

# **CONSIDERATION OF ASSISTIVE TECHNOLOGY BY PHYSICAL THERAPISTS WITHIN FALL PREVENTION SCREENING TOOLS FOR COMMUNITY-DWELLING ADULTS**

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## **ABSTRACT**

This research study aimed to add clarity to the discussion about the relationship between assistive technology (AT) and fall prevention screening (FPS) tools within the context of the home health setting. The purpose was to evaluate if the home health fall prevention screening process, currently in use to identify community-dwelling seniors at risk of falling and administer by the home health physical therapy staff, is effective in evaluating the influence assistive technology has upon fall risk for this population. Specifically, this study investigated the effect that occurs with the inclusion of two separate independent variables when seeking to identify community-dwelling seniors at risk of falling: 1.) Provision of assistive technology training to the physical therapy staff performing fall screenings and 2.) The addition of assistive technology screening questions to the fall prevention screening tool. The attitude physical therapists (PT) have regarding their knowledge base of and comfort level in assessing for assistive technology factors involved in falling was explored. A triangulation method was chosen to investigate these issues with use of both an attitudinal survey and an experiment.

It was determined that an addition of assistive technology questions to the fall prevention screening tool as well as the training of PT's in AT had a positive effect on the subjects' knowledge and confidence regarding assessment of A.T. within a fall prevention screening. More importantly, and statistically significant, was the finding that the addition of A.T. assessment questions as part of the fall prevention screening tool and the training of P.T.'s in A.T. related to fall prevention results in significantly higher fall risk scores for community-dwelling seniors being assessed for fall risk. A need for a range in fall risk score categorization to include: 1.) Not at risk; 2.)

Mild risk; or 3.) High risk for falls was identified as a recommendation directly related to study results.

## **BACKGROUND**

Assistive technology use by the elderly is acknowledged in many studies as being an important tool to prevent falls and is a consideration for addition to fall intervention programs (CDC, 2008; Aminzadeh & Edwards, 1998; Bailey, Foran, Scanail & Dromey, 2011; Krulish, 2007; Miskelly, 2001; Rubenstein, Powers & MacLean, 2001; Stevens, 2009; Tinetti, Gordon & Sogolow, 2006; van Hof, Kort, Ruffen & Dujnstee, 2011, United States Department of Veteran Affairs, 2009, Panel on the prevention of falls in older persons, 2011). Despite being listed as one of the top ten quality indicators utilized to identify an elderly person as being at an increased risk of falling (Rubenstein, Powers & MacLean, 2001; Panel on the prevention of falls in older persons, 2011), it was found that assistive technology is not adequately represented in the majority of the fall prevention screening tools (FPST) currently in use in the home health care setting. Knowledge about and training in assistive technology by those responsible for performing the screenings must also be evaluated. Home health physical therapists (P.T.) are a group of professionals who routinely perform these screenings for the elderly community-dwelling adult referred to their services. As standard training in assistive technology is not currently part of the formal physical therapy curriculum and physical therapists working in the field note a need for more A.T. education, the efficacy of FPST performed by the physical therapists may be questioned (Long & Perry, 2007).

The impact of falls by the elderly extends into a financial impact to all involved parties as well as to the community as a whole. Fall treatment is responsible for 6% of all the healthcare costs in the United States

(Rubenstein et al., 2001) and 80% of all healthcare costs for the elderly (Sjorgren & Bjornstig, 1989).

### **PURPOSE**

The purpose of this study, that employed a triangulation of methods (descriptive and evaluative), was to answer the following research questions:

1. "Do fall prevention screening tools used by home health physical therapist(s) incorporate a comprehensive assistive technology review as part of the process used to identify seniors at risk of falling?"
2. "What effect will occur by the addition of a comprehensive assistive technology review as part of the fall prevention screening process used to identify community-dwelling seniors at risk of falling?"
3. "How do the attitudes and views about assistive technology knowledge and confidence held by physical therapists performing home health fall screenings impact the efficacy of fall prevention screening assessments?"

### **METHOD**

Subjects: Two groups of participants were involved in this study: 16 home health physical therapists that perform FPS for community-dwelling seniors and 140 seniors for whom FPS were being completed upon. The 16 PTs were randomly assigned to one of three groups: Group A (five PTs): Variable X; Group B (six PTs): Variable X and Y; and Group C (five PTs): Control. Senior participants were randomly assigned as possible group participants, after confirming that they met the criteria for inclusion. A total of 140 seniors were included in this study: 49 in group A, 60 in group B and 31 in group C.

Data collection:

#### **Likert Survey**

At the start of the study all PT participants were asked to complete a seven-question attitudinal survey exploring fall prevention screenings and assistive technology. After explanation of study detail the five control group C participants were asked to complete the post-training Likert

survey again. The five Groups A participants and six Group B participants then received instruction on how to administer and score the 5 additional A.T. questions added to the fall screening tool that they would be using in this study (independent variable X). Group A participants completed the post survey and were dismissed. Group B participants then received 30 minutes of training in assistive technology (independent variable Y), specifically as related to fall prevention. Prior to being dismissed group B participants took the post survey.

### **Experiment**

Physical therapist participants performed fall prevention screenings for community-dwelling seniors using the current fall prevention screening tool and submitted the totaled score gathered while using this tool (FPS score). Based upon the qualitative score the client is then identified as either at "no risk" (score <6) or "high risk" (score at or > 6) for falling. Group A and Group B participants also asked the additional A.T. questions added to the screening as part of this experiment and totaled that score independently using the scoring instructions they had received (AT score). FPS score and AT score were then summed to arrive at a final fall risk score (Final Score).

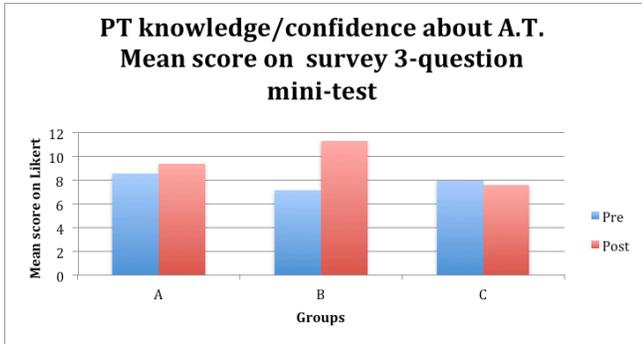
This procedure resulted in the control group C performing fall prevention screenings with the current tool only, group A performing the fall prevention screening tool with the additional A.T. questions (independent variable X) and group B performing the fall prevention screening tool with the additional A.T. questions as well as receiving instruction in A.T. prior to use of the tool (independent variables x and Y). Mean age of senior participants was 78.1 years. 50 female and 90 males participated.

### **RESULTS**

Survey: Group A (variable X: increase in mean score of +0.8) and the Group B (variable X and Y: increase in mean score of +4.1) had a positive effect on the subjects' knowledge and confidence regarding A.T. assessment as part of the fall prevention screening tool. (See Appendix I.) The group B participants who received both the addition of A.T. questions on

the screening tool and the training in A.T. demonstrating the greatest improvement. In comparison, the mean score for the control group C demonstrated a decrease of -0.4.

Table 1

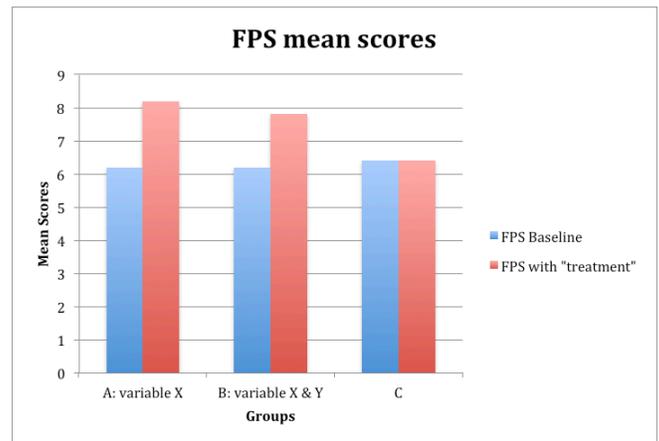


Experiment: For both groups of participants that included the addition of A.T. questions and/or A.T. training as part of their fall risk screening, a significantly higher FPS score was obtained as compared to the test group score. The mean score for Group A (variable X) was 8.0. This was significantly higher than the Group C mean score of 6.4 ( $p < 0.001$ ). The mean score for Group B (variables X and Y) was 7.8. This was also significantly higher than the Group C mean score of 6.4 ( $p < 0.001$ ). (See Appendices K and L.) The results for both the A and B groups demonstrated statistical significance as compared to the control C group and as tested by the use of the t-test.

Results demonstrate that the addition of the 90-minute A.T. training session was no more likely to raise the mean scores than was the addition of A.T. questions to the fall preventions screening tool (variable Y). The mean score for Group A (variable X) was 8.0. The mean score for Group B (variables X and Y) was 7.8 ( $p = 0.905$ ). There was not a significant difference between these two means.

It is important to note that of the total 34 patient in the combined test groups who started with fall scores of 5 or lower, 30 (88%) were re-classified as being at risk for falls as a result of adding the A.T. questions and/or A.T. training.

Table 2



## DISCUSSION

Analysis of the scores on the post survey demonstrated that an addition of training in A.T. as well as the addition of A.T. questions to the FPS tool resulted in an increase in the therapist's knowledge and confidence factor regarding the relationship between A.T. and fall prevention. This was especially demonstrated by the significant improvement noted in the scores of group B participants, who received the training as compared to those of group A participants, who evaluated clients using questions related to A.T. but who had no training in A.T. prior to the addition of those A.T. related questions to the fall screening tool.

Due to the small sample size of this attitudinal survey, these findings should be regarded as directional rather than conclusive, but it does appear that 90 minutes of A.T. training are effective in increasing the knowledge and confidence related to A.T. issues and fall prevention for physical therapists. It is recommended that further testing of this issue be completed, using a larger and more stable sample size. It is also recommended that the development of competency quality indicators and training in the areas of fall prevention screening and assistive technology assessment as related to falls prevention be considered for home health professionals performing fall prevention screenings for community-dwelling seniors.

Based upon the literature review and the analysis of data obtained during the experiment it can be concluded that current fall prevention

screening tools are not as effective in identifying seniors at risk of falling as is a fall prevention screening tool that includes A.T. assessment. Although data collected during the experiment supports the hypothesis that the addition of A.T. questions to the fall prevention screening tool results in an increased numbers of seniors identified as being at a higher risk of falling, the addition of the A.T. training did not exclusively demonstrate this same result. What was noted was that when A.T. use or non-use was assessed, fall risk scores were greater and that due to the larger variance in fall scores obtained, the stratification of the risk assessment scores into specific categories should be considered rather than merely the current "at risk" or "not at risk" categories.

### CONCLUSION

The results and recommendations discovered by this study will be helpful to professionals involved in geriatric care, specifically as related to community-dwelling seniors and fall prevention. An improvement in fall screening tools by consideration of A.T. was found to be of value. Future policy and procedures development may be able to extrapolate the findings of this study to improve the standard of care for fall prevention screenings with the goal of ultimately decreasing the frequency of falling by community-dwelling adults and a resulting cost savings for consumer and provider. This supports the need for continued development of regulatory policies that address A.T. and a need for empirically based study results to support the use of assistive technology.

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