



Dependence Level in Basic and Instrumental Activities of Daily Living in Older Adults

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Research Article

Volume 4 Issue 3

Received Date: March 31, 2021

Published Date: May 05, 2021

DOI: 10.23880/jqhe-16000221

Abstract

During the life cycle of human beings, various evolutionary processes take place in a constant and irreversible way, aging is characterized by a progressive loss of functionality and adaptability; this process involves functional changes and a greater degree of dependence, gradually affecting their health and performance of daily activities, leaving a negative impact in the lives of older people.

Objective: Evaluate the dependence level in basic and instrumental activities of daily living in older adults.

Materials and Methods: A descriptive, cross-sectional study with a quantitative approach and simple random sampling, the sample size consisted of 84 older adults, residents of Tepic Nayarit, Mexico. The Katz Index instruments were used to assess the functional dependence of the basic activities of daily living and the Lawton-Brody Instrumental Activities of Daily Living (IADL) scale to measure the level of independence in the instrumental activities of daily living.

Results: The mean age of older adults was 74.58 ± 12.4 years. In regards to gender, 58% were female and 42% were male. The dependency classification according to the Katz index for basic activities of daily living determined that 50% had a significant prevalence of mild disability, 35.72% had moderate disability and 14.28% had severe disability. The Lawton-Brody (IADL) scale contributed evaluating the dependence level in instrumental activities of daily living, the results showed that 17% of older adults were independent, 21% had mild dependence, 25% had moderate dependence, 29% had severe dependence, and 5.9% had total dependence.

Conclusions: The level of dependence is related to the health and age of persons and they are a constraint to be self-sufficient in managing the care they require daily, therefore, it is important to carry out interventions to promote independence and functionality in older adults.

Keywords: Dependence; Basic Activities of Daily Living; Instrumental Activities of Daily Living; Older Adults

Introduction

Currently, due to accelerated demographic growth and progressive aging, an exponential increase in older adults has been observed. Globally, the population over 65 years of age is growing at a faster rate than the rest of the population

segments [1]. According to the United Nations (UN), most countries in the world are experiencing an increase in the number and proportion of older people. The aging population, is about to become one of the most significant social changes of the XXI century, with consequences for almost all sectors of society, including the labor market,

financial market, and the demand for goods and services, as well as family structure and intergenerational ties [2].

According to data from the United Nations' 'World Population Prospects 2019' report, by 2050 one of every six people in the world will have more than 65 years of age, presenting a greater proportion than that recorded in 2019 where it stood at one of every 11 people. By 2050 one in four people living in Europe and North America will be more than 65 years of age. In 2018 for the first time in history, people over 65 years old outnumbered children under five worldwide. The number of people aged 80 and over is estimated to triple, from 143 million in 2019 to 426 million by 2050 [3].

The World Health Organization (WHO) said that the world population is aging at an accelerated pace, it is estimated that between 2000 and 2050, the proportion of the inhabitants of the planet with 60 years of age or more will almost double, rising from 12 % to 22%. In absolute numbers, this age group will grow from 605 million to 2100 million over the course of half a century [4]. Similarly, the number of people aged 80 and over will increase almost four times, reaching 395 million [5]. In Mexico, according to the data from the National Institute of Statistics and Geography (INEGI), the National Survey of Health and Aging of 2018 and the Population and Housing Census of 2020 reported that a gradual aging process of the population is being observed, registering an increment of 12.0% in the proportion of adults over the age of 60 years, this figure increased to 15.4 million people [6,7].

After reaching the maximum level of development, the human being undergoes important biological changes, which generate a reduction in the capacity of the organs systems. This is mainly reflected in a loss of reserve and functional capacity that exponentially increases the risk of illness, disability or death [8]. Aging from the physiological point of view is the consequence from the accumulation of a great variety of molecular and cellular damages over time, which leads to a gradual decrease in physical and mental capacities [9]. With continuous exhaustion in their capacity and physical functions, older adults become more vulnerable to pathological conditions and complications that may lead them to require dependence. These changes are not linear or uniform, and their relationship with a person's age in years is relative. While a number of older adults have excellent health and function independently, others are fragile and weak, requiring considerable support and care, which makes them dependent in areas such as physical, emotional, affective and economic.

An extremely important aspect in the life of older adults is the deterioration of their functional capacity, including the physical and cognitive areas. These changes, along with

chronic non-communicable diseases, limit the independence to carry out habitual and necessary activities in the life of people, leading to a decrease in quality of life and the need for help. The presence of some type of dependency in the basic and instrumental activities of daily living converge temporarily or permanently, leaving the possibility of triggering another type of dependency, which has a negative impact on the quality of life.

The progressive biological deterioration and consequent increase in health problems associated with individual aging are the result of the interaction of biomedical and contextual factors, which includes lifestyles, eating habits, physical activity and the presence of diseases. This deterioration can manifest itself in various forms and generally is associated with a decline of functional abilities and autonomy of the older person.

The basic levels of functionality are the actions that persons perform on a daily basis in order to subsist and care for themselves. The capacity to perform these actions allows individuals to maintain their independence and remain in the community, integrated into their usual environment and fulfilling their social role [10].

Functional impairment is a prognostic indicator of disability and dependence, therefore, its evaluation acquires special relevance. The most used instruments to study functionality in older adults are quantifiable sets of activities in different levels of complexity that measure the activities of daily living (ADLs). Currently a large percentage of older adults have a partial or total loss of their independence, a situation that is related primarily to various pathologies that interfere directly with the capacities of people and other conditions that have developed over the years, leading to a series of complications [11].

In the healthcare field, people over 60 years of age are considered a vulnerable group, this is because of the characteristics and conditions that naturally occur with age and how they are accentuated when a greater degree of longevity exists. Older adults in this period, experience numerous bio-psychosocial changes that depend on lifestyle, social and family system, and continuously influence the multiple functioning areas, facilitating the loss of functionality and autonomy [12], not counting with the ability to live independently because of mobility limitations, frailty or other physical or mental problems, which builds the need to depend on others by requiring assistance to carry out daily activities in life.

The constant loss of capabilities, mainly physical, has given rise to stereotypes regarding increased age, causing people to experience certain fear for that stage in life, which

can lead to social isolation. Therefore, timely interventions must be implemented, allowing people to enjoy the aging stages of life in an active, healthy and dignified way.

The functional capacity of older adults alludes to the ability to carry out activities of daily living, face the demands of the environment, and live independently. An evaluation of the current capabilities and competencies of functionality present in older adults to perform various activities must be conducted along with the degree of dependence that can be developed through the implementation of instruments that allow functional assessment, with the aim of knowing the degree of independence and autonomy [12].

The care management for older adults must be directed to the satisfaction of care demands presented by the individual and the search for hidden deficits that limit their functionality.

These considerations intervene to preserve or increase the autonomy of older adults; thus the importance of the comprehensive geriatric assessment, a fundamental piece to identify risks of dependency and obtain a clear and broad view about the context of the individual and the care measures required, allowing the design of holistic intervention strategies in accordance to the needs and conditions of such individual that guarantee an improved health status, a higher level of independence and a superior quality of life.

Dependency refers to the state of experiencing difficulty and requiring help to perform a series of elementary activities called activities of daily living (ADLs) on a permanent basis. These activities are classified into 2 types: basic activities of daily living (BADL), and instrumental activities of daily living (IADLs). The former classification measures basic functional levels, such as moving around a room, eating, using the toilet, personal hygiene, and dressing. The latter classification involves greater cognitive and motor complexity, including the performance of certain tasks including cooking, traveling by means of transport, and taking medications [13].

Materials and Methods

The type of study was descriptive, cross-sectional, with a quantitative approach; the study population included 112 adults over 60 years of age, all residents of the urban area of Tepic, Nayarit. The sampling was determined through simple random sampling, with 84 people representing 75% of the population study; the sample size was based on the formula for finite populations. According to the inclusion criteria, they were: adults from 60 to 89 years of

age, residents of Tepic, who agreed to participate in the study and signed an informed consent. Older adults who were previously diagnosed with senile dementia and older adults who presented health problems that prevented them from answering the instruments were excluded and incomplete questionnaires were eliminated.

It was decided to exclude people with neurological disorders or some type of dementia, for they are considered some of the factors that contribute most to disability and dependence in older adults. Dementia implies the deterioration of memory, behavior and the ability to carry out activities of daily living, as well as the performance of self-care actions such as personal care. Currently, Alzheimer's disease and Parkinson's disease are disorders with a high prevalence and incidence in Mexico, in this study, 3.6% of the total study population (three patients) were excluded for having a previous diagnosis of senile dementia, this situation was more evident in women and is associated with the presence of pathologies such as metabolic syndrome, cardiovascular disease and diabetes; conditions present in more than 80% of the study population.

The information was collected through two scales: the Katz Index to measure dependence for Basic Activities of Daily Living and the Lawton and Brody Instrumental Activities of Daily Living scale to Evaluate Physical Autonomy in Instrumental Activities of daily living.

The Katz Index assesses the degree of dependence/independence of people using six basic functions: bathing (sponge, shower or bathtub), dressing, toileting, transference (mobility), continence and feeding. Each activity is categorized into two levels (independence and dependence). People are classified in one of the eight levels of dependency from the index that range between A (independent for all functions) and G (dependent for all functions), having level O (dependent on at least two functions but not classifiable as C, D, E or F) as the last one [14].

The Lawton and Brody Scale: Evaluates physical autonomy in instrumental activities of daily living. It evaluates 8 items (ability to use the telephone, shopping, preparing food, housekeeping, doing laundry, use of transportation, handling medication and handling finances) and assigns them a score of 1 (independent) or 0 (dependent). The final score ranges from 0 (maximum dependence) and 8 (total independence) [14].

Descriptive statistics with frequency distribution and measures of central tendency were used for the analysis, a statistical significance value of $p < 0.05$ and a reliability of

95%. The data were processed with the SPSS IBM Statistics package version 23.

Results

In regard to the socio-demographic variables, the data evaluated established the age of older adults in the range from 60 to 89 years, the group that set the highest percentage were the subjects from 70 to 74 years of age, reaching a 25%, nevertheless, the rest of the groups were not as distant as previously expected, the group aged from 80 to 84 years had a score of 21.4%, followed by 17.9%, obtained from the group of 65 to 69 years of age, the fourth group presented ages from 85 to 89 years, showing a 13.1%, while the other two groups, with ages ranging from 60 to 64 and 75 to 79 years, reached a similar proportion scoring 10% and 11% respectively.

The mean age was 74.58 ± 12.4 years, with a minimum age of 60 years and a maximum age of 89 years. Regarding gender, 58% were females and 42% males, this situation prevails both locally and nationally, being females the highest percentage of people with 51.2%, leaving males with 48.8%. In relation to marital status, married people predominated with 58.4%, followed by those who said they were single, in common law/free union, widowed and divorced summing up 41.6%. Referring to the occupation, 49% said they were housewives, 36% said they were pensioned and only 15% of older adults expressed depending both economically and sanitarily on their children/family.

As the population ages, there is an increased risk of developing neurological disorders that have a significant impact in the life of people over 65 years of age. Regarding the health status of older adults, 85% presented a chronic non-communicable disease, such as: Systemic Hypertension, type 2 Diabetes, Rheumatoid Arthritis, Metabolic Syndrome, Obesity, visual impairment, and in a smaller proportion (4%), the presence of cerebrovascular accidents was reported, having important repercussions that affect their independent development.

According to the dependence level of older adults in carrying out the BADLs, it is important to point out that more than 50% are independent in various activities; however, this is not generalized everywhere, in fact, more than 40% of the study population reported having some level of dependence in the different dimensions of the basic activities of daily living. In regard to continence activities, 59.52% were observed presenting urinary incontinence, followed by the use of the bathroom (shower), where 42.86% referred difficulty to perform it independently, existing the need for help from a third party.

The 41.67% expressed mobility dependence, and lastly, with a similar percentage, the performance of activities in the feeding area had a 40.48%. This situation occurs in both genders, and it's related with multiple factors such as age, comorbidities, drug consumption as part of a treatment or neurologic disorder Table 1.

Katz index	Independent		Dependent	
	f	%	F	%
Feeding (cooking)	50	59.52	3.4	40.48
Bathing	48	57.14	36	42.86
Dressing	52	61.9	32	38.09
Toileting	51	60.71	33	39.29
Transference	49	58.33	35	41.67
Continence	3.4	40.48	50	59.52

Source: Katz index scale.

Table 1: Dependence Level of Basic Activities of Daily Living (BADLs) in older adults according to the Katz index.

The results in Table 2 present the level of disability to perform the BADLs in a global way, 50% of older adults presented mild disability, followed by 35.72% with moderate

disability and in a lesser proportion the 14.28 %, showing severe disability, which includes activities of continence, transference, bathing (hygiene measures) and toileting.

Katz Index Classification	Frequency	Percentage
Slight disability	42	50.00%
Moderate disability	35	35.72%
Severe disability	7	14.28%
Total	84	100%

Source: Katz index scale.

Table 2: Level of disability to perform the Basic Activities of Daily Living in older adults.

Regarding the data in Table 3, the level of dependence to perform the instrumental activities of daily living in older adults is shown, registering a greater dependence in the components regarding shopping, responsibility for medication, use of means of transport, and preparing

food; nevertheless inferior numbers were present in responsibilities, highlighting laundry, use of telephone, housekeeping and finances as the activities with the highest level of personal independence.

Lawton and Brody scale Components	Maximum independence		Total dependence	
	F	%	F	%
A. Using the telephone	71	84%	13	16%
B. Shopping	48	57%	36	43%
C. Preparing food	55	65%	29	35%
D. Housekeeping	66	78%	18	22%
E. Doing laundry	62	74%	22	26%
F. Using transportation	50	60%	3.4	40%
G. Handling medication	45	54 %	39	46%
H. Handling finances	60	72%	24	28%

Source: Lawton and Brody scale.

Table 3: Level of dependence required to perform the Instrumental Activities of Saily Living in older adults according to the *Lawton and Brody* scale.

The data shown in Table 4 presented the dependence level of older adults ranging from independence with 17.86%, to severe dependence with 29.76%, since several users do not have the capacity to perform the instrumental activities of daily living independently. The activities where the greatest limitation is observed are: making purchases, older adults require help and advice. Another important aspect is that they are not responsible for managing medication in terms of doses and schedules, by the same way the capacity

to transport themselves is deteriorated, they cannot do it alone, thus transporting has to be assisted, either with the help of a relative, the help of a driver or the help of an orthopedic appliance, likewise, the ability to use money and the need of help to go to the bank and pay expenses arise, they remain unable to manage their finances on their own, making them prone to swindles and abuse from third parties or their own family.

Lawton and Brody classification	Frequency	Percentage
No dependence	15	17.86%
Light dependence	18	21.43%
Moderate dependence	21	25.00%
Severe dependence	25	29.76%
Total dependence	5	5.95%
Total	84	100%

Source: Lawton and Brody scale.

Table 4: Dependence level required to perform the Instrumental Activities of Daily Living in older adults according to the Lawton and Brody scale.

Discussion

According to the findings obtained throughout the research, older adults who participated in the study are dependent on one or more basic activities of daily living, according to the Katz scale, it was determined that 50% of older adults presented mild dependence, followed by 35.72% with moderate dependence and only 14.28% referred severe dependence. The most affected dimension was continence scoring 59.52%, however, they show independence for the other instrumental activities of daily living. Other important aspect that resulted altered is transference with 41.67%, an issue that affects persons over 75 years of age. These results are similar to those reported by Gutiérrez Robledo, et al. [15] his study found that 10% of subjects, a group of older adults from 60 to 64 years of age, were dependent to perform BADLs, while the 77% of older adults with ages over 90 years were also dependent. By the same token, Martínez Mendoza, et al. [16] indicated that 62% of adults aged 70, had some kind of dependency when dealing with BADLs and 75% expressed dependence with IADLs. These differences in prevalence have led to the identification of various factors associated with dependence.

Conclusion

The degree of dependence to perform the basic and instrumental activities of daily living in older adults is directly related to aging and relies on several factors, both physiological and social. Age and health status were determinants to manifest a type of dependency.

Promoting self-care and healthy habits in the population guarantees the quality of life of older adults; with the employment of health promotion, nursing professionals should implement effective interventions to carry out a healthy aging through the development process and maintenance of functional capacity, allowing the wellbeing of persons during the stage of aging and at the same time achieving independence performing the basic and instrumental activities of daily living.

The results reached through this research showed that a large percentage of older adults present a dependence level and functionality suited to face and live the aging phase successfully. A reason to emphasize the importance of conserving the capacities previously mentioned for the longest time possible, especially during this particular stage due to the complications related to their medical conditions that could incline them to develop a certain degree of dependence. Another important aspect to consider, is their functional capacity, a function conditioned by the aging process, fundamentally affecting the instrumental activities of daily living; similarly, some variables such as age, health

status and gender, relate significantly in contrast to the functional component and the degree of dependence of the person

Functional dependence is directly related to aging and depends on multiple determining factors. This research confirmed age as a factor independently associated with dependence in older adults to perform both BADLs and IADLs. Other significant determining factors include having a greater number of chronic diseases, which presents depressive symptoms, visual impairment and pain.

The social determinants of health are important situations to consider in older adults, this is due to the major impact such situations have on the state of health and quality of life of individuals, who are in a state of vulnerability, both for their care needs and their physical, emotional and mental functional problems, as well as their economic and educational capacities and the availability of family support. Therefore, economic, social, political and educational aspects, along with their position in one social class or another, are determining factors that directly influence the level of wellbeing and self-care capacity of the person, favoring their integral development.

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