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# Does therapeutic horseback riding decrease balance deficits in community-dwelling older adults?

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## AOTA Critically Appraised Papers Series

# Evidence Exchange

*\*A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

### CRITICALLY APPRAISED PAPER (CAP)

#### **FOCUSED QUESTION**

Does therapeutic horseback riding decrease balance deficits in community-dwelling older adults?

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Homnick, D. N., Henning, K. M., Swain, C. V., & Homnick, T. D. (2013). Effect of therapeutic horseback riding on balance in community-dwelling older adults with balance deficits. *Journal Of Alternative & Complementary Medicine*, 19(7), 622–626. <http://dx.doi.org/10.1089/acm.2012.0642>

#### **CLINICAL BOTTOM LINE:**

Hippotherapy and therapeutic riding (TR) provide pleasurable activity and physical exercise to individuals and yet limited study is available on its therapeutic value to improve balance in older adults. In this study, the researchers measured the benefit of TR on balance and quality of life in community-dwelling older adults. A convenience sample of individuals 65 years and older was recruited from a local community. The study is a single-blind, pretest-posttest, controlled study of a 10-session TR program with a Professional Association of Therapeutic Horsemanship (PATH) trained and certified TR instructor. Each TR session included grooming and tacking, mounting, a warm-up exercise on the horse, riding, and dismounting. The results of this study showed a significant improvement in balance scores as well as participant perception of overall health after the intervention period. Therefore, this study illustrated the practicality, safety, and benefit on improvement of balance in community-dwelling older adults from a short-term TR program. However, the small sample size prevented the data from being conclusive. Larger scale studies should be conducted to clinically prove the benefit of therapeutic riding for older adults.

Therapeutic riding has the potential to improve balance and increase quality of life in older adults. Connecting the results from this study to the larger issue of fall prevention may provide evidence to include hippotherapy or TR in occupational therapy for older adults with balance deficits.

#### **RESEARCH OBJECTIVE(S)**

List study objectives.

Test the effect of an 8-week TR program on balance and quality of life in individuals with balance deficits

#### **DESIGN TYPE AND LEVEL OF EVIDENCE:**

Level III: Pretest-posttest, single group

#### **SAMPLE SELECTION**

How were subjects recruited and selected to participate? Please describe.

The participants were recruited from the local community by convenience sample methods. Eleven community-dwelling older adults met the entry criteria and 9 completed the intervention.

**Inclusion Criteria**

The inclusion criteria for this study were: (1) community-dwelling adults 65 years or older; (2) completed a health screening; (3) scored between 6 and 12 in the short version of the FABS balance screening; (4) physician clearance.

**Exclusion Criteria**

Individuals with a chronic condition known to affect balance were excluded. This included individuals with a history of stroke, Parkinson’s disease, multiple sclerosis, vestibular dysfunction, or any other condition leading to severe musculoskeletal or neurologic dysfunction or impairment in balance. Subjects were also excluded if they had a history of drinking more than one and a half ounces of alcohol per day, fear of horses, or if they participated in any recreational or therapeutic horseback riding within 1 year prior to enrollment to the study.

**SAMPLE CHARACTERISTICS**

N= (Number of participants taking part in the study)	9
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#/ (%) Male	4 (44%)	#/ (%) Female	5 (56%)
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Ethnicity	N/R
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Disease/disability diagnosis	Participants were community-dwelling older adults with established balance deficits.
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**INTERVENTION(S) AND CONTROL GROUPS**

A pretest posttest design was used rather than using a control group in order to minimize the effects of confounding variables in a comparison group.

Brief description of the intervention	<p>The study was completed in three phases. The first phase was an 8-week observation period to establish a baseline for the participants balance deficits.</p> <p>The second phase of the study was 8 weeks of the actual intervention, therapeutic horseback riding (TR). The TR sessions included grooming, tacking, and mounting the horse, as well as a warm up exercises on the horse, riding skills, and dismounting. The riding portion lasted around 45 minutes, and consisted of either walking or trotting, depending on the skill of the rider. One to three volunteers assisted the rider during the session to maintain safety.</p> <p>The third phase of the study was an 8-week follow-up period. This follow-up period was used to determine if change due to the intervention was sustained.</p>
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How many participants in the group?	9
Where did the intervention take place?	Cheff Therapeutic Riding Center in Augusta, MI, a Professional Association of Therapeutic Horsemanship (PATH) International premier accredited therapeutic riding center.
Who delivered?	A PATH trained and certified TR instructor investigator
How often?	1 hour, once a week
For how long?	8 weeks for the actual TR intervention, 24 weeks total.

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

Contamination:

YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> NR <input type="checkbox"/>	<i>Comment:</i> Single group design, so contamination is not a consideration
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Co-intervention:

YES <input type="checkbox"/> NO <input type="checkbox"/> NR <input checked="" type="checkbox"/>	<i>Comment:</i> Participants may have been exercising or attending another type of therapy throughout the 24-week study.
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Timing:

YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> NR <input type="checkbox"/>	<i>Comment:</i>
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Site:

YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> NR <input type="checkbox"/>	<i>Comment:</i> The TR sessions were completed at the same riding center.
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Use of different therapists to provide intervention:

YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NR <input checked="" type="checkbox"/>	<i>Comment:</i> Two different individuals provided the intervention.
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## MEASURES AND OUTCOMES

Complete for each measure relevant to occupational therapy:

Measure One: Balance

Name/type of measure used:	Short version of the Fullerton Advanced Balance Scale (FABS) standardized assessment
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What outcome was measured?	Static and dynamic balance. A score of 9 and below indicates high fall risk.
Is the measure reliable?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NR <input type="checkbox"/> No value for reliability was reported by the authors
Is the measure valid?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NR <input type="checkbox"/>
When is the measure used?	This assessment was done 4 times during the study. The first and second times were during initial enrollment and 8 weeks later, prior to the start of intervention in order to establish the pretest baselines. The third time was during the posttest phase after the intervention, and the fourth time was 8 weeks after ending the intervention in order to determine the long-term effects.

Measure Two: Quality of Life

Name/type of measure used:	Rand Short Form 36
What outcome was measured?	Quality of life
Is the measure reliable?	YES <input type="checkbox"/> NO <input type="checkbox"/> NR <input checked="" type="checkbox"/>
Is the measure valid?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> NR <input type="checkbox"/> No value for validity was reported by the authors.
When is the measure used?	This measure was used at the start and end of the 8-week intervention phase of the study. However, only 7 out of the 9 participants completed this portion of the study. It was not reported why the other 2 participants did not complete this portion.

Measurement Biases

Were the evaluators blind to treatment status? *Check yes, no, or NR, and if no, explain.*

YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> NR <input type="checkbox"/>	<i>Comment:</i>
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Recall or memory bias. *Check yes, no, or NR, and if yes, explain.*

YES <input type="checkbox"/> NO <input type="checkbox"/> NR <input checked="" type="checkbox"/>	<i>Comment:</i> The Rand Short form asked questions on quality-of-life indicators and may possibly be subject to recall bias because the participants were answering personal questions such as their energy/fatigue level, emotional problems, and social functioning.
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Others (list and explain):

N/R

## RESULTS

List key findings based on study objectives

Include statistical significance where appropriate ( $p < 0.05$ )

Include effect size if reported

There was no significant difference in balance scores between the start and end of the observation period ( $p = .350$ ), indicating that the participants had no change in balance prior to the intervention. However, there was significant improvement in balance scores from the start to the end of the TR intervention. There was significant improvement in the balance score from the start to the end of the intervention period ( $p = .001$ ), and no significant difference between the end of the intervention and the end of study, suggesting that improvements may have been sustained ( $p = .908$ ). Most measures of quality of life improved from the start to the end of the TR intervention, but only general health improvement reached statistical significance ( $p = .003$ ).

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

YES   
NO   
NR

*Comment:*

The sample size was small. There were only 9 participants in this study.

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

YES   
NO   
NR

*Comment:*

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

YES   
NO

*Comment:*

Was the percent/number of subjects/participants who dropped out of the study reported?

YES   
NO

Limitations:

What are the overall study limitations?

One of the study limitations is small sample size. The researchers failed to ask or report whether participants were engaging in physical activity or attending other types of therapy during the intervention and follow-up periods, which may have accounted for any improvement and sustained improvement. A control group could have been used to add validity to the study as well.

## CONCLUSIONS

State the authors' conclusions related to the research objectives.

Therapeutic horseback riding is a safe activity for older adults with mild to moderate balance deficits and may lead to both improvements in balance and quality of life. Longer and larger studies to assess the benefit of equine-assisted activities on improvements in balance and reduction in fall risk are recommended.

This work is based on the evidence-based literature review completed by Salwa Yaser, OTS, Lisa Mrsny, OTS, Krystin Beeman, OTS, Skyler Moon, OTS, and Kitsum Li, OTD, OTR/L, Faculty Advisor, Dominican University of California.

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