

Correlation between memory ability and age in older adults

Correlación entre la habilidad para la memoria y la edad en adultos mayores

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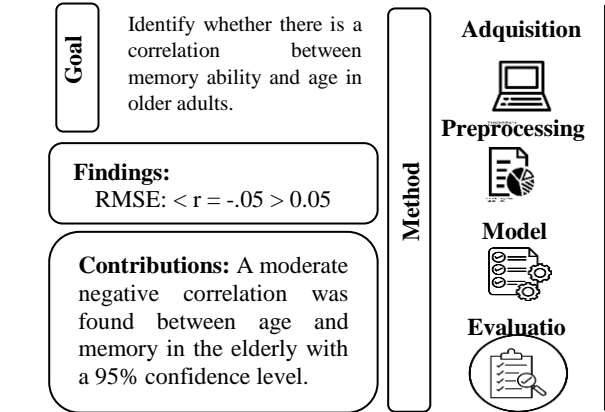


Abstract

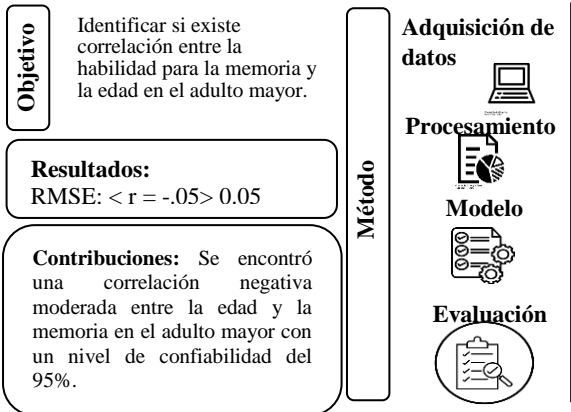
It is important to point out that old age is a substantive state, which is reached by a chronology of biological events, whose most visible and experiential manifestation is the functional wear and tear of daily life. In this article we identified the correlation between memory and age in the elderly, evaluated by means of the MINI-MENTAL test. Methodology: non-experimental, exploratory, observational research with correlational analysis. Contribution: in a sample of 19 participants, a moderate negative correlation was found between age and memory in older adults with an average of 78 years of age. Therefore, it is interpreted that the older the age, the lower the memory ability with an $r = -0.05$ and a $p = 0.05$ of reliability.

Resumen

Es importante señalar que la vejez es un estado sustantivo, a la cual se llega por cronología de sucesos biológicos, cuya manifestación mas visible y experiencial es el desgaste funcional de la vida cotidiana. En el presente artículo sidentificó la correlación que existe entre la memoria y la edad en el adulto mayor, evaluados mediante en Test MINI-MENTAL. Metodología: investigación de tipo no experimental, exploratorio, observacional y con análisis correlacional. Contribución: en una muestra integrada por 19 participantes, se encontró una correlación negativa moderada entre la edad y la memoria en adultos mayores con una media de 78 años de edad. Por lo que se interpreta que a mayor edad, menor habilidad para la memoria con una $r = -0.05$ y una $p = 0.05$ de confiabilidad



Memory, Elderly, Correlation.



Memoria, Adulto Mayor, Correlación

Area: Promotion of frontier research and basic science in all fields of knowledge

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Introducción

The affective or emotional component of the daily life of the older adult, often deprived of the warmth and support of the family group or a minimum of positive social interactions, confers different meanings to the gradual reduction of various biological, cognitive or sensory functions and, with it, a greater vulnerability to various agents or pathogenic factors. [Tello, 2020]

There are elements to take into account that determine the maintenance of cognition in the elderly patient such as; pathologies of the patient, social support, mood and the presence of geriatric syndromes such as frailty and osteopenia. [Zambrano, 2020]

With aging, there is the consequence of a degenerative process at the organic level, due to the accumulation of molecular errors, including in the brain. Dr. María Sagrario Manzano, a neurology specialist in Madrid at the Infanta Cristina Hospital, mentions that in the aging brain only certain areas involved in executive functions and memory are affected. Throughout this process, neurons decrease in size and others die [Riojas, 2021]

Memory and attention are higher brain functions that, under normal conditions, allow human beings to perform appropriately in personal and social life. To a large extent we are what we remember, and in doing so we can guide and inform our present and future behavior [Zanín, 2004].

Since these functions are of utmost importance for our life, the question arises whether mood influences the alteration of these functions, hence the objective of this research which is to know the processes of attention and memory and their relationship with mood in the elderly through the application of the following tests: Hamilton test, Beck test and mini-mental screening test.

Justification

It is known that memory and attention are main aspects of executive functions; with the passage of time the quality of life and health of people is affected by a decline in their functionality, which leads to consequences at social, mental and physical levels. [Riojas, 2021]

Age-related memory problems are a cognitive alteration considered normal, they are mild forgetfulness. It has been suggested as a normal stage in the elderly. This event is known as Age-Related Memory Impairment [ARMD], but this cognitive alteration is not considered a disease. [Sosa, 2016]

Carbajal [2007] explains that in our country most of the older adults who consult for memory loss do not have cognitive disorders, what they present are these subjective memory losses, where they believe they present a decrease of some cognitive function but in reality this loss is not made known after the corresponding tests have been performed. This subjective loss is strongly related to anxieties, fears of developing dementia, relationship conflicts and attention problems of older adults. [Sosa, 2016].

According to the above mentioned and seeing the importance of attention and memory in daily life, it was considered important to conduct this research in order to verify the impact that the mood of older adults may have in relation to the loss or deterioration of attention and memory.

Based on the above, the interest of this research is to investigate attention and memory in older adults and their relationship with mood.

Problem

Depression is a common illness worldwide, with an estimated 3.8% of the population affected, including 5.0% among adults and 5.7% among adults over 60 years of age. Approximately 280 million people worldwide have depression. Depression can become a serious health condition. It can cause the affected person to suffer greatly and function poorly at work, at school and in the family. In the worst cases, depression can lead to suicide. More than 700 000 people die due to suicide every year [INEGI, 2021].

According to the World Health Organization [WHO] dementia and depression affect approximately 5% and 7% of the world's elderly population, respectively. Anxiety disorders affect 3.8% of the older population. [INEGI, 2021].

Older people with depressive symptoms have poorer functioning compared to those with chronic medical conditions such as lung disease, hypertension or diabetes. [GOB, 2017].

Hypothesis

Ho: “Age is not a factor influencing memory ability in the older adult.”

Hi: “Age is a factor that influences memory ability in the older adult.”

Objectives

General objective: to identify whether there is a correlation between memory ability and age in older adults.

Specific objectives

- To know the total score of the memory subsection of the Mini Mental Test.
- Determine the mean age of the study population.

Theoretical framework

Background:

Older adult

In Mexico, older adult is considered a person who is over 60 years old and refers to the stage that adds up all the experiences of life and goes through most of the family, professional and social goals. But it also marks the beginning of a stage where people present conditions of physical, social and economic vulnerability. [GOB, 2017]

Aging involves a series of physical, psychological and social changes related to changes in all organs, including the brain. With the passage of time, a series of cognitive modifications begins involving memory, language, perception and attention. These cognitive changes constitute one of the central factors of the late stages of life. [Ardila, 2007]

Individuals between 55 and 74 years of age are considered senile young, senile old those over 75, and senile older those over 85 years of age. [Ardila, 2007]

Aging

Human aging is a dynamic process and not a static one; it is a natural process of change. Therefore, it does not occur suddenly or accidentally, but is gradual and progressive. It is characterized by the existence of biological, psychological and social conditions determined as a function of time [Tortosa, 2002]

Aging is a multifactorial phenomenon, which affects all levels of biological organization, from molecules to physiological systems. However, this biological phenomenon does not always coincide with the chronological one [Allevato, 2008]

Aging is a process inherent to human nature. All men of all times and cultures, transit and will continue to transit through aging. But it is worth noting that this process is highly differential and asynchronous in its manifestations [Binotti, 2009].

There is a great variation among individuals, since each person ages differently due to physical and physiological characteristics, personality structure and life history, as well as the socioeconomic context in which he/she develops. [Comachione, 1999]

Human aging is becoming a relevant topic for current research in all fields; however, there is still little information and dissemination on the topic of aging, which professionals should study in depth to improve the quality of life of the elderly and promote healthy and active aging.

Pathological deterioration in the older adult

Mainly it is necessary to clarify that there is a healthy aging that is the physiological aging process that develops chronologically in a normal way according to the standards of biological, physiological and psychological changes that are gradual and irreversible in the process of human development and a pathological aging that deviates below the ranges classified as normal. [Falqué, 2014]

The key is to recognize and make known to every human being that the aging organism is not necessarily sick; healthy aging is possible. Many problems can be avoided or reversed [Allevato, 2008].

The important thing is to reach old age, the last stage of the aging process with quality of life, surrounded by conditions not only material, but also affective, emotional, that provide an economic, social and spiritual balance. [Falqué, 2014]

The World Health Organization [WHO] has defined active aging as the process “by which opportunities for physical, social and mental well-being are optimized throughout life, with the aim of extending healthy life expectancy, productivity and quality of life in old age”. [INEGI, 2021].

Allevato & Gaviria tells us that, although at the moment it is not possible to stop the aging process, you can work to obtain a good quality of life. He mentions that the ideal would be to reach old age with a good cognitive level, adaptation to the changes associated with age, including some disease or degree of physical disability, a good level of socialization and life satisfaction. [Allevato, 2008].

Memory:

Memory is a neurocognitive function that allows recording, encoding, consolidating, retaining, storing, retrieving and recalling previously stored information. While learning is the capacity to acquire new information, memory is the capacity to retain the information learned [Portellano, 2005].

Basically, we can establish two main memory modalities according to the time elapsed for its storage: short-term memory and long-term memory. [Portellano, 2005].

Short-term memory [STM]

It is the process of initial retention of information for a short period of time ranging from a few fractions of a second to several minutes, although some authors place the time limit of short-term memory at 30 seconds. Before any perceptual processing of information can take place, it is necessary that a sensory encoding of the stimuli to be memorized takes place, so that within short-term memory there are several modalities: sensory memory, immediate memory and working memory. [Portellano, 2005].

Long-term memory [LTM]

is the ability to retain information for longer periods of time or permanently. LTM also refers to the ability to recall information after an interval of time in which the subject has focused his attention on another task. [Portellano, 2005].

Mini Mental Screening Test

The Mini-Mental State Examination [MMSE] is a written test commonly used as part of the process when considering a diagnosis of dementia, with a maximum score of 30, with lower scores indicating more severe cognitive problems.

It is one of the most widely used tools worldwide for its brevity and easy application it has 10 areas of assessment: spatiotemporal orientation, three-word register, attention fixation, memory, verbal nomination, repetition and comprehension, reading, writing and visuospatial construction, The cut-off point established for the MMSE defines "normal" cognitive function and is generally set at 24, although theoretically it could be anywhere between 1 and 30 [Llamuca, 2020].

It is mandatory when starting the test to begin by collecting the patient's data, as well as their degree of schooling and work they did before retirement [year in which they started school and year of completion, approximately]. This will also help to create a degree of trust with the patient and facilitate their collaboration.

If we analyze the MMSE, we see that it consists of 5 sections: [1º] Orientation, [2º] Fixation, [3º] Calculation and attention, [4º] Memory and [5º] Language and praxis. When carrying it out, we should not interrupt it, especially the sequence of fixation, calculation and attention and memory. Between the 1st and 2nd, and between the 4th and 5th we can make a brief pause if the patient gets tired or is very nervous, trying to reassure him and tell him that it is not an exam.

Range Level of cognitive impairment

< = 24 Probable cognitive impairment
> 24 No cognitive impairment

With all this we will have reached the end of the test and we will have to make the correction for age and cultural level. After reviewing the MMSE we reach the following agreement.

Schooling refers to the age of completion of studies, not to the number of years of schooling. Broadly speaking, the first group includes those who have not completed primary school, the second group includes those who have completed primary school and those who have completed high school, and the third group includes those who have completed high school or a degree.

Patients with depression and anxiety usually score low on this type of test due to impaired attention and concentration, without being indicative of MCI or dementia [the response of "I don't know, I don't know" to simple orientation or calculation questions is characteristic, and they end up performing if we insist that they pay attention and make an effort.

Research methodology

The present study is exploratory, non-experimental, observational and cross-sectional, with a descriptive statistical analysis.

The complex variable of memory was analyzed for its relationship with neurocognitive functions by means of Mini Mental. In addition, the following variables were considered: age, gender and school grade.

For the statistical analysis of the population studied, measures of central tendency and dispersion were used.

Procedure

The participants were patients attending a geriatric center called "taking care of those who gave us life" in the city of Durango. Data collection was carried out during the month of February 2021, culminating at the end of February of the same year.

Informed consent was obtained after signing the informed consent in accordance with the official Mexican standards 004-ssa3-2012 on the clinical record and 040-ssa2-2004 on information, and the instruments for data collection and interpretation of the results were applied.

The identification of the signalistic variables and academic performance [gender, age and school average] was obtained through the application of a clinical survey. Statistical analysis of the information obtained was performed using Excel software.

The inclusion criterion was limited to all those patients in the group who agreed to be part of the sample and signed the informed consent corresponding to the Mexican official standards [NOM-004-SSA3-2012 for the clinical record and NOM-040-SSA2-2004 on information] prior to their participation in the evaluation. Elimination criteria were discarded for participants who left any of the evaluation tests unfinished, previous neurodegenerative diseases and non-attendance at evaluations, as well as patients who wished to withdraw from the study. According to these criteria, out of a total of 20 patients, 10 were eliminated, leaving a total of 10 valid cases for the investigation.

Results

The sample studied was made up of 19 participants, who attend the "Geronto-geriatric Center: taking care of those who gave us life", of which 8 correspond to individuals of the female gender and 2 of the male gender [See graph 1].

Box 1

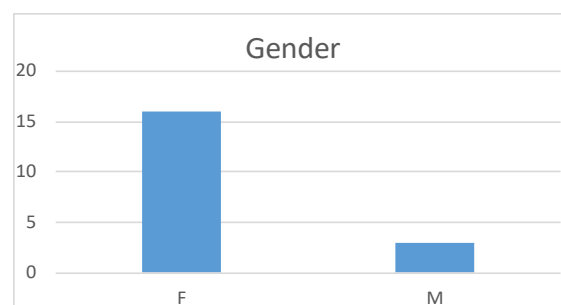


Figure 1

Gender of the sample

The mean age of the participants was 78.3 years, with the minimum being 55 years and the maximum being 88 years, with a mode of 71 years and a mean of 82.5, the standard deviation was 10.57. The reliability of the results obtained in the evaluation of the Beck Depression Test was with a Chronbach's alpha of .90 [excellent reliability].

As for the results obtained from the evaluation of the memory of the subtest of the MINIMENTAL Test, the following results were obtained. [See graph 2].

Box 2

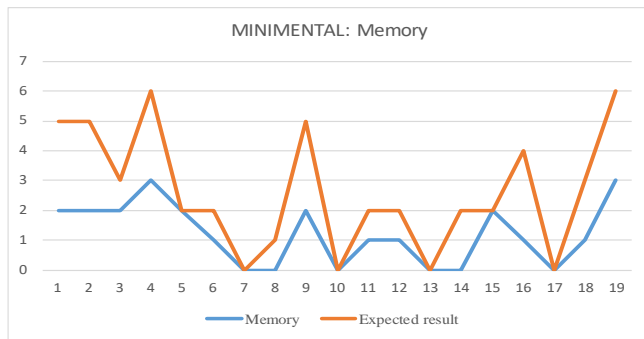


Figure 2

MINIMENTAL: Sub test memory

Regarding Pearson's correlational analysis between age and memory in people older than 78 years, it was found that there is a moderate negative correlation of $r = -.05$ with a reliability of 95%. This means that the older the person is, the lower the memory ability in older adults [See graph 3].

Box 3

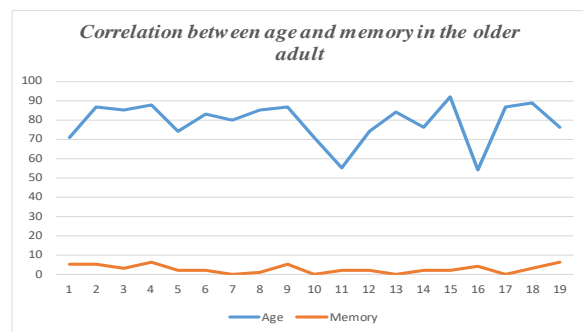


Figure 3

Correlation, age and memory.

Therefore, in the present investigation, the alternative hypothesis is accepted with a value of moderate negative significance with an $r = -.05$ and with a reliability of $p = 0.05$ which refers that, in a moderate negative way, the older the age, the lower the memory ability in older adults.

It is essential to emphasize that the results obtained in this population cannot be extrapolated, since it is a small sample from a single site. Comparisons with other institutes would be necessary to evaluate the state of cognitive functions more broadly and accurately.

Conclusion

Identifying the aspects involved in older adults is fundamental, since neuropsychological alterations can be prevented with timely evaluations and with the purpose of improving the quality of life of those who once cared for us.

With aging, there is the consequence of a degenerative process at the organic level, due to the accumulation of molecular errors, including in the brain. Dr. María Sagrario Manzano, a neurology specialist in Madrid at the Infanta Cristina Hospital, mentions that in the aging brain only certain areas involved in executive functions and memory are affected. Throughout this process, neurons decrease in size and others die [Riojas, 2021]

In the case of the limitations of this research, it is recommended to expand the sample by including a larger number of participants from different rehabilitation centers.

Additionally, it is suggested to increase the participation of professionals in human communication therapy during the rehabilitation steps of this addiction. In this way, along with the behavioral work, a therapeutic plan focusing on neurocognitive processes in adults could be evaluated and structured.

Declarations

Conflict of interest

Rosales Sánchez, Andrea.
Ontiveros Vargas, Angel Adrián.
Santiesteban Contreras, María Tereza.
Vázquez Ríos, Elda Raquel.

We declare that we have no conflicts of interest, either competitive or financial. In addition, we have no interest in personal relationships that could have influenced the article.

In addition, we declare that we have no conflict of interest with the publisher, the members of the editorial and arbitration board or committee.

Authors' Contribution

The contribution of each researcher in each of the points developed in this research, was defined based on:

Rosales-Sánchez, Andrea: Contributed to the project idea, research method and technique. He supported the design of the field instrument. He carried out the data analysis and systematisation of results, as well as writing the article.

Ontiveros-Vargas, Angel Adrián: Carried out the systematisation of the background for the state of the art. She supported the design of the field instrument. She also contributed to the writing of the article.

Santiesteban-Contreras, María Tereza: contributed to the research design, the type of research, the approach, the method and the writing of the article.

Vázquez Ríos, Elda Raquel: He supported the design of the field instrument.

Availability of data and materials

The data obtained were previously authorized by the geriatric center called “taking care of those who gave us life” in the city of Durango, as well as from the participants in this research by means of informed consent.

Funding

The research did not receive any funding.

Abbreviations

APA	American Psychiatric Association
DSM-V	Diagnostic and statical manual of mental disorders
IMMS	Mexican Institute of Social Security
INAPAM	According to the National Institute of Older Adults
INEGI	National Institute of Statistics and Geography
MMSE	The Mini-Mental State Examination
NOM	Mexican Official Standards
WHO	World Health Organization
NOM	Mexican Official Standards
OMS	World Health Organization

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