

Decreased muscle strength predicts functional impairments in older adults

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Decreased muscle strength is associated with difficulty in performing functional activities such as stooping, crouching, or kneeling (SCK) in older adults, according to an observational study published in the January issue of *Physical Therapy* (PTJ), the scientific journal of the American Physical Therapy Association (APTA).

These researchers found that adults with SCK difficulty had significant decreases in adjusted strength measurements of trunk extensor, knee extensor, and ankle flexion muscles. Concluding that measurements of strength predict SCK difficulty, their study sets the stage for research exploring whether rehabilitation programs that focus on training specific muscle groups are effective in improving functional performance and whether improvements in functional performance reduces falls in [older adults](#).

Bending down and kneeling are fundamental tasks of daily living. Other researchers have suggested that older adults with SCK difficulty are more likely to have limitations in other lower-body functional tasks, such as lifting and prolonged standing. "As with standing up from a chair, stooping, crouching, and kneeling movements require coordination of the whole-body center of mass over a wide range of postures in order to prevent a loss of balance or fall," said physical therapist researcher and APTA member Allon Goldberg, PT, PhD, assistant professor in the Department of Health Care Sciences, Program in Physical Therapy, Mobility Research Laboratory, at Wayne State University in Detroit, Michigan. "More research is needed, but it is reasonable to predict that a

[physical therapy](#) program to improve strength in older adults who have difficulty performing basic stooping, crouching, or kneeling movements could lead to improvements in performing these activities, and these improvements could be associated with reduced number of falls." The study was conducted when Goldberg was a post-doctoral fellow at the Institute of [Gerontology](#) at the University of Michigan in Ann Arbor. Co-authors of the study are Manuel Hernandez, MS (lead author), and Neil Alexander, MD, both at the University of Michigan.

The study's purpose was to compare trunk and lower-extremity [muscle strength](#) differences in older adults who had difficulty with stooping, crouching, or kneeling with older adults who did not have these difficulties. The study analyzed 48 community-dwelling older adults, over age 65, with and without self-reported SCK difficulty. Participants rated their ability to stoop, crouch, or kneel according to a 5-point difficulty scale and were tested on balance, strength, and fall-related measures.

Researchers hypothesized that lower-extremity strength would be significantly decreased in older adults who have trouble stooping, crouching, or kneeling and that measures of distal strength would be the main predictors of these issues in patients. Results suggest that older adults who reported trouble with basic stooping, crouching, or kneeling also had decreased strength in their legs. Researchers also discovered a relationship between SCK difficulty and both the level of strength and the ability to maintain proper balance. Findings suggest that in older adults, a major contributor to SCK difficulty is the strength of the distal leg musculature, which may provide a common link to balance. Future investigation will examine how other trunk and lower-extremity muscle strength may be related to these daily tasks.

"The results of this study may have important implications for clinicians working to reduce falls risk in older adults," Goldberg explained.

"Rehabilitation or intervention programs aimed at addressing deficits in self-reported performance in stooping, crouching, or kneeling should focus on improving distal strength. Although addressing strength deficits is very important, those with stooping, crouching, or kneeling difficulty may also benefit from comprehensive programs by physical therapists that address balance confidence, coordination, leg joint limitations such as stiffness and pain, and sensory capacities."

Provided by American Physical Therapy Association

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