimally to social stimuli and requires constant support to participate in collaborative tasks. Social responses are limited and difficult to express.
Level 3 - Basic Competence	The participant shows basic functional social skills. Responds appropriately to social stimuli and participates in group activities with external guidance. Initiates simple interactions, though struggles to maintain them. Progress is observed in non-verbal communication and teamwork.
Level 4 - Advanced Competence	The participant establishes and maintains interactions with greater autonomy and effectiveness. Actively participates in group activities, demonstrates initiative, and cooperates with peers. Non-verbal communication is clear and adaptive, allowing for effective interaction in various contexts.
Level 5 - Outstanding Mastery	The participant exhibits a high degree of social interaction skills. Initiates, maintains, and concludes interactions fluently and autonomously. Actively and collaboratively participates in group activities, demonstrating empathy, cooperation, and clear, adaptive social responses. Non-verbal communication is rich and nuanced.

The art therapist who directed the intervention received specific training in puppetry with deafblind people and worked as an actress with deaf and/or blind people.

In addition, interviews were conducted with FCF specialized personnel who participated in the construction of puppets (psychomotor therapist, coordinator, art therapist, and interpreters), and a questionnaire of open-ended questions was applied to FCF communicative mediators (Table 5).

Procedure

Documentation related to the different instruments was collected at different stages of the procedure (Table 5). The field diary was used to assess how puppet building affects the perception of self and space in individuals with

deafblindness and to observe changes in the participants' relational abilities.

The interviews and open-ended questionnaire aimed to investigate participants' subjective experiences and impressions of the art therapy program (Gao, 2006) and included questions to identify experts' and observers' views on the impact of the puppet-making process on the ability of people with deafblindness to perceive their own embodiment and the position of embodiment in space, their communicative effectiveness, emotional expression, and interaction skills, as well as their personal subjective appraisals of the art therapy program. The data were compared to identify meaningful categories based on the research questions and analyzed further.

Table 5. **Triangulation process of instruments and participants**

Participants	Instruments	Data collection	Target
APASCIDE specialized personnel	Open-ended questionnaire	Following the construction process of puppets	To analyze the external validity of the observational instrument.
Specialized personnel FCF	Interview	During the construction process of puppets	To analyze the external validity of the observational instrument. Evaluate how puppet construction affects the perception of one's own body and space. Observe changes in the relational skills of the participants.
Art therapist	Interview	Following the construction process of puppets	Analyze participants' communication ability through art therapy, especially through touch, orality, and other non-verbal forms. Identify the differences in the techniques and methods used by the participants in the creation of puppets and their relationship with creativity and originality.
People with deafblindness	Field diary	During the sessions	Evaluate how puppet construction affects the perception of one's own body and space. Observe changes in the relational skills of the participants.

This study adheres to ethical standards, prioritizing integrity, confidentiality, and respect for all participants and stakeholders. Specifically, it follows the AERA standards and the British Educational Research Association (BERA) recommendations.

In addition, to achieve methodological consistency, a best practice protocol is adopted by the Declaration of Helsinki (World Medical Association, 2024), which is divided into two phases:

1. Participants are informed about the nature, purpose, and methodological procedure, requesting their voluntary collaboration and explaining that they can withdraw from the program anytime.
2. They are asked for informed consent, which specifies the confidential treatment of the data, limits its disclosure to the academic environment, and establishes a personal responsibility and a physical place for its custody.

Participants

The study described above involved a group of 14 deaf-blind people from the FCF who received a 16-week continuous intervention, which included regular and personalized 45-minute sessions, following an adapted

methodology with work on the body, use of drawing, puppet construction, and puppet performance.

Work Sessions

16 sessions were conducted with a progressive approach, structured into three main phases: body awareness, puppet construction, and performance. These sessions included activities designed to enhance body awareness, interaction with recycled materials, and the connection between the body and expression through puppets. Each session was organized into three parts: beginning, development, and closure.

- Phase 1: The exercises focused on exploring the body and spatial perception through activities such as massages, movements, and drawing.
- Phase 2: Puppet construction was introduced using recycled materials, linking this creative process to the prior bodywork activities.
- Phase 3: The elements developed in the previous phases were integrated into performance activities using the puppets.

Table 6 provides a clear overview of , as well as each session's structure, objectives, and outcomes, highlighting the participants' progression throughout the process.

Table 6. **Structure, Objectives, and Observed Outcomes of the Work Sessions**

Phase	Session	Main Activities	Objectives	Observed Outcomes
Bodywork	1	Body massage, initial drawing.	Develop body awareness through touch.	All participants identified body parts; some required hand-over-hand assistance.
	2	Free movement (walking, arm rotations), drawing.	Explore the body in space.	Increased autonomy in drawing; movements helped participants connect with their surroundings.
	3	Drawing one's own body and movements is derived from the drawing.	Link body perception with self-image and spatial awareness.	7 of 9 participants understood the connection between drawing and body movements.
	4	Vocal exercises, puppet drawing, and movement exploration.	Explore sounds and movements related to the body and puppet.	6 of 9 participants produced distinct sounds for the body and puppet; others required constant support.
	5	Review of exercises, collaborative drawing, and group movements.	Deepen movements and sounds; encourage group interaction.	Increased group participation; 7 of 9 created new movements and sounds with some support.
	6	Introduction of recycled materials, drawing experiences.	Explore tactile materials and communicate through drawing.	Participants began interacting with materials, showing interest and initial personal initiatives.
Puppet Construction	7	Selection and manipulation of recycled materials; conceptual drawings.	Begin puppet construction, linking materials to body concepts.	5 participants understood the link between puppet construction and body concepts; others struggled.
	8	Continued puppet construction and tactile suggestions.	Progress in puppet construction and foster autonomy.	Greater autonomy in 6 participants; 3 required constant assistance.
	9	Development of body details in the puppet; related drawing.	Connect construction with the puppet's body.	7 participants better understood the link; some required frequent demonstrations.
	10	Completion of puppets, initial performance.	Complete puppet construction and begin performance exploration.	6 of 8 participants engaged actively; some began connecting puppet and performance.
	11	Finalization of puppets and first movements.	Solidify puppet construction and prepare for performance.	4 participants clearly understood the link; 3 still struggled.
Puppet Performance	12	Acting with puppets, final adjustments.	Link performance with puppet construction and explore movements.	3 participants successfully established the link; others showed gradual progress.
	13	Movement review, performing with completed puppets.	Deepen the connection between puppet and performance.	4 participants showed significant progress; greater initiative observed in some cases.
	14	Creation of accessories for puppets, performance.	Strengthen the link between construction and performance.	4 participants established the connection; others focused on enjoying the process.
	15	Final puppet construction, group performance.	Consolidate the relationship between puppet, construction, and performance.	5 participants clearly understood the link; others showed less interest in final construction.
	16	Final performance and puppet delivery.	Conclude the process and enable final reflections.	Most participants expressed satisfaction; 4 fully consolidated the link between puppet and performance.

RESULTS

Body and Space Perception

The results obtained reflect how individual sensory experiences influence the understanding and representation of the human body. Thus, participants showed an ability to identify and understand body structure despite their sensory limitations. An illustrative example is the case of a participant who was able to identify that a puppet lacked feet, demonstrating “structural body awareness” (MC1). This finding suggests that, through touch and manipulation, participants were able to construct a detailed mental image of the human body. In the words of one specialist, one participant “showed a remarkable understanding of the different parts of the body as she constructed her puppet” (P). This artistic activity allowed participants to develop greater body and spatial awareness, which positively impacted their self-expression and perception of the world. However, despite reaching a degree of understanding about the dimensions of their own bodies and their position in space, some participants found it difficult to understand the dimensions and proportions of the puppets. A communicative mediator noted that “deafblind people have a perception of the world that is more emotional than physical” (MC2). According to the art therapist’s field diary, “participants tended to explore textures and shapes more” (A), suggesting a more sensory and less structural approach to their perception of space and body.

Variability in puppet construction was notable among participants. Some showed a tendency “to include specif-

ic details while others focused on more general aspects” (MC5). This reflects how individual sensory experiences shape perception, demonstrating differences in how participants perceive and understand the body and space. Particularly, it was observed that participants with visual residuals constructed puppets with more precise details, such as eyes and mouth, while those without visual residuals focused more on general shapes. This indicates that “residual visual ability influences how individuals represent body parts” (MC4). Thus, this initial sensory difference, “which, moreover, is typical of the group of people with deafblindness (C1)”, “may have significantly influenced the final results of puppet construction, evidencing how sensory abilities affect artistic expression and body representation(A)”.

Based on the field journal data collected by the art therapist, Figure 4 illustrates the progression of proprioceptive abilities in 14 participants over a 16-week. The data are scores on a scale from 1 to 5, where 1 represents the lowest level and 5 the highest level of proprioceptive abilities, non-verbal communication, emotional expression, and social interaction, considering their sensory limitations. The corresponding values are presented in Tables 2, 3, and 4 in the instruments subsection.

Thus, it is observed that during the first weeks, participants show variability in their proprioception levels. Most start with scores between 1 and 3. As time progresses, we observe a general trend of improvement. For example, participants 1, 5, and 7 started with low values (1 or 2) and reached maximum scores (5) in the last few weeks.

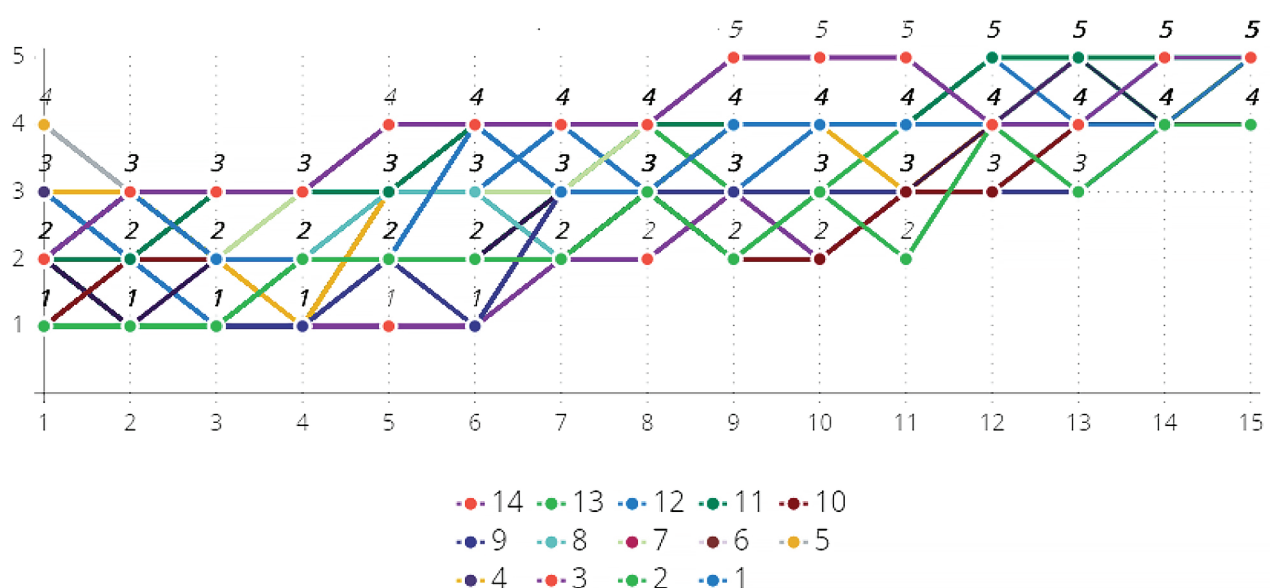


Figure 4. Proprioception. Progression per week and participant

Other participants, such as 4 and 6, show a more irregular progression, although they also end up with scores close to the highest value. Participants 1, 4, and 5, have visual residuals and, therefore, start with a higher score in the first session. The simplicity of the activities caused them to show “fatigue” in the intermediate sessions 2, 3, and 4, which is why the content of the artistic practices was adapted to their particular situation, which caused them to become more actively involved from the 5th session onwards. Nevertheless, despite the differences among the participants, derived from the heterogeneity of the group, the graph shows how most of the participants experienced a constant improvement in proprioception throughout the study, which could suggest that the interventions applied were effective for this particular group.

Non Verbal Communication

The intervention centered on nonverbal communication techniques, which were essential for interacting with deafblind individuals. Puppets were used as tools to help participants express emotions, while touch-based communication emerged as a key method for establishing deeper connections. Body movements played a crucial role in adapting instructions to participants, enhancing their engagement and understanding. Sign language and the finger alphabet were also adapted to the sensory capabilities of participants, facilitating direct and meaningful interaction.

Despite the effectiveness of these communication methods, challenges arose due to the physical effort required for nonverbal communication, particularly in the

use of sign language. The process of signing and adapting movements demanded significant energy from participants, highlighting the need to consider the physical limitations in therapeutic and educational settings. Nonetheless, the intervention demonstrated the potential of nonverbal techniques to enrich communication and foster creative expression among deafblind individuals.

The graph (Figure 5) measures the evolution of the participants’ nonverbal communication variable, also on a scale of 1 to 5, over 16 weeks, according to the record made by the art therapist in the field diary. As with the previous variable, proprioception, it is observed that the initial scores vary considerably, with some participants starting at low levels (e.g., participant 3 with a value of 1) and others already showing more advanced levels (participant 6 with 3), which is due to the fact that participants 1, 4 and 5 maintain visual residuals.

Despite the initial variability inherent in the deafblind population, most participants show gradual improvement, reaching higher scores, especially in the last few weeks. Participants such as 2 and 6 are examples of significant improvements, advancing from 2 at the beginning to scores of 5 at the end. Thus, it is possible to state that an improvement in nonverbal communication is observed as the study progresses, suggesting a possible progressive acquisition of skills in this area.

The creative process and emotional expression

The results obtained show that the participants are original in their interactions with the puppets, although

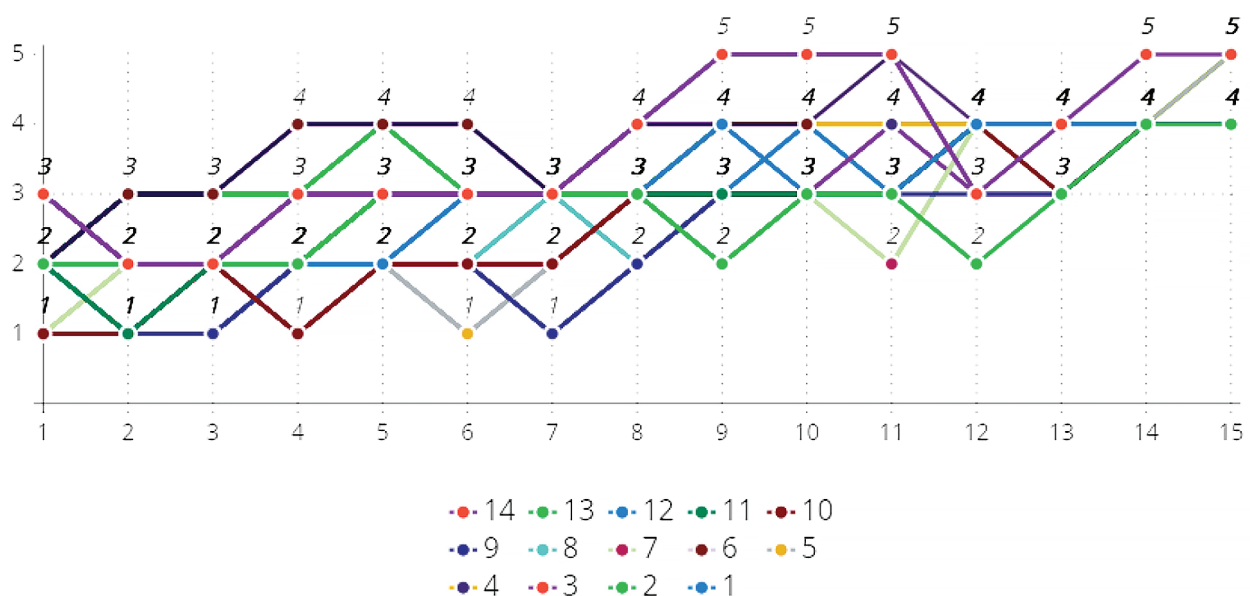


Figure 5. Non-verbal communication. Progression per week and participant

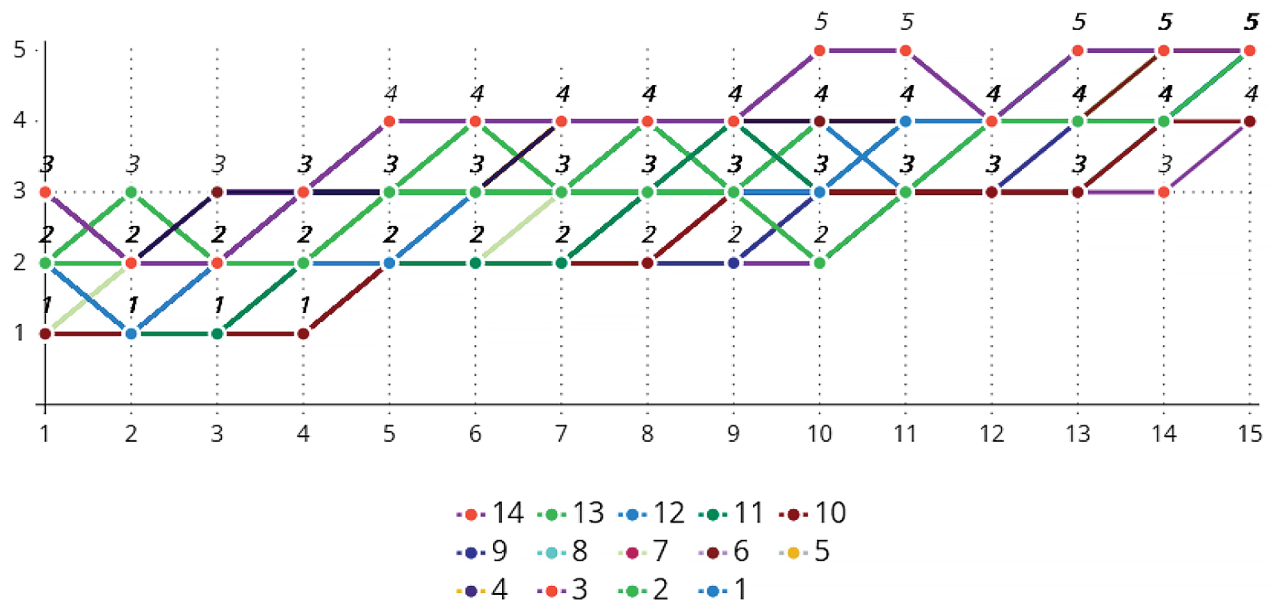


Figure 6. Emotional Expression. Progression per week and participant

there are significant differences in the techniques and approaches used.

Thus, the use of touch as a means of communication was important in expressing emotions, and participants were observed to personalize their puppets in unique ways, such as decorating them with hearts, reflecting their “personal and emotional expression” (A). This personalization allowed participants to explore and express their identity artistically, suggesting a high degree of self-expression and creativity.

During the intervention, the interpreter translated into sign language what was being explained, making it possible for participants with visual impairments to understand the activity better, since, “it is important to use all possible communicative means (I2)”. In addition, puppets and other objects were used as tactile tools that facilitated “rich nonverbal interaction (MC4)”, allowing participants to “explore their emotions in a tangible way (A)”.

On the other hand, originality was manifested mainly in the selection of recycled materials for the construction of puppets. A communicative mediator indicated that “working with different textures helps them to relate the parts of the body” (MC2). This experimentation with diverse materials allowed participants to express their identity in unexpected and personalized ways, thus enriching their artistic experience.

Despite the high levels of originality observed, there were notable differences in the techniques used and in the way difficulties were overcome. Thus, the participants showed a significant capacity to reinterpret and modify

the designs, evidenced in the variety and uniqueness of their puppets, since, “throughout the sessions more puppets appear that move away from the proposed models” (C1). This analysis is based on the observation of the puppets built and the methodologies used during the process.

The methods used to guide the participants were crucial. Communication by touch and the adaptation of instructions to the specific sensory abilities of each individual were “essential to the success of the workshop” (C1). This methodological adaptation allowed “even those with severe disabilities to actively participate and benefit from art therapy” (I1).

Despite the high levels of originality and emotional expression found, some cases were also detected in which it was not possible to determine a specific way of performing the puppet, suggesting that adaptations of activities are not always possible “it depends on the degree of deaf blindness and the time at which the loss of one or both senses occurred, there are people who find it very difficult to express themselves (I2)”.

The results of the art therapist’s field diary regarding the evaluation of the sessions of the variable “Emotional Expression” during the 16 weeks of the intervention are shown in Figure 6, which shows how most of the participants start with low or medium scores in the range of 1 to 3. However, from week 5 onwards, a general trend of improvement is observed in most participants, with some reaching scores of 4 and 5 at week 16. Participant 3, for example, starts at a low level (1) and progresses to

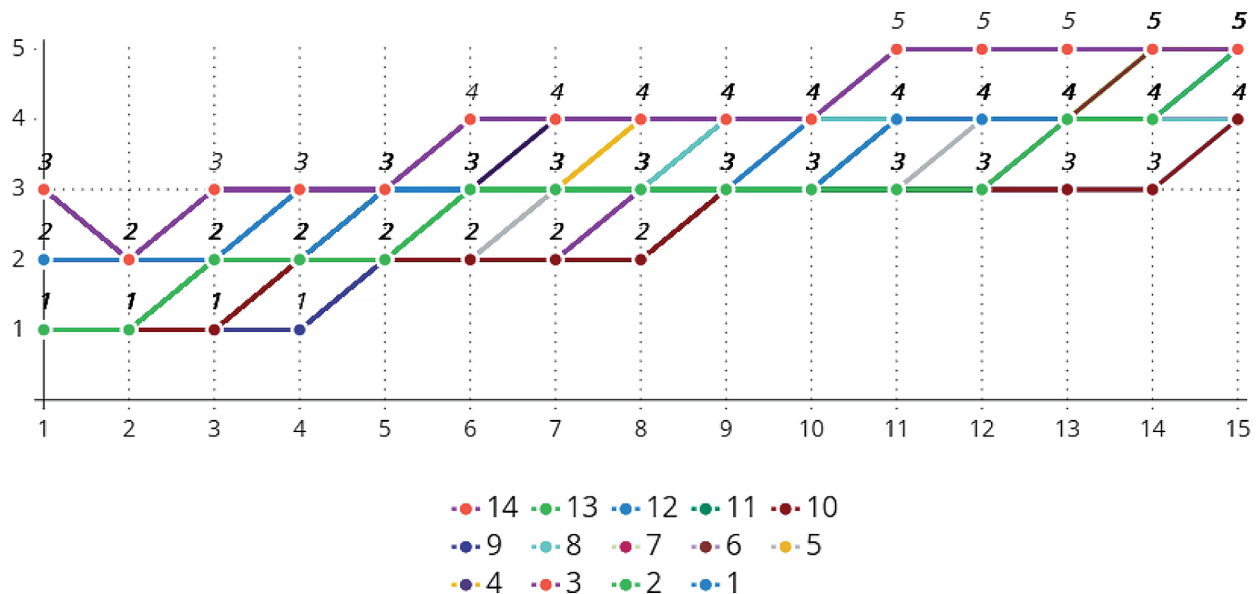


Figure 7. Social Interaction. Progression per week and participant

4, while others, such as participant 2, reach a level of 5. Thus, it is possible to state that there is clear progress in emotional expression, highlighting a positive evolution throughout the weeks.

Interpersonal Relationships

The art therapy sessions proved to be a catalyst for improving social interaction among participants with deaf blindness. Thus, an increase in the participants' ability to focus and relate to others was observed.

Group activities promoted the development of interpersonal relationships and a sense of community. The workshop sessions fostered a mutually supportive environment, "where participants helped each other and collaborated in the creation of puppets (MC1)." The art therapist noted that "it was inspiring to see how participants cooperated with each other, sharing materials and supporting each other in manipulating the puppets (A)".

Regarding FCF staff, the art therapist considers that "teamwork and cooperation were also evident (A)". It was noted that "the communication mediators, the sign language interpreter, and the participants formed an inclusive environment, where each individual could express themselves and contribute to the group (A)". One specialist noted that "the workshop not only facilitated creativity and individual expression, but also teamwork (MC2)".

One of the most notable findings was the improvement in the participants' ability to focus on activities and relate to others. The puppet building and interaction during the sessions provided an environment where par-

ticipants could develop and strengthen these skills, thus, the activity "also served as a means for them to interact and relate more effectively (MC1)."

Despite the observed improvements, challenges in communication and patience persisted in some cases that showed difficulties in "staying focused and patient during activities (MC3)".

Considering the evolution of the sessions for the social interaction variable collected by the art therapist in her field diary (Figure 7), it can be observed that, as in the previous graphs, the initial scores are varied and low, with values between 1 and 2, but over time, most participants improve their scores, reaching values of 4 and 5 in the last weeks. Participants such as 1 and 2 show linear progress, gradually increasing their scores from low values (1 or 2) to the maximum of 5. Based on these results, it is possible to affirm that the social interaction ability of the participants improved considerably throughout the study, suggesting that the activities or interventions applied contributed to this improvement.

Figure 8 shows the upward evolution of the average score of the sessions, with some peaks of discontinuity in the first sessions in which the need to adapt the activities and the approach to meet the individual needs of the participants was a recurring theme.

The mediators' ability to customize the art therapy sessions to the abilities and limitations of each participant was crucial to foster an inclusive and supportive environment, in this sense, "tailoring activities to participants' specific interests and abilities helped to maintain their interest and participation (MC5)."

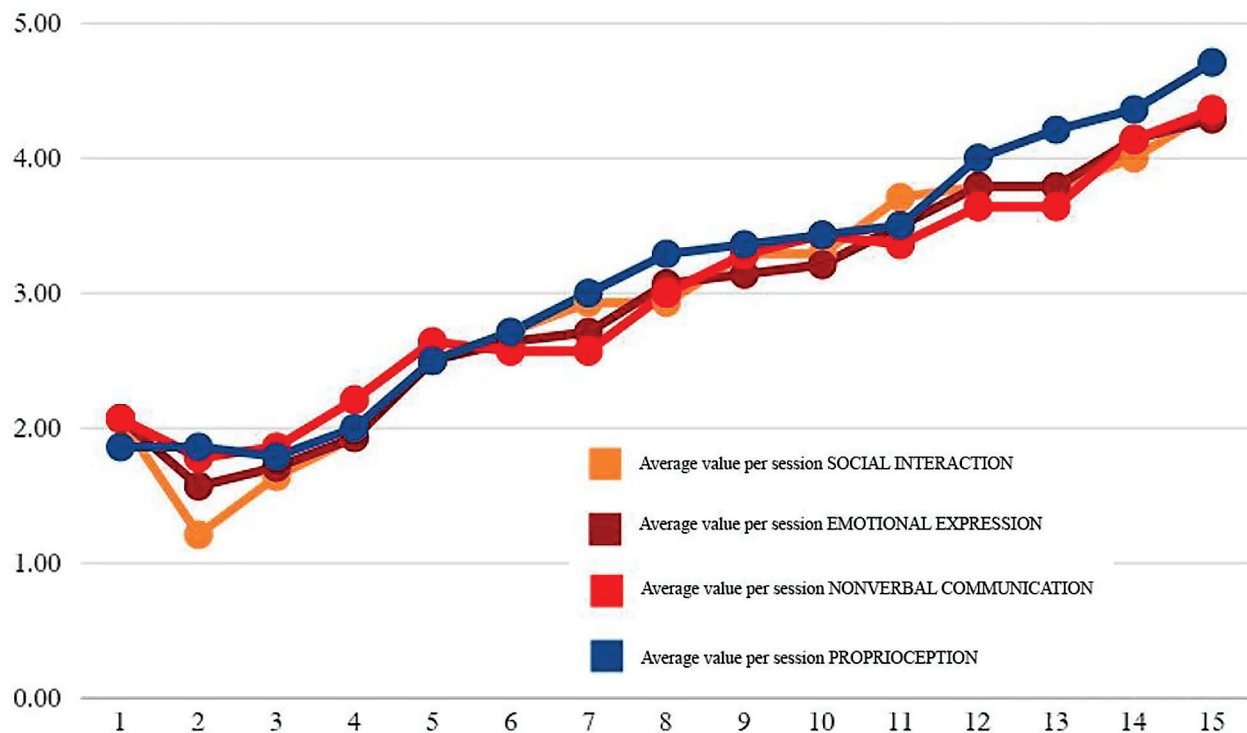


Figure 8. Average score per week

This issue is also observed in Figures 4, 5, 6, and 7 and is due to the different levels of ability and functionality typical of the group of people with deaf-blindness. Thus, the graphs show how the participants with less disability, those with hearing impairment, or those with greater disability were inhibited in the first sessions because they found them too simple or complicated, which meant a greater workload for the art therapist and at the same time, an increase in social interaction and nonverbal communication.

DISCUSSION

The present study explores the efficacy of an art therapy program, focused explicitly on puppet making, as a therapeutic intervention for deafblind individuals. This approach was based on the hypothesis that the process of artistic creation of a puppet can improve participants' proprioception, communication, and relational skills. The choice of puppets is due to their tactile nature, which facilitates both expression and perception of the body and environment, offering an accessible alternative for people with sensory disabilities (King et al., 2019). The importance of integrating adaptive technologies and innovative methods in art therapy is highlighted by authors such as Alders et al. (2011), who point out the challenges and opportunities these technologies present in therapeutic contexts.

The results obtained indicate that the intervention had a positive impact on the selected variables. The puppets' construction allowed participants to explore and represent body parts in greater detail and develop greater body and spatial awareness. This finding is consistent with that observed by Hackett et al. (2017), who note that activities such as these can provide a form of meaningful self-expression for individuals with sensory disabilities. Furthermore, the use of tactile modeling, as suggested by Buonamici et al. (2015), was shown to be effective in the exploration and autonomy of blind people in understanding their environment.

Nonverbal communication, primarily through touch and body movements, proved to be an effective method for expressing ideas and emotions, overcoming the traditional communication barriers faced by deafblind people. This aspect is supported by previous studies, such as those of Hackett et al. (2017), who highlight the importance of these methods for effective communication in this population. Participants' ability to use these nonverbal means facilitated the transmission of information, and promoted a deeper emotional connection with mediators and other participants, as mentioned by Buonamici et al. (2015).

Regarding the impact of the creative process on emotional expression, participants demonstrated the ability to innovate, adapt puppet designs, and establish dia-

logues through the puppets, indicating flexibility and adaptation in techniques that promote a , more prosperous, and more diverse emotional expression. This finding is consistent with the observations of Ferro and Byers (2017), who highlight the efficacy of puppets in developing communicative and creative skills. Furthermore, Coleman and Cramer (2015) suggest that the use of assisted techniques can enrich the artistic experiences of people with multiple disabilities, a relevant aspect in the context of art therapy with people who are deafblind.

The improvement in interpersonal relationships and social interaction was also evident, as participants showed a steady increase in the ability to focus on activities and relate to others, especially through mutual support and cooperation. Thus, as Coleman and Cramer (2015) refer, the puppets' construction and use favored originality and promoted teamwork. These results underline the importance of adapting artistic activities to individual needs, highlighted by Faramarzi and Moradi (2015), who evidence that artistic activities can significantly reduce loneliness and hopelessness in people with sensory disabilities.

Based on these aspects and the upward evolution of the average score of the sessions, it is possible to affirm that the construction of puppets is an effective intervention for improving body perception, nonverbal communication, emotional expression, and interpersonal relationships in people with deaf-blindness.

The findings underscore the need to include art therapy programs in specialized centers, adapting the activities to the sensory abilities and specific needs of the participants to maximize the therapeutic benefits.

CONCLUSIONS

The general objective of the present research is to explore how the process of building a puppet can influence the body and spatial perception, as well as the communication and relational skills of people with deaf blindness. The results obtained reflect significant findings in several areas.

First, the puppet-building activity allowed participants to explore and represent body parts in detail, which encouraged the development of a mental image of the human body through tactile manipulation. This process was particularly effective in improving proprioception, and it was observed that individual sensory abilities, such as the presence of visual cues, influenced the level of puppet accuracy, with those who had visual cues adding more specific details.

Throughout the 16-week intervention, data derived from the art therapist's field diary reflected continued

improvement in the group's proprioceptive skills, despite individual differences in the rate of progress. Nonverbal communication facilitated interaction between the specialists and the deafblind individuals. Techniques such as touch, the finger alphabet, and adapted sign language enabled effective nonverbal interaction between participants. However, challenges were also identified, such as the physical effort required for nonverbal communication, which in some cases was exhausting for the participants.

The records of the sessions indicated that the art therapy interventions were effective in promoting the development of nonverbal communication, evidencing sustained progress in this skill. Although initial scores varied significantly, due to individual differences such as visual residuals, all participants showed remarkable progress by the end of the program.

In addition, the intervention allowed observing a remarkable originality in the creative process of the participants, which favored emotional expression. The field diary records of the art therapist suggest that this emotional evolution was constant and positive throughout the program, reinforcing the effectiveness of art therapy in this area.

In terms of interpersonal relationships, the art therapy sessions fostered the development of a sense of community and collaboration among participants. The mediators adapted the activities to individual needs but some participants, especially those with greater or lesser levels of disability, faced difficulties, evidencing the need for additional strategies to improve these skills.

Differences in sensory abilities and methodological adaptations reinforce the importance of personalized approaches to maximize the therapeutic benefits of these activities. Session score records derived from the art therapist's field diary reflect a positive evolution in participants' social interaction skills over the 16 weeks of intervention, with initial low scores gradually improving. This general trend of improvement in social interaction suggests that the art therapy activities implemented have been effective, contributing significantly to the development of this skill in the group. The results support the hypothesis that the intervention promoted a favorable evolution in the participants' social interaction.

Thus, from an overall perspective, it is possible to conclude that the evolution of the average score of the sessions shows an ascending pattern, with some fluctuations in the first weeks due to the need to adapt the activities to meet the diverse abilities and limitations of the participants with deaf-blindness. The personalization of the

sessions by the mediators was a key factor in maintaining an inclusive and participatory environment, allowing participants to maintain their interest and commitment.

For all these reasons, it is considered that the study highlights the importance of art therapy, specifically the creation of puppets, as an effective tool for the improvement of proprioception, nonverbal communication, emotional expression, and social interaction in deafblind people.

LIMITATIONS

The present clinical study has several limitations that should be considered when interpreting the results and planning future research. The small sample size, while justified by the characteristics of the deafblind population (Alders et al., 2011), affects the generalizability of the findings to the broader population of individuals with deaf-blindness.

Additionally, the diversity within the experimental group in terms of visual and auditory residuals introduces variability that may limit the representativeness of the results for all people with deaf blindness. This heterogeneity, inherent to the deafblind population, underscores the need for highly personalized approaches, which may not always be feasible (Choe & Carlton, 2019). More-

over, this variability could affect the replicability of the study in different contexts (Hackett et al., 2017).

Another important factor is the influence of the communicative mediators, whose experience and skills in adapting art therapy techniques and effectively communicating with participants likely impacted the study's outcomes. The success of such programs relies heavily on the mediators' expertise (King et al., 2019), highlighting the importance of providing them with adequate training to ensure effective interventions.

These limitations should be carefully considered when analyzing the study findings and designing future research to enhance the external validity and applicability of the results.

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DECLARATION OF INTEREST STATEMENT

The author reported no potential conflict of interest

ETHICS DECLARATION

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the University of Valladolid (PI 23-3402 NO HCUV), in December 2023.

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