FOCUSED QUESTION
What type of prevention is most effective for improving fall risk knowledge and prevention in older adults to prevent lower extremity fracture? What type of prevention education is most effective for increasing fall risk knowledge for older adults?


CLINICAL BOTTOM LINE:

The results of this study indicate that the use of an authenticity and motivation Multimedia Fall Prevention intervention showed a significant increase in knowledge of fall risks for older adults. Within this study, a motivation intervention focused on education program goals and purpose and an authenticity intervention, provided by a primary investigator, a licensed occupational therapist, and an instructional technologist, focused on daily situations. During this intervention, the multimedia was provided by the Multimedia Fall Prevention system to give visual content based on activities and situations the participants identified as most influential to their lifestyle.

Limitations to this study include the sample of participants and setting. Participants were mostly females located in a community living setting for older adults. There was a control group to examine changes in those without intervention. This study was only 1 month long, which does not provide long-term study effects or further follow-up data.

Future research should address the limitations mentioned to examine the effectiveness of a fall risk intervention with a larger demographic population. Currently, extremity fractures and systemic management are common referral diagnoses in occupational therapy with the older adult population. With more evidence-based practices, occupational therapists can be more effective in providing educational techniques to increase fall risk knowledge and prevent fall risk behaviors to provide older adults with safe living conditions.

RESEARCH OBJECTIVE(S)
List study objectives.

1. To compare the effectiveness of two multimedia fall prevention educational interventions in fall prevention in community living older adults.
2. To study an authenticity strategy in an occupational therapy fall prevention intervention.
3. To study a motivational strategy in an occupational therapy fall prevention intervention.

**DESIGN TYPE AND LEVEL OF EVIDENCE:**

**Level I:** Randomized controlled trial (RCT) using pretest–posttest methods

**Limitations (appropriateness of study design):**

Was the study design type appropriate for the knowledge level about this topic? *Circle yes or no, and if no, explain.*

**YES/NO**

This design type allowed for the two interventions to be tested separately while giving support to the study focus of fall risk education. The prior research in fall prevention education in older adults indicated the need for a more rigorous design such as the RCT used.

Although the researchers created an interview assessment that has not been standardized, prior research allows for variables to be understood and controlled by the researchers.

An ethical issue is the lack of intervention provided to the control group after the study was completed. This group was not provided any education on falls, even after it was identified that this was a risk for these participants.

The RCT design is well suited to studying the effectiveness of the interventions.

**SAMPLE SELECTION**

How were subjects selected to participate? Please describe.

Participants included 53 older adults who were recruited from direct approach and flyers within senior community housing. All procedures were approved by Wayne State University’s Human Investigation Committee. All participants provided informed consent prior to participation.

**Inclusion Criteria**

- Lived in senior community housing
- Age 65+
- English-speaking
- Self-reported normal or medically corrected vision and hearing
- Aware and oriented to person, place, and time
- Ability to follow 3-step directions

**Exclusion Criteria**

- Diagnosed mental disorder or neurologic disease that affects cognition
- Diagnosed learning disability
- History of or current vertigo
- Chronic ear infections
- History of or current motion sickness

**SAMPLE CHARACTERISTICS**

$N = 58$

<table>
<thead>
<tr>
<th>% Dropouts</th>
<th>5 (0.08%)</th>
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<tbody>
<tr>
<td>#/ (%) Male</td>
<td>10 (19%)</td>
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<tr>
<td>#/ (%) Female</td>
<td>43 (81%)</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>NR</td>
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<tr>
<td>Disease/disability diagnosis</td>
<td>NR</td>
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Check appropriate group:

<table>
<thead>
<tr>
<th>&lt;20/study group</th>
<th>20–50/study group</th>
<th>51–100/study group</th>
<th>101–149/study group</th>
<th>150–200/study group</th>
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**INTERVENTION(S) AND CONTROL GROUPS**

*Add groups if necessary*

Group 1: Authenticity Group (19 participants assigned)

| Brief Description | The protocol was based on situated learning theory (Lave & Wenger, 1991). Initial interview was followed by a 30-minute education session with five short media clips that were discussed with the participant to identify fall risks.
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<tbody>
<tr>
<td>Setting</td>
<td>Participant-chosen for convenience, either in the participant’s home or the Mobility Research Laboratory at the Wayne State University.</td>
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<tr>
<td>Who Delivered?</td>
<td>Primary investigator, a licensed occupational therapist, and an instructional technologist. The instructional technologist was given training for the MFP system directly from the developer.</td>
</tr>
<tr>
<td>Frequency?</td>
<td>Assessment was done at initial visit and posttest 1 month later; initial assessment was followed by a 30-minute education session.</td>
</tr>
<tr>
<td>Duration?</td>
<td>1 month; this was completed by the primary investigator using the assessment portion of the MFP program.</td>
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Group 2: Motivation Group (20 participants assigned)

| Brief Description | The protocol was based on the ARCS model (Frymier & Shulman, 1995; Keller, 1987), which focuses on making the content of interventions relevant to participants by focusing on a desired goal, like safety and independence. Initial interview was followed by intervention, consisting of three motivational interventions: program goals are made clear, positive aspects of completing the program are made clear, and participant selection addressed during the program. Participants were allowed to choose between 20 situations that they considered most relevant to their lives. All participants were asked to keep a fall diary. |
| Setting | Participant-chosen for convenience, either in the participant’s home or the Mobility Research Laboratory at the Wayne State University. |
| Who Delivered? | Primary investigator, a licensed occupational therapist, and an instructional technologist. The instructional technologist was given training for the MFP system directly from the developer. |
| Frequency? | Assessment was done at initial visit and posttest 1 month later; initial assessment was followed by a 30-minute educational session. |
| Duration? | 1 month; this was completed by the primary investigator using the assessment portion of the MFP program. |

Group 3: Control group (19 participants assigned)

| Brief Description | Initial interview with no education following. All participants were asked to keep a fall diary. |
| Setting | Participant-chosen for convenience, either in the participant’s home or the Mobility Research Laboratory at the Wayne State University. |
| Who Delivered? | Primary investigator, a licensed occupational therapist, and an instructional technologist. The instructional technologist was given training for the MFP system directly from the developer. |
| Frequency? | Assessment was done at initial visit and posttest 1 month later; initial assessment was followed by a 30-minute education session. |
| Duration? | 1 month; this was completed by the primary investigator using the assessment portion of the MFP program. |

Intervention Biases: Circle yes or no and explain, if needed.

Contamination  

**YES/NO** Although participants are in separate groups, treatment groups were given interventions by the same primary investigator, licensed occupational therapist, and instructional technologist. Protocols could have inadvertently been used together.
Co-intervention | YES/NO | Exclusion criteria did not include outside interventions that could affect results.

Timing | YES/NO | From initial interview to follow-up was only a 1-month period. This time frame did not continue for an extended amount of time that would allow for major changes in health, living situations, or major care provider changes.

Site | YES/NO | The interviews, interventions, and follow-ups were all done for participants’ convenience, allowing it to be at the Mobility Research Laboratory at Wayne State University or at the individual participant’s homes. No site data comparison was done during this study.

Use of different therapists to provide intervention | YES/NO | Three professionals were used to provide the intervention, but interventions were provided by the therapists as a group.

MEASURES AND OUTCOMES
Complete for each relevant measure when answering the evidence-based question:
Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

Pretest–Posttest Interview: This measure was created to quantify knowledge by the total number of fall risks threats that participants were able to identify during the interview. This interview was used with the MFP system, before and after intervention to determine levels of fall risk knowledge.
- Reliability: NR
- Validity: NR

Fall Journals: Used to record daily balance loss, falls, situations with falls, any new fall risk preventions used, and any medical issues that occurred during the study. The journals were manually counted by the primary investigator.
- Reliability: NR
- Validity: NR

Measurement Biases
Were the evaluators blind to treatment status? Circle yes or no, and if no, explain.

YES/NO | No. The primary investigatory, the licensed occupational therapist, and the
Recall or memory bias. *Circle yes or no, and if yes, explain.*

**YES/NO** Yes. It is possible that fall diary entries were done in the evening, creating an opportunity for reflection or exaggeration of daily events.

Others (list and explain):

NR

**RESULTS**

List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate (p < 0.05)
Include effect size if reported

The ANOVA found a statistical significance in fall threats identified during the posttest for those identified during the pretest for the authenticity group (p = 0.029) and the motivation group (p = 0.007) when compared to the control group (p = 0.96).

There was no statistical significance in fall threats identified between the authenticity and motivation groups.

The ANOVA found a statistical significance in fall prevention behaviors for the motivation group compared to the authenticity group (p = 0.05) and for the motivation group compared to the control group (.001).

There was no statistical significant in fall prevention behaviors between the authenticity and control groups.

Effect size: NR

Was this study adequately powered (large enough to show a difference)? *Circle yes or no, and if no, explain.*

**YES/NO** Yes. The sample size of 53 participants was large enough to find statistical significance between the intervention types. This sample’s participants were mostly female; therefore, the sample populations may not be generalized to other older adult populations not in community living. This sample’s participants were also large enough per group to show significances between the intervention types.

Were appropriate analytic methods used? *Circle yes or no, and if no, explain.*

**YES/NO** Yes. A Fisher’s Exact test was used for category information that included fallers, falls, and participants’ knowledge of fall risks for baseline data. This was used to determine if groups were equally distributed. This type of analytical method is appropriate to determine the significance of association.
between category information. It is appropriate to use in this study because of the sample sizing of each intervention group.

A mixed design repeated measures ANOVA was used to compare fall risk knowledge over time between groups and to compare knowledge between groups from pretest to posttest. This type of analytical method is appropriate to evaluate between participants within a group, as well as among the three groups.

Were statistics appropriately reported (in written or table format)? Circle yes or no, and if no, explain.

YES/NO Yes. The study flowchart of participants and participant characteristics were reported in table form and written. Results were reported in a written format.

CONCLUSIONS
State the authors’ conclusions that are applicable to answering the evidence-based question.

This study used a mixed design repeated measures ANOVA to conclude that authenticity and motivational interventions for fall risk knowledge and prevention are both effective for the community-living older adult population. The clinical implication of this study indicated that the older adult population could benefit from a multimedia education fall risk knowledge and prevention intervention. These specific intervention types could be used by occupational therapist to provide older adults with a client-centered, effective approach to fall interventions.

This study has limited generalization based on the small sample that consisted mainly of women. This is also limited by the specific community-based setting in which the study was completed. To control the unequal distributions between groups, specifically fallers and non-fallers, the use of a Fischer’s Exact test was utilized.

This study warrants future research for generalization to other population of older adults and assessing for long-term effects of interventions.

This work is based on the evidence-based literature review completed by Katie Loop, OTS, and Kelly Erickson, PhD, OTR/L, Faculty Advisor, College of St. Scholastica.


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