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Assessing balance in older adults in rural Ecuador: implications for sustainable lifestyle

Evaluación del equilibrio en adultos mayores del Ecuador rural: implicaciones para un estilo de vida sostenible

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ABSTRACT

Background: in Ecuador there are 1,049,824 people over 65 years of age (6.5% of the total population), 42% live in rural areas (395,180 AM), 14.6% of poor households are made up of an older adult living alone, which constitutes a high increase in the risk of falling. In this research, we worked with 15 of 22 elderly people who attend the "Saquisili Senior Center" taking into account their contextual reality, respecting their integrity and availability. **Objective:** evaluate the balance of the elderly of the "Home for the Elderly Saquisili". **Methods:** this research is a quantitative observational study since it obtains specific data from the direct assessment of the balance of the elderly. A sociodemographic data survey was used with inclusion and exclusion criteria and the Berg Balance Scale. **Results:** 100% of those evaluated present a moderate risk of falls. The easiest test is "Standing without help" and the most difficult test is "Standing on one foot". **Conclusions:** the assessment of balance reveals that 100% of those evaluated have a moderate risk of falls. The risk of falls does not have any predominance or relationship with sociodemographic factors such as sex, age or type of housing. Balance assessment in older adults is essential to promote activities and reduce the risk of falls.

Keywords: Balance assessment; Rural elderly; Fall risk; Sustainable health and lifestyle.

RESUMO

Antecedentes: no Equador, há 1.049.824 pessoas com mais de 65 anos de idade (6,5% da população total), 42% vivem em áreas rurais (395.180 AM), 14,6% das famílias pobres são compostas por um idoso que vive sozinho, o que constitui um alto aumento do risco de quedas. Nesta pesquisa, trabalhamos com 15 dos 22 idosos que frequentam o "Centro Sênior Saquisili", levando em conta sua realidade contextual, respeitando sua integridade e disponibilidade. Objetivo: avaliar o equilíbrio dos idosos do "Lar dos Idosos Saquisili" Métodos: esta pesquisa é um estudo observacional quantitativo, pois obtém dados específicos a partir da avaliação direta do equilíbrio dos idosos. Foi utilizado um levantamento de dados sociodemográficos com critérios de inclusão e exclusão e a Escala de Equilíbrio de Berg Resultados: 100% dos avaliados apresentam risco moderado de quedas. O teste mais fácil é "Ficar em pé sem ajuda" e o teste mais difícil é "Ficar em um pé só" Conclusões: a avaliação do equilíbrio revela que 100% dos avaliados têm risco moderado de quedas. O risco de quedas não tem nenhuma predominância ou relação com fatores sociodemográficos, como sexo, idade ou tipo de moradia. A avaliação do equilíbrio em idosos é essencial para promover atividades e reduzir o risco de quedas..

Palavras-chave: Avaliação do equilíbrio; Idosos rurais; Risco de queda; Saúde e estilo de vida sustentáveis.

INTRODUCTION

The evaluation of the balance of older adults in rural areas was carried out against the contextual need of the older adult since balance is an indicator of performance in the functional status of the elderly. The balance variable allows evaluating the functionality of various segments in the nervous system. Its integrative action enables the evaluation of peripheral segments such as proprioception, visual and vestibular systems (Daysi et al, 2018).

In old age, the characteristics of balance and age itself change. It is not an inevitable cause of the disorders that may occur at this stage of life. However, normal physiological changes should not disturb overall function and participation in usual activities. (Subirana & Adell, 2020). Worldwide, 30 percent of people over 65 years of age suffer an annual fall and in people over 75 years of age this figure rises to 40 percent. (Social communication, 2019). In Latin America in the next 15 years, the expected growth of the elderly population is 71%, being the highest worldwide, which reveals the need to have ready tools to face future problems such as falls. (Benavides-Caro, 2018). Falls are the second cause of death due to unintentional trauma worldwide, and more than 50% of these falls refer to older adults. (Díaz-Ramos et al, 2018).

In Ecuador there are 1,049,824 people over 65 years of age (6.5% of the total population). In this period of life, there are greater limitations in accessing subsistence resources and care needs increase. 45% live in conditions of poverty and extreme poverty (424,824 AM), 42% live in the rural sector (395,180 AM), 14.6% of poor households are made up of an elderly

person living alone, which constitutes a high increase fall irrigation. (Senior population address, 2020). As a result of aging, we observed changes in body posture, an imbalance in the oscillation of the upper extremities and a noticeable incoordination in the speed of daily tasks in the elderly. (Petronila Gómez et al, 2017)

Evaluating the causes of balance disorders in the elderly is not an easy or simple job; it can be an arduous task to recognize and diagnose. These alterations, that can be presented as subtle manifestations, are not very differentiated from age-related changes. Frequently, a single cause cannot be determined (they can be multifactorial in up to 75% of cases), and they can be derived from multiple diseases that can affect balance. (Barajas-Galindo et al, 2021)

Falls, the result of altered balance in this population, are possibly the geriatric syndrome for which the risk factors are best known and, therefore, where the different preventive strategies are most effective. (Chacón-Serna et al, 2017). When an elderly person suffers a fall, this can trigger feelings of anxiety and fear of suffering a similar event again. That is, the person can develop what is known as "post-fall syndrome", loss of self-confidence and restriction of certain activities of daily living (ADL) as a consequence. Even the social relationships that patients previously had may be affected. (Bella Beorlegui et al, 2017)

The evaluation of balance and the prevention of falls will help us achieve maximum mobility in the elderly, healthy aging with the shortest possible time of morbidity, disability and dependency. This reduces the risk of falls and mortality. (Blasco-Lafarga et al, 2018). It can be said then that there is a pressing need to implement strategies at the level of each country to contribute to care for the elderly in a comprehensive and collective manner. It allows aging to become a normal and inclusive process with the lowest number of disabilities possible. (Esmeraldas Vélez et al, 2019).

This is why, analyzing the local national reality, the elderly is a population group that needs a lot of social, health and economic attention. (Casado-Verdejo et al, 2018) In this sense, Abreus, et al. (2019), considered that gait and balance alterations in the elderly represent the main cause of falls. The development of valid as well as reliable balance assessment methods is essential to identify the main cause of fall in a timely manner. It states that older adults, who remain physically active as they age, retain a higher level of static and dynamic control.

Smith et al. (2017), in their research work, found that the assessment of balance carried out denotes the prevalence of the risk of falls in women, with decreased cognitive performance, of advanced age, and with a history of falling in the last 6 months. These factors indicate that the sociodemographic study is essential to direct work on the prevention of falls in this age group. Carballo et al. (2017) in their assessment of balance in the elderly found an evident prevalence of the risk of falls in elderly people, mostly women, with chronic diseases, and with orthotic devices for ambulation. It proposes planning future studies with individualized monitoring of residents to define characteristics and types of falls, improving the safety and quality of life of older adults living institutionalized.

Ferreira et al. (2019) evaluated balance where the Berg Balance Scale was the tool with which they obtained the most relationship of their variables. The results obtained in relation to sociodemographic data and the number of previous falls helped to conclude that body balance in the Elderly is more compromised by age, personal pathological history, worse walking performance, pain, fear of falling and not doing physical activity.

Chen et al. (2019) evaluated the difficulty when performing each test of the Berg Balance Scale applied in older adults living in the community since some tests are actually very easy when applied. Their methodology was to compare the difficulty of each test with the functional capacity of each older adult and showed that there are tests such as standing on one leg that are actually tests with minimal difficulty. Based on this information, it was proposed to evaluate the balance of the older adults of the "Saquisili Elderly Home".

METHODS

It is an observational study since older adults were evaluated in order to obtain results on their balance status, with a quantitative approach to obtain direct assessment data. (Morejón et al, 2018)

With the authorization of the director of the "Home for the Elderly Saquisili", the activities to be carried out and the purpose of the investigation were socialized. Of the 22 older adults, 15 were chosen, including men and women, through non-probabilistic convenience sampling based on inclusion criteria such as: Older adults who live in the rural area, over 65 years of age, men and women, who attend the "Hogar del Saquisili Senior Adult". The exclusion criteria were: older adults with excessive alcohol consumption, with sensory deficiencies that prevent hearing or seeing, with serious mental disorders, neurological disorders with a definitive medical diagnosis that affect the study, and older adults who are receiving other treatment in Physical Rehabilitation centers. This information was obtained by applying a survey that included sociodemographic data which was validated by a committee of experts. (Martínez González et al, 2020).

The physiotherapeutic evaluation of balance was carried out with the Berg Scale, which is a tool to quantitatively assess the functional status of balance in the elderly. (Oliveira Martins et al, 2017). This scale includes 14 items, each rated from 0 to 4 points, which give a total of 56, that is, the total scores can range between: 0-20 high risk of falling; 21-40 moderate risk of falling; and 41-56 low risk of falling. This scale has reliability. Studies of several elderly populations (N = 31–101, 60–90+ years) have demonstrated high intrarater and interrater reliability (ICC = 0.98,14,15 ratio of intersubject variability to total = 0.96–1.0.16 rs =.88) Test-retest reliability in 22 people with hemiparesis was also high (ICC [2,1]=.98). (Steffen et al., 2002)

The materials that were used for this assessment were: common chairs, 5-, 12- and 25-centimeter rulers, and a common step. A stopwatch was used as equipment. (Park SH, 2017). That said, the Berg Balance Scale was applied with understandable language, with available materials, so that older adults can carry it out and the scale can be applied continuously. There was permanent direct supervision of the researcher to be able to provide immediate help and support in case of any adverse event. (Guzmán-Muñoz et al, 2018)

The evaluation values were tabulated with the help of the Excel program of the Windows 8 package. Later, the data were processed applying SPSS 29 (Statistical Package for Social Sciences) which allowed them to be analyzed.

This research was developed with approval number 045-CEISH-UTA-2023 from the Human Research Ethics Committee of the Faculty of Health Sciences of the Technical University of Ambato. Ethical and gender considerations were taken into account. Older adult participants, after giving their approval to the research, signed their informed consent freely and voluntarily. (Lazaro del Nogal et al, 2018)

The results were expressed in tables containing the frequency, percentages, the mean of the data entered and the standard deviation to easily express the differences between each variable.

RESULTS

The following results were obtained in the population that participated in this study:

Sociodemographic information

We worked with a population of 15 older adults of which 60% are male, 60% are in the range of 75 to 84 years old and 53.3% live in an easily accessible home (Table 1).

Table 1. Sociodemographic results of the population studied in the "Saquisili Elderly Home"

Variable	Denomination	Frequency	Percentage
Sex	Male	9	60.0
	Female	6	40.0
Age	65-74	4	26.7
	75-84	9	60.0
	85-94	2	13.3
Accessibility of the living place	Hard access	7	46.7
	Easy access	8	53.3

Source: Sociodemographic survey.

Evaluation of balance in older adults

After applying the Berg Balance Scale, the results were that 100% of older adults have a moderate risk of falling. 60% of older adults who have a moderate risk of falling are male (Table 2).

Table 2. Balance status of the elderly from the "Saquisili Elderly Home" using the Berg Balance Scale.

Falling risk	Sex	Frequency	Percentage
Low risk	Male	0	0
	Female	0	0
Moderate Risk	Male	9*	60.0*
	Female	6*	40.0*
High risk	Male	0	0
	Female	0	0
Total		15	100.0

Source: Berg scale

Analysis of each question of Berg Balance Scale

The test in which the least difficulty is recorded is test No. 2: Standing without assistance and the test with the greatest difficulty to perform is test No. 14: Standing on one foot. (Table 3)

Table 3. Analysis of difficulty and ease for each question of the Berg balance scale

	Score		
Berg Scale Test	**AVG**	**Dev. standard**	
From sitting to standing	2.87	0.352	**Score 0-4**
Standing without assistance	3.60*	0.507	
Sitting without supporting the back	3.40	0.632	
From standing to sitting	2.93	0.258	
Transfers	2.53	0.640	
Unassisted standing with eyes closed	3.00	0.378	
Standing without holding on with feet together	2.73	0.594	
Bring your arm extended forward in a standing position	2.47	0.516	
While standing, pick up an object from the ground	2.60	0.507	
When standing, turn to look behind	2.47	0.516	
Rotate 360 degrees	2.27	0.594	
Alternately raise your feet to a step	2.73	0.458	
Standing with feet in tandem	1.53	0.743	
Standing on one foot	1.40*	0.632	

Source: Berg balance scale

DISCUSSION

In the present investigation, 100% of the older adults evaluated in the "Saquisili Elderly Home" live in rural areas and present a moderate risk of falls. Mazon et al (2021) in their study affirm that all older adults who evaluated in rural areas present a moderate risk of falls and a better balance in relation to those who live in homes and institutions which presented a high risk of falls, since the more restricted the environments, the greater the risk of falling.

In this research, when assessing the balance of the elderly at the "Saquisili Elderly Home", 100% of men and women evaluated using the Berg scale present a moderate risk of falls, that is, there is no predominance according to sex. In the same way, there is no predominance according to the age range since 100% of those evaluated in their age ranges presented a moderate risk of falls, Ferreira et al (2019) in their assessment using the same scale as stated balance, in relation to sex, does not predominate, as in this study and according to age, a high risk of falls was obtained in the elderly over 80 years of age, which differs from this research.

The assessment of balance using the Berg scale has shown that the easiest test to perform by older adults was No. 2, "Standing without assistance" and the one with the greatest difficulty was No. 14, "standing on one foot." On the contrary, in the study by Chen H (2019), when assessing the balance of older adults, he established that in the hierarchy of difficulty the easiest test was No. 3, "sitting without support" and the most difficult was, the same as in this study, No. 14 "standing on one leg".

CONCLUSIONS

The assessment of the balance of older adults in rural areas using the Berg balance scale establishes that 100% of those evaluated have a moderate risk of falls. In relation to sociodemographic data such as sex, age or type of housing, the risk of falls has no predominance or relationship.

According to the analysis of each question in Berg balance scale, the second test, "Standing without assistance" is the least difficult and test number 14, "Standing on one foot" is the most difficult. The Berg balance scale has provided the ideal elements for assessment within the daily activities of the elderly and with a significant range of assessment of the risk of falls. The assessment of balance in older adults is essential to identify the activities that need to be worked on in order to reduce the risk of falls.

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