



2016

The Activities-Specific Balance Confidence Scale and Its Use in Assessing Confidence in Elderly Community-Dwellers Attending the Stepping on Program

Sierra Heeren
University of North Dakota

[How does access to this work benefit you? Let us know!](#)

Follow this and additional works at: <https://commons.und.edu/pt-grad>



Part of the [Physical Therapy Commons](#)

Recommended Citation

Heeren, Sierra, "The Activities-Specific Balance Confidence Scale and Its Use in Assessing Confidence in Elderly Community-Dwellers Attending the Stepping on Program" (2016). *Physical Therapy Scholarly Projects*. 584.

<https://commons.und.edu/pt-grad/584>

This Scholarly Project is brought to you for free and open access by the Department of Physical Therapy at UND Scholarly Commons. It has been accepted for inclusion in Physical Therapy Scholarly Projects by an authorized administrator of UND Scholarly Commons. For more information, please contact und.common@library.und.edu.

THE ACTIVITIES-SPECIFIC BALANCE CONFIDENCE SCALE AND ITS USE IN
ASSESSING CONFIDENCE IN ELDERLY COMMUNITY-DWELLERS
ATTENDING THE STEPPING ON PROGRAM

by

Sierra Heeren
Bachelor of Science
Black Hills State University, 2012

A Scholarly Project

Submitted to the Graduate Faculty of the

Department of Physical Therapy

School of Medicine

University of North Dakota

In partial of the requirements

For the degree of


Doctor of Physical Therapy

Grand Forks, North Dakota


May

2016

This Scholarly Project, submitted by Sierra Heeren in partial fulfillment of the requirements for the Degree of Doctor of Physical Therapy from the University of North Dakota, has been read by the Faculty Advisor and Chairperson of Physical Therapy under whom the work has been done and is hereby approved.



(Graduate School Advisor)



(Chairperson, Physical Therapy)


PERMISSION

Title The Activities-Specific Balance Confidence scale and its Use
 in Assessing Confidence in Elderly Community-Dwellers
 Attending the Stepping On Program

Department Physical Therapy

Degree Doctor of Physical Therapy

In presenting this Scholarly Project in partial fulfillment of the requirements for a graduate degree from the University of North Dakota, I agree that the department of Physical Therapy shall make it freely available for inspection. I further agree that permission for extensive copying for scholarly purposes may be granted by the professor who supervised my work or, in her absence, by the chairperson of the department. It is understood that any copying or publication or other use of this scholarly project or part thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of North Dakota in any scholarly use which may be made of any material in my scholarly project.

Signature 

Date 10-30-15

TABLE OF CONTENTS

LIST OF TABLES	vi
LIST OF FIGURES	vii
ACKNOWLEDGEMENTS.....	viii
ABSTRACT.....	ix
CHAPTER	
I. INTRODUCTION	1
II. METHODOLOGY	5
III. RESULTS.....	9
IV. DISCUSSION/CONCLUSION.....	14
APPENDIX A: Stepping On Exercises.....	18
APPENDIX B: Activities-specific Balance Confidence Scale	20
APPENDIX C: IRB, Consent Form, Participant Surveys.....	24
REFERENCES.....	32

LIST OF TABLES

Table

1. Characteristics of Participants at Week 1 of Stepping On Program 6
2. ABC Scores Week 1 and Week 7 of Stepping On 11
3. Week 7 Survey Results13

LIST OF FIGURES

Figure

1. ABC Scores Week 1 of Stepping On..... 9
2. Comparison of ABC Scores Week 1 to Week 7 of Stepping On..... 11

ACKNOWLEDGEMENTS

I would like to thank Meridee Danks, DPT for all of her hard work and involvement with this project. Her prior experience and work with the Stepping On program made this possible.

I would also like to thank Corissa Kruse, Julia Nelson, Brittney Herbst, Cory Sailer, and Eric Estes for their time and contributions to this research project as a whole.

ABSTRACT

Introduction: Stepping On is a 7-week comprehensive fall program aimed at reducing falls for the community-dwelling elderly. Participants are educated on balance and strengthening exercises, and the influence medications, visions, inclement weather, etc. has on safety and falls.

Purpose: The main purpose of this study is to utilize the Activities-specific Balance Confidence scale (ABC) and survey results to determine if attendance of Stepping On improves balance confidence. Secondly, this research sought out to discover if increased balance confidence relates to decreased fall risk.

Methods: Participants of this were included 13 individuals initially (with one participant joining the 2nd week), but only 8 individuals participated in the program the entire duration to complete both Week 1 and Week 7 measures. These eight were all female ranging in age from 80-94, with a mean age of 88.1. All participants reside at the assisted-living facility in which Stepping On was held.

The ABC was administered via 1:1 interview during Week 1 and Week 7 sessions. Participants completed the measure along with other measures, such as the TUG, Cognitive TUG, 30 second Sit to Stands, and Romberg's test. Participants completed the all activities at different stations.

Results: Six out of eight individuals showed an increase in their confidence following participation in Stepping On as per ABC score and subjective ratings. Two individuals also had a significant enough increase in their confidence to put them from "Fall Risk" (<67%) to above the

cut-off score. When comparing confidence scores between ABC and ABC-S, 80% of results remained the same. Overall, participants subjectively ranking themselves as more active also had greater balance confidence. When comparing fall risks to increased balance confidence following Stepping On, there does appear to be a trend with larger number of fall risks relating to worry about falling based on ABC and survey results.

Conclusion: Participation in Stepping On increases balance confidence in the elderly population. The ABC is a simple form that can be used to assess balance confidence changes before and after attendance of Stepping On. Limitations for the ABC-16 include: length of survey, time to complete survey, and minimal confusion in completing the survey appropriately.

Clinical Significance: Stepping On increases confidence in an age group that is not the typical population. The ABC can be easily incorporated as an objective functional assessment for future Stepping On programs. Future studies may be able to incorporate the ABC-S as an objective measure to decrease time taken to complete the form.

CHAPTER I

INTRODUCTION

Stepping On is a program that aims to reduce falls through balance and strengthening exercises along with comprehensive education.¹ (See Appendix A) Throughout 7 weeks, patients are educated by physical therapists on exercise and mobility, risk appraisal, vision, medication side effects, and community safety. The sessions last 2 hours and are attended once a week for the 7 week period. The results of this program have been significant. Stepping On has been effective at reducing fall risk in participants, adults over age 65, by 30%. Interestingly enough, the program is especially effective for the males participating in the program. Data shows that fall risk for the male participants was reduced by almost two-thirds.²

Much of the data collected on the ABC pertains to the elderly population, community-dwelling older adults, or those with diagnoses such as Multiple Sclerosis or Parkinson's Disease. Community-dwelling older adults are the target population of Stepping On. One study examined 168 healthy individuals ages 60 and older still living in their homes.³ The study assessed the participants' balance confidence during a variety of tasks and determined a mean score of 79.89, though concluded a possible ceiling effect for higher functioning individuals. The less-frail participants who scored an 80 originally were unlikely to improve balance confidence 8 weeks later after completing an exercise program. However, an article in 2001 reported no ceiling effect in a study of 287 seniors

living in senior living facilities.⁴ Another study determined a mean test score of 78.87±19.08 for their sample of 50 community-dwelling individuals with a mean age of 81.7.⁵

The Activities-specific Balance Confidence (ABC) scale is a survey utilized for assessment of participant's confidence before and after the program. See Appendix B. Developed in 1995 by Powell and Myers⁵ the questionnaire is a 16-item self-report measure that assesses subject's confidence when performing a variety of tasks. The subject rates their confidence when performing those situations from 0% no confidence, to 100% completely confident. The ABC is both a reliable and valid measure.

The ABC scale also has reliability ($r=.092$, $p<.001$).⁵ In terms of validity, the ABC demonstrates good construct validity for community dwelling older adult. Hatch⁶ examined determinants of balance confidence in the elderly population. The study involved 50 participants ages 65-95 (mean age 81.7). Their study determined that the ABC has excellent correlation to the Berg Balance Scale ($r=.0752$, $p<0.01$) as well as to the Timed Up and Go ($r=.698$, $p<0.01$). The Timed Up and Go (TUG) was another tool that was used in assessing the fall risk of Stepping On participants, so this correlation is important when reviewing this data. Data also shows excellent correlation between the ABC and ABC short form (ABC-S), which ensures that the choice to utilize the ABC for this research is appropriate.⁷

The ABC-S is a simplified version of the ABC. There are only 6 questions utilized. These 6 questions are the most balance challenging questions from the full version of the ABC. This scale was selected due to the non-typical participants of the program. For someone attending a Stepping On program, it can be assumed that they are

less confident in their abilities and safety and therefore might score their confidence lower with simpler activities than the average elderly adult.

Talley et al⁸ conducted a study involving 213 elderly woman (70 years or older) living in the community. The study showed correlation of the ABC to the Survey of Activities and Fear of Falling (SAFE) both at baseline and following intervention. At baseline, ($r=-.65$, $p<.001$) after following intervention correlation was ($r=-.61$, $p<.001$). This data confirms that as worrying about falling increases, balance confidence decreases. Finally, ABC has been shown to correlate with Tandem Stance time ($r=.592$) and the TUG ($r=-.606$) for 167 mildly balance-impaired older adults who were recruited to participate in a balance-training, fall-reduction program.⁶

In relation to sensitivity, Lajoie⁹ conducted a research study looking at 125 seniors from the YMCA, a nursing home, and senior residencies. They predicted a cut off score of 67 and above for indicating fall risk with a sensitivity of 84% and a specificity of 88%. This score and below indicates a fall risk. Another article studied 174 individuals ranging in age from 23-84 who were with and without balance dysfunction. The study determined a sensitivity of 83% and specificity of 90% for predicting falls.¹⁰

Presently, there is no established minimally clinically important difference (MCID). There have been studies evaluating minimal detectable change, but only in patients with Parkinson's. In on estudy with 37 individuals with Parkinson's, the minimal detectable change was 13¹¹ whereas another study with patients diagnosed with Parkinson's had a minimally detectable change of 11.¹²

The ABC also differs from the Falls Efficacy Scale (FES), utilized by the original Stepping On research, in that it includes more detailed item descriptors and questions

participants on a wider continuum of activity difficulties. See Appendix B. Original Stepping On research has utilized the Tinetti Falls Efficacy Scale (FES).¹³ Like the ABC, this scale also assesses fear of falling in the elderly population based on how they perceive their balance and stability during actions. This is a 10-question survey. Unlike the ABC, the FES questions pertain to daily activities only within the home, such as “getting on and off the toilet.” The ABC addresses activities not only within the home, but in the community as well. The community aspect of the ABC makes it pertinent to the participants of Stepping On and is a large factor in why the ABC was utilized for this research.

The first purpose of this study is to determine if participation in Stepping On improves balance confidence as measured by ABC and survey reporting. The ABC scale can also be compared to performance in functional assessments, such as the Timed-Up and Go (TUG), Cognitive TUG, tandem stance, and 30 second Sit to Stand, to determine if balance confidence and improvement in balance is related. Second, this research sought out to learn if decreased balance confidence corresponds to increased fall risk as compared to characteristics and data collected via questionnaires, surveys, and other outcome measures.

CHAPTER II

METHODOLOGY

Participants

Participants for the study were recruited by attendance of the 7-week Stepping On program. To participate in Stepping On individuals must be over age 65 and be able to walk 200'. Participation was strictly voluntary. Participants reviewed and signed a consent form prior to the study and the Institutional Review Board (IRB) of North Dakota has approved the research (Appendix C). Initially, the study had 13 participants (with one participant beginning attendance the 2nd session), however, due to decrease compliance in participation, medical issues, etc. Only 8 individuals completed both the before and after assessments. These 8 individuals were all female ranging in age from 80-94 years, with a mean age of 88.1 years. Surveys were given out at both Week 1 and Week 7 (Appendix C) collecting general demographic information and balance confidence ratings. Demographics of the original 14 participants are listed in Table 1. These participants differed from the typical population attending Stepping On. Typically, individuals are aged 65+ and are still living independently in their homes, rather than an assisted living complex.

Table 1. Characteristics of Participants at Week 1 of Stepping On Program

Subject #	Gender	Age	Type of Assistive Device Used	# of Falls Last Year	# of Fall Risk on UND Survey	Worry About Falling	Vision Issues/Type	> 4 Meds	Minimally Active > 30 min/day	LE Sensation Deficits	Depressed	Med Hx
1	F	92	None	0	3/11	No/Yes	Yes; not specified	Yes	Yes	No	Yes	
2	F	92	WW/WC	2	5/10	Yes	No	Yes	-	Yes	No	R knee pain
3	F	89	Manual WC/FW W	2	6/11	Yes	Yes; glasses, macular degeneration	No	No	Yes	No	L ankle surgery; Dizzy
4	F	87	FWW	0	4/11	No	Yes; not specified	Yes	Yes	No	No	Bilat TKA
5	F	94	4WW for longer distances	0	1/11	No	Yes; legally blind, bifocals	No	Yes	No	No	
6	F	80	None	0	3/11	No	Yes; deficits	Yes	Yes	Yes-knee	No	
7	F	84	FWW	6-7	6/11	Yes	Yes; macular degeneration, glaucoma	Yes	No	No	No	
8	F	85	SEC	0	6/11	No	Yes; glasses	Yes	No	No	No	
9	F	80	None	2	8/11		Yes; glasses	Yes	No	Yes	Yes	L knee pain R hip pain
10	F	87	FWW	0	3/11	No	No	Yes	No	No	No	
11	F	84	FWW	2	6/11	Yes	Yes; macular degeneration	Yes	Yes	Yes-knee	No	R rotator cuff tear
12	F	89	4WW	Yes ?#	2/11	No/Yes	Yes; glasses	No	Yes	No	No	
13	F	90	4WW	0	5/11	No	Yes; glaucoma	No	No	Yes	No	R TKA; OAL knee
14	F	89	Power WC/4W	Yes ?#	NT	Yes						

Instrumentation/Procedure

This research chose to utilize the Activities-specific Balance Confidence (ABC) Scale to assess if participation in Stepping On has any effect on balance confidence. Though this research could have had participants fill out the shorter, simplified version, the 16 item ABC was utilized instead. The Activities-specific Balance Confidence Scale is a 16-item self-report measure which allows patients to rate their balance related confidence when completing a variety of activities. These activities range from basic, routine activities such as walking around their home to more difficult tasks such as walking on icy sidewalks. The questions specifically ask “how confident are you that you will not lose your balance or become unsteady when you...”. The patient then rates their confidence on a rating scale from 0-100, with 0%, no confidence, to 100%, or completely confident. See Appendix B.

The ABC has a descriptor paragraph which includes the statement “If you do not currently do the activity in question, try and imagine how confident you would be if you had to do the activity.” This statement answers the most common question that a participant filling out the survey may ask. This leaves little confusion in filling out the 16 item survey, therefore increasing reliability. Someone conducting research is present if questions do arise. If questions are asked, the questions are answered in a similar manner to ensure consistency.

The scale is simple to use and simple to score (a max score of 1600 divided by 16 items equaling 100%). If a question is not answered, then the score is divided by the total for the number of items the participant did answer. The survey is completed twice, either

Week one or two for a baseline score, as well as Week seven after participation in the Stepping On program. See Appendix B.

For this work with the Stepping On project, pilot participants were given two varying copies of the ABC functional assessment, which only differed in how the confidence number was selected. Pilot individuals preferred the version which involved circling the number of confidence, so this method was used during this research. It allowed them to complete the survey quickly with little to no confusion in what the assessment was asking.

Participants completed the ABC 1:1 while completing other research measures. Stations were held and the participants would move from station to station, completing the ABC when they were available. There was no consistent individual that provided the verbal instructions to complete the measure. Week 1 data along with demographic information and fall risk surveys were later compared to Week 7 data.

CHAPTER III

RESULTS

Of the 13 participants who attended Stepping On Week 1 and completed the Week 1 measures, 12 of the individuals rated themselves at below 67% on the confidence scale (92% of participants). This can be seen on Figure 1. This score indicates a risk for falling and is able to accurately classify people who fall 84% of the time.⁸ There is currently no normative data for this population available.

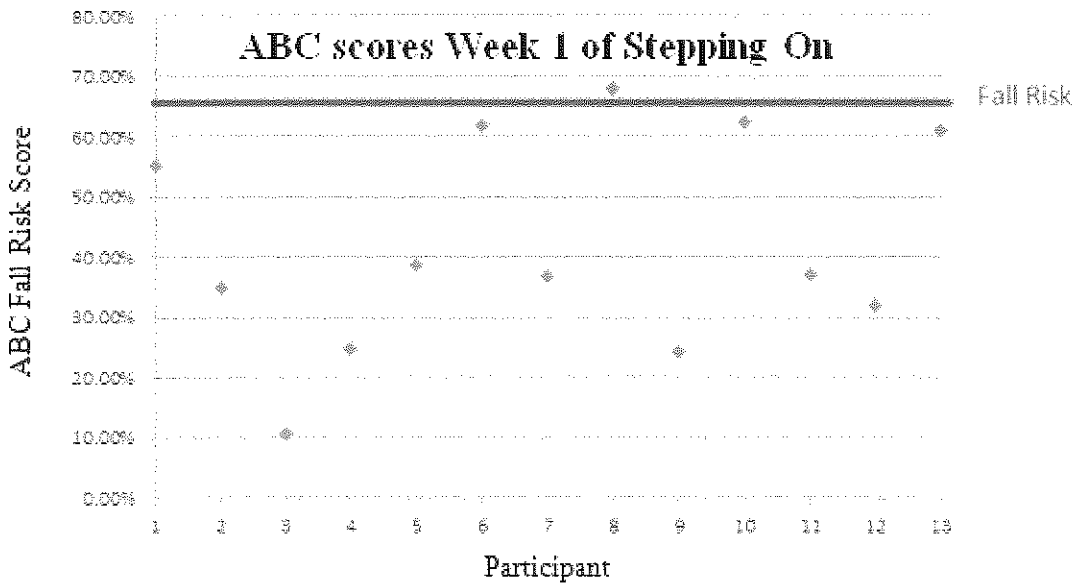


Figure1. ABC Scores Week 1 of Stepping On.

At Week 7, the ABC was given out to participants once more. Unfortunately, 5 participants did not attend Week 7 and one participant had not attended Week 1, therefore their scores are unavailable. Of the 8 participants who filled out both the Week 1 and Week 7 surveys and ABC, 6 participants (75%) had an increase in their balance confidence as shown by their total score. Two participants also had an increase in scores to place them over 67%, the determined cut-off for fall risk. Of these two participants, Participant 6 had a 15% increase and Participant 13 stated an 11% increase. Table 2 includes ABC confidence scores before and after the program, as well as their overall total related to their fall risk score. The table also lays out whether or not each participant had an increase in confidence.

Table 3 shows data from the 14 initial participants and includes demographic information. It also displays number of fall risks (as outlined by the CDC), present level of activity, and faithfulness in performing Stepping On exercises for the 8 individuals who attended both Week 1 and Week 7.

Table 2. ABC Scores Week 1 and Week 7 of Stepping On

Participant	Pre-test Percent	Pre-Test Indicating Fall Risk (<67%)	Post-test Percent	Post-Test Indicating Fall Risk (<67%)	Increase in Confidence?
1	55.33%	Yes	35.00%	Yes	No
2	35.00%	Yes	-	-	-
3	10.63%	Yes	38.75%	Yes	Yes
4	25.00%	Yes	29.38%	Yes	Yes
5	38.75%	Yes	56.93%	Yes	Yes
6	62.00%	Yes	77.50%	No	Yes
7	36.88%	Yes	-	-	-
8	68.13%	No	-	-	-
9	24.38%	Yes	-	-	-
10	62.50%	Yes	-	-	-
11	37.13%	Yes	32.5%	Yes	No
12	32.14%	Yes	48.75%	Yes	Yes
13	61.25%	Yes	72.50%	No	Yes
14	-	-	14.38%	Yes	-

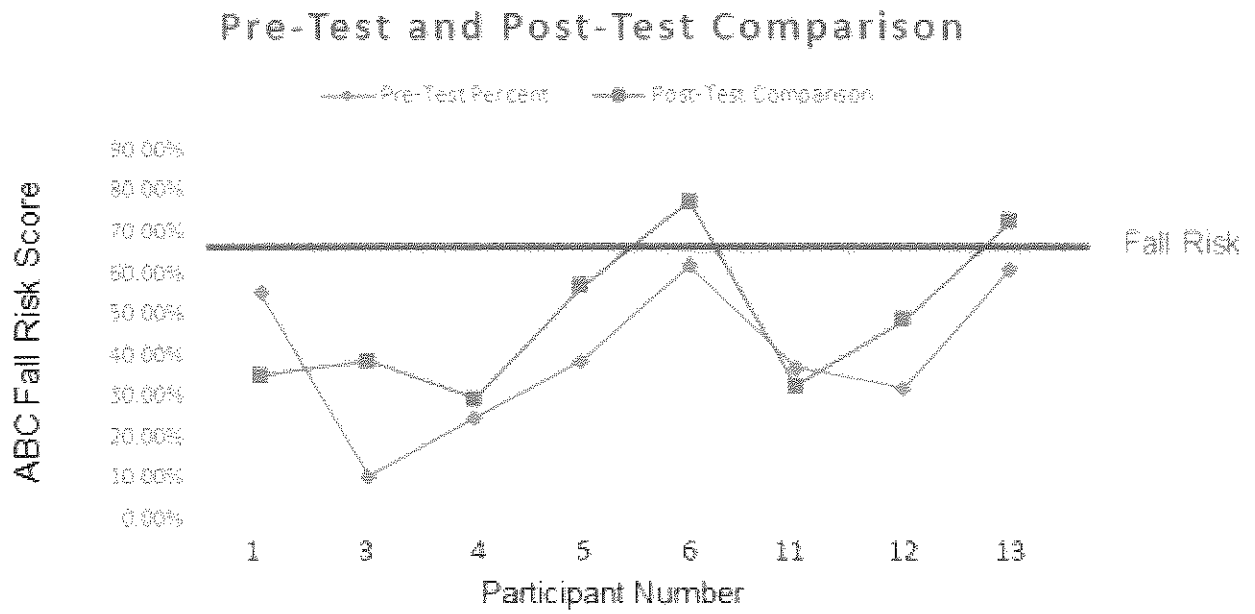


Figure 2. Comparison of ABC scores Week 1 and Week 7 of Stepping On.

Table 3. Week 7 Survey Results

Subject #	Age	Sessions Attended out of 7	# of Fall Risks (CDC)	Improved Balance/ Confidence	Falls during Stepping On Program	Present Level Of Activity	Faithful in Performing Stepping On Exercises
1	92	7	5/12	Yes	0	High	Yes
2	92	1	-	-	-	-	-
3	89	6	10/12	Yes "a little bit"	0	Moderate	Yes
4	87	7	6/12	Yes	0	Moderate	Yes
5	94	6	5/12	Yes	0	Moderate	Yes
6	80	6	2/12	Yes Balance/No for confidence	0	Moderate	Yes
7	84	2	-	-	-	-	-
8	85	2	-	-	-	-	-
9	80	1	-	-	-	-	-
10	87	6	-	-	-	-	-
11	84	6	10/12	Yes	0	Inactive/low	No
12	89	7	6/12	Yes	0	Moderate	No
13	90	7	5/12	Yes	0	High	No
14	89	5	11/12	Yes	0	Moderate	No

CHAPTER IV

DISCUSSION

The ABC scale showed a large increase in the majority of the participant confidence after attending the program. Important to note, Clemson reports an average age of 78.47 years for participation in Stepping On.¹ The participants in this program are 8 years above average. Only two individuals, who had completed both the Week 1 and Week 7 ABC scale, had a decrease in confidence. Participant 1 (age 92) had a large decrease in confidence (20%). Participant 11 (age 84) who also had the decrease had a small decrease (5%) in confidence. This may be attributed to having two different individuals help the participant complete the survey. However, it is important to note that this participant was the only individual who rated herself as “inactive/low” activity. The other 7 individuals all stated they were moderately to highly active.

Both participants who had a decline in ABC confidence scores both are considered at a fall risk according to the Center for Disease Control and Prevention (CDC) survey. For the 6 individuals who had an increase in confidence, 5 were ranked “fall risk” by the CDC. Therefore, there does not seem to be a relation.

When comparing ABC scores to the assistive device (AD) use, 5 out of 6 individuals that had an increase in ABC scores from Week 1 and Week 7 also used an AD, either a 2-wheeled or 4-wheeled walker. Of the individuals that had a decrease in confidence, Participant 1 used no AD while Participant 11 uses a 2-wheeled walker.

Data has shown that the ABC and ABC-S have strong correlation,⁶ so scores for this participant group were examined to determine if this correlation held true for this older population. Of the 8 Week 7 participants, 6 had the same results when determining if there was an increase/decrease in confidence. Participant 5 showed a decrease in confidence when looking at the ABC-S rather than the 16-item ABC and Participant 13 had the same ranking in confidence for the ABC-S in comparison to the increase the ABC-16 showed. One interesting thing to note was that Participant 6 who had an increase in confidence to 77%, above the fall risk, only had a confidence rating of 60% when looking at the more challenging tasks of ABC-S. The score of 60% deems this participant still at fall risk.

Subjects also filled out subjective information in a Week 7 program evaluation survey. This survey included things like: “worrying about falling”, general feeling of improved balance and confidence following Stepping On, and activity level ranked low/inactive, moderate and high. Of the 8 participants, 4 individuals said they worried about falling. For the two participants ranked at “high” activity levels, one stated she was worried about fall risk. This is the same participant (#1) who also had a decrease in her ABC score following Stepping On. Five out of 8 individuals stated they were at a moderate level of activity and 2 of them selected “yes” to worrying about falls. Finally, one participant ranked herself as low/inactive. This participant also stated yes to worrying about falls.

For the improved balance and confidence subjective ratings, only one individual stated “no” to increased confidence (participant stated “yes” to improved balance. This may be because this individual was the youngest, most able-bodied of the group. Perhaps

she felt she had no increase in confidence due to not having any previous falls or significant worries about falls.

Finally, participation in the program was also considered. All participants were consistent with attendance of sessions by attending 6 or more of the 7 sessions. Some participants stated less compliance with performing the exercises at home, however, due to feeling less confident with some of the exercises. This lack of compliance may explain some lack of improvement in function and confidence.

The majority of these participants are still ranked at a fall risk, however, their scores are consistent with those of home health care clients (<50% confident).¹³ The scores may not be comparable to a typical Stepping On program population, but they are not unrealistic with others at a comparable health status since all of these individuals are living at an assisted-living center. This is important to keep in mind when looking at this elderly population's data.

Limitations

Though research was conducted as consistently as possible, one large problem noted with the ABC could be that individuals may have had differences between week 1 and week 7 due to their interpretation of the questions. When administering the scale it is important to stress the difference between "I do not do that activity" and "I would never do that activity" to ensure consistency. For example, a participant may not ever walk on an escalator because they do not have access to one versus someone who does not take the stairs because they feel safer taking the elevator. In the future, this can be made more clear to participants.

Recommendations

In the future, research groups could utilize the ABC rather than FES to evaluate confidence changes. Also, studies could utilize the ABC-S for a quicker, more concise testing of balance confidence. Interestingly, Ory et al.¹⁵ conducted research on fall prevention with Stepping On and used a 5 point scale ranging from “Strongly Agree” to “Strongly Disagree” to evaluate whether Stepping On influenced balance confidence. A simple 5 point scale would be the fastest option to determine any changes in confidence.

Furthermore, research could evaluate statistical analyses to determine correlations between the varying tests performed to examine balance confidence, number of fall risks, and overall function. This data could be compared to the correlations Hatch⁵ discovered with ABC correlating to Tandem Stance Time and TUG tests.

Conclusion

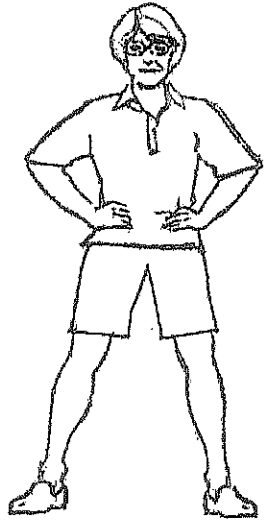
In all, Stepping On is an effective program in that it does increase older individual’s awareness of falls and what precipitates falls, as well as what can be done to prevent them. Through education and balance end strengthening, the majority of individuals do note an improvement in their confidence and balance objectively. The ABC scale is a simple screening tool which can be administered quickly for participants and the ABC-S could be utilized for a shorter method to evaluate balance confidence. Its usefulness in assessing balance confidence is important to not and the tool can easily be used in the future for upcoming Stepping On participants.

APPENDIX A

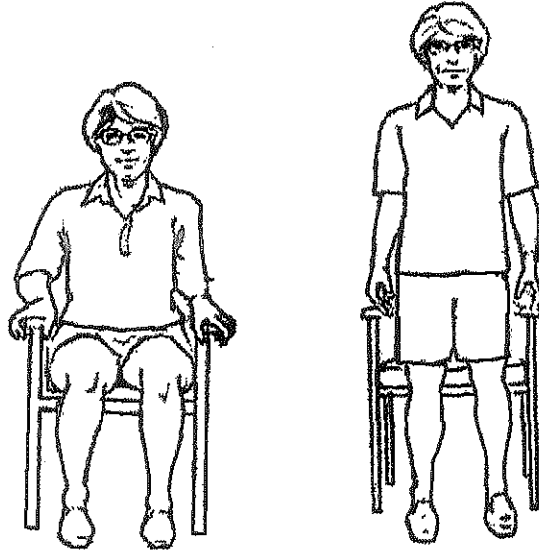
Balance Exercises

Exercises at a Glance

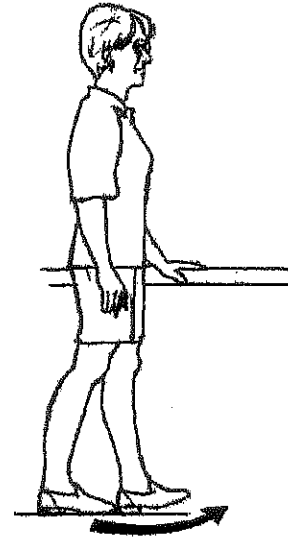
Sideways Walking



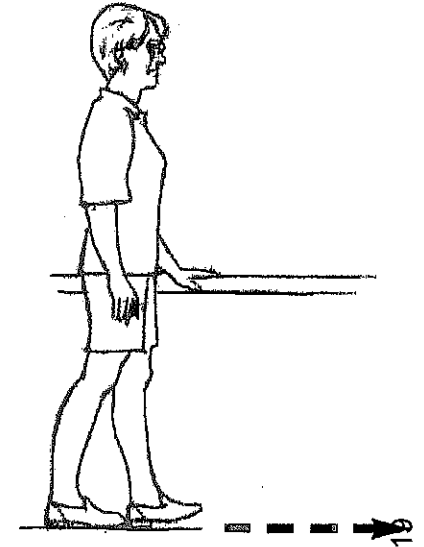
Sit-to-Stand



Heel-Toe Standing

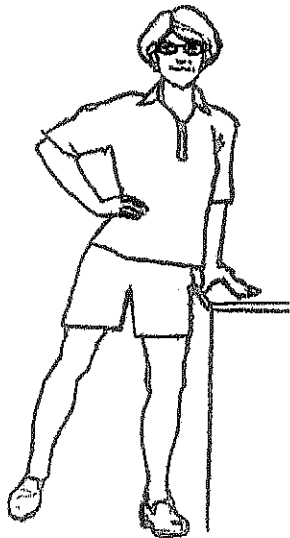


Heel-Toe Walking

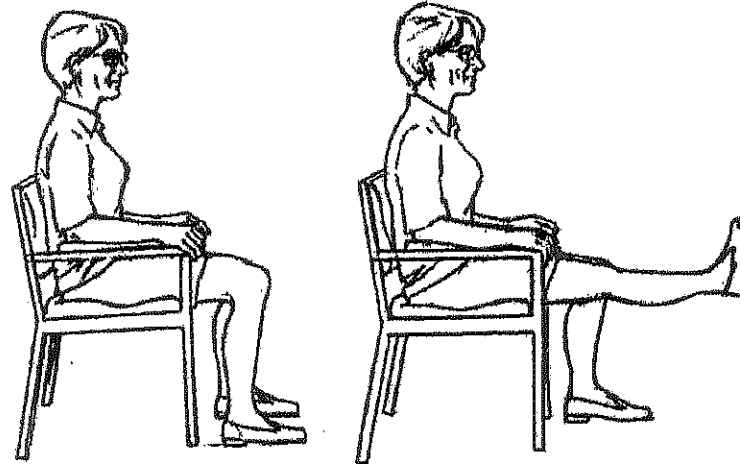


Strength Exercises

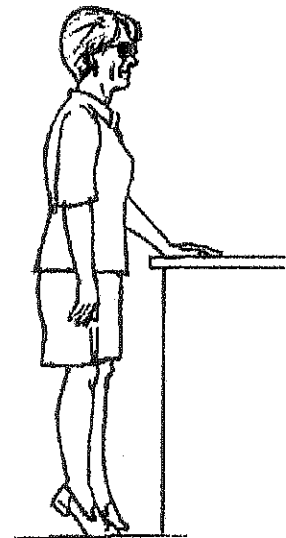
Side Hip Strengthening



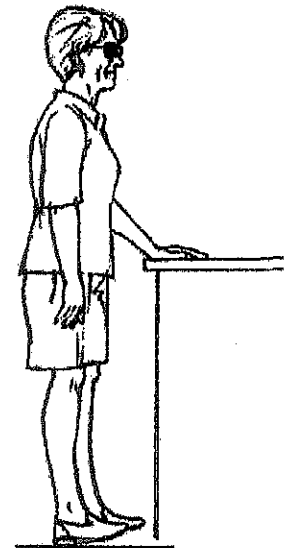
Front Knee Strengthening



Heel Raises



Toe Raises



APPENDIX B

The Activities-specific Balance Confidence (ABC) Scale*

Administration: The ABC can be self-administered or administered via personal or telephone interview. Larger typeset should be used for self-administration, while an enlarged version of the rating scale on an index card will facilitate in-person interviews. Regardless of method of administration, each respondent should be queried concerning their understanding of instructions, and probed regarding difficulty answering specific items.

Instructions to Participants: For each of the following, please indicate your level of confidence in doing the activity without losing your balance or becoming unsteady from choosing one of the percentage points on the scale from 0% to 100%. If you do not currently do the activity in question, try and imagine how confident you would be if you had to do the activity. If you normally use a walking aid to do the activity or hold onto someone, rate your confidence as if you were using these supports. If you have any questions about answering any of these, please ask the administrator.

Instructions for Scoring: The ABC is an 10-point scale and ratings should consist of whole numbers (0-100) for each item. Total the ratings (possible range =0 -1600) and divide by 16 to get each subject's ABC score. If a subject qualifies his/her response to items #2, #9, #11, #14 or # 15 (different ratings for "up" vs. "down" or "onto" vs. "off"), solicit separate ratings and use the lowest confidence of the two (as this will limit the entire activity, for instance the likelihood of using the stairs.)

- 80% = high level of physical functioning
- 50-80% = moderate level of physical functioning
- < 50%. = low level of physical functioning Myers AM (1998)
- < 67% = older adults at risk for falling; predictive of future fall Lajoie Y (2004)

1. Powell, LE & Myers AM. The Activities-specific Balance Confidence (ABC) Scale. *J Gerontol Med Sci* 1995; 50(1): M28-34
2. Myers AM, Fletcher PC, Myers AN, Sherk W. Discriminative and evaluative properties of the ABC Scale. *J Gerontol A Biol Sci Med Sci.* 1998;53:M287-M294.
3. Lajoie Y, Gallagher SP. Predicting falls within the elderly community: comparison of postural sway, reaction time, the Berg balance scale and ABC scale for comparing fallers and non-fallers. *Arch Gerontol Geriatr.*2004;38:11-26 .

The Activities-specific Balance Confidence (ABC) Scale

For each of the following activities, please indicate your level of self-confidence by choosing a corresponding number from the following rating scale: 0% 10 20 30 40 50 60 70 80 90 100% or no confidence to completely confident

"How confident are you that you will not lose your balance or become unsteady when you..."

1. ...walk around the house? %
2. ... walk up or down stairs? %
3. ... bend over and pick up a slipper from the front of a closet floor? %
4. ... reach for a small can off a shelf at eye level? %
5. ...stand on your tiptoes and reach for something above your-head? %
6. ...stand on a chair and reach for something?%
7. ...sweep the floor? %
8. ...walk outside the house to a car parked in the driveway? %
9. ...get into or out of a car? %
10. ...walk across a parking lot to the mall? %
11. ...walk up or down a ramp? %
12. ...walk in a crowded mall where people rapidly walk past you? %
13. ...are bumped into by people as you walk through the mall? %
14. ...step onto or off an escalator while you are holding onto a railing? %

15. ...step onto or off an escalator while holding onto parcels such that you

cannot hold onto the railing? %

16. ...walk outside on icy sidewalks? %

APPENDIX C

Institutional Review Board

Twamley Hall, Room 106
264 Centennial Drive Stop 7134
Grand Forks, ND 58202-7134
Phone: 701.777.4279
Fax: 701.777.6708

March 13, 2015

Principal Investigator:	Meridee Danks, D.P.T. and Beverly Johnson, PT, DSc, GCS
Project Title:	The Effectiveness of the "Stepping On" Program for Reducing the Incidence of Falls in the Elderly
IRB Project Number:	IRB-201209-047
Project Review Level:	Expedited 4, 7
Date of IRB Approval:	03/12/2015
Expiration Date of This Approval:	06/24/2015
Consent Form Approval Date:	03/12/2015

The Protocol Change Form and all included documentation for the above-referenced project have been reviewed and approved via the procedures of the University of North Dakota Institutional Review Board.

Attached is your revised consent form that has been stamped with the UND IRB approval and expiration dates. Please maintain this original on file. **You must use this original, stamped consent form to make copies for participant enrollment. No other consent form should be used.** It must be signed by each participant prior to initiation of any research procedures. In addition, each participant must be given a copy of the consent form.

You have approval for this project through the above-listed expiration date. When this research is completed, please submit a termination form to the IRB. If the research will last longer than one year, an annual review and progress report must be submitted to the IRB prior to the submission deadline to ensure adequate time for IRB review.

The forms to assist you in filing your project termination, annual review and progress report, adverse event/unanticipated problem, protocol change, etc. may be accessed on the IRB website:
<http://und.edu/research/resources/human-subjects/>

Sincerely,



Michelle L. Bowles, M.P.A., CIP
IRB Coordinator

MLB/jle

Enclosures

Cc: Chair, Physical Therapy

INFORMED CONSENT

TITLE: The Effectiveness of the "Stepping On" Program for Reducing the Incidence of Falls in the Elderly

PROJECT DIRECTOR: Meridee Danks and Beverly Johnson

PHONE # 701-777-2831

DEPARTMENT: Physical Therapy

STATEMENT OF RESEARCH

A person who is to participate in the research must give his or her informed consent to such participation. This consent must be based on an understanding of the nature and risks of the research. This document provides information that is important for this understanding. Research projects include only subjects who choose to take part. Please take your time in making your decision as to whether to participate. If you have questions at any time, please ask.

WHAT IS THE PURPOSE OF THIS STUDY?

You are invited to be in a research study that will look at the effectiveness of education and exercise in reducing falls. You have been identified as a possible subject as you are presently participating in the "Stepping On" program. The purpose of this research study is to test whether the Stepping On program is effective in reducing falls in older people living at home. Participants need to be 65 or older, live in on their own, and be able to walk independently in the community.

HOW MANY PEOPLE WILL PARTICIPATE?

Approximately 10-12 people at each site will take part in this study being performed by University of North Dakota Department of Physical Therapy.

HOW LONG WILL I BE IN THIS STUDY?

Your participation in the study will last the same length of time you will be in the Stepping On program (7 weeks with a 3 & 6-month follow-up). The assessment times will be at the same days as when you will be attending your Stepping On program. Each visit will take about 20 minutes during the Day 1, Day 7, 3-month & 6-month recheck of the Stepping On program.

WHAT WILL HAPPEN DURING THIS STUDY?

Assessments will occur at Week 1 and 7 sessions and then at 3 month booster session and at 6 month recheck at the same site. Assessment will include the following:

1. Baseline Questionnaire and Fall Risk Survey - are filled out as part of the Stepping On program. Questionnaire is to gather demographic, mobility and fall information. You are free to skip any questions that you prefer not to answer. Time to complete is ~10 minutes.

Additional test performed (beyond Stepping On gathered information), include:

2. Activities-specific Balance Confidence (ABC) Scale - subject rates level of confidence in doing everyday activities with out falling using a 0 – 100% scale (0 = no confidence to 100 = completely confident). Total score is sum of 16 individual activity scores, which is than averaged, the higher the score the less concerns the subject has about falling. Time to complete is less than 5 minutes.

3. Sit to Stand Test (STS) - the subject will be asked to go from a sit to stand for 30 seconds. The number of repetitions will be completed in 30 sec and the length of time to complete the first 5 sit to stands will be recorded. This is an objective measurement of strength and balance. Time to complete ~ 3 minutes.

4. Timed Up and Go Test (TUG) - the test requires that subjects stand up from a chair, walk 10 ft, turn around, and return. The time to complete the activity is recorded. A second trial will be performed with the subject performing a cognitive task (i.e. subtracting by 3s or spelling words) while walking. A safety belt will be used when performing the assessment. Time to complete is 1 minute. This is an objective measure of balance in an activity of daily function. If available, the GAITRite electronic walkway may be used to allow the researchers to gather greater data on subjects walking parameters during the 10 meter walk.

5. Four-Test Balance Scale – This is a four part balance test, each part progressively challenges a person balance. The subject first will try to balance for 10 seconds with feet together, then with feet together but one slightly ahead of the other, progressing to one foot in front of the other (heel-toe) and lastly, the subject stands on one leg for up to 30 seconds with eyes open. If subject is unable to stand for the allotted time for any part the test will be stopped. A safety belt will be used during this assessment. Time to complete is 3-5 minutes. This is an objective measure of balance and strength.

6. Fall and Activity Survey and Stepping On Participation Evaluation - each subject will be given the 2 survey's following the completion of Stepping On session at Week 7, at 3-month Booster session and at the 6 months recheck to record any falls that have occurred and to monitor follow through of assigned strength and balance exercises. Fall is defined as an event that results in a person unintentionally coming to rest on the ground, floor, or

other lower level. (Buchner) If a subject is unable to attend the Booster session and/or at the 6-month recheck they will be contacted by phone or mail in regards to the survey.

WHAT ARE THE RISKS OF THE STUDY?

There may be some risk from being in this study, mainly with the potential to lose your balance. This risk will be minimized by use of safety precautions. For each physical balance assessment a safety belt and spotter will be used to prevent any falls. You can decide not to perform any assessment that you do not feel comfortable/safe performing.

WHAT ARE THE BENEFITS OF THIS STUDY?

You benefit personally from being in this study. However, we hope that, in the future, other people might benefit from this study because it may help identify benefits of prevention education and exercise on falls in the elderly population. You may benefit by knowing your balance strengths and weakness that will be identified by the assessment scores.

ALTERNATIVES TO PARTICIPATING IN THIS STUDY

You can decide to participant only in the Stepping On program and not in the research study.

WILL IT COST ME ANYTHING TO BE IN THIS STUDY?

You will not have any costs for being in this research study. Nor will you be paid for being in this research study.

WHO IS FUNDING THE STUDY?

The University of North Dakota and the research team are receiving no payments from other agencies, organizations, or companies to conduct this research study.

CONFIDENTIALITY

The records of this study will be kept private to the extent permitted by law. In any report about this study that might be published, you will not be identified. Your study record may be reviewed by Government agencies, the UND Research Development and Compliance office, and the University of North Dakota Institutional Review Board Any information that is obtained in this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by means of assigning you an identification number that will be used instead of your name on any data that is kept. Your signed consent form and your data will be stored separately in a locked room. Only the researchers will have access to any identifiable information. If we write a report or article about

this study, we will describe the study results in a summarized manner so that you cannot be identified.

IS THIS STUDY VOLUNTARY?

Your participation is voluntary. You may choose not to participate or you may discontinue your participation at any time without penalty or loss of benefits to which you are otherwise entitled. Your decision whether or not to participate will not affect your current or future relations with the University of North Dakota or the Stepping On program

CONTACTS AND QUESTIONS?

The researchers conducting this study are Meridee Danks and Beverly Johnson. You may ask any questions you have now. If you later have questions, concerns, or complaints about the research please contact **Meridee Danks or Beverly Johnson at 701-777-2831** during the day.

If you have questions regarding your rights as a research subject, or if you have any concerns or complaints about the research, you may contact the **University of North Dakota Institutional Review Board at (701) 777-4279**. Please call this number if you cannot reach research staff, or you wish to talk with someone else.

Your signature indicates that this research study has been explained to you, that your questions have been answered, and that you agree to take part in this study. You will receive a copy of this form.

Subjects Name: (Print) _____

Signature of Subject

Date

I have discussed the above points with the subject or, where appropriate, with the subject's legally authorized representative.

Signature of Person Who Obtained Consent

Date

Fall Risk Survey

ID # _____ Age: _____ Gender: Male Female Date: _____

Fall Risk Factor	Factor Present	Notes
Any falls in the last year?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, how many?
Do you use an assistive device? (Cane, Walker, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, what kind?
Do you worry about falling when standing or walking?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you spend less than 30 minutes per day 5-7 days per week being physically active?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you take more than 4 prescription medications?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Has it been longer than 1 year since your last vision check?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you have vision impairments? (glasses, macular degeneration, glaucoma, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, what kind?
Have you had any surgeries in the last year? (Hip, Knee, etc.)	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes, what kind?
Do you have any heart rate or rhythm issues?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Do you have any sensation loss to your legs or feet?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Are you depressed?	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Yes TOTAL:		

Date _____

ID # _____

Stepping On Survey – Week 7

1. Do you feel your balance and confidence have improved while performing daily activities as a result of participating in the Stepping On Program?

Balance Yes _____ No _____

Confidence Yes _____ No _____

If yes, what information helped you the most?

2. A fall is any event that led to an unplanned, unexpected contact with a supporting surface such as the floor. Have you fallen since starting the Stepping On Program?

Yes _____ No _____ If yes, how many falls since the program began: _____

Describe the cause of fall(s) and any injuries that occurred:

3. How would you rate your present level of daily physical activity? (circle one)

Inactive/Low

Moderate

High

If your physical activity is limited, what do you think is the major reason?

4. Have you performed the Stepping On exercises faithfully?

Yes ___ No ___

If no, what has kept you from performing the exercises as per the recommended amount of times?

Place an X in the box to indicate your response.

	Nothing	←	Some	→	Alot
8. Overall, how much did you learn from these sessions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please rate your level of knowledge on each of the following:

	Low	←	Moderate	→	High
--	-----	---	----------	---	------

9. My understanding of how vision can influence the ability to get around safely.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. My understanding of the importance of balance and strength exercises for preventing falls.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. My knowledge of recognizing hazards in home environments.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

12. My understanding of the relation between safe footwear and fall prevention.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. My confidence in applying safe strategies in mobility situations.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

14. My understanding of the relation between medications and falls.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. My knowledge of the importance of good bone health and fall prevention.

Before Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Now, After Participation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

16. Which of your behaviors are you most likely to change?

17. List the three most important things you learned in this workshop.

a.

b.

c.

18. Which topic was least interesting?

19. Other comments concerning the workshop

REFERENCES

1. Clemson L, Swann M, Mahoney J. Stepping on: building confidence and avoiding falls. A community-based program for older adults. 3rd North American edition. 2011.
2. Centers for Disease Control and Prevention. Multifaceted interventions: Stepping On. Centers for Disease Control and Prevention.
http://www.cdc.gov/HomeandRecreationalSafety/Falls/compendium/3.1_stepping_on.html. Published May 24, 2011. Updated last May 24, 2011. Accessed April 21, 2015.
3. Huang T, Wang W. (2009). Comparison of three established measures of fear of falling in community-dwelling older adults: Psychometric testing. *International Journal of Nursing Studies*, 46(10), 1313-1319.
4. Kressig, R., et al., Associations of demographic, functional, and behavioral characteristics with activity-related fear of falling among older adults transitioning to frailty. *JAGS*, 2001. 49: p. 1456-1462
5. Powell LE, Myers AM (1995). "The Activities-specific Balance Confidence (ABC) Scale." *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences* 50A(1): M28-34

6. Hatch J, Gill-Body KM, et al. (2003). Determinants of balance confidence in community-dwelling elderly people. *Physical Therapy* 83(12):1072-1079.
doi:<http://dx.doi.org.ezproxy.undmedlibrary.org/10.1016/j.ijnurstu.2009.03.010>
7. Filiatrault, J. Gauvin, L., et al. (2007). Evidence of the psychometric qualities of a simplified version of the Activities-specific Balance Confidence scale for community-dwelling seniors. *Archives of Physical Medicine and Rehabilitation* 88(5):664-672.
8. Talley K, Wyman J, Gross C. Psychometric properties of the activities-specific balance confidence scale and the survey of activities and fear of falling in older women. *J Am Geriatr Soc*, 2008
9. Lajoie Y, Gallagher S. Predicting falls within the elderly community: comparison of postural sway, reaction time, the Berg Balance scale and the Activities-specific Balance Confidence (ABC) scale for comparing fallers and non-fallers. *Arch Gerontol Geriatr*, 2004. 38: p. 11-26.
10. Whitney S, Wrisley DM, Marchetti GF, et al. 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(10): p. 1034-1045.. 56(2): p. 328-333
11. Steffen T, Seney M. (2008). "Test-retest reliability and minimal detectable change on balance and ambulation tests, the 36-item short-form health survey, and the unified Parkinson disease rating scale in people with parkinsonism." *Physical Therapy* 88(6): 733-746

12. Dal Bello-Haas V, Klassen L, et al. (2011). "Psychometric properties of activity, self-efficacy, and quality-of-life measures in individuals with parkinson disease." *Physiother Can* 63(1): 47-57
13. Tinetti M, Richman D, et al. Falls efficacy as a measure of fear of falling. *J Gerontol.* 1990; 45(6): P239
14. Myers AM, Fletcher PC, Myers AH, Sherk W. Discriminative and evaluative properties of the activities-specific balance confidence (ABC) scale. *J Gerontol A Biol Sci Med Sci* 1998;53:M287-94.
15. Ory M, Smith M, Jiang L, et al. Prevention in community settings: results from implementing Stepping On in three states. *Frontiers in Public Health.* 2014;3:232.