Lifestyle - integrated Functional Exercise program to reduce falls

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What is LiFE?

Same same but different

Same exercises – different approach to doing them

Aim of the LiFE program

To reduce falls and improve function in older people by having them perform LiFE activities that improve their balance and strength.

Fall reduction and functional outcomes

Reduced fall rate by 31% (IRR = 0.69), n= 212

Improved balance and balance confidence

Improved functional capacity, participation, energy expenditure and perceived overall health status

(Clemson et al., British Medical Journal 2012)

Balance, strength and balance confidence findings

<table>
<thead>
<tr>
<th></th>
<th>LiFE v’s Control</th>
<th>effect size</th>
<th>Structured v’s Control</th>
<th>effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timed tandem walk</td>
<td>F=6.6 P = 0.002</td>
<td>0.42</td>
<td>F &lt; 8.5 P&lt; .0001</td>
<td>0.49</td>
</tr>
<tr>
<td>Balance hierarchy scale (8 level)</td>
<td>OR 1.3, wald 15.6 P&lt;.0001</td>
<td>0.63</td>
<td>NS</td>
<td>0.29</td>
</tr>
<tr>
<td>R Ankle Strength</td>
<td>F= 5.5 P&lt; .005</td>
<td>0.40</td>
<td>NS</td>
<td>0.26</td>
</tr>
<tr>
<td>Balance confidence</td>
<td>F= 5.52 P&lt; .004</td>
<td>0.38</td>
<td>F= 5.22 P&lt; .008</td>
<td>0.37</td>
</tr>
</tbody>
</table>
LiFE v's Control effect size
Structured v's Control effect size

<table>
<thead>
<tr>
<th>Measures of participation and function</th>
<th>LIFE v's Control</th>
<th>Structured v's Control</th>
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<tbody>
<tr>
<td>ADL (NHANES)</td>
<td>F = 15.01</td>
<td>p &lt; .0001</td>
</tr>
<tr>
<td></td>
<td>0.62</td>
<td>F = 4.85</td>
</tr>
<tr>
<td></td>
<td>P = .008</td>
<td>0.36</td>
</tr>
<tr>
<td>Late Life Function index</td>
<td>F = 21.05</td>
<td>p &lt; .0001</td>
</tr>
<tr>
<td></td>
<td>0.73</td>
<td>F = 6.66</td>
</tr>
<tr>
<td></td>
<td>P = .04</td>
<td>0.41</td>
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<tr>
<td>Late Life Disability Index (free)</td>
<td>F = 9.28</td>
<td>p &lt; .003</td>
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<tr>
<td></td>
<td>0.49</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>0.17</td>
<td></td>
</tr>
<tr>
<td>Paffenbarger PA index</td>
<td>F = 15.01</td>
<td>p &lt; .0001</td>
</tr>
<tr>
<td></td>
<td>0.62</td>
<td>F = 4.85</td>
</tr>
<tr>
<td></td>
<td>P = .008</td>
<td>0.36</td>
</tr>
<tr>
<td>Health status (EQ-VAS)</td>
<td>F = 4.46</td>
<td>p &lt; .01</td>
</tr>
<tr>
<td></td>
<td>0.34</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>0.06</td>
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How do we achieve the aim?

These balance and strength activities are embedded into participant’s daily tasks and routines. To do this people need to change their everyday habitual routines in how they do some things.

Mean adherence (percent of prescribed weekly exercise) over first 6 months

<table>
<thead>
<tr>
<th></th>
<th>Mean Proportion of adherence</th>
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<tbody>
<tr>
<td>LIFE</td>
<td>107</td>
</tr>
<tr>
<td>Structured</td>
<td>105</td>
</tr>
<tr>
<td>Control/gentle</td>
<td>105</td>
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</tbody>
</table>

Abella, M. PhD study
Beliefs – LIFE Strength Principles

To improve their strength they will need to make their muscles work harder by loading their muscles.

LiFE Balance Principles and Activities

Reducing your base of support
1. Tandem stand
2. Tandem walk
3. One leg stand

Shifting weight & moving to the limits of stability
4. Leaning side to side
5. Leaning backwards & forwards

Stepping over objects
6. Stepping over objects
**LiFE Strength Principles & Activities**

- Load your muscles
  - Increase the number of times you use a muscle
  - Move slowly
  - Use fewer muscles
  - Increase the amount of weight

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

**Habitual Change**

- Active memory till embedded in routines
  - Planning - how, when and where
  - Situational and environmental cues serve as prompts to action

**Beliefs**
- LiFE principles for balance and strength
- Understanding links to function, falls and gait

**Skill**
- Finding LiFE opportunities
- Challenges self
- Mastery
- Upgrading LiFE activities & Autonomy

**Experience functional outcomes**
- Plans achieved
- Balance, function
- Confidence and participation
- Protection from falls

**Embedded balance and strength training into daily activities and routines**
I moved the coffee to a higher shelf so that when I went to make the coffee it would remind me to go on my toes as I reached for the coffee.

**Habitual change**
- Active memory till embedded in routines
- Planning – how, when and where
- Situational and environmental cues serve as prompts to action
- Practice and repetition in the same context
- Self monitoring and repetitions

<table>
<thead>
<tr>
<th>Skill</th>
<th>Finding LIFE opportunities</th>
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**Skills – challenging yourself, mastery, upgrading and autonomy**

Looking for ways and opportunities to make the activities more challenging - more challenging level, more times, more places.

Upgrading is a continuous and ongoing activity for the participants

When an activity is ‘mastered’ – upgrade to a more challenging level or increase the situations in which it is done

Aim that they can upgrade themselves

**Upgrading and increasing autonomy**

- Find opportunities to do a particular activity in more places
- Make the activity more challenging
- Changing the environment to provide opportunities to increase the challenges
- Combine principles
- Continuous and ongoing process
- Need to be engaged and increasingly autonomous in planning what and where
Beliefs
- LIFE principles for balance and strength
- Understanding links to function, falls and participation

Skill
- Finding LIFE opportunities
- Challenges self
- Mastering LIFE activities & autonomy

Opportunities exist in everyday tasks and routines to challenge balance and load muscles
I do all the same things - just changed the way I do them

I was looking for ways to make life easier by doing less - now I look for ways to make some things harder

Teaching the program
- Teach balance and strength principles & key points throughout the program
- Discuss the relevance of activities to improving walking and decreasing the risk of falls
- Demonstrate as much as possible - correct form
- How often? - whenever have the opportunity
- Ownership of the session goals
- Increasing autonomy

Other LIFE research
Translation into a restorative care program, (Burton 2015) West Australia
Group based LIFE with women at retirement, Ashe, Fleig (Fleig, 2013) Canada
Current projects
- PLATform – people with severe vision impairment
  NHMRC funded RCT (Kaey, Sydney) 2016-18 (Feasibility paper, 2015)
- Fidelity tools - development and reliability testing
  Maloney & Hamrick, Wisconsin, US
- LIFE and Home safety – for people after stroke – pilot work (Dean, Sydney)
- LIFE and Home safety – CDC grant (Szanzin & Gitlin) Johns Hopkins, Baltimore
- PreVETIT – Jorunn Helbostad Horizon Grant

LIFE Resources
Sydney University Press (SUP)
- LIFE Participant manual
- LIFE Trainer’s manual
- LIFE “More LIFE Activities” (to come)

Purchase from
Sydney.edu.au/SUP (Browse books, author, clemson)
Amazon.com and Book Depository
Free download from SUP:
- Life Assessment Tool
- Daily Routine Chart
- Activity Planner
- Activity Counter
References


- Participant and therapist LiFE manuals available Sydney University Press lian.info@sydney.edu.au (Also The Book Depository UK/Europe and Amazon.com US/Canada)