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Improving the quality of life of aphasics through therapeutic interventions

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Abstract: Aphasia is a language disorder caused by neural damage, with significant impact on the patient and loved ones. This research is a case study that aims to demonstrate that therapeutic interventions improve the quality of life of those affected by aphasia, highlighting the importance of total communication and family counseling. The study includes three patients with post-stroke aphasia and three family members. This paper contains 2 hypotheses that we tested with the help of 3 lenses. The findings show that constant speech therapy rebalances patients' personality and improves their quality of life, highlighting the need for a holistic approach and family counseling.

Key notions: aphasia, quality of life, counseling, speech therapy, total communication

1. Theoretical highlights about aphasia

1.1. General description

The term "aphasia" describes a language disorder caused by neural impairment, studied from multiple perspectives (clinical, neurological, cognitive) over time, with significant contributions from researchers Broca and Wernicke (Incze, 2017). Modern approaches use advanced imaging techniques to understand the functional neuroanatomy of language, highlighting the importance of extended neural networks and their connections in language processing, going beyond classical univariate, lesion-symptom models (Yuste, 2015).

Verza E., offers a comprehensive definition of aphasia as "a neuropsychic disorder that causes serious disorders of language, in all its levels: understanding, expression, reception, formulation and elaboration of ideas, being associated with disorders of intellect, gnosis and other disorders of various psychic processes and functions as well as disorders at the level of personality and behavior" (Verza, 2011, p. 606).

Aphasia, a language disorder, derives from lesions of the linguistic area of the brain, specifically in the Broca and Wernicke regions. These injuries can be caused by various conditions, including stroke (stroke), traumatic brain trauma (TBI), brain neoplasms or neurodegenerative diseases. The symptoms associated with aphasia vary and may include difficulty articulating words or sentences, deficits in language comprehension, or a combination of both. The evaluation and treatment of aphasia are crucial aspects, highlighting the importance



of an interprofessional approach in the care of subjects affected by this condition (Le & Lui, 2023).

In recent literature, the most important criterion for classifying aphasic syndromes is verbal fluency. Depending on the area of the brain affected, verbal language disorder can manifest itself in two main forms:

1. Fluent aphasia, in which the individual may exhibit the ability to emit speeches that, at first impression, seem normal, however, these may include made-up words or contain distorted sounds. It has the following subtypes: Wernicke sensory aphasia, conduction aphasia, transcortical sensory aphasia, amnesiac aphasia, anomia aphasia.

2. Nonfluent aphasia, in which the individual presents difficulty extracting words, showing a tendency to omit or abbreviate words. It has the following subtypes: Broca's aphasia (motor aphasia), transcortical motor aphasia, dynamic aphasia, global aphasia, mixed aphasia (Verza, Verza, 2011, pp. 613 - 614).

1.2. Quality of life of the patient with aphasia

Language plays an essential role in people's lives, and any deterioration of language, such as aphasia, negatively affects personality and behavior, thus reducing patients' quality of life. Patients with aphasia face multiple challenges, including loss of personal autonomy, difficulty understanding and communicating, and non-linguistic cognitive impairments. These factors lead to depression (Baker et al., 2020, Mitchell et al., 2017), anxiety (Cahana-Amitay et al., 2015, Laures-Gore & Buchanan, 2015), apathy (Kennedy, Granato & Goldfine, 2015), agitation and aggression (Osa García et al., 2020, Santos & Ferro, 2019) and other neuropsychiatric disorders, negatively influencing participation in speech therapy. The impact of aphasia also extends to the family, which feels the physical and emotional burden (Lima et al., 2021), emphasizing the importance of involving and counseling family members in the rehabilitation program (Baker et al., 2021).

2. Therapeutic interventions in aphasia

Recovery of language function in patients with post-stroke aphasia depends on multiple variables, including the size and location of the lesion, the degree of white matter network damage, and characteristics of unaffected brain tissue (Turkeltaub, 2019). The severity of aphasia influences recovery outcomes, with notable improvements. Most of the improvement can be seen two to three months after onset and tends to peak at six months, with recovery rates dropping drastically thereafter. Broca's aphasia has better recovery compared to global aphasia, and global aphasia has better recovery compared to Wernicke's aphasia (Le&Lui, 2023).

Traditional methods of language retrieval in aphasia, such as "watch-listen-imitate," focus on word repetition, melodic intonation therapy, motor control rehabilitation through action observation, visual perception of articulatory movements, gesture communication, and the use of alternative communication technologies (Brady et al., 2012).

Modern neuroscience-based methods of language neurohabilitation in aphasia include functional brain reorganization techniques such as transcranial magnetic stimulation and transcranial DC stimulation, which use neuroplasticity to activate intact neural networks and improve language functions. In order to determine the optimal timing of intervention and identify the best therapeutic strategies, it is essential to understand the brain's neural plasticity processes, which can lead to spontaneous recovery or improvement through specialized rehabilitation. The brain has the ability to alter its neural circuits, which allows impaired functions to adapt and recover.



Integrating motor learning into neurorehabilitation is crucial for improving motor skills and language in aphasia, as there is a common neural link between manual motor skills and speech (Hodgson et al., 2021). The holistic and multidisciplinary approach, including the use of neuroimaging and neuromodulation, is essential for assessing and supporting functional brain and language recovery in patients with aphasia.

3. Research methodology

General purpose of the research

Assessing how early recovery intervention in aphasia, as well as counseling the aphasic patient's caregivers about the difficulties encountered by him, influences both the quality of life of the aphasic patient and of the family members to which he belongs.

3.1. Research objectives

Objective 1. Identification of language difficulties and cognitive deficits acquired by the patient with aphasia.

Objective 2. Highlighting the negative impact of language difficulties on the quality of life of people with aphasia and their caregivers.

Objective 3. Studying the role of the family in verbal rehabilitation of people with aphasia.

3.2. Research hypotheses

Hypothesis 1. Language impairment in people with aphasia is thought to have a negative impact on their quality of life and that of their caregivers.

Hypothesis 2. Early verbal rehabilitation intervention and involvement of family members to implement the therapeutic program is presumed to play a positive role in the recovery of people with aphasia.

3.3. Research methods and techniques

⇒ Minimum Mental State Assessment Test (MMSE) – is a cognitive screening tool that evaluates various cognitive functions, including memory, attention, and language. This tool is used to assess aphasia because, as is common in aphasic patients, cognitive dysfunction primarily affects language skills. The use of this tool was necessary to highlight the specificity of language difficulties of subjects with aphasia, from the selected group, with the role of supporting the analytical approach of demonstrating objective 1, as well as hypothesis 1 of this research.

⇒ Questionnaire for family members of subjects with aphasia from the selected group - Given that family members are those who know best the patient with aphasia, we have conducted a questionnaire to support our analytical approach to demonstrate objectives 2 and 3, as well as hypothesis 2 of the present research.

⇒ Conversation method - The method of conversation involves a direct relationship between the researcher and the subject, in which certain aspects of the therapeutic process are intentionally discussed, taking the form of spontaneous dialogue or debate.

⇒ The method of observation - is systematic and objective, capturing the natural manifestations of the patient with aphasia in his living environment, orienting therapy according to his real needs. By observing the patient's communication and interaction, difficulties affecting his quality of life are identified.

⇒ Case study - is a qualitatively useful method in the detailed understanding of the individual experience of subjects, providing deep insights into the difficulties encountered by



people with aphasia and their families in everyday life, facilitating the development of a therapeutic program adapted to real needs.

3.4 Research lot

The group of this research is composed of 3 subjects diagnosed with aphasia and 3 caregivers of people with aphasia from the selected group. The participants are adults, from urban areas, and the speech therapy diagnosis is as follows: 2 people are diagnosed with Broca Aphasia and one person with Mixed Aphasia. All subjects acquired the language disorder as a result of an ischemic stroke.

3.5. Organization of research

The research was conducted between October 2023 and April 2024, in which the batch of subjects was selected, initial testing and retesting were performed, detailed information was captured using non-standard methods and a therapeutic plan for verbal rehabilitation of subjects with aphasia and a counseling program for family members were applied.

4. Analysis of research results

Hypothesis 1

Hypothesis 1 is consistent with the first two objectives, in which we aimed to identify language difficulties and cognitive deficits acquired by the patient with aphasia and highlight how language difficulties of patients with aphasia lead to negative mood changes, with a negative impact on their quality of life and that of their caregivers.

In the first stage of the research, the initial MMSE test was administered to identify language and cognitive difficulties in patients with aphasia.

Table 1 - Initial testing with MMSE sample, comparison of 3 cases of aphasia

Sample structure	R.E., female, Broca aphasia	S.A., male, Broca aphasia	R.M., male, Mixed aphasia
Spatio-temporal orientation (max 10 pts)	7	9	0
Immediate and short-term memory (max 6 pts)	1	4	0
Vocabulary (max 3 pts)	3	3	0
Understanding an order (max 3 pts)	3	3	0
Writing-reading (max 2 pts)	0	0	0
Calculation (max 5 pts)	0	1	0
Copied (max 1 pt)	0	0	0
Total = 30 pts	14	20	0
Stage	Severe	Marked	Serious

Results from initial testing with MMSE sample, as shown in Table 1, indicate that subjects with Broca's aphasia had good spatiotemporal orientation but impaired immediate and short-term memory. They had a small vocabulary, produced words with incorrect phonemes, poor grammatical structure and slow verbal flow, but mostly understood the messages transmitted. The subject with mixed aphasia had major difficulties with all pregnancies.



According to the interpretation of the tests, the female subject with Broca's aphasia falls into the severe stage of cognitive impairment, this stage indicates that he needs help with daily care activities. The male subject with Broca's aphasia falls into the marked stage, shows compensatory coping strategies. And the subject with mixed aphasia falls into the serious stage, indicates that it requires institutional care and permanent supervision. These results led to the identification of language difficulties and cognitive deficits acquired by the patient with aphasia and the achievement of goal 1.

Following the application of the questionnaire for aphasic caregivers, it was concluded that aphasic subjects are aware of their difficulties and react depressively.

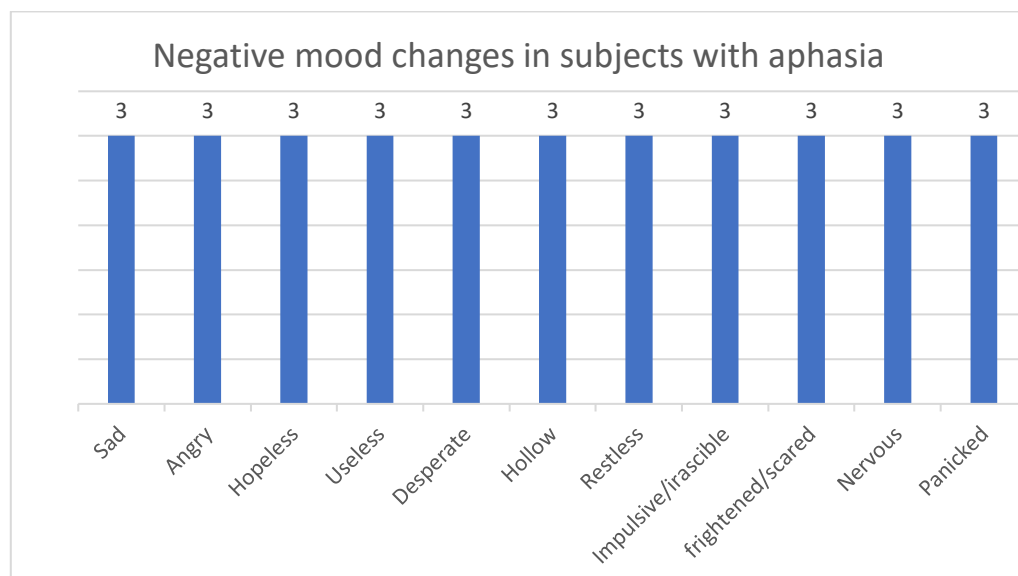


Figure 1 - Negative mood changes in subjects with aphasia

From the graphic representation shown by Figure 1, it appears that all subjects with aphasia, in the selected group, are perceived by the family as manifesting functional negative emotions (sadness, anger) and dysfunctional negative emotions (hopeless, useless, desperate, depressive). Dysfunctional negative emotions from the "fear" category are also present: impulsive/irritable, frightened/frightened, nervous, panicked. The presence of these dysfunctional negative emotions in the category of sadness and fear shows that diminished functional communication in subjects with aphasia frustrates them a lot and they become less tolerant and irritable, reacting totally disproportionately in trivial situations of everyday life within the family. Anger is an emotional reaction, and aggression is the behavioral reaction subsequent to this emotion, which is why the subjects with aphasia participating in this study are perceived by the family as hostile and aggressive.

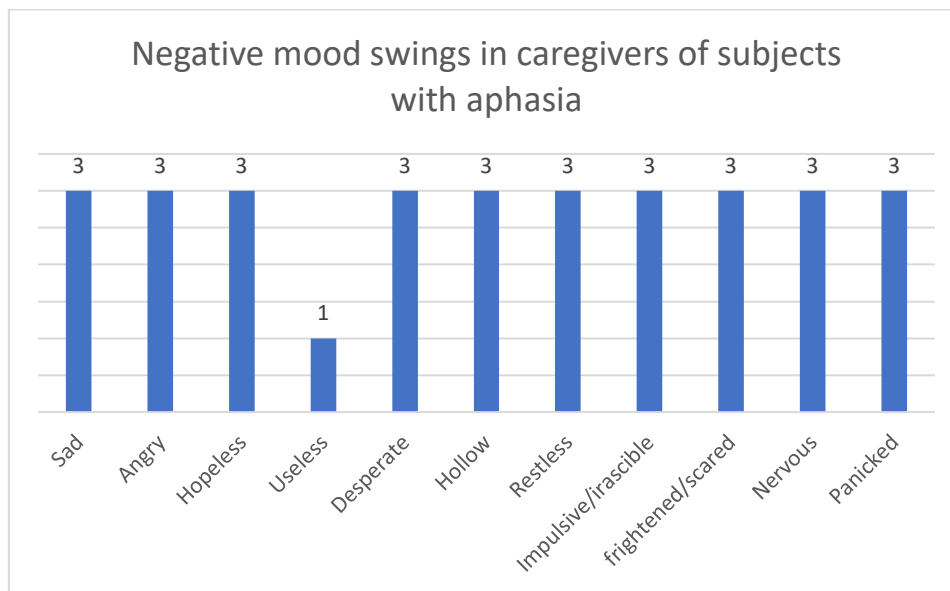


Figure 2 - Negative mood swings in caregivers of subjects with aphasia

According to the graphic representation shown in Figure 2, we see that people who care for subjects with aphasia, feel a physical and emotional burden and experience to a large extent negative functional/dysfunctional emotions in the categories of sadness and fear, and are forced to change their lifestyle. Living with a person who has survived a stroke and has motor, cognitive and language deficits has been found to be a significant challenge. Ineffective communication with aphasic contributes to their emotional exhaustion. All this leads to the formation of a hostile environment within the family, with direct consequences for everyone's quality of life. It shows that both subjects with aphasia and family members who care for them experience anxiety, anger and lack of personal worth. These results highlighted how aphasia patients' language difficulties lead to negative mood swings, negatively impacting their quality of life and that of their caregivers, and we were able to achieve goal 2.

Therefore, the first two objectives of the research were achieved, and the initial hypothesis of the research was confirmed, where it is assumed that language impairment in people with aphasia has a negative impact on their quality of life and that of their caregivers. These findings are consistent with studies by Meier et al. (2022), which showed that people with aphasia have language impairments in comorbidity with impairments of executive functions, and this situation will influence verbal and functional rehabilitation of the patient with aphasia.

Hypothesis 2

The identification of aphasic difficulties and mood swings of caregivers led to the development of a comprehensive speech therapy program and to the creation of a counseling program for family members, because it was assumed that early verbal rehabilitation intervention and involvement of family members to implement the therapeutic program has a positive role in the recovery of people with aphasia.

The speech therapy program included, besides verbal rehabilitation objectives, cognitive stimulation objectives, using various methods and techniques to improve the affective state and attitude of patients: Montessori method, ABA, PECS, AAC. The family counseling program aims to create a favorable recovery environment to improve their quality of life. Baker



et al. (2021) recommend involving family members of the patient with aphasia in the verbal rehabilitation program and psychological counseling for both the aphasic patient and their caregivers. After presenting the two programs, we found that all caregivers want to get involved in the implementation of the verbal rehabilitation therapeutic program and cooperate with the speech therapist.

Table 2 - Retest with MMSE sample, comparison of 3 cases of aphasia

Sample structure	R.E., female, A. Broca	S.A., male, A. Broca	R.M., male, A. mixed
Spatio-temporal orientation (max 10 pts)	8	10	0
Immediate and short-term memory (max 6 pts)	2	6	0
Vocabulary (max 3 pts)	3	3	0
Understanding an order (max 3 pts)	3	3	0
Writing-reading, calculating and copying (max 2 pts)	0	1	0
Calculation (max 5 pts)	0	3	0
Copied (max 1 pt)	0	0	0
Total = 30 pts	16	26	0
Stage	Moderate	Easy	Serious

Table 2 shows how speech therapy can have such a positive and far-reaching impact on a person with aphasia. The performance of the three subjects improved significantly. The subject R.E. (female, Broca's aphasia) improved both vocabulary and words are articulated using correct phonemes, and verbal flow and concentration improved, suggesting that the therapy was not only effective but comprehensive in treating the needs of the individual, and this progressed by one stage. It should be noted that he started therapy 3 months after diagnosis and did not participate constantly. The subject of S.A. (male, Broca Aphasia) acquired the ability to develop independence and better manage frustration, and the number of words used increased, progressed by two stages, even exceeding the limit stage of 23 points, specifying that he started speech therapy from the first month and constantly participated in the therapeutic process. The R.M. subject with mixed aphasia, besides not seeing results indicated by the MMSE test, learned some basic words and sounds associated with certain objects, and his aggressive behavior was reduced.

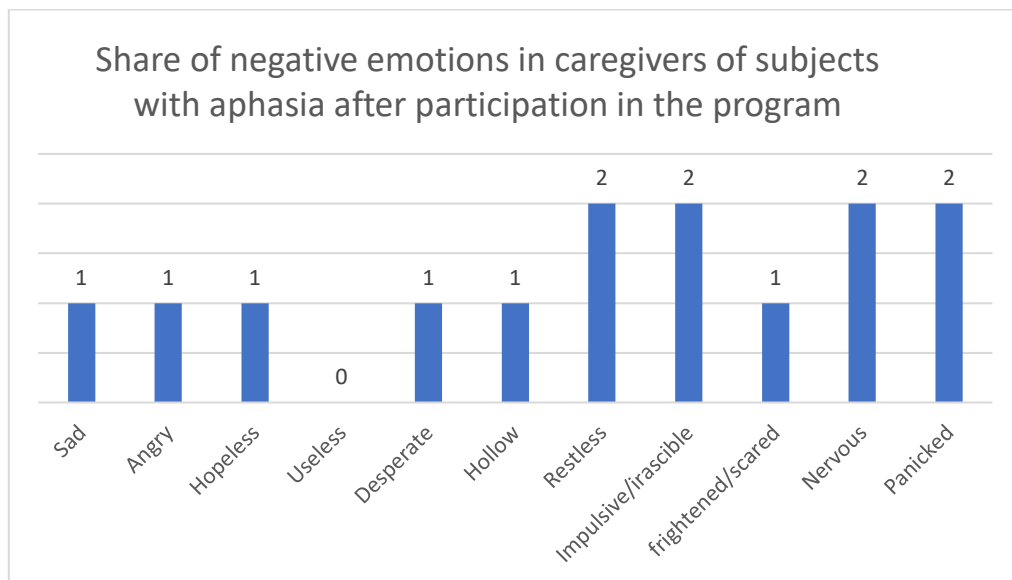


Figure 3 Share of negative emotions in caregivers of subjects with aphasia after participation in the program

The graphic representation shown by Figure 3 highlights the negative emotions of the caregivers of the subjects with aphasia in the selected group. We notice, however, that as a result of the counseling received within the program, the negative emotions decreased in intensity, and the "useless" item has a value of 0. He shows that getting involved in expanding speech therapy has brought them a sense of competence and helped them understand why recovery is so difficult. Most of the participants developed maladaptive coping strategies as a result of the fact that in solving problems they focused on emotions and not on the real problem they had to solve. And in their case the valences of total communication led to favorable results, because when a synchronization between thought and emotional is achieved, it will result in the rebalancing of the entire personality.

Therefore, improved results from retesting with MMSE sample and positive results from questionnaire reassessment helped achieve goal 3 and confirm hypothesis 2, where early verbal rehabilitation intervention and involvement of family members to implement the therapeutic program are assumed to have a positive role in the recovery of people with aphasia. These findings are consistent with studies by Huang et al. (2021), Godecke et al. (2021).

Conclusions

We believe that this study highlights the importance of therapeutic interventions in improving the quality of life of patients with aphasia, highlighting that the rebalancing of their personality depends on several factors. These include constant speech therapy intervention, which is initiated after obtaining approval from the neurologist, holistic approach to the therapeutic program, involvement and counseling of family members and individual motivation of each patient. It is essential to treat the patient as a whole, taking into account not only the physical but also the emotional, social and psychological aspects, since aphasia is not a disease, but a consequence of neuronal damage that requires effort and support from all factors involved in the recovery process.



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