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Literature review

Body language as a cognitive stimulation strategy in people with hearing disabilities

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ABSTRACT

Through body language, it is possible to generate a series of meaningful learning experiences through bodily sensory perceptions. This medium is considered a mechanism for social, psycho-emotional, and general cognitive development. The objective was to determine the significance of body language as a cognitive stimulation strategy in people with hearing impairments. Methodologically, the study is a bibliographic research project, utilizing the following academic platforms: Scielo, MEDLINE, Dialnet, Scopus, Psycodoc, Redalyc, PsycArticles, Google Scholar, and major postgraduate repositories. Works published within the last five years were included. Among the main results obtained, it is noteworthy that body language is a cognitive stimulation strategy in people with hearing impairments, as it leverages brain plasticity to transform movement into a thought



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process. The brain reorganizes itself to process information through the visual and kinesthetic systems, transforming the body into a tool for analysis, memory, and problem-solving. It is concluded that body expression is an excellent stimulant of higher cognitive functions in people with hearing loss. It has an impact on the Neurotrophic Factor, promoting neuronal survival and plasticity. It acts as a stimulant of the cerebellum and basal ganglia, which control balance, movement precision, and fine motor coordination, generating greater and better cognition. There is also a positive effect on psychological, emotional, communicational, and social elements.

Keywords:Hearing Impairment; Cognitive Stimulation; Body Expression.

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Introduction

Before starting the crucial part of the research on body expression as a cognitive stimulation strategy in people with hearing disabilities, it is essential to address the topic of disabilities in a precise and complementary manner, as suggested by Charry-Bressan, et al. (1) who note that people who present different problems of this type are usually isolated from the group or the environment, for which reason they require specialized interventions, both from the perspective of the condition, as well as within the educational and formative processes from the early stages, until the formation of their personality or “self”.

Bennasar-García (2), on the other hand, points out that body expression is part of physical and recreational activity, which constitutes a very valuable element for educators, psychotherapists, psychologists, parents, and therapists who have children, adolescents, or adults with diverse disabilities in their classrooms. Body expression allows for the activation of the body, in addition to generating emotional control, facilitating the



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development of internal and external socialization processes, and contributing to the homeostasis of personality elements such as self-esteem, self-concept, self-confidence, and the ability to relate to others. It is one of the most effective and readily applicable neuro-perceptual enhancement strategies.

Within the framework presented so far, it is essential to cite the contribution of Franco-Llanos et al. (3), who, moreover, complement this view on body expression and the teaching-learning processes in people with disabilities such as hearing impairment. The authors state that didactic and psychopedagogical training is essential for teachers responsible for the education or intervention of people with various disabilities, as they require personalized attention in many cases. Body expression techniques allow for giving meaning and coherence to movements, as they transmit messages, feelings, and emotions, but they must be managed by a professional or expert in the field.

Furthermore, from the perspective of Hernández-Beltrán et al. (4), there is a serious problem regarding pedagogical, psychological, and psychophysiological rehabilitation interventions for people with various physical or social disabilities. Given this background, body expression offers an economical way to stimulate the brain through the planning, organization, and execution of movements. It fosters mental flexibility and the development of physical, psychological, and emotional inhibition and disinhibition, which directly impact the individual's psyche.

At the level of psychomotor development, Fonseca-Lette (5) proposes that body expression includes components such as analytical technical movements, locomotion, creativity, and body exploration, among others. This demonstrates its value as an ally in educational and rehabilitation planning at all levels. Furthermore, it allows for overcoming intrinsic and extrinsic relational obstacles such as repression, negative emotional states, behavioral inhibitions, social isolation, and low self-esteem, among the most prominent.

Another determining element that justifies body expression as a means of channeling cognitive potential, and not only in people with physical, psychological, social disabilities, lies in the close link with gross and fine motor skills, balance, spontaneity, spatial



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perception, eye-hand coordination, in addition to being a means of psychological-emotional, sentimental, affective, creative transmission, it allows potential to the imaginary, and constitutes a cathartic mechanism of the psyche and the body as proposed by Silva-Delgado, et al. (6)

Regarding the impact of body language on executive functions, Montávez-Martín et al. (7) state that it promotes personal and social development, which generates interest in different types of learning. It also activates "mirror neurons," located in the inferior parietal lobe and premotor cortex, which are activated when performing movements or observing others doing so. Greater efficiency is observed in the transfer of information between the right hemisphere (associated with creativity and spatial reasoning) and the left hemisphere (logic and language).

Altamirano-Cortez, et al.,(8) from a perspective focused on learning and development processes at the cognitive level, highlights that there is feedback between body, mind and sensory perceptions, thus indicating that body language facilitates the restructuring of communicative thought, improves the perception of the body schema, stimulates spatial location, enhances laterality, generates internal and external focus of attention, and also nourishes memory capacities.

Regarding sensory perceptions and their relationship to bodily activity, Montávez-Martín et al. (7) state that there is greater awareness of muscles, the skeletal system, and bones, and that it develops skin sensitivity and galvanic skin responses, particularly in terms of resistance or conductance. Furthermore, it is essential to note that it allows for a better sense of rhythm and timing to coordinate individual or group movements; all of these elements are crucial in inclusive education and intercultural communication.

Body expression, such as dance, therapeutic theater, and clowning, allows for an internal encounter with the person practicing it, generates pleasure, awakens all the senses, develops social inclusion, and raises levels of brain-derived neurotrophic factor (BDNF), a protein that acts as a "fertilizer" for neurons, promoting neuronal survival and plasticity. It



acts as a stimulant of the cerebellum and basal ganglia, which control balance, movement precision, and fine motor coordination, as noted by Arévalo-Baeza & Pacheco-Fuentes. (9) It is also important to mention what was cited by Garrigó-Viloria & Pacheco, (10) who refer to the fact that physical activity, such as body expression, allows the activation of the hypothalamus-pituitary-adrenal (HPA) axis, while reducing levels of cortisol, the hormone responsible for stress and psychological exhaustion. Additionally, neurotransmitters such as endorphins and dopamine are generated, responsible for feelings of pleasure and well-being, allowing for psychological and emotional recovery, as well as mitigating the perception of pain.

The multisensory experience that can be generated by the expression of the body in an oriented way is highlighted by Bennasar-García, (2) who clarifies that these elements are essential to be developed in people with disabilities, in the case of those who suffer from deafness or serious hearing problems, it contributes to developing "belonging to oneself", generating a strong stimulation in the vestibular system, which is responsible for balance, gravity, acceleration, and visuospatial orientation.

Based on this conceptual background, the objective was to determine the significance of body expression as a cognitive stimulation strategy in people with hearing disabilities, identifying its benefits, impact at the brain level, within the teaching-learning processes, its repercussions on the psyche and moods.

Methods

This study was based on a documentary-bibliographic exploration as a research resource that directly contributes to cognitive learning processes and allows for understanding the realities of the contemporary environment. Parameters proposed by Barros-Bastidas & Turpo-Gebera (11) were followed, who highlight the importance of bibliographic explorations as ideal strategies for promoting academic research processes.



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For this purpose, the following academic platforms were consulted: Scielo, MEDLINE, Dialnet, Scopus, Psycodoc, Redalyc, PsycArticles, Google Scholar, and major postgraduate repositories. All works found within the last five years that included studies on body expression as a cognitive stimulation strategy in people with hearing impairments were included.

Development

Body language and its impact on communication in people with hearing disabilities

According to Guamán-Pichasaca et al. (12), the importance of body language as a means of psychological and communicative intervention centers on the sign language used by the person with a hearing impairment. Trunk position, head tilt, and shoulder movement are grammatical components. For example, a forward lean can indicate a question or emphasize a phrase. These concepts are complemented by the perspective of Atariguana-Tuza et al. (13), who mention that, through body language, the person with a hearing impairment learns to "hear" vibrations and visual rhythm, improves the precision of movements in general, and regulates and enhances facial expression, transcending mere play to become a cognitive-motor strategy.

Paredes Echeverría, (14) on the other hand, emphasizes the importance of body expression within the comprehensive development of children with hearing impairments, since this didactic, pedagogical, therapeutic, and social integration resource allows for greater contact between the child and their inner self and their environment, improving their self-esteem and enabling them to better adapt to the various challenges that hearing loss entails. Regarding cognitive stimulation and body expression, Vargas Jiménez, et al., (15) point out that Physical Education is often included in educational processes, which is responsible for developing physical skills; however, it also stimulates cognitive areas such as abstract reasoning and logical-mathematical thinking.

Body expression techniques such as dance in its various forms allow for the expression and channeling of feelings. It is possible to mention cognitive-motor development, in



addition to the importance of movement in human development, as it can be considered the "language of the brain." Furthermore, mental representation schemes are developed, where it is no longer necessary to follow a learning model; the mind develops the capacity to structure itself spatially, as detailed by Simbaña-Haro, et al. (16)

Among the aspects discussed so far in this section of analysis, it is essential to include a different but similar contribution from Martínez-Serrano (17), who highlights the importance of the motor story, one of the most powerful pedagogical tools for promoting inclusion. It is defined as a sung or narrated story in which the participants become the protagonists, essentially acting out the actions of the story. In the case of people with hearing impairments, the motor story should be transformed into a predominantly visual and vibratory experience in which the body translates the narrative, maximizing higher mental functions.

Importance of body language as a psychotherapeutic resource in people with hearing loss

A highly relevant contribution to the understanding of body expression and its benefits for people with hearing disabilities is presented by Álvarez & Morantes (18), who describe the diversity and interventions that can be achieved through dance and biodanza. They argue that it is an exceptionally effective tool for the integration of children and adolescents with hearing impairments, as its methodology is not based on the biological perception of music, but rather on lived experience (the experience of the here and now) through movement and human connection. This allows for psycho-emotional and physical homeostasis, and furthermore, adaptation within the social environment surrounding the person with a hearing disability. Calderón et al. (19) reinforce this approach, clarifying another type of intervention and expression through inclusive dance with deaf people. They also state that this is not merely an artistic adaptation, but rather a field that redefines the relationship between sound, body, and space. In this practice, music ceases to be an exclusively auditory phenomenon and becomes a tactile, visual, and vibratory experience.



From this perspective, Cedeño Andade et al. (20) differentiate the integration of contemporary dance and body expression in inclusive physical education, noting that it represents a paradigm shift, moving from a discipline based on performance and competition to one centered on communication, creativity, and self-awareness. These types of intervention alternatives allow the body to take center stage in its own unique way, regardless of functional abilities. In the specific case of deaf individuals, it fully stimulates both physical and cognitive development. An interesting contribution is made by Arce Velásquez et al. (21), who emphasize that body expression becomes the primary language of learning when one of the senses, such as hearing or sight, is impaired. For students with hearing disabilities, this strategy is not just a complement; it becomes a bridge that translates abstract concepts into a physical and tangible reality.

Bravo Vega et al. (21), on the other hand, clarify that the planning of physical exercises, which have playful connotations, also constitute therapeutic means for the psyche of people with disabilities. In the specific case of those with hearing loss, it becomes a passport to the psycho-emotional catharsis and expression of conscious and unconscious feelings, emotions, and frustrations. Furthermore, there is a projection of what the psyche contains through the mechanisms of "repression" and "sublimation," considered the "psycho-emotional storehouse" and the "channeling of impulses," respectively. These concepts are complemented by the work of Ermel Caicedo et al. (23), authors who assert that the intersection between physical exercise, balance, body expression, and inclusion in people with hearing disabilities generates a profound psycho-neuronal impact.

In the absence or reduction of auditory stimuli, the brain resorts to neuroplasticity to compensate and reorganize its functions, using movement and balance as its main allies. Cognitive functions are forced to prioritize information from proprioception (sensors in muscles and joints) and the visual system, in order to seek compensation for the absence of hearing.



Conclusions

In conclusion, it can be said that body expression enhances all brain functions in people with hearing impairments. It produces a higher level of brain-derived neurotrophic factor (BDNF), a protein that acts as a "fertilizer" for neurons, promoting neuronal survival and plasticity. It stimulates the cerebellum and basal ganglia, which control balance, movement precision, and fine motor coordination, leading to greater and better cognition. Furthermore, it also demonstrates a positive impact on psychological, emotional, communicational, social, and behavioral aspects. It also generates catharsis at the personality level and becomes an excellent didactic, pedagogical, and stimulation intervention mechanism for people with hearing loss.

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Conflict of interest

The authors declare no conflict of interest.

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