FALLS, DYNAMIC BALANCE, AND FUNCTIONAL MOBILITY IN ELDERLY PEOPLE AT UNIAPI

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ABSTRACT

Senescence results from the decline of physiological reserves and affects social, cognitive, and physical aspects. Changes in neuromuscular functions, together with deterioration of the vestibular and visual systems, reduce physical fitness and balance. Falls can be serious consequences of imbalance and represent the second leading cause of death among older adults. Thus, this study aims to identify the history of falls and dynamic balance/functional mobility in older adults. This is a cross-sectional, descriptive field study based on the analysis of 120 participants from the Open University for Older Adults at UniEVANGÉLICA (UniAPI). Functional mobility was assessed using the *Timed Up and Go* (TUG) test, categorizing performance into three fall risk ranges. Of the participants, 40% reported at least one fall in the last 12 months, with an average of 2.42 falls per year among frequent fallers. Analysis by age group showed that, despite longer TUG times among older adults over 75 years of age, they reported fewer falls than the 70-75 age group, suggesting the influence of multiple factors in the assessment of fall risk.
Keywords: Aging; Elderly; Fall accidents; Postural balance.

INTRODUCTION

Aging is defined as a phenomenon that affects all human beings, characterized as a dynamic, progressive, and irreversible process, closely linked to biological, psychological, and social factors (LITVOC; BRITO, 2004). These changes result from the decline in physiological reserves, which vary individually and affect different areas of the older adult's life, compromising their quality of life (FREITAS, 2018).

These losses are evident in both social and cognitive aspects and are even more evident in neuromuscular functions. Among the various systems affected, the musculoskeletal system stands out, suffering a significant loss of bone and muscle mass and wear and tear on the joints. These changes, together with the deterioration

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of the vestibular and visual systems, result in a decrease in physical fitness and balance, increasing the vulnerability of the elderly to accidents (ESQUENAZI, 2020).

Furthermore, it is known that body balance is fundamental for an individual's orientation in space, and this ability is also limited in senescence (BUSHATSKY et al., 2018). Thus, imbalance, which is classified as the loss of the ability to control the intentional movements of the body's center of mass over the support base, becomes a limiting factor and has effects on the lives of older adults. Falls, for example, can be serious consequences of imbalance (ARAÚJO et al., 2019).

Falls represent a serious public health problem, being the second most common cause of death in older adults globally. This multifactorial geriatric syndrome is associated with high morbidity and mortality rates, which highlights its relevance to public health. Risk factors for falls in older adults cover a wide range of influences, including individual characteristics, lifestyle, environmental conditions, and socioeconomic factors. Therefore, knowing and relating the factors associated with changes in postural balance and falls is essential to help this population and promote prevention strategies (FIORITTO, 2020).

In this context, the *Timed Up and Go* (TUG) test is widely recognized as a reliable tool for assessing functional mobility and has been associated with factors such as risk of falls, fear of falling, and functional performance in older adults. In addition, TUG has shown promise as a screening method for sarcopenia, as it allows for the simultaneous assessment of dynamic balance, muscle strength, and speed. This potential application has demonstrated a sensitivity of 88.9% for the prediction of sarcopenia, highlighting its usefulness as a screening tool (FILIPPIN LI, 2017).

Therefore, it is necessary to identify the history of falls and dynamic balance/functional mobility in older adults.

METHOD

This cross-sectional, descriptive field study was conducted at UniEVANGÉLICA, in the context of the Open University for the Elderly (UniAPI), which aims to promote healthy aging. A total of 120 elderly individuals participated, selected from a population of 160 through a sample calculation with a 5% error margin.

The study included elderly individuals over 60 years of age, able to walk independently and in good health, who voluntarily agreed to participate and signed the Free and Informed Consent Form (FICF). Those with serious health problems, amputees, wheelchair users, or with severe visual impairment were excluded.

The elderly respondents completed a sociodemographic and clinical questionnaire, and their history of falls was investigated. Dynamic postural balance/functional mobility was assessed using the *Timed Up and Go* (TUG) test, in which the time taken to stand up from a chair, walk 3 meters, and return was timed. Results of less than 10 seconds indicated good mobility; between 11 and 20 seconds, partial mobility; and greater than 20 seconds, compromised mobility and high risk of falls.

The data were analyzed descriptively in Excel. The study was approved by the Ethics Committee of UniEVANGÉLICA (opinion no. 1,583,515) and followed the guidelines of Resolution 466/12 of the National Health Council.

RESULTS

The analysis of falls and dynamic postural balance in 120 older adults, performed using the *Timed Up and Go* (TUG) test, provided important insights into functional mobility and the risk of falls. Of the elderly individuals evaluated, 72 (60%) did not fall in the last year, with an average TUG time of 10.51 seconds. In contrast, 48 (40%) reported at least one fall, with an average time of 10.80 seconds, and fell 2.42 times in the last year, according to data recorded in the yellow columns of Figures 1 and 2. It was also observed that 25 (20.8%) elderly individuals suffered two or more falls, a factor associated with a higher risk of new falls.

The older adults were classified according to the TUG criteria/performance time, with Group 1 (≤ 10 seconds) and Group 2 (time between 11 and 20 seconds) shown in the blue columns in Figures 1 and 2. It was observed that 54 (45%) elderly individuals had good mobility and a low risk of falls, with an average TUG time of 8.75 seconds and a rate of 0.67 falls in the last year. Group 2, with 66 (55%) older adults, had partial mobility and moderate risk of falls, with an average time of 12.16 seconds and 1.21 falls in the last year. In this sample, there were no older adults classified with a time ≥ 20 seconds.

When stratified by age group, as shown in the red columns in Figures 1 and 2, older adults aged up to 70 years (n = 59; 49.17%) had an average TUG time of 10.48 seconds and fell on average, once a year. Older adults between 70 and 75 years of age (n = 36, 30%) had an average time of 11.70 seconds and fell 1.20 times, on average. Elderly individuals over 75 years of age (n = 25; 20.83%) had an average TUG time of 12.25 seconds, but reported fewer falls (1.06 falls, on average) compared to the 70-75 age group.

Figure 1. Classification of the sample according to TUG performance, test execution time, age group, and number of falls in the last 12 months.

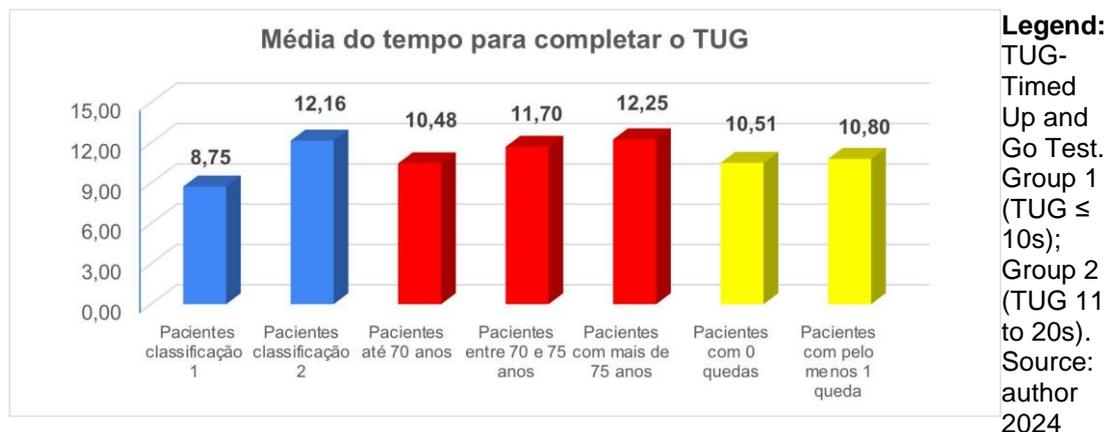Legend: TUG-Timed Up and Go Test. Group 1 (TUG ≤ 10s); Group 2 (TUG 11 to 20s). Source: author 2024

Figure 2. Classification of the sample according to the average number of recurrent falls, test execution time, age group, and number of falls in the last 12 months.

Legend: Group 1 (TUG ≤ 10s); Group 2 (TUG 11 to 20s). Source: author 2024

CONCLUSION

It can therefore be concluded in this study that functional mobility/dynamic postural balance may be a predictive variable for assessing the risk of falls in older adults. The observation that older adults over 75 years of age had fewer falls, despite their lower performance on the TUG, reinforces the need for a multifactorial approach to fall prevention that goes beyond chronological age. Therefore, a multifactorial approach that integrates functional assessment with personalized interventions, such

as regular physical activity programs and education on fall prevention, is essential to promote safety and quality of life for those in senescence. Furthermore, continuous analysis of the physical and environmental conditions of these individuals can help prevent falls and their consequences, contributing to healthy and independent aging.

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