# Fall Risk in Older Adults: Literature Review

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As individuals start to age, their fall risk becomes more significant. Therefore, fall risk assessments in the elderly are critical and can predict and prevent future falls. Approximately 28 – 35% of older adults fall each year (Severo et al., 2018). Each one of these studies analyzes assessments for fall risks in the older adult population. The literature review will focus on the factors associated with fall risks in the older adult population.

### Quantitative Falls Risk Assessment in Elderly People: Results from a Clinical Study with Distance-based Timed up-and-go Test Recording

When assessing the elderly for fall risk, nurses evaluate many different subjects, including gait, balance, and timed up-and-go tests. Every year, about one-third of older adults fall at least once (Ziegl et al., 2020). A risk factor for this age group is their gait and balance. The older adult's balance becomes unsteady, and they cannot catch their balance. In the study, the older adult patients were put into two categories depending on their fall risk assessment: non-fallers and fallers. This study shows how the timed up-and-go test will evaluate 39 individuals' gait and balance (Ziegl et al., 2020). The timed up-and-go test will feature several activities for the participants to complete. For example, the participates will stand up from a chair to walk three meters, turn around, and then walk back. This test can be introduced into practice by healthcare professionals for fall-risk individuals (Ziegl et al., 2020). Using the timed up-and-go test can assess risk factors occurring in the elderly due to gait and balance.

**Key Points**

The most critical information in the article is testing the gait and balance for older adults in predicting a fall risk. The ages of the participants were 65 and up. They were competent to give consent. Furthermore, the timed up-and-go test is a straightforward way to evaluate the elderly risk of falling (Ziegl et al., 2020). To test the time, they brought in an ultrasonic sensor that sticks to the chair and records the time it takes to do the tasks. During this test, the researchers were also testing to see how they prevented these falls. The recordings were then measured six times a week for 15 weeks (Ziegl et al., 2020). After completing the study, the statistical data was sent directly to a computer to be collected and analyzed. If they fell, they would be listed in the fallers category. Then if the participants did not fall, they are in a non-fallers category (Ziegl et al., 2020). Thus, the timed up-and-go test focused on the participant's gait and balanced to test fall risk in older adults.

**Assumptions**

Statistical analysis implemented the study data into a bell curve of time and distance graph of the timed up-and-go test (Ziegl et al., 2020). The bell-shaped curve and the linear line fitting graph show the difference between fallers and non-fallers. The statistical significance between fallers and non-fallers was a p-value $< 0.05$ for a normal distribution fitting and a p-value $< 0.02$ for linear regression testing (Ziegl et al., 2020). After analyzing the data and looking at the graph, it was apparent that the curve for non-fallers had more smooth curves than the fallers did (Ziegl et al., 2020). Therefore, they found that it could help predict falls for patients with fall risk with the timed up-and-go test.

**Deficit/Conclusion**

In conclusion, this article explains that by testing gait and balance through a quantitative case study, the timed up-and-go test has proven its statistics feasible in effect with patients in a nursing home (Ziegl et al., 2020). The timed up-and-go test could be used with patents to predict future falls; this line of reasoning is agreeable. This research would imply that this test can help predict future falls in a clinical setting in older adults. If nursing fails to accept this line of reasoning, the implications will not help further fall risk assessments. Although healthcare professionals have many different aspects when considering a fall risk, this will add another way to test fall risk and prevent falls in the future. An older adult's gait and balance as they age is a deficit that the time up-and-go test could detect.

## A Prospective Cohort Study of The Risk Factors for New Falls and Fragility Fractures in Self-caring Elderly Patients Aged 80 Years and Over

As aging occurs, fall risks should be assessed to prevent future falls. Many risk factors could play a part in fall risk. Risk factors that can harm an elderly individual could be due to their health or environment (Zhou et al., 2021). When older adults start to age, their bodies become affected due to their foundations decreasing, affecting their gait, balance, vision, muscle strength, and walking stability (Zhou et al., 2021). In this article, a total of 300 participants participated in the timed up-and-go test, walking speed, fall risk assessment, and daily activity score were tested to assess older adult's risk of falls. Therefore, the risk factors can severely affect one's risk for falls in the future. When falling starts to happen, it can put the elderly in a more fragile state than they already were.

### Key Points

Statistics show that approximately 40-50% of the elderly fall at least once a year (Zhou et al., 2021). In this study, participants were aged 80 or above and participated in various balance and stability activities. Falls in the older adult population are due to their health of aging and environmental hazards. Falls can cause cognitive decline and disability in the elderly population (Zhou et al., 2021). In addition, these tools that are being used include the TUG test, activity of daily living, and fall risk assessment are all inexpensive techniques to assess fall risk in individuals (Ziegl et al., 2020). Adding these to the fall risk assessment can improve individuals' lives as older adults' bodies decline due to aging.

**Assumptions**

If fall risk is assessed through gait and balance testing, the timed up-and-go test, daily activities, and walking speed show that falls can be predicted with these screening techniques. Statistical analysis shows a positive correlation with the TUG test, which had a p-value of 0.021 in predicting future falls and a p-value of 0.000 in testing the older adults walking speed (Ziegl et al., 2020). Thus, this revealed that these tests could help further predict falls in the fall risk assessments.

**Deficit/Conclusion**

Overall, researchers testing the timed up-and-go test, activities of daily living, and walking speed all showed they could assess the risk of new falls in the older adult population (Zhou et al., 2021). The research implies that these tests can help with fragility fractures, predict new falls, and be used in a clinal setting by healthcare professionals. If nursing fails to accept this line of reasoning, it could not help prevent future incidents in the elderly population. Further**, these tests could better older adult's lives and could help safety hazards.** While older adults

have many changes ahead with vision, gait, balance, and muscle strength, adding these tests in fall risk assessments could help them predict future falls and create a safer environment.

## Quantitative Mobility Assessment for Fall Risk Prediction in Dementia: A Systematic Review

Cognitive disorders like dementia can create challenging issues with gait and balance, which can cause a high fall risk in the older adult population. In addition, participants with dementia are at greater risk due to their change of neuromuscular, sensory, and cognitive functions (Dolatabadi et al., 2018). In this article, researchers conducted a quantitative study to measure gait and postural stability through a timed up-and-go test and gait speed (Dolatabadi et al., 2018). The older adult population that was studied were participants with dementia. While testing gait, speed, and stride length, the researchers identified that fall risk could be prevented.

### Key Points

Fall risk factors are not just from footwear, medications, or hazardous items; they can also be from cognitive disorders like dementia (Dolatabadi et al., 2018). For example, it was found that older adults with dementia have a shorter stride, immense body sway, and a slower gait (Dolatabadi et al., 2018). Learning how older adults walk, stride, or sway can help predict future falls in a fall risk assessment. Further, Non-instrumented participants would, for example, do a few-minute walk with no wearable sensors. The participants would use wearable sensors or accelerometers (Dolatabadi et al., 2018). Overall, older adults who have dementia have a greater risk of falling. With this being said, older adults can use many different techniques like wearable sensors or getting assessed by a healthcare professional.

### Assumptions

If older adults knew there was a significant risk of falls due to dementia or other risk factors, they would prevent the majority of their falls. At the same time, researchers looked through many databases like CINAHL and found that gait speed, stride length, and postural sway were successful ways to predict falls (Dolatabadi et al., 2018). Predicting falls through an older adult's sway, and stability helps people get the information they need to create a safe environment.

### Deficit/Conclusion

In conclusion, gait and postural stability measures could contribute to falls risk prediction in the older adult population (Dolatabadi et al., 2018). This study aimed to create a systemic review quantitative study to show that these measures can predict falls in older adult patients with dementia. Thus, fall prevention starts with learning and assessing fall risks and then prevents them from further occurrence.

## Conclusion

In conclusion, fall risk assessments are critical in assessing the older adult population. If falls cannot be predicted or prevented, they can cause many consequences in one's life. Some of these risk factors are aging, tissue deteriorating, lower limb weakness, and the environment (Zhou et al., 2021). Due to approximately one-third of older adults fall at least once a year, it is crucial that healthcare professionals are educated and can educate patients on falls risk and assess older adults (Ziegl et al., 2020). The information could improve by adding more risk factors that can help many healthcare professionals or researchers look out for in preventing future falls. Having more of this information can create safer environments for older adults. When having the

timed up-and-go test, the older adult patient outcomes, knowing the different types of fall risks, testing strength, speed, gait, and balance, can affect patient outcomes in fall risk assessments. When adding these to nursing practice, they can create safe environments for patients and provide a more sustained quality of life for the older adult population.

Further, while using many of these methods, interventions can help predict falls and fall risks in the elderly population. Assessing fall risk is very important because predicting falls and educating patients on fall risks can help older adults. Quality improvement efforts by using the timed up-and-go test can save future falls in many older adults by testing their gait and balance (Ziegl et al., 2020). Implementing this test into fall risk assessments will support the fall risk assessments already being used by healthcare professionals. Patients who can be tested with the timed up-and-go test will improve their chances of falling in the future (Ziegl et al., 2020). Healthcare as a whole can benefit from implementing these into fall risk assessments will further assess more torturously. In conclusion, these articles analyze many ways of predicting falls in the older adult population.

## References

Dolatabadi, E., Van Ooteghem, K., Taati, B., & Iaboni, A. (2018). Quantitative mobility assessment for fall risk prediction in dementia: A systematic review. *Dementia and Geriatric Cognitive Disorders*, *45*(5-6), 353–367. https://doi.org/10.1159/000490850

Severo, I. M., Kuchenbecker, R. S., Vieira, D., Lucena, A. F., & Almeida, M. A. (2018). Risk factors for fall occurrence in hospitalized adult patients: A case-control study. *Revista Latino-Americana de Enfermagem*, *26*, e3016. https://doi.org/10.1590/1518-8345.2460.3016

Zhou, J., Liu, B., Qin, M.-Z., & Liu, J.-P. (2021). A prospective cohort study of the risk factors for new falls and fragility fractures in self-caring elderly patients aged 80 years and over. *BMC Geriatrics*, *21*(1), 116. https://doi.org/10.1186/s12877-021-02043-x

Ziegl, A., Hayn, D., Goswami, N., Loffler, K., Kastner, P., Weidinger, L., Brix, B., & Schreier, G. (2020). Quantitative falls risk assessment in elderly people: Results from a clinical study with distance-based timed up-and-go test recording. *Physiological Measurement*, 41(11), 1-12. https://doi.org/10.1088/1361-6579/abc352