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Research Article

Reading, A Way to Enhance Cognitive Reserve in Young People with a Predisposition to Alzheimer's

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Abstract

The objective of this research is to use reading as a means to enhance the development of memory and its cognitive reserve in young people with a predisposition to Alzheimer's from the "Abel Santamaría Cuadrado" district of Santiago de Cuba. Encouraging and maintaining the habit of reading has been found to help maintain activity and cognitive functions in people with this condition. From the diagnosis applied to a sample of 15 young adults with a predisposition to Alzheimer's and scientific observation, it was possible to know the deficiencies in the cognitive processes of memory and the presence of forgetfulness in the intellectual sphere that these subjects possessed. Theoretical and empirical methods, techniques and instruments were applied that made it possible to collect the necessary information for the study. Narrative texts and poems were used to improve the memory reserve. The proposal showed that reading is an important tool for stimulating the capacities and memories of these people, taking into account the likes, preferences, needs and interests of the person with Alzheimer's, to make reading attractive and even allows them to remember vital aspects or emotions of their personal life.

Keywords: *Cognitive Reserve; Predisposition to Alzheimer's; Cognitive Functions; Cognitive Memory Processes; Narrative Texts*

Introduction

Alzheimer's is a primary neurodegenerative disorder that usually appears after the age of 65, although its appearance has also been shown in people under 40 years of age. When a person suffers from Alzheimer's disease, they experience microscopic changes in the tissue of certain parts of their brain and a progressive loss of a chemical, vital for brain function, called acetylcholine. This substance allows nerve cells to communicate with each other and is involved in mental activities related to learning, memory and thinking.

Alzheimer's is recognized as one of the most significant health crises of the 21st century and together with other diseases that cause deterioration in brain functions and cause various brain syndromes, it has been given the collective name of dementia. The functions that can be affected are memory, thinking, recognition, language, planning and personality (Hernández, 2008).

Alzheimer's disease accounts for 50 to 60 percent of dementia cases in the world. Every three seconds, someone develops this ailment; the number of people is expected to double in 20 years, so by 2050 there will be 152 million (Hernández, 2008).

Cuba is not exempt from this reality. Currently, a fifth of the population is 60 years or older is affected, and this disease increases proportionally with aging. According to statistics, in the Antillean nation it is estimated that there are approximately 160,000 people with Alzheimer's disease or a related dementia, and this number will increase to reach 273,000 in 2030, and 421,000 in 2050 (Hernández, 2008).

Fuentes (2008) highlights that there are some activities such as chess, physical exercise and reading that provide preventive benefits against this degenerative disease that affects memory and language. These activities perform a function of training skills such as planning, memory, decision-making and concentration, which are available to everyone.

Some experts from the ACE-Barcelona Alzheimer Treatment and Research Center Foundation advise promoting reading among people with dementia as a tool for working with language and memory. Encouraging and maintaining the habit of reading has been shown to help maintain activity and cognitive functions in people with Alzheimer's.

Despite the fact that reading ability is one of the processes that people lose later, it is common for them to gradually abandon this practice due to the effort involved in following the thread of the story and maintaining their attention. Faced with this situation, the experts from the ACE Foundation recommend that relatives and caregivers of people with dementia facilitate this activity by accompanying them in reading and making a book or newspaper available to them or by writing them, for example, a short text with handwriting clear.

Reading can be used as a tool to stimulate the capacities and memories of people prone to suffering from this disease, in such a way that a defense mechanism is created to help the brain exercise memory. In this sense, América Morera, deputy director of the Day Care Unit, in the Cognitive Stimulation Workshops recommends that family members and caregivers take into account the specific needs of the person and the stage of the disease in order to adapt and facilitate the readings [1].

Morera [1] assures that "If we can adapt the readings to the needs and interests of the person with Alzheimer's, we can make this activity attractive and even allow them to remember vital aspects or emotions." Readings can be shared spaces between people prone to this condition and their family members promoting values, experiences, their own experiences or not that make this stage of the individual's life much more bearable.

Based on these antecedents, an increase in people with Alzheimer's disease was observed in the community of the "Abel Santamaría" neighborhood of Santiago de Cuba, since the 16 people who suffered from it in 2019 increased to 27 people. The prevalence of young adults with a predisposition to suffer from Alzheimer's was also verified, which is why memory training is necessary in the asymptomatic stage; to delay the development or appearance of this disease based on brain plasticity.

It was also known that in the therapeutic areas that are attended by teachers of therapeutic physical culture and health specialists; Treatments are only applied to people with neurological diseases in their physical rehabilitation, not in their initial stage.

Due to the insufficient activities directed to the prophylaxis of Alzheimer's disease in people with a predisposition to suffer from it, this study was carried out with young adults who present genetically predisposing factors to inherit this disease.

For this reason, insufficiencies in the use of exercises from the intellectual point of view (work with the text), to enhance the development of memory and its cognitive reserve in young people with a predisposition to Alzheimer's in this urban community of Santiago, is declared as a research problem. As a research objective, develop memory exercises with the text to improve memory performance in young people with a predisposition to Alzheimer's.

Methodology and Methods

To develop this proposal, it was necessary to use a set of methods and techniques that would allow starting from the most essential elements that characterize the cognitive reserve in young people with a predisposition to Alzheimer's.

Among the theoretical methods we use the analysis - synthesis, to characterize from the epistemological point of view the cognitive reserve in young people with a predisposition to Alzheimer's, the dialectical hermeneutical method, for the understanding, explanation and interpretation of the object of the research.

As empirical methods, interviews with teachers, a survey of young people with a predisposition to Alzheimer's and observation of different activities were carried out, to characterize the current state of the cognitive reserve in these young people.

Statistical methods were used for the percentage assessment of the results of the applied instruments and support the processing of qualitative and quantitative data obtained in the research process.

The training of the cognitive component of young people with a predisposition to Alzheimer's, belonging to this community, was assessed, the opinion of community health professionals was known regarding the implementation of the basic elements of the text and memory exercises in prophylaxis of these young people, the medical records of Alzheimer's patients were reviewed to find out when they first manifested symptoms and who their descendants are.

The applied techniques allowed us to know the memory and frequency failures, present in young adults with a predisposition to Alzheimer's disease and to evaluate the level of learning of the young people on the basic elements of recreational chess. As for the psychological tests, they served for the neuropsychological evaluation and memory capacity of young adults with a predisposition to Alzheimer's.

Results and Discussion

The medical records of 27 people with Alzheimer's disease were reviewed to know their descendants, the type of Alzheimer's they present and the stage in which they are, from which a population of 35 young adults was obtained, from this an intentional sample of 15 was taken young adults predisposed to Alzheimer's disease with memory failures representing 43% of the total of the population, belonging to the "Josué País" polyclinic of the Abel Santamaría Cast.

These young adults have, with an age between 30 and 40 years, nine are female and six are male. With these individuals, a pre-experimental study was developed, with their prior approval, with the aim of determining the relevance of applying a set of memory exercises with a therapeutic approach, in order to train memory to improve its efficient performance. We worked with an intentional sample determined because these people:

- They were between the ages of 30 and 40, with a predisposition to Alzheimer's and manifesting memory failures.
- Voluntariness to participate in the research.
- Like reading.
- Not present some of the excluding criteria.
- Not present symptoms or neurological alterations that make it difficult to carry out the research.
- Do not present a history of alcoholism or drug abuse.

When working on cognitive stimulation with people prone to Alzheimer's, the different phases in which they are must be taken into account as it cannot be the same as with people who have their cognitive abilities in good condition. For this reason, this study focused on young people in Phase 1, which is the first phase of the disease, in which people have slight memory loss, have difficulty learning new things and begin to surround themselves with familiar things and situations, without hardly give the possibility of getting involved in strange situations for him.

At this time, cognitive stimulation would be more efficient, since the patient's cognitive abilities are not yet greatly affected. Cognitive stimulation directed towards the following areas is recommended (Course, 2019): Perform simple tasks that help mental activation:

- Work on temporal, spatial and personal orientation so that the patient can position himself at all times and knows where who is around him is.

- Carrying out exercises that stimulate memory. In the short term we can stimulate it with repetition games, but we must not forget it stimulates remote memory, making the patient remember events from his past.
- Calculation exercises are ideal to reinforce memory.
- Use basic reasoning.
- Reading and writing can be very helpful at this time: reading, dictating, journaling.

For this research, reading was used as the basis for the cognitive stimulation of these young people.

Training for cognitive stimulation and memory performance through reading.

Memory according to Alarcón, Mazzotti and Nicolini (2005) is: "process by which information is encoded, stored and retrieved. It is a cognitive process through which the information that is collected can be encoded, stored and ultimately retrieved when needed.

The memory consists of different phases according to Hernández (2012):

- Coding: In this phase the information that comes from the different sensory channels is processed and represented in the memory system.
- Retention: It is the phase in which the information represented in memory takes a place in sensory memory, short-term memory or long-term memory, so that this information can be recalled and used immediately or later.
- Retrieval: This phase allows access to and recall of previously stored information during the retention phase.

According to Soriano (1986), low brain performance as a consequence of the loss of neurons can be reversed with training, to reestablish neuronal connections or produce new ones; In other words, establishing new arrival paths for information to our cerebral cortex, where activities such as memory are processed.

Montero (2016) highlights that cognitive training allows the stimulation of memory processes through exercises and structured situations with ascending difficulty adapted to the cognitive capacities of each individual in order to improve it, allowing training also in certain cases of those capacities in the process of degenerating.

This approach by Montero (2016) leads us to try to verify and verify the main objective set out in this research: to demonstrate this relationship between the continued practice of reading and the improvement of cognitive processes.

Reading, as various and numerous studies have shown, is one of the most beneficial habits for the brain. As Morera affirms "our brain, in order for it to enjoy good health, needs us to keep it active, to exercise it; but despite the fact that it is one of the most important organs of our body, we do not always dedicate enough time to take care of it" [1].

Thus, as García [2], coordinator of the SEN's Behavior and Dementia Study Group, explains: (...) Reading is one of the most beneficial activities for health, as it stimulates brain activity and strengthens neural connections and, in addition, increases cognitive reserve, which preserves the proper functioning of our brain when we age and acts as a protective factor against the clinical symptoms of neurodegenerative diseases, among which Alzheimer's disease stands out.

An active brain improves its functions and increases the speed of response. As the SEN refers, "while we read, we force our brain to think, to order ideas, to interrelate concepts, to exercise memory and to imagine, which allows us to improve our intellectual capacity

by stimulating our neurons; Furthermore, reading also generates conversation topics, which facilitates interaction and social relations, another key aspect to keep our brain exercised" [2].

Reading increases cognitive reserve and is a protective factor against the clinical symptoms of neurodegenerative diseases. Reading is a mental process, of perception, understanding, and reaction, or as Ontza [2] refers: "It is a process by which our eyes go through a writing, and our brain interprets, organizes, and understands".

When reading, critical and analytical, reflective, and creative thinking skills are developed, thus exercising memory, imagination, capacity for abstraction and intelligence. This author affirms that reading is the gymnastics room to prevent this disease, it is a habit that we must develop from childhood, so that our brain develops all its cognitive functions.

When reading, a complex process takes place in which various areas of the brain intervene and that take about ten years to form and reach full maturity. It develops in the left hemisphere and the inferotemporal cortex - the area in charge of detecting and recognizing written words - transmits the information to other areas. García [2] affirms that "a part of the brain is specialized in the interpretation of symbols, so that we are able to use non-verbal communication. (…) Said symbols are grouped, ordered and linked in order to be understood".

When using reading as cognitive stimulation, the genre that is used matters because it is not the same to read an adventure novel than a text on criminal law for the brain. "Novels activate regions that not only interpret symbols, they also stimulate imagination or motor action.

It is what we call "getting into a book", explains the neurologist [2]. In reading there are two important aspects: one referring to the syntactic complexity -which decodes the language- and the other to the symbolic thought or the narrative that the reading itself has, that is, by increasing the efficiency of the neurons with reading, we would have You have to lose a lot more connections to get noticed (instead of at fifty to seventy). Therefore, it has been shown that active reading practice reduces the impact of the disease.

Reading at first can be monotonous and cause effort or fatigue, but when this barrier is overcome, it begins to arouse concerns, motivate and can be very satisfactory. Reading awakens the desire to learn, fantasy, creativity, imagination and the curiosity to know other places and other realities and awakens the will to live.

One of the greatest assets of reading is being able to imagine what you are reading through images. In addition, it is an activity that connects with all the rest of the learning that one has (the inferences). And it is that the imagination is so powerful that just by reading a verb that implies an action, regions in charge of movement are also activated, as shown by many functional magnetic resonances in some studies. "This implies that there is a connection between the areas of interpretation of symbols and others, such as movement, which until now we did not know," concludes [2].

Methodology to follow for working with the text and people prone to Alzheimer's.

In the initial stage or phase I, tools should be provided in the use of reading for the cognitive stimulation of young people with a propensity to suffer from Alzheimer's:

- The reading of short stories, stories or news in the press is recommended, also texts such as poetry, fables or short stories that have few characters.

As they read, annotations should be made in a notebook about the actions that take place during the reading:

- The annotations have a retrospective function, it will make you remember the argument and will make the reading activity more complete.

- Reading with someone will allow you to make comments about the plot, talk about the characters or the memories that reading awakens. If the reaction is not positive, stop the activity.
- The theme or genre of the readings provided must attend to the taste or preference of the affected people, even if they are readings already done previously.
- Pay attention to the symptoms displayed by the person and avoid causing agitation, mistrust or discomfort when reading.
- Particular attention must be paid to visual monitoring, selective attention to words and their meaning in the text, working memory, perception of light and manual dexterity in handling the text.
- The selected books must be carefully attentive to the details of printing, format and content, including graphic design, typeface, syntax, style, visual contrast, reference language and subject matter.
- Books must present integrity in their content and vocabulary to offer an enriching experience to these people.
- The books will provide relevant vocabulary and images along with the text, photos and words that stimulate personal and episodic memories. This will allow the person to describe and share elements of the reading done more easily in the conversation.
- Easy-to-read books: high-contrast texts, clear, concise and accessible language for people with memory problems, with real full-color images of universal appeal and large print.

Among the suggested books are those of adventure and swashbuckling, such as: The Three Musketeers (Alejandro Dumas), The Treasure Island, Around the World in 80 Days, Tales from the Jungle (by Horacio Quiroga), - ---- (from Daniel Defoe).

Methodological steps to follow for the application of memory reading exercises.

Overall objective:

- The set of memory exercises is aimed at improving memory performance in young people with a predisposition to Alzheimer's disease in the "Abel Santamaría Cuadrado" district of Santiago de Cuba.

Specific objectives:

1. Delay the onset or possible development of memory disorders in young people predisposed to Alzheimer's disease.
2. Train in memory strategies and techniques.
3. Stimulate basic cognitive processes such as: attention, perception, language, logical ability.
4. Promote the practice of reading.

The proposal consists of eight activities, distributed in the work with eight different texts selected and adapted to the characteristics and possibilities of young people with a predisposition to Alzheimer's. They contain in their structure the most important methodological principles for working with the text that includes:

I. The selection of the text

II. The understanding itself.

It must be taken into account for these people that:

1. The reader's cognitive ability allows him to penetrate the text and for this he needs to have sufficient knowledge and concepts that can be different types: your general knowledge of the world or universe of knowledge, of the topic or topic that you read, and information about the state from your own knowledge base.

2. Linguistic competence refers essentially to the semantic and syntactic aspects of the language. The semantic aspect is made up of the designations of the concepts in the language; while the syntactic aspect is based on the way the language is constructed. These two elements are closely related in the comprehension process because throughout the reading of a text the reader is constructing and reconstructing the meaning since he continuously accommodates the information received; because we understand by the general context, by the way in which sentences are chained and linked; even, the text sometimes contains words whose meaning we do not know and we rely on the context to infer it.

Reading strategies used for cognitive stimulation in people prone to Alzheimer's:

1. Activate previous knowledge: recognize what information is already known that can be linked to the new information provided by the text.

2. Contextualize the text. Reading is understood as a social experience that involves both the reader and the text, as well as the context; Consequently, meaning can be defined as a variable product of that interaction (Interactive components in reading comprehension).

3. Read the text one or more times. Read out loud. It requires concentration and effort to penetrate your sense.

4. Know what the function of the titles, subtitles or indexes is.

5. Work with the lexical unknowns or look for contextual meaning through inferences.

6. Determine the semantic key of the text, that word phrase or sentence that constitutes the essence of what is said in the text, the nucleus around which revolves

7. The whole statement. It is always explicit in the text: it is there, we just have to find it.

8. Segment the text into semantic units or subtexts. Establish networks of words linked to keywords.

9. Pause to summarize what is being read in long texts.

10. Prepare diagrams about the information that can be represented in the texts.

11. Identify in the organization of the text patterns of the type problem-solution, cause-consequence, comparisons, general ideas that contain details.

12. Ask yourself about the new knowledge acquired through reading.

13. Establish intertextual relationships.

Reading and comprehension of text demands a guide to achieve self-preparation of the person prone to Alzheimer's through independent work with the notes obtained from the reading carried out. The reading guide will allow the consolidation of what has been read

and the acquisition of new knowledge, as well as habits and skills for working with the text. Likewise, diversity and particularities will be addressed according to the characteristics of these people [3-13].

Example of activity to stimulate cognitive memory

Activity 1: Approach to reading Tales from the jungle, by Horacio Quiroga.

Objective: Reinforce visual and procedural memory.

Methodology: do a quick reading of a story from the book. Read the story aloud. Recognition of the topic covered. Find meaning of words that are not known. Identify the thematic nucleus around which the story revolves. Main actors. Link the theme of the story with personal experiences. Establish the new knowledge acquired in reading. Make a brief summary of what have been read.

Materials: Book.

Variant: After the initial reading, relate a lived experience similar to the one read in the story. Talk about the protagonists of that personal experience. Compare that experience with that of the story you read.

Evaluate: The acquisition of new words and the story of what has been read.

Starting from memory training with memory exercises through reading, increase cognitive stimulation in people prone to Alzheimer's and thus prevent the loss of neurons by improving their connections.

By exercising the brain, the onset of Alzheimer's disease is delayed; in addition to reducing daily memory forgetfulness as much as possible in young adults predisposed to this disease of the "Abel Santamaría' 'cast, in Santiago de Cuba.

The achievements achieved after the use of reading as a tool for cognitive stimulation in people prone to Alzheimer's are expressed in:

- Improve the quality of life of these people.
- Slow down (where possible) the progression of the disease.
- Maximize the patient's personal autonomy in their daily chores.
- Enhance the mental capacities that they continue to preserve.
- Avoid isolation and help them to increase contact with reality.
- Minimize the stress they experience.
- Dignify the patient.
- Reading awakens the desire to learn, fantasy, creativity, imagination and curiosity to know other places and other realities.

Conclusion

The theoretical foundation carried out allowed us to identify from the Therapeutic Physical Culture process it is possible to work in the prophylaxis of diseases such as Alzheimer's, influencing it, in its asymptomatic stage; by training our memory in cognitive processes with memory exercises from the practice of reading. In the diagnosis made through the different instruments applied, it reveals that young

adults with Alzheimer's predisposition from the "Abel Santamaría" neighborhood of Santiago de Cuba has a decrease in memory capacity with low performance.

The work activities with the text were selected taking into account the memory performance and more frequent forgetfulness of young adults for their training of processes such as perception, attention, memory and executive functions.

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