

Do Canes and Walkers Prevent Falls in Community-Dwelling Older Adults?

Richard M. Allman, Patricia Sawyer, Cynthia J. Brown, Ali Ahmed
Birmingham/Atlanta VA GRECC, University of Alabama at Birmingham

Objective

More than one in three adults 65 and older will experience at least one fall each year and approximately 10% of these falls will result in injury.^{1,2} Although numerous multifactorial risk factors for falling have been identified, the role of assistive devices (canes and walkers) in preventing falls is unclear.³ Ironically, some studies suggest that canes and walkers may increase the risk of falling.³ The purpose of this research is to examine the association of cane or walker use with incident falls over six months in a sample of community-dwelling adults 65 and older.

Methods

PARTICIPANTS

Participants consisted of a stratified random sample of Medicare beneficiaries over age 65 from 5 central Alabama counties (2 urban, 3 rural). In-home baseline assessments were followed by telephone follow-up interviews six months later.

Sample Characteristics

Mean Age (SD)	73.8 (5.9)
African American	49%
Female	53%
Rural	49%
Education <7 th Grade	19%
Low Income	21%



BASELINE MEASURES

Sociodemographic Factors - Age, gender, race, marital status, living arrangements, income, and education were self-reported.

Diseases and Conditions - Medical conditions were verified by use of a prescription medication for the condition or confirmation by MD questionnaire or hospital discharge summary. A comorbidity score was based on diseases of the Charlson Comorbidity Index without consideration of severity. Other conditions assessed were arthritis, spinal stenosis, history of hip fracture, incontinence, knee or hip replacement, self-reported health, bmi<20 and bmi>30, unexplained weight loss, lower body pain, poor vision, and limited activities due to dizziness, fainting, incontinence, feeling sleepy, stiffness, weakness in legs, or fear of falling.

A medication count was made from a list of current medications shown by the participants to the interviewer.

Cognitive/Emotional - Cognition was measured using the MMSE and depression with the Geriatric Depression Scale.

Health Behaviors - Smoking in terms of pack years, alcohol consumption, nutrition, and leisure time physical activity were assessed.

Function, Walking and Fall History before baseline were determined as were ADLs and IADLs (simple count). Use of canes and walkers was self-reported.

The Short Physical Performance Battery (balance, gait-speed and timed chair stands) was measured.

6-MONTH MEASURES

The telephone follow-up call assessed falls and whether the fall resulted in injury.

STATISTICAL PROCEDURES

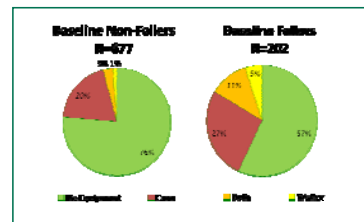
For this analysis, participants had to be able to walk at baseline and complete the 6-month telephone follow-up interview.

An unadjusted logistic regression model was used to assess the association of cane or walker use at baseline with incident falls over 6 months of follow-up.

The expected probability or propensity for cane or walker use at baseline was determined by a multivariable logistic regression model using all of the 41 baseline covariates (see measures:socio-demographics, diseases and conditions, cognitive/emotional factors, health behaviors, function, walking and fall history, and physical performance). This propensity score (PS) was used in a multivariable logistic regression model to examine the independent association between cane/walker use with 6-month incident falls with incident falls over 6 months of follow-up.

Results

879 participants were eligible for the analyses:
Mean Age = 75.1 (SD=6.5) 49% African American; 51% female
247 (28%) reported baseline use of a cane or walker.
202 (23%) reported a fall in the six months prior to baseline.



Baseline Cane/Walker Use by Fall Status

Fall Status	Non-Fallers (N=677)				Fallers (N=202)			
	No Equip	Cane Only	Walker Only	Both	No Equip	Cane Only	Walker Only	Both
Non-Fallers	517	132	8	20	115	54	10	230

Logistic Regression Model of Factors Associated with Cane and Walker Use

Factor	Odds	CI
Older Age	1.09	1.05, 1.14
Prior Knee Replacement	5.36	1.98, 14.52
Fear of Falling	1.96	1.19, 3.24
ADL Difficulty	1.39	1.18, 1.65

Prior falling was not independently associated with cane/walker use (OR = .881, 0.51, 1.52)

Incident Falls Over 6-Months

Reported by 20% of persons using a cane or walker at baseline

9% of persons not using a cane or walker at baseline

Unadjusted Logistic Regression Model of Cane/Walker Use and Incident Falls

Factor	Odds	CI
Cane/walker use	2.56	1.69, 3.87

Propensity Adjusted Logistic Regression Model of Cane/Walker Use and Incident Falls

Factor	Odds	CI
Cane/walker use	.745	.396, 1.403

Conclusion

The use of cane/walker was associated with characteristics known to predispose older adults to falls such as older age and decreased physical function, which may in part explain the bivariate association between cane/walker use and increased risk of incident falls.

However, the reversal of that association after PS-adjustment, to a clinically important, but statistically non-significant, 25% reduction in incident fall risk, suggests a potential role of cane/walker use in reducing falls in older adults.

References

- Bogle Thorbahn, LD & Newton, RA. 1996. Use of the Berg balance test to predict falls in elderly persons. Physical Therapy 76:576-583.
- Tinetti, M. 2003. Preventing falls in elderly persons. New England Journal of Medicine 348:42-49.
- Bateni, H, Heung, E, Zettel, J, Mclroy, WE & Maki, BE. 2004. Can use of walkers or canes impede lateral compensatory stepping movements? Gait and Posture 20:74-83.

The research reported on this poster was supported by the National Institute on Aging. The investigators retained full independence in the conduct of this research. This presentation was made possible, in part, by Grant No. R49-CE000191 from the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control to the UAB Injury Control Research Center.