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**Fall Risk Reduction Using Lifestyle-integrated Functional Exercise (LiFE)**

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Fall Risk Reduction
Using Lifestyle-integrated Functional Exercise (LiFE)
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Introduction

According to the Centers for Disease Control and Prevention (CDC) (2015), falls are a concern facing an aging population; one out of three adults aged 65 years or older experience a fall annually. Falls jeopardize older adults’ ability to safely live in their own home and community independently (Centers for Disease Control and Prevention, 2015). Falls may lead to a fear of falling, sedentary behavior, and lower quality of life (Healthy People 2020, 2015). To address this, strength and balance exercise programs have been found to decrease fall risk in older adults, but may be unsustainable (Cho & An, 2014; Roaldsen, Halvarsson, Sahlström, & Ståhle, 2014). Emerging evidence suggests that integrative exercise programs may be effective in reducing fall risk in older adults (Clemson et al., 2012).

Literature Review

Traditional Exercise Approach

- Increase balance and lower extremity strength in older adults, which are key factors in preventing falls and reducing fall risk (Cho & An, 2014).
- Is not sustainable due to health status, lack of social influence, and poor access to safe environments (Baert, Gorus, Mets, Geerts, & Bautmans, 2010).

Integrative Exercise Approach

- Integration of balance and strength exercises into daily activities are just as effective in decreasing fall risk as traditional exercise programs (Clemson et al., 2012; Fleig, et al., 2016).
- The LiFE program found a significant reduction of 31% in the rate of falls among the participants in the integrative exercise group compared to the participants in the traditional exercise group (Clemson et al., 2012).
- The LiFE program is a sustainable approach and is effective in improving exercise adherence, fall efficacy, and function in older adults with a history of falls (Clemson et al., 2012).

Statement of Purpose

The purpose of this study was to explore if the LiFE program decreases fall risk in community-dwelling older adults with and without a history of falls.

Modified LiFE Program

Design: Quasi-experimental pretest posttest research design
Setting & Subjects:
- Two retirement communities in Marin County, California
- Community-dwelling older adults 65 years and older with or without a history of falls

Procedures:
- Five one-hour face-to-face sessions
- Three one-hour assessment sessions
- One booster session and two follow-up telephone calls
- Activity Planner and Counter Forms to track integration of exercises into daily activities

Data Collection: Data were collected prior to the study (pretest), after the five weekly sessions (posttest), and three months postbooster session (follow-up)

Balance and Strength
- Functional Reach Test (FRT)
- Timed-up and Go (TUG)
- 30-second Chair Stand (30s-CST)
- One-Legged Stand (OLS)

Fall Efficacy
- Activities-specific Balance Confidence Scale (ABC)

Quality of Life
- Patient-Reported Outcomes Measurement Information System (PROMIS) ®

Program Description

LiFE is a client-centered program that incorporates balance and lower extremity strengthening exercises into participants’ daily activities and routines. The LiFE Program consists of 7 balance exercises and 7 strength exercises.

<table>
<thead>
<tr>
<th>Balance Exercises</th>
<th>Fall Efficacy</th>
<th>Quality of Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Tandem stand</td>
<td>Activities-specific Balance Confidence Scale (ABC)</td>
<td>Patient-Reported Outcomes Measurement Information System (PROMIS) ®</td>
</tr>
<tr>
<td>2. Tandem walk</td>
<td>1.2</td>
<td>1.6</td>
</tr>
<tr>
<td>3. One-leg stand</td>
<td>0.18</td>
<td>0.2</td>
</tr>
<tr>
<td>4. Leaning side to side</td>
<td>0.8</td>
<td>0.09</td>
</tr>
<tr>
<td>5. Leaning forwards and backwards</td>
<td>9.56</td>
<td>7.9</td>
</tr>
<tr>
<td>6. Stepping objects - forwards and backwards</td>
<td>10.34</td>
<td>9.25</td>
</tr>
<tr>
<td>7. Stepping objects - side to side</td>
<td>30</td>
<td>OLS (s)</td>
</tr>
</tbody>
</table>

Strength Exercises

1. Bend your knees
2. Sit to stand
3. On your toes
4. On your heels
5. Up the stairs
6. Walk sideways
7. Tighten muscles

Results

Demographics
- Participants’ mean age: 67; 13% Male, 87% Female;
- Fallers: 29%, Non-Fallers: 71%

Discussion & Implications

Similar to Clemson’s et al. (2012) study, this study supports that a client-centered integrated exercise program, where personal routines and environments are considered, may reduce fall risk among community-dwelling older adults. The results revealed that participants who were fallers decreased their fall rate significantly by the end of the study. This study adds to the evidence for occupational therapists to “focus on occupations” when implementing integrative exercise interventions to address fall prevention and support aging in place.

Participants’ Testimonials

“I found the program useful and encouraging. I now bend knees and almost squat to pick up items off the floor. I am more confident with my balance over all. I welcome stairs (most of the time!). I can stand to pull on slacks, one leg at a time! I have learned not to lean on railings as I walk or go up stairs. I am more aware of using my body consciously.” - Participant C

“Great program! Thank you for incorporating the balance exercises into daily movements is the way to go! While traveling I kept up the exercises. I have incorporated other exercises I let fall.” - Participant G

“I could not get out of a regular chair before without a cane or arms, now I can. I think I walk better, without the cane sometimes, even though I have it.” - Participant K

References


Graph 1: Participant means in FRT, TUG, 30-CST, and OLS during the pre-test, post-test, and follow-up tests

Graph 2: Mean number of falls between participants identified as fallers and non-fallers