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The Effects of a Core Strengthening Program on Functional Walking Endurance and the Perception of Fall Risk in Individuals over the Age of 65

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The Effects of a Core Strengthening Program on Functional Walking Endurance and the Perception of Fall Risk in Individuals over the Age of 65

Amber Hackenberg, Angela Shander, Nicholas Dworetzky, Ryan Zuch, Andrew Layne, Melissa Cencetti, PT, DPT, EdD and Nicole Evansky, PT, DPT

INTRODUCTION

- Falls affect 1 in 4 adults ≥ 65 and are a leading cause of injury, mortality, and loss of independence.¹
- Fall risk is multifactorial^{2,3}, involving:
 - Balance
 - Strength
 - Gait
 - Cognition
- Why Core Strengthening?**
 - Weakness or poor activation of the core can contribute to decreased postural control, altered gait, compensatory movement, and ultimately, increased fall risk and fear of falling.⁴
 - Lack of research is available regarding core strengthening on walking endurance and fall risk perception.

QUESTIONS AND HYPOTHESES

Questions:

- Will a core exercise program affect the scores of a 6MWT and the FES in individuals > 65 years of age?
- Will individuals who participate in a core exercise program demonstrate greater improvements in a 6MWT and FES compared to individuals who do not?

Hypotheses:

H_0 : There will not be a positive relationship between the core strengthening program and FES scores or 6MWT distances.

H_A : There will be a positive relationship between the core strengthening program and FES scores or 6MWT.

QR CODES



Figures and Tables



References

GROUPS

- Group 1: Experimental Group:** completed a 6-week core strengthening program 2 days per week. (n= 10 started; 7 completed)
- Group 2: Exercise control group:** currently participate in a regularly structured exercise program. (n=3)
- Group 3: No exercise control group:** completed pre-test and post-test outcome measures only. (n=5)



OUTCOME MEASURES (PRE & POST)

- 6 Minute Walk Test (6MWT)⁵**
 - Submaximal test assessing aerobic and functional walking capacity.
- Falls Efficacy Scale (FES)⁶**
 - Allows participants to rate their confidence performing various activities without falling.
- Unilateral High Bridge Extension Test (UHBET)⁷**
 - Measures core stability.

DATA ANALYSIS/RESULTS

Pre-Testing Data Analysis

- ANOVA to identify between group differences and was followed by a Tukey test.
- Tukey to identify which groups had between group differences.

Data Analysis

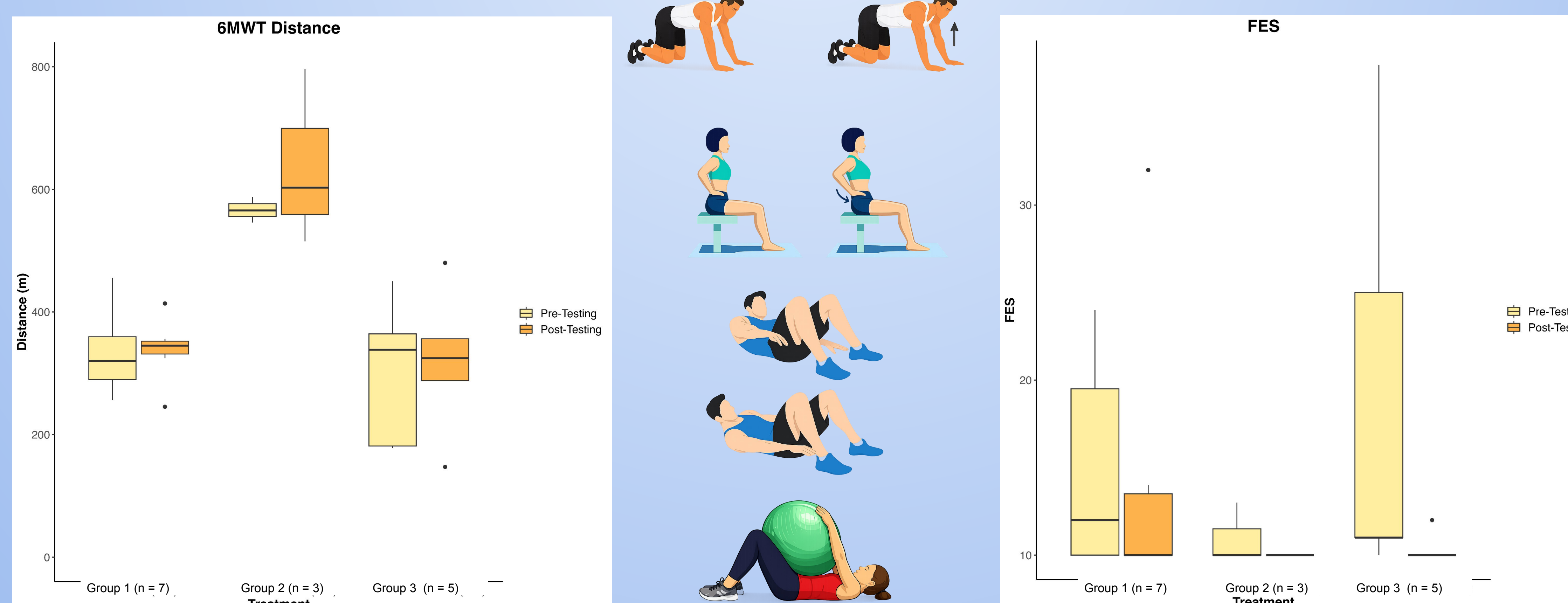
- One-way ANOVA to compare pre-test to post-test data.
- T-tests run to compare within group differences between pre-test and post-test data.

DISCUSSION

- H_0 was accepted and H_a was rejected.
- Non-statistical changes noted in all outcome measures for Group 1 participants.
 - One of the seven participants in group 1 for 6MWT reached the MCID of 50m.⁸
- Statistically significant difference** noted in the UHBET bilaterally for Group 1.
- Patients reported more confidence and needed less assistance for floor \leftrightarrow stand transfers after the six-week program.

LIMITATIONS

- Baseline difference between groups
- Small sample size
- Unequal group numbers
- Number of absences by participants
- Cognitive status of select participants
- Limited generalizability
- Lack of a long-term follow-up



Outcome Measure	Statistical Test	Groups	p value
6MWT	ANOVA	Group 1 v Group 3 : Δ distance pre/post	0.787
	t test	Group 1, Group 2, Group 3	0.8544, 0.4796, 0.8299
FES	ANOVA	Group 1 v Group 3 : Δ score pre/post	0.163
	t test	Group 1, Group 2, Group 3	0.824, 0.4226, 0.1934
UHBET RLE	ANOVA	Group 1 v Group 3 : Δ time pre/post	0.0556
	t test	Group 1, Group 2, Group 3	0.002503 , 0.9566, 0.5826
UHBET LLE	ANOVA	Group 1 v Group 3 : Δ time pre/post	0.0447
	t test	Group 1, Group 2, Group 3	0.006078 , 0.2687, 0.8084

* Group 2 excluded from between group comparison as pre-test data lacked homogeneity