

## Prevalence of dementia in the intervening senior citizen the mini-mental test of the Centro Destellos de luz for older adults with an elderly status of 65 to 90 years of the City of Durango

## Prevalencia de demencia en el adulto mayor mediante el test minimal del Centro Destellos de luz para adultos mayores con un rango de edad de 65 a 90 años de la Ciudad de Durango

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### Abstract

Dementia is one of the neurocognitive disorders that most affect the elderly population, and refers to severe damage to executive functions and is classified according to the condition. (Esparza, 2005). The objective of the research is to identify the prevalence of dementia in the elderly in an age range of 65 to 90 years old in the Destellos de Luz Center in the City of Durango, as well as its main risk factors and the characteristics of people with dementia using the MiniMental Test. The type of methodology implemented is of mixed type and case studies using. In which a cognitive impairment was obtained as a result in the three participants. More than 50% of the population of older adults evaluated suffer from undetected dementia.

### Resumen

La demencia es una de las afectaciones neurocognitivas que más afectan a la población de la tercera edad, y hace referencia al daño severo de las funciones ejecutivas y se clasifican según el padecimiento. (Esparza, 2005). El objetivo de la investigación es identificar la prevalencia de demencia en el adulto mayor en un rango de edad de 65 a 90 años de edad en el Centro de Destellos de Luz en la Ciudad de Durango, así como sus principales factores de riesgo y las características de las personas con demencia mediante el Test MiniMental. El tipo de metodología implementada es de tipo mixto y estudios de caso utilizando. En la cual se obtuvo como resultado en los tres participantes un deterioro cognitivo. Más del 50% de la población de los Adultos mayores evaluados padece de demencia no detectada.

### Dementia, Elderly, Mini-Mental Test

### Demencia, Adulto mayor, Test Mini-Mental

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## Introduction

Cognitive impairment is one of the main alterations manifested by the elderly and given its increase in the progressive mortality rate in the population, it has been decided to evaluate neurocognitive functions. Until a few years ago, cognitive impairment was related to neurodegenerative diseases such as Parkinson's, Alzheimer's and senile dementia. (Cancito. et.al, 2016).

The following research is focused on the prevalence of dementia in older adults using the MiniMental Test in the Destellos de Luz Centre for older adults in the State of Durango and its main objective is to know the main risk factors for dementia according to age, sex and schooling. It is considered of utmost importance to know the functioning of the nervous system, as well as the structures involved with neuropsychological aspects related to dementia and cognitive impairment.

During normal or pathological ageing the most common amnesic dysfunction is cognitive impairment influencing the capacity for new learning and the recall of valuable information for everyday life.

The study on the prevalence of dementia was conducted using the MiniMental test which is a battery that aims to accurately assess areas such as temporal orientation, spatial orientation, repetition, memory, attention, calculation and finally language resulting in cognitive impairment or dementia.

## Justification

Dementia refers to severe damage to cognitive functions, in this study in the elderly, it is a term used to encompass chronic diseases such as: memory loss, alterations in language, spatial orientation, visual recognition, etc.

It is one of the pathologies related to ageing in the elderly, due to this, various health specialists have proposed alternatives for cognitive improvement in which the main priority is an adequate intervention and thus improve the well-being of the elderly with dementia.

According to studies carried out by the World Health Organisation, almost 7% or 8% of older adults present some type of cognitive deterioration. In recent years, according to studies that have been carried out, cognitive deterioration has increased rapidly, and it is estimated that in the future 30% of older adults will present some type of dementia.

Older adults with dementia present some symptoms such as: depression, sleep disturbances, tract signs, corticospinal, confabulation, hemianopsia, pseudobulbar signs and aphasia (Gutiérrez et al., 2014).

Some research such as "Relación entre educación, envejecimiento y deterioro cognitivo en una muestra de adultos mayores de Arequipa" in which 280 subjects were evaluated by means of the MiniMental Test, where a significant relationship between age and cognitive impairment was shown, observing that the lowest score was related to the low educational level, in addition, it was observed that subjects with higher educational level showed higher scores (Abarca et al, 2008, p 2).

Thus, it is considered important to evaluate the neurocognitive functions of the older adult using the Mini-Mental Test in order to identify the levels of dementia in which the older adult may be immersed, and thus make appropriate intervention programmes. As well as for the benefit of their quality of life, this test will allow to identify if it is necessary to go to a Specialist Doctor, Psychiatrist, Psychologist, Geriatrician, Human Communication Therapist, etc., as well as to raise awareness among close relatives for the benefit of the elderly person.

To this end, intervention plans have been proposed with the aim of the well-being of older adults, as well as promoting a dementia-friendly society worldwide by making dementia a public health priority, thus improving public attitudes and those of health professionals.

### Problem

Memory problems currently affect 50% of adults over the age of 65, while dementia affects only 5-10% of the population. As we know memory is a complex mental process by which we fix, retain and produce everything that was once in our day-to-day life making it conscious to later create our experience, therefore, we can say that memory is a fundamental part to develop an independent and productive life making the information already registered to adapt to other neuropsychological functions remaining intact such as attention, language, visual and auditory. Therefore, if there is damage in any of these areas, they interfere with the proper functioning of memory, which could represent dementia. (Pérez, 2005)

When this event occurs (either dementia or cognitive impairment) it happens when the supply of both oxygen and nutrients to the brain is interrupted and may be due not only to cerebrovascular pathology such as thrombosis or embolism, but also to haemorrhage and brain injury such as hypoxia-ischaemia following cardiac arrest or severe arterial hypotension. Dementia can present itself in different ways in each older adult, depending on its aetiology, however, some of the following characteristics may be present: staggered progression, with indeterminate course, some neurological signs and symptoms such as decreased strength or paralysis, problems in memory, concentration, depression associated with dementia, epileptic seizures, as well as acute confusion. And in some others, hallucinations, delusions, irritability with physical and verbal aggression, restlessness and incontinence may occur. (Pupo, et. al, 2011).

It is important to know about the changes that develop in ageing in order to attend to the needs that may arise later on, raising awareness of the multidisciplinary work involved in this stage of life. The aim of this document is to demonstrate the prevalence of dementia in the elderly.

### Hypothesis

**H<sub>0</sub>:** More than 50% of the older adult population between 65 and 90 years of age attending the Destellos de Luz Centre in the State of Durango suffers from undetected dementia.

**Hi:** There is no prevalence of dementia in the older adult population at the Destellos de Luz Centre for older adults with an age range of 65 to 90 years old.

**General objective:** To determine the prevalence of dementia in older adults at the Destellos de Luz Centre using the MiniMental Test.

### Specific objectives:

- To identify the current state of neurocognitive functions using the MiniMental Test.
- To know the total score of the MiniMental test and its relationship with the years of study, sex, and age of the participants.

### Background

There is currently an increase in the number of people being diagnosed with dementia each year, however, one of the important areas to significantly reduce the overall rate of people with cognitive impairment or dementia is prevention.

Cognitive intervention is one of the activities which can stimulate or increase cognitive reserve and have a buffering effect on rapid cognitive decline. (WHO, 2020)

Preventive intervention can provide cognitive stimulation in which the main focus will be on cognitive training through specific tasks designed to improve or stimulate specific executive functions and thus prevent or delay the onset of age-related cognitive decline, dementia or cognitive impairment. (WHO, 2020)

The prevalence of dementia in the elderly, according to the sources reviewed in the study, refer to common aspects involved in the subject, such as gender, age, level of education, etc. They show that the prevalence of dementia is related to functional status, as well as to the way of life they lead, which will be explained below.

In another study carried out in Chile (Muñoz, Et. Al, 2015) called "Criterios de valoración geriátrica integral en adultos mayores con dependencia moderada y severa en centro de atención primaria en Chile" in which the main purpose was to present a comprehensive geriatric assessment for patients with moderate and severe dependency care carried out in Primary Health Care (PHC) which is the basis of the Chilean public health system, The MiniMental Test was used for this purpose and was applied with the main objective of assessing cognitive impairment and determining which factors had an influence, finding that the influence of the educational factor is statistically significant and with differences of up to 7 points between groups with more and less years of schooling, determining that education was an important factor in the prevalence of cognitive impairment (Muñoz, et al., 2015)

Finally, in the city of Monterrey, Mexico in 2006, an investigation was carried out using the MiniMental test, which was called "Cognitive capacity of patients in a geriatric outpatient service in Monterrey, Mexico". Its objective was to evaluate older adults to detect the prevalence of dementia, for which a sample of 142 people was taken, resulting in 59% of patients presenting cognitive impairment, with common characteristics of being older, with low schooling and moderate depression. (Cárdenas et al., 2006).

The articles reviewed reveal that the subject of this research is the assessment in the elderly to determine the prevalence of dementia, thus considering the importance of the evaluation of executive functions in the elderly, therefore, according to the sources mentioned, it can be said that there are more studies on dementia in the elderly in which the results obtained were that the prevalence of dementia has common characteristics such as age and years of study (low schooling).

Therefore, the research to be carried out is of great importance in order to have more knowledge about the prevalence of dementia in older adults who attend the Destellos de Luz centre and thus, to carry out an adequate intervention plan for the older adults who live there.

### *Older adults*

According to the World Health Organisation (WHO), the older adult is a person with changes that constitute and influence ageing. These changes are not usually linear or uniform and are therefore associated with the person's age in years, independently of good physical and mental functioning. It is therefore important to develop a plan where public health ageing is important to consider strategies that counteract the losses associated with older age, but also to reinforce the recovery, adaptation and psychosocial growth of the person. (WHO, 2015)

### **Theoretical framework**

#### *Cognitive impairment*

During normal or pathological ageing, amnesic dysfunction is a most common cognitive impairment in a deterioration of the older adult's quality of life, as well as the capacity for new learning and recall of valuable information. Memory impairment is associated with age, in which a decline in memory is described as a phenomenon that occurs with "abnormality" in older adults, which is where most cases of early stage cognitive impairment or other disease occur. Early detection of frequent memory disorders is of great importance, as well as diagnosis for early intervention. (Casanova, 2004)

#### *Cognitive impairment in older adults*

Cognitive impairment is a clinical syndrome characterised by the loss or impairment of mental functions in different neuropsychological behavioural domains, such as memory, orientation, calculation, comprehension, judgement, language, visual recognition, behaviour and personality. Viewed as a geriatric syndrome, it is an impairment of any dimension of higher mental functions, which the patient complains of, but which may or may not be corroborated by neuropsychological tests, and which is usually multifactorial, such as: depression, hearing and visual deficits, hypothyroidism, adverse effects of medications, among others give rise to a single manifestation. This syndrome merits a comprehensive evaluation to determine whether the patient has dementia, or some other problem that can be resolved (IMSS, 2012).

## Executive functions

Executive functions refer to the capacity to organise, plan and verify behaviour in order to reach a determined objective, they tend to work independently but when there is an imbalance they work together in the needs that are required of them, in the vital cycle of life, imbalances occur in Older Adults presenting more difficulties in being able to have an "active" and healthy ageing, preventing them from reaching a bearable lifestyle. (Betancourt, et.al. 2020).

The main characteristic of executive functions is their independence of the "input", that is, the executive mechanism that coordinates information coming from different input systems, either perceptions from different sensory modalities, or processing such as attention, memory, emotions, as well as the output, i.e., motor programmes (Verdejo, 2010).

### *Memory*

Memory is the brain's ability to store the consequences it learns from what it experiences. It is a fundamental capacity of the brain. Memory reflects both what existed and what exists, which involves a process of recalling as well as updating or recognising what was previously assimilated. Memory is of great importance as it is one of the important processes for the acquisition of specific learning. (Tomás, 2012)

### *Language*

Language makes sense in social interaction and in everyday contextualised use, whether in conversation, writing or speaking, satisfying needs and learning. The use of language, the duration of the exchanges, the enrichment of the context and the degree of satisfaction that is presented in the older adult will be fundamental at the moment of generating a good communication and social adaptation. (Calsimiglisa & Tusón, 1999).

## MINIMENTAL TEST

The MiniMental test is a battery whose field of application is oriented to patients of geriatric age, helping for the clinical examination of the cognitive mental state by making a brief, quantitative and objective measurement evaluating areas by means of a series of questions and tasks, which are grouped in eleven categories. The areas of exploration of the MiniMental Test are: Temporal orientation, spatial orientation, fixation, attention and calculation, memory, nomination, repetition, comprehension, reading, writing and drawing. (Folstein, et.al, 2002).

### *Research methodology*

The present study is exploratory, non-experimental, observational and cross-sectional, with a descriptive and correlational statistical analysis. The complex variable, dementia, was analysed and years of study were used to categorise academic performance, in addition to the signal variables of age, gender and degree.

The methodological perspective for the research is of a mixed type, by means of a case study, as it will be based on a description of the Minimental Test and its quantitative results.

It was carried out over a period of 12 months of collection and evaluation, in order to subsequently carry out the analysis of the results and fulfil the stated objectives.

### **Procedure**

First of all, we select those people who have the characteristics of inclusion, three women were chosen, who were given a letter of consent explaining why the test will be applied and what the research aims to achieve, then we ask the person if they would like to participate voluntarily. Subsequently, the MiniMental Test is applied, which lasts approximately 15 minutes. After the results are obtained, a table is created where the results of the participant are shown, in which it is made known which areas were evaluated and the score obtained by the person. At the end, a percentage of people with dementia is calculated.

The participants are older adults between 65 and 90 years of age from the Destellos de Luz centre in the State of Durango. Data analysis will be classified according to gender, age, educational level and outcome (whether dementia is present or not).

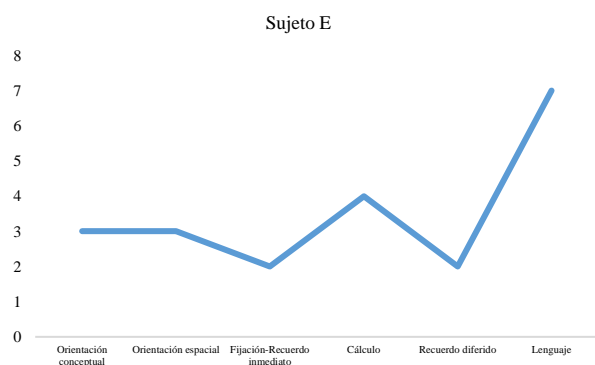
Inclusion, exclusion and elimination criteria, sample size and sampling method are shown in the table below.

Inclusion	Exclusion	Elimination
Women between 65 and 90 years of age	Women under 65 and over 90	Women taking medication that impairs cognitive functioning
		Women already diagnosed with a pathology.

**Table 1** Inclusion, exclusion and elimination criteria

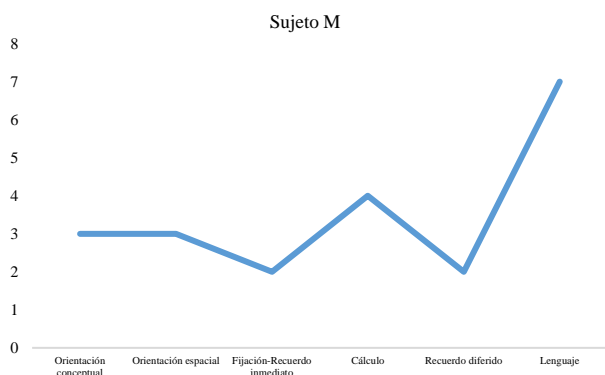
## Analysis and Results

According to the MiniMental Test, a score between 9 and 12 is considered to be manifestations of dementia, and 27 or more is considered to be within the normal range.



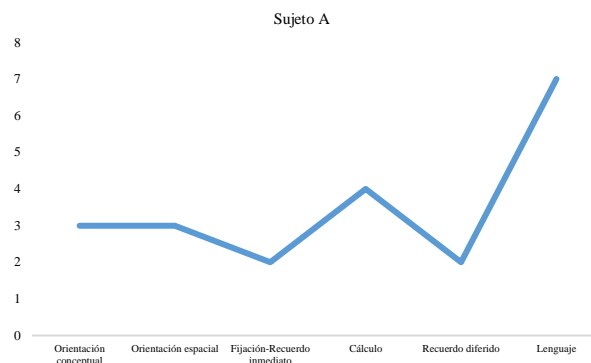
**Graphic 1** Results obtained subject of evaluation E

Female test subject, 65 years old with only primary education, scored 0 points in the area of conceptual orientation, obtaining at the end 15 points out of a total of 30 points.



**Graphic 2** Results obtained with evaluation subject M

Female test subject, 76 years old, with a bachelor's degree education, obtained a score of 0 in deferred recall, obtaining 14 points out of a total of 30 points at the end of the test.



**Graphic 3** Result of evaluation subject A

Female evaluation subject, 90 years old and with primary education, obtained a score of 3 in deferred memory and in immediate memory, obtaining at the end of the test a score of 21 out of a total of 30 points.

The results obtained from the three evaluation subjects were that subject E obtained a total score of 15 points, giving as a result the subject with the lowest points obtained, presenting according to the MiniMental Test, cognitive deterioration without being dementia, subject M obtained a total of 14 points giving as a result according to the evaluation items of the MiniMental Test, cognitive deterioration and subject A obtained a score of 21, giving as a result a pathological suspicion.

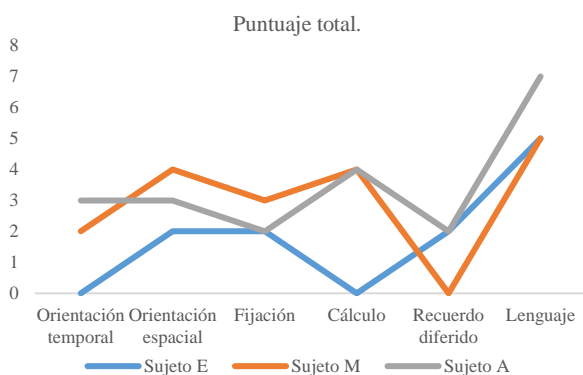
According to the specific objectives, they were fulfilled because it was possible to identify the cognitive characteristics and their relationship with dementia by means of the MiniMental Test.

The test, as well as to know the total score and its relationship with the years of study. It should be noted that there were no manifestations of neurological damage in any of the participants.

Test MiniMent	Normal conditions Score 27 or more	Pathological suspicion 24-27	Cognitive impairment 12-24	Dementia 9-12
Subject E			14 points	
Subject M			15 points	
Subject A			21 points	

**Table 2** Table of contrasts

The users of the Centro de Destellos de Luz del Estado de Durango are in the most fundamental stage of intervention, since by means of the Mini-Mental Test it was observed that they have not yet reached the first level of dementia, and this makes the study important since it is possible to intervene in time, in addition to promoting neurocognitive stimulation workshops in the other care centres for the elderly, previously carrying out evaluations of this type that allow us to identify the primary needs of each of the users.



**Graphic 4** Total score

Therefore, the hypothesis that more than 50% of the older adult population between 65 and 90 years of age attending the Centro Destellos de Luz in the State of Durango suffers from undetected dementia is approved.

It can be concluded that the three evaluation subjects obtained as a result a cognitive impairment, as stated in the specific objectives, it can be seen that the years of study in this research are not related to dementia, so that the evaluations can be extended and thus know in depth what are the factors involved in cognitive impairment.

## Conclusion

To conclude, carrying out this type of study reflects the clear need for the participation of the Human Communication Therapist in these care centres for the elderly, as he/she is a health professional trained to improve the neurocognitive capacity of our older adults, as well as to extend the field of work of the same.

The results obtained in this research reveal that of the three participants, none of them had dementia as a result, being at a fundamental stage for prevention and intervention and slowing down the progression towards dementia.

It was also noted that each of them were not taking medication and had not been previously assessed by a health professional, so they did not have a diagnosis as such.

In the absence of curative treatment, an approach is needed that includes both pharmacological and non-pharmacological interventions aimed at optimising cognition, behaviour and function of dementia patients, as well as addressing the needs of caregivers, although dementia patients are not based on a systematised or structured technique. (French et al., 2003)

Since there is still no cure for dementia, the recommendation would be early intervention as well as prevention.

The evidence found shows that physical activation, cognitive stimulation, social participation, among others, allows the individual (in this case the elderly) to improve cognitive performance and slow the progression of dementia in early stages (Ayala, 2020).

In summary, as a recommendation in the Destellos de Luz Centre, it is important the neuropsychological evaluation of mental health conditions in older adults, in order to subsequently create neurocognitive stimulation programmes for older adults, since a therapeutic approach that includes prevention is of great importance.

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