**RESEARCH PAPER**

# Cognitive impairment and functional capacity in older adults

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**ABSTRACT**
Cognitive impairment in the elderly is a gradual process that affects a significant segment of the population, interfering with their mental faculties and functional capacity in the physical, mental, and social domains. The objective of this study was to determine the relationship between cognitive impairment and functional capacity in older adults. A quantitative, descriptive, and cross-sectional research design was employed, and studies were conducted in Ecuador on 659 older adults aged 60 and over who were part of a project aimed at fostering social connectivity. The study was conducted with the informed consent of each participant. Cognitive impairment variables were measured, and functional capacity was assessed with the Barthel Index (IB) Original Version (Basic Activities of Daily Living, ABVD) with the Mini-Mental State Examination (Mini-Mental). To this end, a descriptive analysis was performed. Results: With respect to functional capacity, the study found that 57.8% of the older adult population was classified as independent, 21.9% exhibited moderate dependence, and 17.3% demonstrated low dependence. With respect to cognitive impairment, it is evident that 48.6% of the sample is within the normal range, while 26.3% exhibit moderate cognitive impairment, and 24.3% demonstrate mild cognitive impairment. In summary, the study demonstrates that a significant proportion of older adults maintain independence in their daily activities and do not exhibit cognitive impairment. However, findings also indicate the presence of dependence and moderate cognitive impairment. It is imperative to ascertain whether the degree of dependence corresponds to that of the cognitive impairment.
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## INTRODUCTION

Aging is an inevitable biological process involving gradual and cumulative changes in physiological and cognitive functions. As individuals age, they undergo a decline in their functional capacity, which can have a deleterious effect on their quality of life and elevate the risk of cognitive decline. The World Health Organization (WHO, 2024) asserts that aging represents an unparalleled global phenomenon. Projections indicate that by the year 2050, the population of individuals over the age of 60 is anticipated to increase twofold. This increase poses significant challenges for health systems, public policies, and social organization.

In the forthcoming three decades, individuals over 80 years of age are projected to comprise 30% of the elderly population in developed countries and 12% in less developed nations (Jiménez et al., 2021). Accordingly, demographic aging signifies a substantial augmentation in the elderly population, particularly in developed countries, in contrast to less developed nations.

### Theoretical models of ageing

In his seminal 1961 theory of Successful Aging, Havighurst (1961) posited that individuals who maintain active and participatory levels in society and adapt to the changes of old age experience more satisfactory aging. This theory, also known as the theory of activity or continuity, has garnered significant attention in the field of gerontology. Petretto et al. (as cited in Havighurst, 2016) describe the theory as being centered on the idea that successful aging depends on a person's ability to maintain active roles in their life, which favors their emotional and mental well-being.

Growing and Henry (1961) postulated in their Theory of Disengagement that the aging process involves a gradual withdrawal from social interactions and active life. This phenomenon is considered natural and beneficial for both the individual and society. This theoretical postulate posits that disengagement enables the transfer of roles and responsibilities from older generations to younger ones, thereby facilitating social continuity.

According to the World Health Organization (2015), the loss of abilities in old age is not exclusively associated with chronological age. Rather, it is contingent on individual experiences throughout the lifespan. This assertion is supported by the "World Report on Ageing and Health," which asserts that this phenomenon is not strictly linked to chronological age. This observation underscores the absence of a "typical" older adult, thereby emphasizing the significance of modifiable factors in relation to the individual's needs. Huenchuan (2013) posits that a unified theoretical framework underpinning the study of aging is lacking, given the multifaceted nature of this phenomenon, which encompasses physiological, sociocultural, and other factors.

**Cognitive impairment**

The identification of cognitive impairment in individuals over 60 years of age is a critical aspect of mental health research, as it facilitates the early detection of changes in cognitive functions. According to the Mexican Institute of Social Security (2012), "Cognitive impairment is a clinical syndrome characterized by the loss or impairment of mental functions in different behavioral and neuropsychological domains, such as memory, orientation, calculation, comprehension, judgment, language, visual recognition, behavior, and personality" (p. 2).

In their scientific research on cognitive impairment in the city of Cuenca, Ecuador, Cabrera et al. (2024) developed a study with a quantitative, descriptive, cross-sectional methodology with a non-probabilistic sample. The researchers evaluated 438 older adults over 65 years of age. The findings indicate the absence of statistically significant disparities with regard to gender. However, the study does reveal notable variations based on age and educational attainment. The analysis suggests a modest decline in the student population, particularly among specific age groups and educational levels.

Huerta's (2023) study proposes a range of intervention methods for preserving both cognitive impairment and functional capacity, with the aim of enhancing the daily development of older adults. Among these alternatives is the proposal of cognitive stimulation through activities of daily living and strategies and organization based on cognitive stimulation. This is how it identifies the importance of integrating effective methods to preserve cognitive functionality and improve autonomy in older adults.

In their research on cognitive status and the relationship with functioning, Flores et al. (2020) conducted a descriptive cross-sectional study, with the participation of 32 older adults. Consequently, he established a correlation between cognitive status and functional capacity in performing basic activities of daily living (BADL) in older adults, thereby concluding that greater cognitive impairment corresponds to greater functional dependence.

According to Ventura (2024), in his research on the Cognitive Rehabilitation Program for Older Adults with Type 2 Diabetes, the study was of a quasi-experimental nature, with a pre-test and post-test. The intervention group was included in a 12-week cognitive rehabilitation program developed from a restorative approach. In her work, she concludes that the implementation of this program provided older people with a treatment option that improved their autonomy in the management of DM2, in addition to contributing significant methodological contributions to research on DM2 and MCI.

In a research study conducted by Gobbo et al. (2024), an online mindfulness intervention was implemented to enhance cognitive performance and emotional well-being in adults. A total of 58 participants were evaluated using neuropsychological and psychological assessments before and after the intervention, following a six-week preparation period focused on mindfulness skills. The results of the study indicated a significant improvement in the criteria of anxiety and depression, as well as in state and trait well-being, in the experimental group when compared to the post-test and pre-test results. However, no changes were observed in the variable of perceived stress after the intervention.

**Functional capacity**

Roure et al. (2022) posit that functional capacity in the home refers to an individual's ability to carry out activities of daily living independently. This analysis elucidates the significance of facilitating the maintenance of autonomy in older adults by enabling the continuation of fundamental daily activities.

The process of aging is defined by its continuous and complex nature, manifesting in a manner that is unique to each individual. The gradual loss of functional abilities and homeostasis is indicative of both physical changes and their potential influence on mental and emotional well-being (Arriola et al., 2017).

**METHODOLOGY**

The present study focused on analyzing the relationship between cognitive decline and functional ability in older adults.

A quantitative research study was developed because the information was collected using neuropsychological

batteries. The objective of this approach was to quantify the existence of cognitive impairment and its effect on the functional capacity of basic activities of daily living. The present study is of a non-experimental nature, as none of the variables under analysis are subjected to manipulation.

The present study is of a descriptive nature, as the result of the Mini-Mental Examination yielded a score that describes cognitive impairment in levels. This score provides a descriptive basis for the study. The study's findings offer a comprehensive explanation, as they provide empirical evidence that validates the existing reality and addresses the current problem. The objective of this study is to utilize a descriptive and correlational statistical analysis to identify patterns that link the degree of cognitive impairment with functional dependence.

**Sample**

The participants of this study were older adults from diverse sectors of Ecuador who are over 60 years of age and part of a project of linkage with society. A total of 659 older adults participated voluntarily and signed the informed consent form to be part of the information collection.

**Instruments**

The acquisition of the results was facilitated by the utilization of two instruments. The measurement of functional capacity was determined by administering the Barthel Index (BI) Original Version (Basic Activities of Daily Living, ABVD). This instrument facilitates the acquisition of a score that reflects the degree of dependence or functional autonomy. Conversely, cognitive impairment was evaluated using the Mini-Mental State Examination (MMSE), a standardized test that assesses various cognitive domains and yields a score indicative of the severity of cognitive impairment. Both instruments are widely used in the evaluation of older adults.

**DATA ANALYSIS**

The data obtained were analyzed using the SPSS statistical program, which allowed descriptive and correlational analyses to be carried out to identify patterns and relationships between the variables.

**RESULTS**

**Table 1.** Measures of central tendency of values

| | | Age of those evaluated | Total score Mini Mental test | Total Dependency Index Score |
|---|---|---|---|---|
| N | Valid | 791 | 791 | 791 |
| | Lost | 0 | 0 | 0 |
| Stocking | | 70,13 | 24,74 | 93,33 |
| Median | | 69,00 | 26,00 | 100,00 |
| Fashion | | 60A | 27 | 100 |
| Minimal | | 55 | 1 | 25 |
| Maximum | | 95 | 29 | 100 |
| to. There are multiple modes. The smallest value is displayed. | | | | |

**Interpretation**

The following table presents the statistical data pertaining to the central tendency of the age variables. The mean number of years is 70.13, the central value is 69, and the mode is 60. This indicates that a greater proportion of the subjects are in that age range. The minimum age of the participants is also evidenced, which is 55 years, and the maximum is 95.

The mean total score on the initial cognitive impairment assessment was 24.74, indicating a suspicion of pathology. This value is close to 26, the median score, with individuals who attained a score of 27 considered within normal parameters. The minimum value assigned is 1, while the maximum is 29.

Finally, the mean total scores for the dependency index evaluated in the subjects is 93.33, which demonstrates low dependence. The mean is 100 as the highest independent value, and a mode of 100 indicates that most of those evaluated are within the indicators of normality. The minimum rating value is 25, and the maximum is 100.

**Table 2.** Dependency Level Frequency

| | | Frequency | Percentage | Valid percentage | Cumulative percentage |
|---|---|---|---|---|---|
| Valid | Severe dependence | 22 | 2,8 | 2,8 | 2,8 |
| | Moderate dependence | 216 | 27,3 | 27,3 | 30,1 |
| | Low dependence | 125 | 15,8 | 15,8 | 45,9 |
| | Independence | 428 | 54,1 | 54,1 | 100,0 |
| | Total | 791 | 100,0 | 100,0 | |

**Interpretation**

Table 3 illustrates the levels according to the scores achieved by the applied instrument. In this sample, 54% of the older adults are classified as independent, indicating a predominant tendency towards normality. A regular percentage manifests moderate dependence,

while a minority manifests scarce dependence. However, the presence of severe dependence is minimal, although most individuals appear to be in a seemingly normal state. A segment of the sample evokes a certain degree of discomfort.

**Table 3.** Frequency of cognitive impairment

| | | Frequency | Percentage | Valid percentage | Cumulative percentage |
|---|---|---|---|---|---|
| Valid | 9-11 Dementia | 7 | ,9 | ,9 | ,9 |
| | 12-23 Deterioration | 212 | 26,8 | 26,8 | 27,7 |
| | 24-26 Pathological suspicion | 256 | 32,4 | 32,4 | 60,1 |
| | 27-30 Normal | 316 | 39,9 | 39,9 | 100,0 |
| | Total | 791 | 100,0 | 100,0 | |

An examination of the levels of deterioration revealed by the scores achieved indicates that the majority of subjects are within the bounds of normality. However, there are indications of close to a pathological suspicion and a state of deterioration in older adults, as well as a minimum frequency of those who present with dementia.

**Table 4.** Cross-table Age Range and Cognitive Impairment Scale

| | | | Cognitive Impairment Scale | | | | |
|---|---|---|---|---|---|---|---|
| | | | 9-11 Dementia | 12-23 Deterioration | 24-26 Pathological suspicion | 27-30 Normal | Total |
| Age Range | 55-65 | Recount | 0 | 65 | 84 | 113 | 262 |
| | | % of total | 0,0% | 8,2% | 10,6% | 14,3% | 33,1% |
| | 66-80 | Recount | 6 | 129 | 142 | 173 | 450 |
| | | % of total | 0,8% | 16,3% | 18,0% | 21,9% | 56,9% |
| | 81-90 | Recount | 0 | 15 | 26 | 28 | 69 |
| | | % of total | 0,0% | 1,9% | 3,3% | 3,5% | 8,7% |
| | 91-95 | Recount | 1 | 3 | 4 | 2 | 10 |
| | | % of total | 0,1% | 0,4% | 0,5% | 0,3% | 1,3% |
| Total | | Recount | 7 | 212 | 256 | 316 | 791 |
| | | % of total | 0,9% | 26,8% | 32,4% | 39,9% | 100,0% |

**Interpretation**

A discrepancy in the prevalence of dementia was observed between subjects evaluated based on their age. The 55-65 age group did not exhibit significant dementia cases; however, the majority of subjects demonstrated a normal state. This outcome is contrasting with the 65+ age group, where dementia manifested in 6 cases. The value increased in deterioration and pathological suspicion, with a slight positive rebound to a normal state. The subsequent range exhibits no instances of dementia; however, it does demonstrate a heightened frequency of pathological suspicion. Notably, the final range exhibits a single case of dementia and four instances of pathological suspicion. The findings indicate that the majority of issues associated with the instrument's scores are prevalent within the range of 55 to 80.

**Table 5.** Cross-table Age range and dependency index

| | | | Dependency Ratio | | | | |
|---|---|---|---|---|---|---|---|
| | | | Severe dependence | Moderate dependence | Low dependence | Independence | Total |
| Age Range | 55-65 | Recount | 1 | 60 | 31 | 170 | 262 |
| | | % of total | 0,1% | 7,6% | 3,9% | 21,5% | 33,1% |
| | 66-80 | Recount | 10 | 127 | 82 | 231 | 450 |
| | | % of total | 1,3% | 16,1% | 10,4% | 29,2% | 56,9% |
| | 81-90 | Recount | 8 | 23 | 11 | 27 | 69 |
| | | % of total | 1,0% | 2,9% | 1,4% | 3,4% | 8,7% |
| | 91-95 | Recount | 3 | 6 | 1 | 0 | 10 |
| | | % of total | 0,4% | 0,8% | 0,1% | 0,0% | 1,3% |
| Total | | Recount | 22 | 216 | 125 | 428 | 791 |
| | | % of total | 2,8% | 27,3% | 15,8% | 54,1% | 100,0% |

**Interpretation**

In consideration of the degree of dependency observed among the surveyed adults, it is evident that a substantial variation exists across all ranges. These individuals exhibit a notable degree of autonomy in their daily lives, indicating a functional capacity. However, within the 66-80 age group, a moderate degree of dependency is observed in 127 instances, with 83 users demonstrating minimal dependency. The values indicate that the sample under evaluation falls

within the bounds of normality for 56.9% of the older adult population.

**Table 6.** *Correlations of scores and age of participants*

| | | | Total score Mini Mental test | Total Dependency Index Score |
|---|---|---|---|---|
| Spearman's Rho | Age of those evaluated | | ,306 | ,204 |
| | | | ,859 | ,000 |
| | | | 791 | 791 |

**Interpretation**

The correlation method employs test scores and age as variables. In the first case, p = -306 signifies a weak positive relationship, indicating that as age increases, there is a concomitant cognitive deterioration. A similar relationship is observed in the second case, where higher age is associated with greater dependence (r = 204).

**DISCUSSION**

**CONCLUSIONS**

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