

**Sigma's 30th International Nursing Research Congress
Associations Among Balance Self-Efficacy, Physical Function, and Pain
Interference Among Community-Dwelling Older Adults**

Mercy Mumba, PhD, RN, CMSRN

*Capstone College of Nursing, University of Alabama Capstone College of Nursing,
Tuscaloosa, AL, USA*

Purpose:

Currently, there are 40.3 million people in the United States aged 65, which is a 5.3% increase since 2000, and older make up approximately 13% of the U.S. population (US Census Bureau, 2016). People in the United States are also expected to live longer, with projections that by 2050, Americans aged 65 and older will constitute approximately 20% of the population (US Census Bureau, 2016). Aging however, is associated with many physiological changes that affect physical function and balance self-efficacy such as changes in postural control, which may result in injurious falls (National Institute on Aging [NIA], 2017). Many factors are associated with physical function among community dwelling older adults including presence of disability (Mckean- Cowdin et al., 2010), balance self-efficacy (Manor & Lipsitz, 2013), socio-economic status (Gaskin & Orellana, 2018), proximity to parks and recreational facilities (McCormack et al., 2014), and presence of pain (Holden, Nicholls, Hay, & Foster, 2015; Hurley et al., 2018). Although current literature exists on relationships between pain interference and physical function, and between physical function and balance-self efficacy, no studies were found in our review that examined the relationship between pain interference and balance self-efficacy. The purpose of this study therefore, was to examine the relationships among physical function, balance self-efficacy, and pain interference and how they are influenced by personal factors such as age, gender, and income level.

Methods:

This study utilized a cross-sectional design to examine the relationships among physical activity, balance self-efficacy, and pain interference. A priori power analysis revealed that 64 participants were required to reach a power of 80% at the 0.05 alpha level and a medium effect size as reported by Brovov et al. (2013). Using convenience sampling, participants were recruited from the community, physicians' offices, local churches, and by snowball sampling method. Inclusion criteria included community dwelling, 50 years and older, able to read and write in English (no translation services were provided), and able to ambulate without use of assistive devices. Exclusion criteria included cognitive impairment and compromised cardiopulmonary function requiring the use of oxygen. All eligible participants were required to obtain a note from their primary health care provider stipulating that they were cleared to participate in our study. All questionnaires were administered using password protected computer in the center laboratory. A trained graduate research assistant (GRA) was available in case participants required assistance with completing the computerized questionnaires. A total of 78 participants were recruited and provided informed consent. The participants also filled out a demographic questionnaire which included items such as age, gender, level of education, and income among others. These questionnaires were completed using institutional computers in the computer lab. Participants spent approximately 45 minutes to complete the questionnaire.

Participants were administered the Patient-Reported Outcomes Measurement Information System® (PROMIS® 29), a 29-item questionnaire based on the previous seven days and is scored on a 5-point Likert scale. Good psychometric properties of the sub-scales, short forms, and entire question bank for the PROMIS have been established (Cella et al., 2010). Participants were also administered the balance self-efficacy scale (BSE), an 18-item questionnaire. The BSE was developed by the Center for Successful Aging at California State University and measures an individual's confidence to perform a particular task. Each task confidence is scored from zero to 100.

Physical Function was the dependent variable. The variable was obtained from the PROMIS Physical Function (PF) sub-scale which contains four (4) items. High scores for Physical Function represent better functioning and high scores for the symptoms represent greater symptom burden. The items are summed to generate a total score and then transformed into T-scores. Two independent (predictor) variables were utilized in this study: pain interference, and balance self-efficacy. Pain interference was obtained from the PROMIS 29 sub-scale while balance self-efficacy was measured using the Balance Self-efficacy Scale. Among the covariates, (a) age was utilized as a continuous variable, (b) gender was dummy coded into 0-men and 1-women and (c) income coded into 0- <\$35,000, 1- \$35,00-\$49,000, 2- \$50,000 Plus, 3- Declined. All statistical analyses were conducted using statistical software called SPSS version 22.0. Descriptive statistics were first conducted. One-way analysis of variance (ANOVA) was conducted to examine the bivariate associations between physical functioning and sociodemographic variables. The Pearson correlation coefficient was utilized to ascertain the association between physical functioning and the main predictor variables (i.e., pain interference and balance self-efficacy). Hierarchical regression analysis conducted to evaluate the association among physical function, pain interference, balance self-efficacy, and sociodemographic variables.

Results:

The mean age of the participants was 75.4 (SD 6.9) years, with nearly half of participants (47.8%) aged between 70-79 years). Most of the participants were women (76.1%, n = 51) and had an associate degree or higher (74.6%, n = 50). Nearly half of the participants had two or more comorbid factors (44.8%, n=30). Over a third of participants reported annual income above \$50,000 (34.3%, n = 23) and female participants reported higher mean physical functioning scores compared to their male counterparts (46.0 and 44.4 respectively). An examination of the association between the physical functioning and the sociodemographic factors indicated that all the associations were non-significant at $p < 0.05$.

In this study, balance self-efficacy was significantly and positively associated with physical function, whereas pain interference was significantly and negatively associated with physical function. Step 1 regression analysis, where by the sociodemographic variables were entered together, predicted very little variance in physical functioning, $R^2 = .19$, $F(11, 55) = 1.16$, $p = .34$. Adding pain interference and balance self-efficacy in step 2, significantly increased the variance in predicting physical functioning, $\Delta R^2 = .43$, $F(2, 53) = 29.45$, $p < .001$. Further, there were significant effects for pain interference ($\beta = -.40$, $p < .001$) and for balance self-efficacy ($\beta = .50$, $p < .001$) indicating that lower pain interference and higher balance self-efficacy were positively

related to physical functioning. Lastly, age, sex, and income level were not significant predictors of physical function in older adults.

Conclusion:

Interventions that improve physical function and balance self-efficacy such as physical exercise should be encouraged among older adults, whether living in the community or when admitted in acute care settings. Most importantly, adequate and safe pain management in older adults should be considered in the promotion of physical function and balance self-efficacy.

Title:

Associations Among Balance Self-Efficacy, Physical Function, and Pain Interference Among Community-Dwelling Older Adults

Keywords:

balance self-efficacy, pain interference and physical function

References:

Brovold, T., Skelton, D. A., & Bergland, A. (2013). Older adults recently discharged from the hospital: Effect of aerobic interval exercise on health-related quality of life, physical fitness, and physical activity. *Journal of the American Geriatrics Society, 61*, 1580-1585. doi:10.1111/jgs.12400

Cella, D., Yount, S., Rothrock, N., Gershon, R., Cook, K., Reeve, B., ... & Rose, M. (2007). The Patient-Reported Outcomes Measurement Information System (PROMIS): progress of an NIH Roadmap cooperative group during its first two years. *Medical care, 45*(5 Suppl 1), S3. doi:10.1097/01.mlr.0000258615.42478.55.

Gaskin, C. J., & Orellana, L. (2018). Factors associated with physical activity and sedentary behavior in older adults from six low-income and middle-income countries. *International Journal of Environmental Research and Public Health, 15*, 908-932. doi: 10.103390/ijerph15050908

Holden, M. A., Nicholls, E. E., Young, J., Hay, E., & Foster, N. E. (2015). Exercise and physical activity in older adults with knee pain: A mixed methods study. *Rheumatology, 54*, 413-423. doi: 10.1093/rheumatology/keu333

Hurley, M., Dickson, K., Hallett, R., Grant, R., Hauari, H., Walsh, N., Stansfield, C., & Oliver S. (2018). Exercise interventions and patient belief for people with hip, knee or hip and knee osteoarthritis: A mixed methods review. Cochrane Database for Systematic Reviews. Retrieved

from https://www.researchgate.net/profile/Kelly_Dickson/publication/324771787_Exercise_interventions_and_patient_beliefs_for_people_with_hipknee_or_hip_and_knee_osteoarthritis_a_mixed_methods_review/links/5ae18489aca272fdaf8d9a42/Exercise-interventions-and-patient-beliefs-for-people-with-hip-knee-or-hip-and-knee-osteoarthritis-a-mixed-methods-review.pdf

[interventions-and-patient-beliefs-for-people-with-hip-knee-or-hip-and-knee-osteoarthritis-a-mixed-methods-reviewReview.pdf](#)

McCormack, G. R., Rock, M., Swanson, K., Burton, L., & Massolo, A. (2014). Physical activity patterns in urban neighborhood parks; Insights from a multiple case study. *Biomedical Central Public Health, 14*, 962-975. doi: 10.1186/1471-2458-14-962.

Manor, B., & Lipsitz, L., A. (2013). Physiologic complexity and aging: Implications for physical function and rehabilitation. *Progress in Neuro-Psychopharmacology & Biological Psychiatry, 45*, 287-293. doi: doi: 10.1016/j.pnpbp.2012.08.020

McKean- Cowdin, R., Varma, R., Hays, R. D., Wu, J., Choudhury, F., Azen, S., & Los Angeles Latino Eye Study Group. (2010). Longitudinal changes in visual acuity and health-related quality of life. *Ophthalmology, 117*, 1900-1907.

doi:[10.1016/j.ophtha.2010.01.059](#)

National Institute on Aging (2017). Exercise and physical activity: Your everyday guide from the national institute on aging. Retrieved

from <https://www.nia.nih.gov/health/publication/exercise-physical-activity/introduction>

United States Census Bureau (2016). *Current population reports: 65+ in the United States*. Retrieved from <http://www.census.gov/library/publications/2014/demo/p23-212.html>

Abstract Summary:

The purpose of this presentation is to discuss the associations among balance-self-efficacy, physical function, and pain interference and their implications for nursing practice. This presentation will also include a discussion on recommendations for appropriate evidence-based nursing interventions that improve physical function among community-dwelling older adults.

Content Outline:

Introduction and Background

- Discuss population of people aged 65 and above
- Discuss factors associated with physical function in this population

Aims of the Study

- Discuss the aims of the study and any hypotheses

Methods and Procedures

- Discuss sampling and sample size estimation
- Discuss recruitment and consent process
- Discuss data collection procedures
- Discuss data cleaning, management, and analysis procedures

Results

- Description of sample and demographic characteristics
- Discuss associations among balance self-efficacy, physical function, and pain interference
- Discuss the results of the hierarchical regression analysis

Discussion and Implications for Nursing

- Discuss challenges related to promoting physical function among community dwelling older adults

- Discuss importance of adequate and safe pain management in older adults to promote physical function
- Discuss evidence-based nursing interventions to promote balance self-efficacy and quality of life among community- dwelling older adults
- Discuss recommendations for future research in this population

First Primary Presenting Author

Primary Presenting Author

Mercy Mumba, PhD, RN, CMSRN
University of Alabama Capstone College of Nursing
Capstone College of Nursing
Assistant Professor- Tenure Track
Tuscaloosa AL
USA

Author Summary: Dr. Mumba is an innovative researcher who is well versed in both qualitative and quantitative research methodologies. Her primary research area of focus is substance abuse among nurses and their psychosocial wellbeing. Dr. Mumba has further conducted several studies involving improving patient satisfaction in acute care setting. She is a published author and has presented her research at many local, regional, and international research conferences.