



## Cognitive Functionality of Elderly Residents in Social Protection Centers in Cartagena, 2012

### KEYWORDS

Elderly, nursing homes, memory, orientation, cognitive disorders. (DeCS)

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**ABSTRACT** Objectives: To Determine factors associated with cognitive functionality of the elderly, residing in nursing homes in Cartagena, 2012.

*Methodology:* Analytic study of a population consisting of 192 elderly residents in Social Protection Centers of Cartagena. A socio- demographic survey and a mental evaluation test (Pfeiffer) were applied.

*Results:* The participants' average age was 75; 50.5% were masculine; 68.23% had no partner.

47% showed some degree of mental deterioration: 20.8% mild impairment, 19.2% moderate impairment and 6.7% serious impairment, according to the Pfeiffer scale. The cognitive function most affected was the ability to perform mathematical calculation: 76.2% on the Pfeiffer scale. As age advances cognitive impairment increases.

*Discussion:* Most of the participants show some degree of deterioration in cognitive function which was related to age. The need to implement intervention programs is demonstrated.

### INTRODUCTION

Cognitive functions are the mental activities performed by human beings as they interact with the surrounding environment. They represent the individuals' personal adaptation and their social processes, their ability to develop strategies, plan ahead and assess consequences. Cognitive functions include, among others, memory, calculations, information about daily life, and orientation;<sup>2</sup> functions that present changes as age advances, and are more evident in the elderly.

The elderly population is on the rise, and both governmental and private organizations have been interested in the welfare and improvement of life of the elderly. In the year 2013, 10.5% (4'964.793) of the Colombian population was 60 years or older. This shows the progressive increase in life expectancy, giving as a result an increase in the elderly population of the country. In Colombia, "elderly" is defined as a person who is sixty (60) years of age or older. Social Protection Centers (SPC) are defined by law as shelter asylums, nursing homes, old-age homes, rest centers, geriatric hospitals, or any other facility providing similar care for the elderly.<sup>5</sup>

Cognitive impairment is defined as the alteration or diminishing of adaptive skills that are specific to the individual's intellectual capacity.<sup>6</sup> Studies of cognitive impairment and memory deficit are few or very recent. Research shows that cognitive function is associated with visual functioning,<sup>7-8</sup> diet<sup>9</sup>, being female, having an age superior to 65 years, and a low educational level.<sup>10</sup> Number of siblings and number of children also affect cognitive functioning.<sup>10</sup>

Regarding cognitive functioning in different countries, it was noted that in Chile, 59% of the elderly have unimpaired cognitive functionality<sup>7</sup>, in Spain, 79.8% showed acceptable cognitive functionality<sup>9</sup>, in Cuba 9.4% of the elderly showed

cognitive impairment,<sup>11</sup> and another study showed cognitive impairment of 13.8%.<sup>12</sup> Mexico showed some degree of impairment<sup>13</sup> and in Argentina 9.1% show a mild cognitive impairment of the amnesic type.<sup>10</sup>

Studies show that women have a higher frequency of cognitive impairment than men.<sup>8-10-12</sup>

Likewise, studies show that aging increases cognitive impairment.<sup>14-15</sup>

At the national and local levels, there were no statistical studies or epidemiological reports on the subject. Knowledge of the cognitive functionality of the elderly living in SPCs permits an approach to identify which, and to what degree the superior mental functions are impaired, and encourage new research that will help maintain or improve them.<sup>16</sup> Also, this can be an indirect way to assess the care given to the mental functions which can then motivate adjustments in the policies, programs and plans of care for this population.

The aim was to determine the factors associated with cognitive functionality of elderly people residing in Social Protection Centers in Cartagena in 2012.

Cognitive functions are the mental activities performed by human beings as they interact with the surrounding environment. From this perspective, they represent the personal adaptation of the individuals and of their social processes, their ability to develop strategies, plan ahead and assess consequences.<sup>1</sup> According to Cediell, R.<sup>2</sup> the aspects of cognitive functioning that should be assessed are, among others, memory, calculation, information about daily events and orientation.

Regarding memory, there are different theoretical models:

those who claim that memory consists of different processes and those who think that memory is composed of different systems and subsystems. Memory is the faculty of preserving previously acquired ideas.<sup>1</sup>

The ability to read, write, and understand numbers and perform arithmetic functions,<sup>1</sup> refers to calculation. As to orientation, it "knowledge of personal identity and present circumstances," such as personal identification data, space and time.<sup>2</sup>

General information includes information about the "most salient events of the time,"<sup>2</sup> such as the names of the main authorities of the country, or one's closest relatives.

Cognitive functionality experiences changes as age advances, which results in cognitive deficits that affect activities performed by the individual. These deficits refer to the alteration of superior mental skills (memory, judgment, abstract reasoning, concentration, attention, praxis).<sup>6</sup>

Cognitive impairment is defined as the alteration or diminishing of adaptive skills that are specific to the subject's intellectual capacity. Patients with cognitive impairment require greater supervision, have a worse prognosis for rehabilitation, their discharge is more difficult and they use more health and social resources.<sup>16</sup> Moreover, physiological impairment that accompanies aging makes it difficult to assess the elderly. However, the literature recommends this assessment.

Cognitive impairment in the elderly, is one of the most common problems, leading to an important loss of quality of life and autonomy, and can affect up to the 10% of total clinic visits.<sup>6</sup> It is evidenced by a decrease in the performance of one of the mental or intellectual capacities that requires a higher cognitive level than the present, showing a decline or decrease in regard to the previous level of functioning.<sup>17</sup>

Lorenzo J.<sup>18</sup> concludes that cognitive impairments in the aging are not very significant, but there is deterioration, which is not normal and can be a symptom of disease.

In Chile, Lara R. in a cross-sectional study found that 59% of older people living at home had intact mental functions. Lopez J.<sup>7</sup> showed in his study that 8.2% had some degree of cognitive impairment, which proved to be associated with visual functioning.

In the study undertaken by Aparicio A. in Spain, it was found that 79.8% of the elderly showed normal cognitive function. This study concluded that the diet of the elderly in asylums is important for cognitive function. Also in Spain, Lopez J. reported association between visual function and cognitive impairment of elderly people residing at home. Damian J.<sup>20</sup> in his epidemiological study on elderly residents in homes reported that 44% had some degree of cognitive impairment.

In Barcelona, Lopez R.<sup>8</sup> reported that 16% were suspected of cognitive impairment, of these, 56% had a positive Pfeiffer, and of those, 81% were women. Bernal M.<sup>15</sup> in Almería, showed that as time progresses cognitive functioning tends to decline, showing a significant relationship to age.

Calero M.<sup>21</sup> in Granada, obtained a result of 41% of the participants having cognitive impairment, but the overall sample showed improvement after the implementation of

a program of stimulation.

In Cuba, Gomez N.<sup>11</sup> and Gonzalez J. in two studies concluded that cognitive impairment was more common among women and people with less education, and memory was the most impaired cognitive function.

Moreover, Fernández N.<sup>22</sup> found that 37% of the 110 seniors who had hypertension, had impaired cognitive function and 13% had dementia, adding that the highest percentage of impairment was found in those living in nursing homes.

In Mexico, Gonzalez C.<sup>13</sup> found that 5.6% of the Mexican population 50 years and over had some cognitive impairment. Ornelas M.<sup>14</sup> showed that on the whole, 49% of the elderly had mild impairment and 12%, severe impairment.

In Argentina, Mías C.<sup>10</sup> found that the socio-demographic variables significantly correlated with the cognitive status of the elderly are: female gender, age over 65, a low educational level, the number of siblings and the number of children.

In the United States, Chodosh J.<sup>23</sup> conducted a study in six nursing homes and found that 19% of study participants had severe cognitive impairment.

At the national and local levels, there were no statistical studies or epidemiological reports on the subject.

## METHODOLOGY

Analytical study. Population consisting of 192 elderly people living in the SPCs in Cartagena. Being a relatively small population, the total number of people was included and a representative sample was not necessary.

Inclusion criteria were: being elderly (60 years and over), living in a Social Protection Center in Cartagena, and voluntarily participating in the study. The criteria for exclusion were: those considered to have mental disorder or conditions that would prevent them from providing the information required by the survey. Information was collected by previously trained nursing students. Sociodemographic surveys and mental assessment tests (Pfeiffer) were performed.

The Mental Assessment Test (Pfeiffer): This was used in our environment because of its brevity and ease of implementation; it has good validity in the clinical diagnosis of dementia with good intraobserver reproduction. Castillo I., used this instrument in the city of Cartagena, with an elderly population and reported an internal consistency of 0.669. It has a sensitivity of 68%, a specificity of 96%, a positive predictive value of 92%, and a negative predictive value of 82%. The brevity of this scale is adjusted to that reported in the literature that states that, in this population, a short test is a more accurate method for cognitive assessment<sup>23</sup>. Pfeiffer's test includes 10 items and four dimensions: long and short-term memory, orientation, information on daily events and ability to perform consecutive mathematical operations. Errors are scored. Depending on the score obtained: From 0 to 2 errors, no deterioration; from 3 to 4 errors, mild impairment of intellectual capacity; from 5 to 6 errors, moderate impairment; and 7 to 10 errors, serious deterioration. One additional error is acceptable in elderly patients who have not received elementary education, and none for those who have completed higher education. The survey's main problem is that it does

not detect small changes in evolution.

For the statistical analysis the SPSS 17.0<sup>®</sup> software was used, which allowed the development of graphics and figures for the data description. Central tendency measures, statistical dispersion, and statistical position were estimated.

The privacy and anonymity of the participants were respected, and informed consent was obtained in writing.<sup>25</sup> The ethical issues referred to in the Declaration of Helsinki and the Code of Ethics of Nursing in Colombia (Law 911 of 2004 of the Congress of Colombia)<sup>27</sup> were also considered.

**RESULTS**

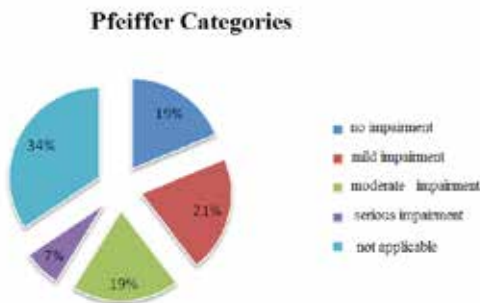
The 192 older adults living in SPCs in Cartagena, in 2012, were distributed as follows: 50 in La Milagrosa, 15 in Unamanoamiga, 21 in San José and 106 in San Pedro Claver.

The average age of participants was 75 years, and 65.1% of the participants were between 66 and 85 years old. The group over 90 years stands out with a participation of 3.1%. As for gender, 50.5% were male (97) and 49.5% female (95), of which 68.23% (131) had no living companion: 31.77% (61) were widows, 26.04% (50) single adults, and 10.42% (20) divorced adults. Those who had partners represented 31.77%: those married 5.21% (10) and those cohabiting 26.56% (51).

Regarding income, 58.33% (112) received a subsidy. According to the educational level, the category of no education prevailed, with 47.40% (91), followed by elementary level studies with 38.54% (74). The higher educational level was represented by the lowest percentage, 0.52% (1). The greatest incidence of pathology was hypertension, which showed 22.92% (44), followed by 8.33% diabetes. (16), and diabetes and hypertension over 7.29% (14).

In terms of test results showing mental condition, Pfeiffer showed that 47% (90) had some degree of mental impairment. It highlights the 34% (66) to which no test was applied due to presenting mental disorder or special conditions that prevented them from providing the information required (See Graph1)

**Graph 1: Percentage of older adults living in SPCs in Cartagena in 2012, according to the results for the Pfeiffer test categories.**



Source: Surveys conducted in SPCs in Cartagena in 2012.

Table 1 shows the Pfeiffer results according to the instrument items (see Table 1)

**Table 1: Results for Pfeiffer Test questions applied to the elderly living in SPCs.**

PFEIFFER QUESTIONS	Wrong	%	Right	%	Total
Today's date	81	64,3	45	35,7	126
Day of the week	34	27,0	92	73,0	126
Place	32	25,4	94	74,6	126
Phone number	87	69,0	39	31	126
Current age	50	39,7	76	60	126

Birthplace	37	29,4 %	89	70,6 %	126
Name of the country's president	54	42,9 %	72	57,1 %	126
Name of the former president	55	43,7 %	71	56,3 %	126
Mother's maiden name	21	16,7 %	105	83,3 %	126
Subtracting from 20 in sequences of 3 to reach 0	96	76,2 %	30	23,8 %	126
Not applicable	66	34,4 %			192

Source: Surveys conducted in SPCs in Cartagena in 2012.

The bivariate analysis established that only age shows significant association to cognitive functioning, as shown in Table 2.

**Table 2: Distribution of variables by age and Pfeiffer test results.**

Age	Not applicable	%	No impairment	%	Mild Impairment	%	Moderate impairment	%	Serious impairment	%	Total	Total
											1	%
From 60 to <	8	61,5	0	0	1	7,6	3	23,1	1	7,8	13	100
From 61 to 70	19	34,6	14	26,9	10	19,2	8	15,3	2	4	52	100
From 71 to 80	18	28,5	12	19	20	31,7	10	15,8	3	5	63	100
From 81 to 90	22	37,9	10	17,24	7	12,1	13	22,4	6	10,36	58	100
From 90 or >	0	0	0	0	2	33,3	3	50	1	16,7	6	100
X2	11,4											
	89											
P value	0,0216											

**Source:** Surveys conducted in SPCs in Cartagena in 2012.

**DISCUSSION:**

The study involved 192 older adults living in Cartagena SPCs, of which, 80% showed some form of cognitive impairment, the performance of mathematical functions being the ability most affected. The cognitive functioning of older adults in this study showed correlation to chronological age.

In this study, the average age was 75, similar to the findings of Aparicio A<sup>9</sup>, Calero M.<sup>21</sup>and Chodosh J.<sup>23</sup>, who reported averages of 76, 24 years, 76.8 years and 74 years respectively.

These results differ from the findings of Damian J.<sup>20</sup>, who found an overall average of 83.4 years.

This study found no significant difference in terms of the gender variable since 50.5% were male and 49.5%female,similar to the data reported by Ornelas M., who also found no difference by sex. These data differ from the findings of Aparicio A.<sup>9</sup>, Bernal M.<sup>15</sup>and Damian J.<sup>20</sup>, who reported a much higher percentage of women than men in their studies, and the findings of Chodosh J.<sup>23</sup>,who reported a 95.2% male participant.

In terms of marital status of the participants, the present study found a prevalence of 68.23% elderly who are single (widowed, single and divorced), which was expected since this condition predisposes a person to require assistance to care for his/her health and thus require institutionalization. Inthe Bernal M.<sup>15</sup> study, a similar finding was reported, where 56.2% were single, 27, 4% were widowed, and 4,1% were separated.

There was a considerable lack of education and, in the level observed, the absence of education predominated in 47.40% of those surveyed, followed by those with an elementary level in 38.54% of the population studied. The higher education level showed the lowest percentage, 0.52%. These results differ from those reported by Calero M.<sup>21</sup>, who found that 64.4% of adults in their study had received some type of academic training, followed by 35.6% who were illiterate. Also, Chodosh J. reported that 4.1% of the participants in his study had a high school education and Damian J.<sup>20</sup>, reported 74.4% with some type of education.

DamianJ.<sup>20</sup> andBernalM.<sup>15</sup>, coincide with this study in that the lowest percentages are for older adults with higher education, with 6% and 2.7% respectively.

There are no research results with which to compare our research findings regarding financial aid since other studies did not include this category.

In this study participants showed high blood pressure in 22.92% and diabetes in 8.33%; 7.29% had both diseases. Also 2.6% had high blood pressure accompanied with visual problems, which is corroborated by the pathologies of life cycle in which the study participants are found<sup>28, 29</sup>.

The present study showed that the highest percentage of elderly living in the SPCs were not able to answer the questionnaires employed. This finding was to be expected, as reported byIraizoz I<sup>16</sup>, older adults with greater limitation- or those who require more individualized care are institutionalized.

In this study, had no cognitive impairment, similar to that reported by Fernandez N., for the institutionalized older adults of his study, with 23.2%.

In this study, 47% of participants had some degree of cognitive impairment, similar to the findings ofDamianJ.<sup>20</sup> who reported 44.8%, Fernandez N. who reported that 52% of elderly had cognitive impairment. However, this differs from Aparicio A.'s studies, reporting 20.2% with cognitive impairment.Ornelas M.<sup>14</sup> found 61% with moderate or severe impairment.

The bivariate analysis allowed us to learn that in this study the age variables showed association with cognitive functioning, similar to the results of Ornelas M<sup>15</sup>, who found that the older the age, the greater the cognitive impairment.

**CONCLUSIONS**

The cognitive functioning of the elderly in this study showed association to chronological age. Most of the elderly living in SPCs show some degree of impairment in cognitive function. The highest percentage of them are alone (single, widowed or divorced), and are without formal education. The most common diseases were hypertension and diabetes. The dimension of cognitive functioning

most affected was the ability to perform mathematical operations.

The necessity to implement intervention programs in order to benefit the maintenance or improvement of cognitive functioning as a result the quality of life of the elderly living in the SPCs is described. Nursing plays a crucial role in the care and stimulation of the residents, since the nursing staff is in charge of personalized care in these institutions.

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