

Comments on: The correlation between fear of falling and upper extremity muscle strength

To the Editor

In their study titled “the correlation between fear of falling and upper extremity muscle strength” published in the Saudi Medical Journal, April 2021, Dr. Yardimci et al¹ studied the relationship between fear of falling (FOF) and upper extremity muscle strength. This single-center, cross-sectional study lacked longitudinal follow-up; hence, it is difficult to make generalized conclusions. The authors also acknowledged that the data are observational due to the study’s cross-sectional design; therefore, they could not establish a cause-and-effect relationship.¹

The study excluded patients confined to bed. It is unclear why the authors excluded these patients, as such patients could have a high FOF, consequently limiting their activities to bed. Similarly, other musculoskeletal diagnoses affect upper extremity strength and function. Examples include hand osteoarthritis, shoulder impingement syndrome, and rheumatological or degenerative bone and joint diseases.²⁻⁴ These are not mentioned in the exclusion criteria and could potentially lead to a selection bias.

The Geriatric Depression Scale is validated for the elderly population,⁵ so it may not be applicable in a population <65 years. The study by Dr. Yardimci et al¹ included patients ranging from 43 to 97 years of age. Additionally, elderly people >75 years of age have an increased risk of low handgrip strength⁶ and may also have balance-related problems. This could potentially affect the interpretation of the results. Moreover, the population, being nursing home residents, would have practical limitations in relation to the Falls Efficacy Scale (FES) (for example, cleaning the house, going to the shop). These activities may not be relevant to nursing home residents, as most of their daily activities/tasks will be facilitated. Also, nursing homes have other practical limitations for conducting the Lawton-Brody Instrumental Activities of Daily Living (iADL) scale, as it includes categories like shopping and laundry, which may not be applicable to nursing homes.

This study included a population with severe cognitive impairment, since the median \pm SD of the Mini-Mental State Examination (MMSE) was 13.6 \pm 5.8. Again, this further limits the application of FES, as it has been studied for a population with mild/moderate

cognitive impairment (MMSE scores of 17-23), and patients with severe cognitive impairment have shown severe limitations in comparable data acquisition by questionnaires.⁷

Yardimci et al¹ found variation between right- and left-handgrips for the cut-off values in those without a falling risk. It is interesting to note that the authors did not investigate a correlation between handgrip/key pinch strength and hand dominance in the study population. Handedness and grip strength are well documented in the literature; however, Bohannon⁸ found that grip strength is typically greater on the dominant than on the nondominant side, but the difference between sides varies widely among studies and depends on whether individuals are right- or left-hand dominant.

The authors used a 6-meter up-and-go test to determine lower extremity strength. However, the only similar test is the Timed Up and Go test (TUG), which differs in the unit used to calculate time calculation, since TUG calculates the time in seconds, while the authors calculated time in minutes for the 6-meter up-and-go test. The TUG test is a reliable and validated test for quantifying functional mobility and screening balance deficits that lead to increased fall risk, but it has limited ability to predict falls.^{9,10} Timed Up and Go test is not usually used to determine lower extremity strength. Other tests, like the Five Times Sit-To-Stand test, could better quantify functional lower extremity strength.¹¹ Similarly, for fall risk assessment, the Morse Fall Scale (MFS) would give a more direct and valid assessment of fall risk.¹²

Finally, the authors stated, “we have concluded that FOF increases with decreased muscle strength,” but it is difficult to justify because no baseline measurement of hand strength or fear of fall assessment was carried out.

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Reply from the Author

Our research’s aim was to study the correlation between upper extremity muscle strength and fear of falling. In our paper, we have used tools that are acknowledged and proven reliable in Europe. As the study was carried out in a nursing home, number of

participants were accordingly. Our data and statistics show us that upper extremity strength and fear of falling are correlated. We believe that this study can be a pioneer of oncoming studies that are trying to find correlations between physical capabilities of elderly patients and fear of falling.

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References

1. Yardimci B, Akdeniz M, Demir T. The correlation between fear of falling and upper extremity muscle strength. *Saudi Med J* 2021; 42: 411-418.
2. Lee HJ, Paik NJ, Lim JY, Kim KW, Gong HS. The impact of digit-related radiographic osteoarthritis of the hand on grip strength and upper extremity disability. *Clin Orthop Relat Res* 2012; 470: 2202-2208.
3. Kachanathu SJ, Zedan AME, Hafez AR, Alodaibi FA, Alenazi AM, Nuhmani S. Effect of shoulder stability exercises on hand grip strength in patients with shoulder impingement syndrome. *Somatosens Mot Res* 2019; 36: 97-101.
4. Higgins SC, Adams J, Hughes R. Measuring hand grip strength in rheumatoid arthritis. *Rheumatol Int* 2018; 38: 707-714.
5. Kørner A, Lauritzen L, Abelskov K, Gulmann N, Marie Brodersen A, Wedervang-Jensen T, Marie Kjeldgaard K. The Geriatric Depression Scale and the Cornell Scale for Depression in Dementia. A validity study. *Nord J Psychiatry* 2006; 60: 360-364.
6. Riviati N, Setiati S, Laksmi PW, Abdullah M. Factors related with handgrip strength in elderly patients. *Acta Med Ines* 2017; 49: 215-219.
7. Hauer K, Yardley L, Beyer N, Kempen G, Dias N, Campbell M, Becker C, Todd C. Validation of the Falls Efficacy Scale and Falls Efficacy Scale International in geriatric patients with and without cognitive impairment: results of self-report and interview-based questionnaires. *Gerontology* 2010; 56: 190-199.
8. Bohannon RW. Grip strength: a summary of studies comparing dominant and nondominant limb measurements. *Percept Mot Skills* 2003; 96: 728-730.
9. Nightingale CJ, Mitchell SN, Butterfield SA. Validation of the Timed Up and Go Test for Assessing Balance Variables in Adults Aged 65 and Older. *J Aging Phys Act.* 2019; 27: 230-233.
10. Barry E, Galvin R, Keogh C, Horgan F, Fahey T. Is the Timed up and go test a useful predictor of risk of falls in community dwelling older adults: a systematic review and meta-analysis. *BMC Geriatr* 2014; 14: 14.
11. Whitney SL, Wrisley DM, Marchetti GF, Gee MA, Redfern MS, Furman JM. Clinical measurement of sit-to-stand performance in people with balance disorders: validity of data for the Five-Times-Sit-to-Stand Test. *Phys Ther* 2005; 85: 1034-1045.
12. Morse JM, Black C, Oberle K, Donahue P. A prospective study to identify the fall-prone patient. *Soc Sci Med* 1989; 28: 81-86.