

Functional Mobility as a Fall Risk Predictor in Active Nursing Home Residents

Heidi S. Moyer¹, Jeffrey L. Gale¹, S. Kyle Severe¹, Dr. Heather J. Braden²

¹Student Physical Therapist, Angelo State University

²PT, MPT, Ph.D, GCS Angelo State University Physical Therapy Department



Abstract

Falls pose a fatal risk to the elderly. Nursing home residents are at an increased risk for falls and their resulting injuries are often deadly. The purpose of this project is to assess functional mobility outcomes measures related to fall risk in highly functional, long term nursing home residents. 17 nursing home residents were assessed using eight measures related to functional mobility. These outcomes were then correlated to the number of falls the subject had experienced in the past 6 months. Right ankle ROM and strength, TUG, gait speed, and 5 Timed Sit-Stand were all significantly correlated to past falls. Further research is warranted to accurately determine the construct validity of these tools in relation to fall risk prediction.

Introduction

Falls often result in death or severe injury in the geriatric population. In nursing homes alone, the mean number of falls per bed is 1.5¹, putting this population at an increased risk of injury and death. While rehabilitation measures post-injury are comprehensive and extensive, injuries incurred from falls are often devastating to such a frail population^{2,3}. Many fall assessment studies are performed in community-dwelling individuals, thus ignoring this particularly volatile population. By analyzing the correlation of falls to non-invasive measures of functional mobility, falls and their respective threat to life can be minimized in an effort to extend the lives of our growing nursing home population. This study employs several functional mobility measurements, allowing us to draw stronger conclusions by eliminating population characteristic deviations often seen when performing a systematic review.

Methods

Subjects: 17 nursing home residents (83.76y±11.71) were included in this study. Inclusion criteria for participation included residents who were 60 years or older who were able to ambulate 15 ft as modified independent or independently, and were able to complete ¾ of items 5, 9, 11, or 12 on the MMSE. Exclusion criteria comprised of past medical history of stroke and hospital discharge within last 6 weeks prior to admission into the study.

Methods: Data was gathered during a single visit to the place of residence of the subject, lasting approximately 1 hour. Eight outcome measurements were recorded in the following order:

- assistive device assessment
- Mini-Mental Status Examination
- gait speed
- Timed-Up-and-Go (TUG)
- lower extremity MMT screen (hip, knee, and ankle) using a Microfet handheld dynamometer
- ankle plantar flexion/dorsiflexion active range of motion
- hand grip strength
- 5 Time Sit-to-Stand test (5TSTS)

Anthropomorphic data was gathered from the facility charts including: age, height, BMI, gender, marital status, ethnicity, number of oral medicines, types of active diagnoses, and number of falls in the last 6 months.

Results

SPSS version 21 was used to obtain Pearson's correlations and significance levels (p>0.05). Significant correlations with falls include: 5 Time Chair Sit-to-Stand time (.585), TUG time (.475), gait speed (.457), right dorsiflexion ROM(-.436), and right dorsiflexion strength (-.504).

Conclusion

In our study, we found The 5TSTS, TUG, gait speed, and right ankle DF/PF to be the values most correlated to past fall history. Subjects who fell reported slower gait speed times⁴, supporting TUG and gait speed as a fall risk associate in the nursing home setting⁵. 5TSTS was also found to be connected to fall risk, supporting a theory from a Swedish study, claiming most falls occur during transfer activities⁶. Right dorsiflexion ROM was observed to be related to falls, supporting the claims in Mecagni et al in which balance performance is correlated with ankle dorsiflexion⁷. Finally, right dorsiflexion strength deficits were found in subjects who fell more frequently, supporting similar claims from earlier studies^{8,9}. Further investigation is warranted to determine if a similar, prospective study obtains the same results as this retrospective study to strengthen the relationship between falls and functional mobility measurements.

Clinical Significance

Many studies establish functional mobility norms from community-dwelling adults, but these values do not translate across all stages of geriatric health and wellness. As physical therapists, we are challenged to do the most good in the shortest amount of time. By identifying which sub-populations require certain outcome measures, we are able to better serve our patients.

Outcome Measure	Correlation
5 Time Sit-to-Stand	0.585
Timed-Up-and-Go	0.475
Gait Speed	0.457
R Ankle ROM	-0.436
R Ankle Strength	-0.504

