Effect of a non-pharmacological neurointervention program in adults with cognitive impairment in a sample population from Sincelejo, Sucre

Efecto de un programa de neurointervención no farmacológica en adultos con deterioro cognitivo en una población muestra de Sincelejo, Sucre

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Received: 09/26/2021 Accepted: 12/15/2022 Published: 12/25/2022 DOI: https://doi.org/10.5281/zenodo.7658766

AVFT Volumen 41, número 12, 2022 ISSN 2610-7988

Abstract

Introduction: mental illnesses in the elderly population continue to increase worldwide, which is why research aimed at non-pharmacological intervention is very important, which will allow the stimulation of cognitive activity through interesting routines and activities. and nearby in older adults with cognitive impairment, thus allowing them to stop the progress of the deterioration and the comorbidities that cause this type of disease. **Objective**: to determine the effectiveness of a non-pharmacological neurointervention program in adults with cognitive impairment in a captive population from Sincelejo, Sucre-Colombia. **Methodology**: it was based on the selection of a control group and an experimental group, to which neurocognitive therapy was applied consecutively for a period of three months, three times a week, with a daily duration per patient of about 30 minutes. **Results**: improvement was found in terms of cognitive impairment in patients undergoing non-pharmacological therapy compared to the control group. **Conclusion**: it is recommended to apply this type of programs in elderly people.

Keywords: elderly, cognitive dysfunction, pharmacological therapy.

Resumen

Introducción: enfermedades mentales en la población de la tercera edad continúan en aumento a nivel mundial, por ello son muy importantes las investigaciones encaminadas a la intervención no farmacológica, la cual va a permitir la estimulación de la actividad cognitiva a través de rutinas y actividades interesantes y cercanas en los adultos mayores con deterioro cognitivo, permitiéndoles así detener el progreso del deterioro y las comorbilidades que causan este tipo de enfermedades. Objetivo: determinar la efectividad de un programa de neurointervención no farmacológica en adultos con deterioro cognitivo en una población cautiva de Sincelejo, Sucre-Colombia. **Metodología**: se basó en la selección de un grupo de control y uno experimental, al cual se le aplicó terapia neurocognitiva durante el período de tres meses de forma consecutiva, tres veces por semana, con una duración diaria por paciente de cerca de 30 minutos. Resultados: se encontró mejoría en cuanto al deterioro cognitivo en los pacientes sometidos a terapia no farmacológica en comparación con el grupo control. **Conclusión**: se recomienda aplicar este tipo de programas en personas de la tercera edad.

Palabras clave: anciano, disfunción cognitiva, terapia farmacológica.

Introduction

Between 2000 and 2010, Latin America and the Caribbean increased by 23% the prevalence of need for care in the elderly population, by 2020 it will have increased by 47%, which will mean that more than ten million people of 60 years or older, will require daily assistance[1]. In Colombia, a prevalence of 1.8 and 3.4% has been identified in groups of patients older than 65 and 75 years, respectively; these data correspond to dementia without specifying sub-classification.1 Currently, several pharmacological interventions (for example, donepezil, huperzine A, vitamin E and cholinesterase inhibitors) have been examined as potential agents to slow or reverse cognitive decline. However, evidence suggests that these agents do not alter cognitive function outcomes or slow progression to dementia. Therefore, the most recent efforts have focused on non-pharmacological interventions[2]. The concept of non-pharmacological therapies (TNF) has been used for several decades to refer to interventions that, through primary non-chemical agents, aim to improve the quality of life of healthy or sick people[3].

Nonpharmacological interventions may hold promise for a variety of reasons. First, older adults may prefer nonpharmacologic strategies to maintain cognitive function and independence from the community over pharmacologic strategies that may have adverse side effects. Second, nonpharmacologic strategies have fewer risks than pharmacologic strategies (ie, the low probability of contraindications or problems that occur with polypharmacy); therefore, they are likely to be more generalizable. Nonpharmacological interventions that address cognitive function and the impact of cognitive function on daily life have been extensively studied in a variety of clinical populations (eg, learning disabilities, stroke, traumatic brain injury, and dementia)[4-8]. Consequently, it is important to conduct studies utilizing the benefits of TNF.

The objective of this study was to determine the effectiveness of a non-pharmacological neurointervention program in adults with cognitive impairment in a captive population from Sincelejo, Sucre-Colombia, using orientation therapy, which was performed intensively three times a week and lasting half an hour a day and requiring active and constant guidance; Structured activities were included aimed at promoting, stimulating and maintaining cognitive processes of attention, orientation, language, memory and praxis, which tend to improve the quality of life of older adults.

The MOCA Test is a tool that has demonstrated its usefulness at an international level for the evaluation of mild or moderate cognitive impairments[9], it is also a highly reliable test, it has a sensitivity of 87% and a specificity greater than 90%[10-12]; allowing the classification of patients with some degree of deterioration.

Methodology

In this study, a quasi-experimental design of the pretest-posttest type with a control group was used, with the non-pharmacological intervention program acting as the independent variable, using for this purpose the learning technique without error, which consisted in preventing the subjects from make errors during the learning of a task or the acquisition of information, giving them the correct answers at all times, with the aim of keeping the interference caused by the errors to a minimum, thus favoring the encoding of new information.

Six older adults from a geriatric home in Sincelejo participated in the study, who were randomly selected, forming two intervention groups. A control group is defined, to which non-pharmacological therapy is not performed, and a group subjected to a non-pharmacological neurointervention program, both groups with a degree of cognitive impairment. To determine the cognitive status of the patients, the "Montreal Cognitive Assessment - (MOCA) version November 12, 2004" test was used, which was administered by the researchers, after training by the neuropsychologist, who was The correction and extraction of the data produced by the test also corresponded.Activities were planned to work on attention, orientation, language, memory and praxis, which were carried out individually, during a period of three consecutive months, three times a day. week, with a daily duration per patient of approximately 30 minutes. For this purpose, the cut-off points stipulated by the test were taken into account, where a perfect score is obtained, if 30 points are reached, with the cut-off score being 26 points, considering that those who obtain this or higher scores present a normal performance, and lower scores suggest suspicion of deteri cognitive gold[9], those below these scores will determine the degree of deterioration presented by the older adult.

At the end of the neurointervention period, the post-test was carried out individually, the MOCA test was applied to both groups, in order to re-evaluate their cognitive status and present the results of the study. The product of this last evaluation was compared with those obtained previously and is subjected to an analysis of whether or not there was progression, improvement or worsening of the neurocognitive status of the volunteers. The data of each patient was recorded in a database, safeguarding the confidentiality of the information. Variables such as age, schooling and final diagnosis were categorized to facilitate their analysis. Once the processes of analysis of the results of the neurointervention with the non-pharmacological therapy were completed, the data obtained was tabulated and analyzed. Inclusion criteria: patients older than 60 years with cognitive impairment, without serious comorbidity, who present informed consent, signed by the participant or the guardian. Exclusion Criteria: patients who know how to read and write, who retain the visual ability to read and who do not have underlying disabling diseases. Before starting, this project was socialized to the volunteers and workers of the Institution where the participants were held captive, proceeding to collect the respective signatures of the informed consent and permissions of the directors.

Ethical aspects: all participants or their managers were asked to sign the consent after obtaining the endorsement of the ethics

committee of the University of Sucre. In the informed consent, the adults were informed that their participation is voluntary, that they can withdraw at any time they wish, the benefits they will obtain and that the data is absolutely confidential, among other aspects. The type of risk to which the research subjects will be exposed is with risk greater than the minimum. The statistical analysis included the comparison between the groups (control and treated) using the t-student analysis to determine if there were significant differences between the means of two groups, with a value of significance $p < 0.05$.

Results

The evaluation of each of the study participants was carried out by a disciplinary team, made up of professors of medicine, speech therapy and neuropsychology and students in their final semester of medicine, using previously established protocols. Adapted instruments were applied, which included clinical and cognitive assessment, observing that the predominant gender was male, the average age of the groups was 65 to 74 years, with a predominance of widowed marital status, the highest school level reached was high school; In both groups, a patient presented with diagnosed and medicated health problems. (Table 1).

Table 1. Health status of the control and experimental group.

HEALTH PROBLEMS		
	CONTROL GROUP	EXPERIMENTAL GROUP
HIV / AIDS	1	
Diabetes	1	
High blood pressure		1
Vascular disease		1
Physical measurements		
Size (m)	1,58 – 1,62	1,61 – 1,70
Weight (Kg)	59 – 63	60 – 73
Body mass index	22 – 25	22 – 28
Blood pressure (mmHg)	110/60 – 110/90	120/80 - 125/85
Formulated Medicine	Alazanavir 300 mg, ritonavir 100 mg, convudina 150/30 mg, insulina	Metroprolol 50 mg, levotiroxina 9,5 mg, carbamazepina 200 mg, ácido fólico 5 mg complementos de calcio

Source: the authors.

In the application of the MOCA test for the realization and development of the study, the patients were stratified with a score and a cognitive category depending on said score. This was done in both the control group and the treated group, yielding quantitative data on cognitive impairment (Table 2).

Table 2. Results of the initial evaluation before the implementation of the program

GROUPS/CASES	MOCA TOTAL SCORE	COGNITIVE STATE
CONTROL GROUP		
Case 1	7	Cognitive impairment
Case 2	14	Cognitive impairment
Case 3	17	Cognitive impairment
EXPERIMENTAL GROUP		
Case 1	11	Cognitive impairment
Case 2	17	Cognitive impairment
Case 3	24	Cognitive impairment

Source: the authors.

As can be seen in Table 3, patients with cognitive impairment, submitted to the non-pharmacological intervention program using the learning technique without errors, improve the scores obtained at the end of the intervention, since the test scores increase after the application of the non-pharmacological intervention, evidenced in the changes of test scores in the pretest (Table 3).

Table 3. Evaluation results after the implementation of the program

GROUPS/CASES	MOCA TOTAL SCORE	COGNITIVE STATE
CONTROL GROUP		
1	7	Cognitive impairment
2	5	Cognitive impairment
3	15	Cognitive impairment
EXPERIMENTAL GROUP		
4	14	Cognitive impairment
5	18	Cognitive impairment
6	29	Normal

Source: the authors.

Discussion

In this study, after applying non-pharmacological cognitive therapy to the experimental group and comparing the results obtained in the first application of the Moca test with the results of the scores achieved in the second application after the cognitive intervention to the experimental group, differences are observed. in these, which indicates that non-pharmacological cognitive therapy in the population produced favorable effects. These data coincide with those found in a study carried out by Rodríguez and Bastos 2012[13], they report that the communicative interaction showed higher times in attention, maintenance of the topic of conversation and identification of their interlocutor. The authors of this study proposed the design and application of a cognitive-communicative stimulation program for subjects with moderate cognitive impairment derived from dementia, for which an initial and subsequent evaluation of cognitive and communicative performance was carried out to determine changes; the evaluation after the program showed discreet changes in tests of nomination, evocation and sequentiality. This suggests that stimulation programs can contribute to the benefit of communicative contexts that support interpersonal relationships from effective interaction and contribute to

other higher cognitive processes. Likewise, in this study it was shown that non-pharmacological therapy improves affectivity, enhances independence in daily life and ultimately increases the quality of life of the patients operated on, so that this type of program can continue to be implemented, In fact, other studies, such as the one reported by Carballo-García et al. 2013[14], show an improvement in the general mental state in healthy aging and the absence of progression in pathological aging. The authors state that a battery of tests assessing 4 main domains (general mental status, affectivity, quality of life, and activities of daily living) was applied to a sample of adults over 64 years of age with normal aging and cognitive impairment.

Subsequently, they were assigned to TNF groups based on their capabilities or to other non-specific activities. The benefit was assessed after 9 months of TNF with the same battery of tests.

On the other hand, it is important to highlight that a certain emotional improvement was seen in the patients as the time of execution of the therapies passed, all of them were very assertive in their therapies and collaborators. Among the benefits that were detected, the patients improved their therapy times, presented improvement in the analysis and abstraction of previous knowledge, reduction in the therapy time marked in the last sessions, on average they took less time. One of the patients showed marked dexterity compared to the other two patients, who had very different educational backgrounds, as one patient had an education up to eighth grade and the other two patients up to elementary school; The foregoing, related to cognitive performance or the improvement they presented, could be related to a protective factor of cognitive therapies and intellectual development habits such as reading, abstraction exercises, logic, mathematics, memory and others that were some parameters that were evaluated in the exercises performed in the therapies after reapplying the test to categorize the patients.

Regarding the diet given to the project participants, it could be said that it was the same in all cases, but the pharmacological treatment was different for all of them, since they had different underlying diseases (Table 1). When comparing the scores obtained in the first with the second application of the MOCA to the control group, it is observed that these patients presented a lower score in the second score of the test, once the cognitive behavioral therapy with the treated group had finished. In both groups (experimental and control), affectivity and self-perceived quality of life benefited from TNF, which is evidenced by the positive results obtained by applying a TNF program in aging. It is important to note that individuals with cognitive impairment benefit more from it, although its widespread application seems to be an optimal primary preventive program in these cognitive and emotional aspects (Tables 2 and 3). The state of mind of the participants must be taken into account when applying this type of intervention, since there will be times when they are more animated and will be able to participate in the proposed activities, facilitating their learning. When working with older adults with cognitive impairment, it requires varied activities that are close to their tastes and experiences, as well as doing them individually and offering a lot of affection and affection when working. In fact, there are reports indicating that cognitive interventions are more effective in promoting a better quality of life and reducing the risk of cognitive impairment progression in old age[15].

Conclusion

The results found indicate that TNF can be used to maintain and improve cognitive impairment in elderly patients in the municipality of Sincelejo Sucre. It is recommended to apply the proposed program in a larger population.

Acknowledgment
The authors thank the University of Sucre and El Socorro Nursing Home for providing the spaces and permits to carry out the research project.

Conflict of interest: The authors declare that they have no conflicts of interest.

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