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2022

The Use of Assessment Measures to Determine the Outcomes of a Therapeutic Riding Program at the Charleston Area Therapeutic Riding Center

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Doctoral Capstone Presentation

The Use of Assessment Measures to Determine the Outcomes of a Therapeutic Riding Program at the Charleston Area Therapeutic Riding Center

Sarah Eddy, OTD student

MUSC Medical University of South Carolina | College of Health Professions

Acknowledgment of invited attendees

Faculty mentor: Dr. Patty Coker-Bolt, Ph.D., OTR/L, FNAP, FAOTA

Capstone Site Mentor: Anja Cain, PATH Intl. Advanced Level Instructor, Interactive Vaulting Instructor, Program Director

Capstone Coordinator: Dr. Hazel L. Breland

Peer support of fellow OTD students

Background

- Therapeutic riding (TR) is guided activities done while mounted and unmounted that are aimed at therapeutic outcomes
- Individuals with a wide range of physical and psychosocial disabilities can gain benefits from a therapeutic riding program
- Charleston Area Therapeutic Riding Center (CATR)

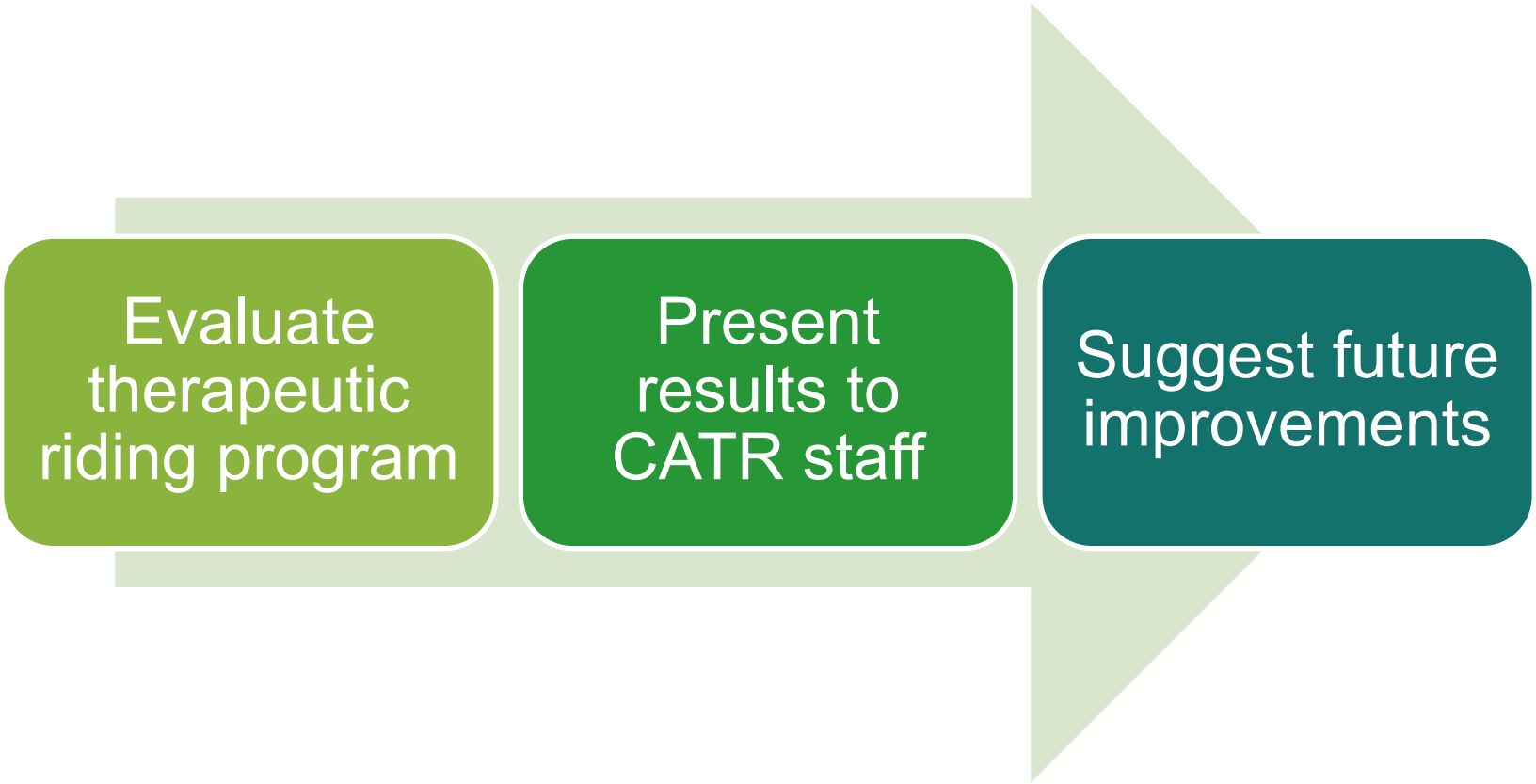
(Gabriels et al., 2015)
(Johnson et al., 2018).

Problem/Gap statement

CATR does not have a systematic way to collect data

A study will enhance future programs

Purpose statement



Conceptual Model or Theoretical Framework

Model of Human Occupation

Gary Kielhofner, M.A, Dr. P.H, OTR

1980

Explains how occupations are chosen

Includes volition, personal causation, and interests

Elements lead to participation in the task of riding a horse

(Kielhofner & Burke, 1980)

Specific Aims

Aim 1: Gain an in-depth experience to understand the methodology of how therapeutic riding can provide cognitive, physical, and psychosocial benefits

Aim 2: To explore the use of assessments as outcome measures of **gross motor skills**, **sensory processing skills**, and **executive functioning skills** to determine the effectiveness of a therapeutic riding program provided by CATR.

Aim 3: To educate CATR staff on the results of the study to enhance future programs to target specific deficits.

Methods

Prospective Cohort Study

IRB Approval

Children aged 6-12 with special needs engaged in therapeutic riding

Therapeutic riding program including riding and groundwork

Hypotheses

HY 1: Executive functioning skills

- Behavior Rating Inventory of Executive Function-2 (BRIEF-2), main classroom form

Hy 2: Sensory processing skills

- Sensory Processing Measure (SPM), teacher form

HY 3: Gross motor skills

- Timed Up and Go (TUG)
- Functional Reach Test
- Balance and Bilateral Coordination subtests of the Body Coordination composite of the Bruininks-Oseretsky Test Second Edition (BOT-2)

Assessments

BOT-2 Fine motor and gross motor control **Standard score (composite)** **Scale score (subtest)** well above average, above average, average, well-below average	BRIEF-2 Executive functioning **T Score** mildly elevated degree of executive dysfunction, potentially clinically elevated degree of executive functioning, clinically elevated or clinically significant degree of executive functioning	**SPM** Sensory processing issues, praxis, social participation **T Score** normal functioning, mild to moderate problems, severe problems	**TUG** Dynamic Balance and Functional mobility	**Functional Reach Test** Dynamic Balance

Data collection

Pre-testing

Week 2

Post-testing

Week 8

Strengths and limitations

- Wide variety of assessments used
- Group A missed week 1
- Administration of assessments by fellow OTD students

Intervention: Therapeutic Riding Curriculum

Group A

Completed 7 weeks

Rode 5 weeks; ~30 mins

Unmounted focused on motor planning, social skills, fine motor skills, recall memory

Group B

Completed 7 weeks

Rode 4 weeks; ~20 mins

Unmounted focused on reading comprehension, spelling, handwriting, gardening, team building, recall memory

Data Analysis

Paired T-Test (Mean and Standard Deviation between pre and post)

- To compare scores on pre and posts assessments with participants from the same group

BRIEF-2 (T-Score)

- Behavior Regulation Index
  - inhibit and self-monitor
- Emotional Regulation Index
  - shift and emotional control
- Cognitive Regulation Index
  - initiate, working memory, plan/organize, task-monitor, organization of materials
- Global Executive Composite

SPM (T-Score)

- Total sensory system scale
  - Social Participation
  - Vision
  - Hearing
  - Touch
  - Body awareness
  - Balance and Motion
  - Planning and Ideas

BOT-2 (Scale score and composite standard score)

- Bilateral coordination subtest
- Balance subtest
- Body coordination composite

Reach

- Average of the 2nd and 3rd trial

TUG

- First trial

Results: Participants

N=7	4 from group A
	3 from group B
Regular classroom with resource support	Group A from Mt. Zion Elementary School
	Group B from Frierson Elementary School

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Participant Demographics

Table 1: Descriptive Statistics N=7 (%)

		Group A N=4	Group B N=3
Gender	Male	4 (100)	1 (33)
	Female	0 (0)	2 (66)
Mean Age		8	8.66
Diagnosis	Developmental delay-communication	2 (33)	0 (0)
	Autism	2 (33)	0 (0)
	Dyslexia	1 (17)	0 (0)
	ADHD	1 (17)	1 (25)
	Specific learning disability	0 (0)	1 (25)
	Reading disability	0 (0)	1 (25)
	Anxiety	0 (0)	1 (25)

Results: Combined Groups A and B

Assessment	Combined Groups N=7				
	Pre		Post		P-value (two-sided)
	M	SD	M	SD	
Global Executive Composite	62.6	11.8	50.7	9.4	**0.006**
Behavior Rating Index	58.3	15.1	49.0	8.8	**0.045**
Inhibit	55.9	13.4	49.1	8.1	**0.048**
Self-Monitor	61.0	15.8	49.0	9.0	**0.047**
Shift	62.6	13.0	51.1	10.2	**0.010**
Cognitive Regulation Index	60.7	8.9	49.9	7.8	****0.003**
Initiate	54.6	8.3	46.0	8.4	**0.007**
Working Memory	60.1	8.6	49.4	7.0	**0.010**
Plan/organize	63.2	9.1	51.4	7.2	****<0.001**
Organization of Materials	58.4	9.7	48.7	8.1	****<0.001**
Body Coordination Composite	44.1	13.0	51.3	10.7	**0.027**
Bilateral Coordination	11.6	3.4	14.6	2.8	**0.018**
Total Sensory Scale	59.4	9.0	53.4	7.2	**0.021**
Social Participation	56.6	15.5	51.4	11.9	**0.042**
Hearing	60.0	10.9	51.3	9.0	****0.002**
Touch	60.9	5.0	55.9	7.6	**0.034**
Planning and Ideas	62.4	8.6	55.4	9.1	****<0.001**

Table 2: P-values of the T-scores from combined groups A and B.

** Sig. after Bonferroni correction for multiple corrections

BRIEF-2 SPM

BOT-2

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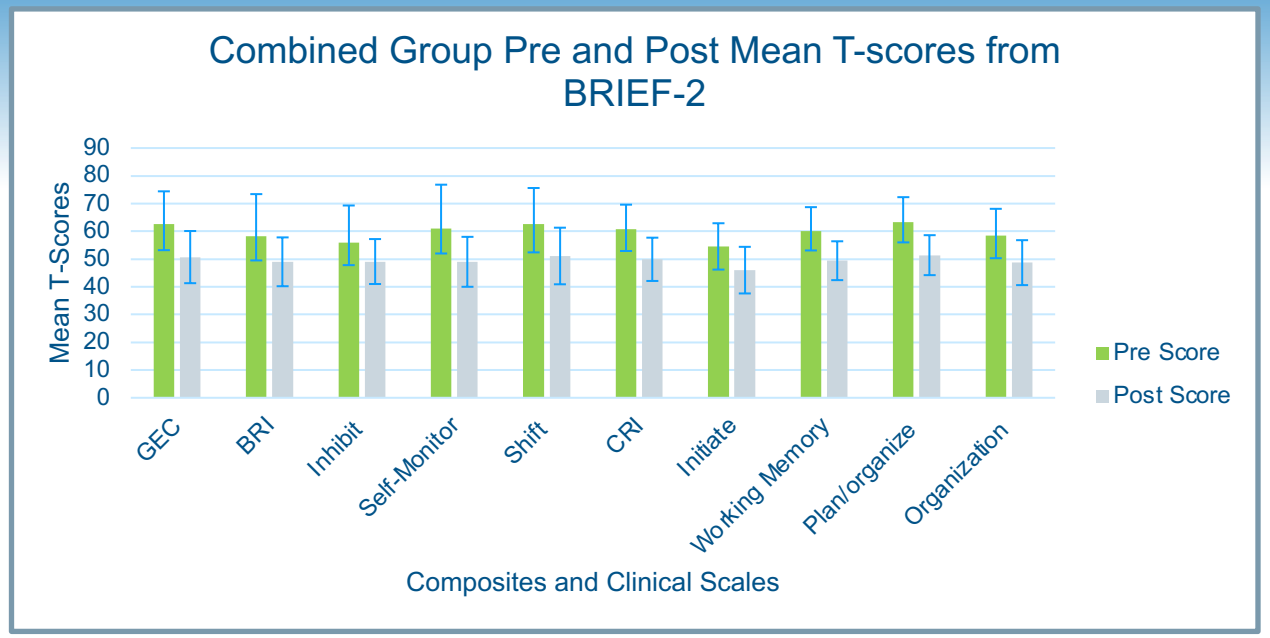

Figure 1: Combined group A and B pre and post mean T-scores from the BRIEF-2.

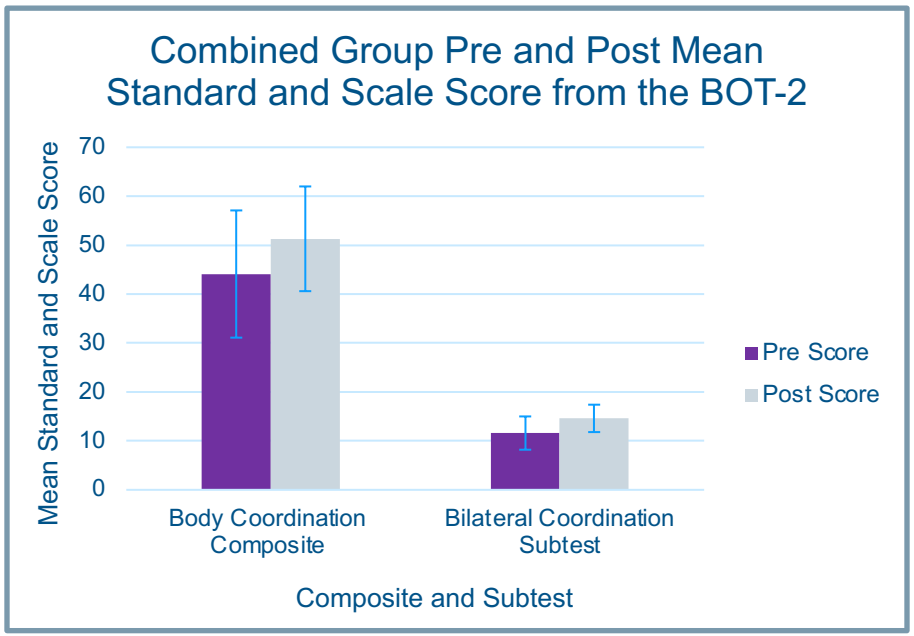

Figure 2: Combined group pre and post mean standard and scale score from the BOT-2.

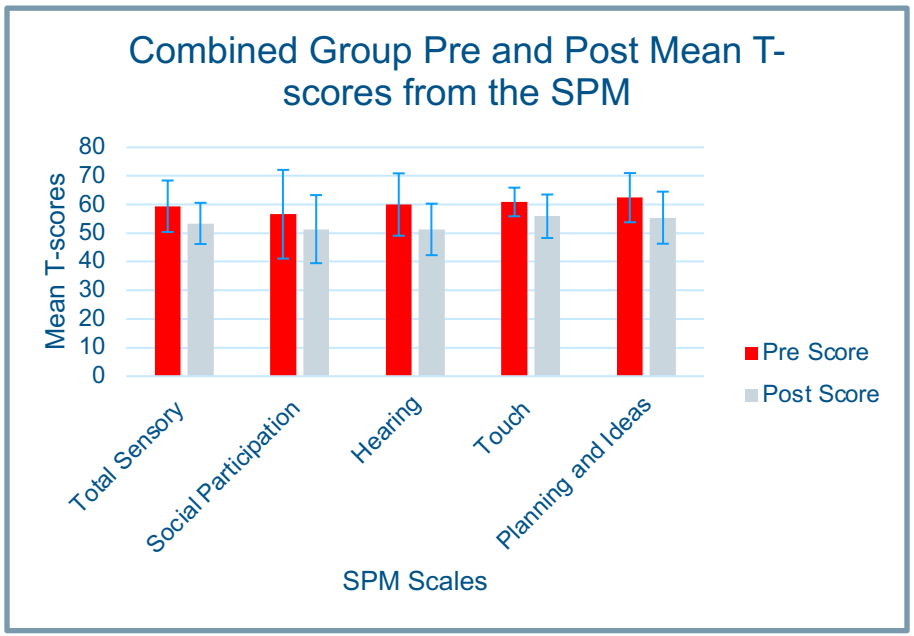

Figure 3: Combined group A and B pre and post mean T-scores from the SPM.

Result: Group A

Assessment	Group A N=4				
	Pre		Post		P-value (two-sided)
	M	SD	M	SD	
Global Executive Composite	70.7	7.4	53.8	11.5	**0.006**
Behavior Rating Index	69.8	6.6	53.5	9.4	**0.013**
Inhibit	65.8	6.7	54.0	7.0	**0.017**
Self-Monitor	73.3	5.5	52.3	11.2	**0.016**
Shift	74.0	5.9	54.0	12.2	**0.011**
Cognitive Regulation Index	65.5	8.9	51.8	10.4	**0.014**
Initiate	59.3	7.1	49.0	10.5	**0.023**
Working Memory	64.8	8.1	49.5	9.9	**0.016**
Plan/organize	67.8	9.5	53.5	9.1	**0.014**
Organization of Materials	61.3	10.9	49.8	8.5	**0.006**
Total Sensory Scale	65.3	6.2	56.5	3.6	**0.010**
Social Participation	68.0	8.4	59.8	8.1	**0.037**
Hearing	65.5	8.8	55.3	9.7	**0.009**
Balance and Motion	64.5	8.3	53.5	8.2	**0.021**
Planning and Ideas	66.5	6.6	59.5	7.5	**0.007**

Table 3: Significant P-values from the T-tests from group A.

BRIEF-2 SPM

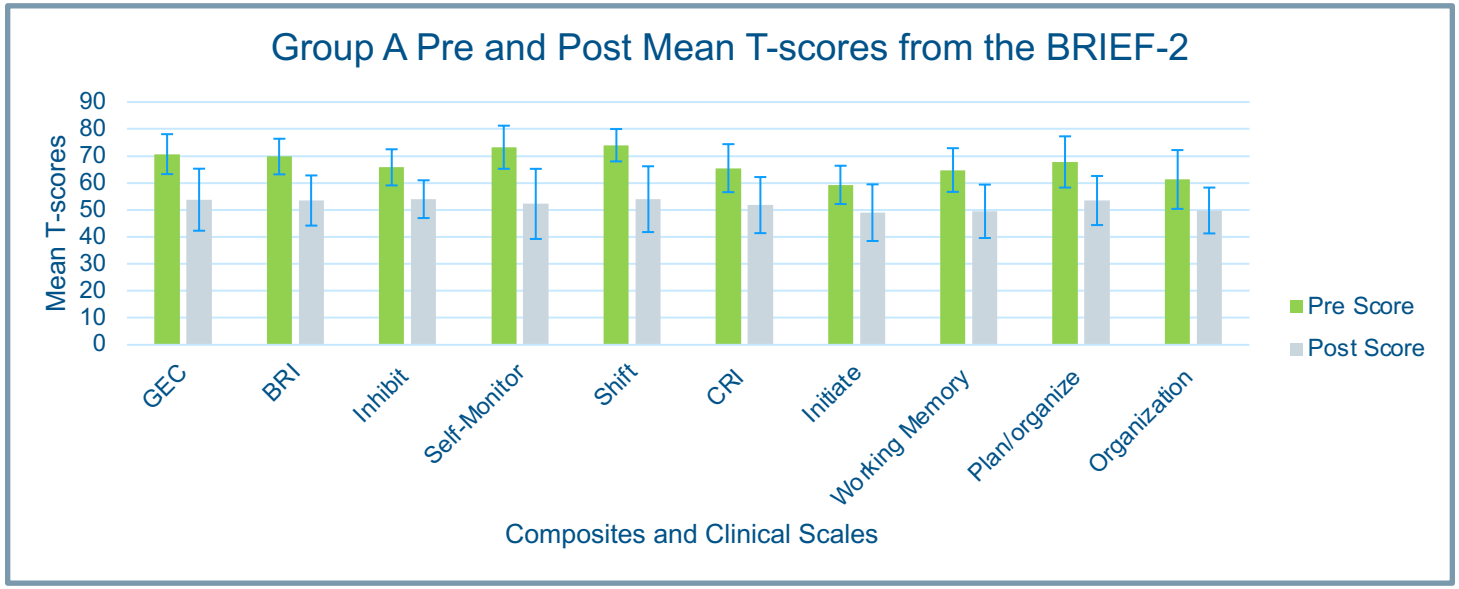

Figure 4: Group A pre and post mean T-scores from the BRIEF-2.

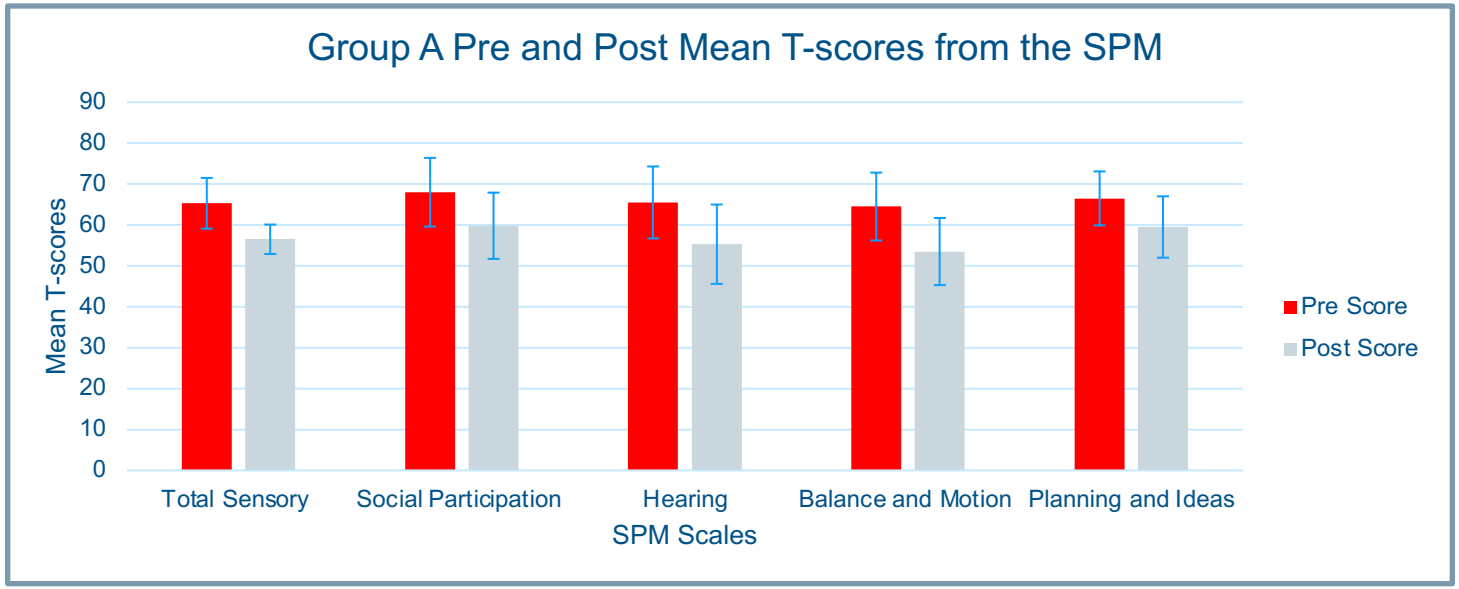

Figure 5: Group A pre and post mean T-scores from the SPM.

Results: Group B

Assessment	Group 2 N=3				
	Pre		Post		P-value (two-sided)
	M	SD	M	SD	
Plan/organize	57.3	4.0	48.7	3.5	**0.001
Reach	8.3	1.3	11.6	2.2	0.044

Table 4: Significant p-values from the T-tests from group B.
** Sig. after Bonferroni correction for multiple corrections

SPM

Reach

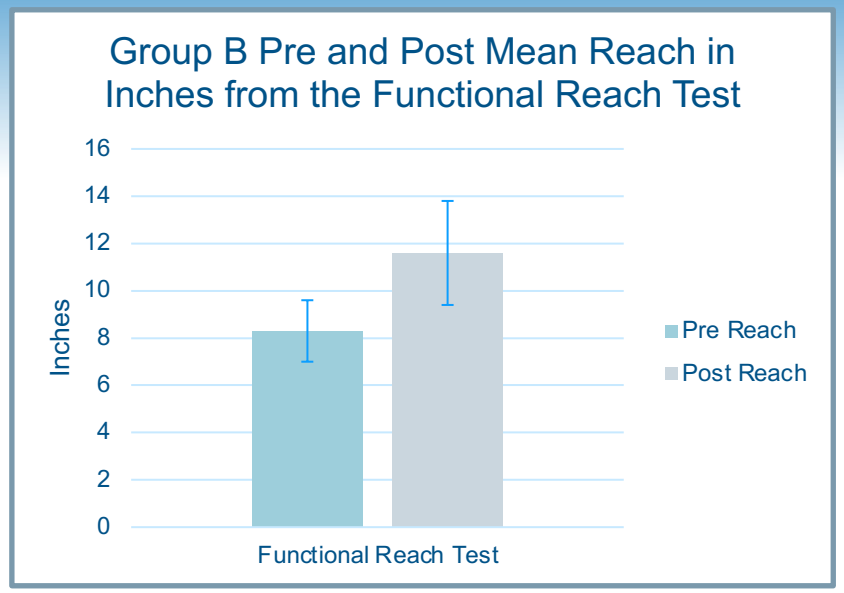

Figure 9: Group B pre and post mean reach in inches from the Functional Reach Test.

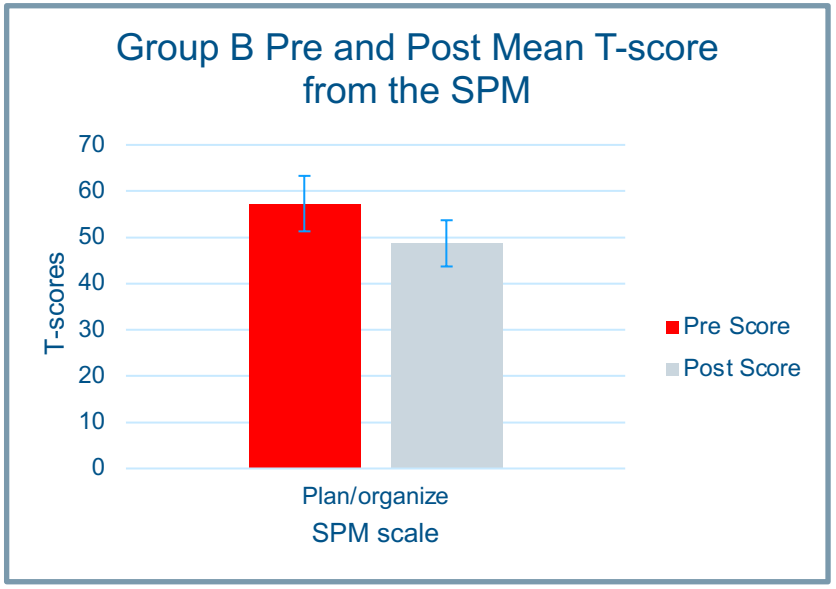

Figure 10: Group B pre and post mean T-score from the SPM.

Summary

Combined Group A and Group B
- **Executive functioning skills**
- Sensory Processing Skills
- Body Coordination

Group A
- **Executive functioning skills**
- Sensory Processing Skills: Praxis and Proprioceptive

Group B
- Planning/organizing
- Dynamic balance

Evidence
- Improved executive functioning and self-esteem in children diagnosed with ADHD

(Aviv, Katz, & Berant, 2021)

Impact

Picture 1: Horse anatomy labeling activity improved organization of materials, problem-solving, and recall memory

Picture 2: Activities around the horse improved attention, processing auditory stimuli (hearing), emotional control, inhibition, and self-monitoring skills

Picture 4: Social activities with horses improved social participation, plan/organization, working memory, inhibit, and self-monitor skills

Picture 3: Teamwork activities improved self-monitoring, task-monitoring, and initiation

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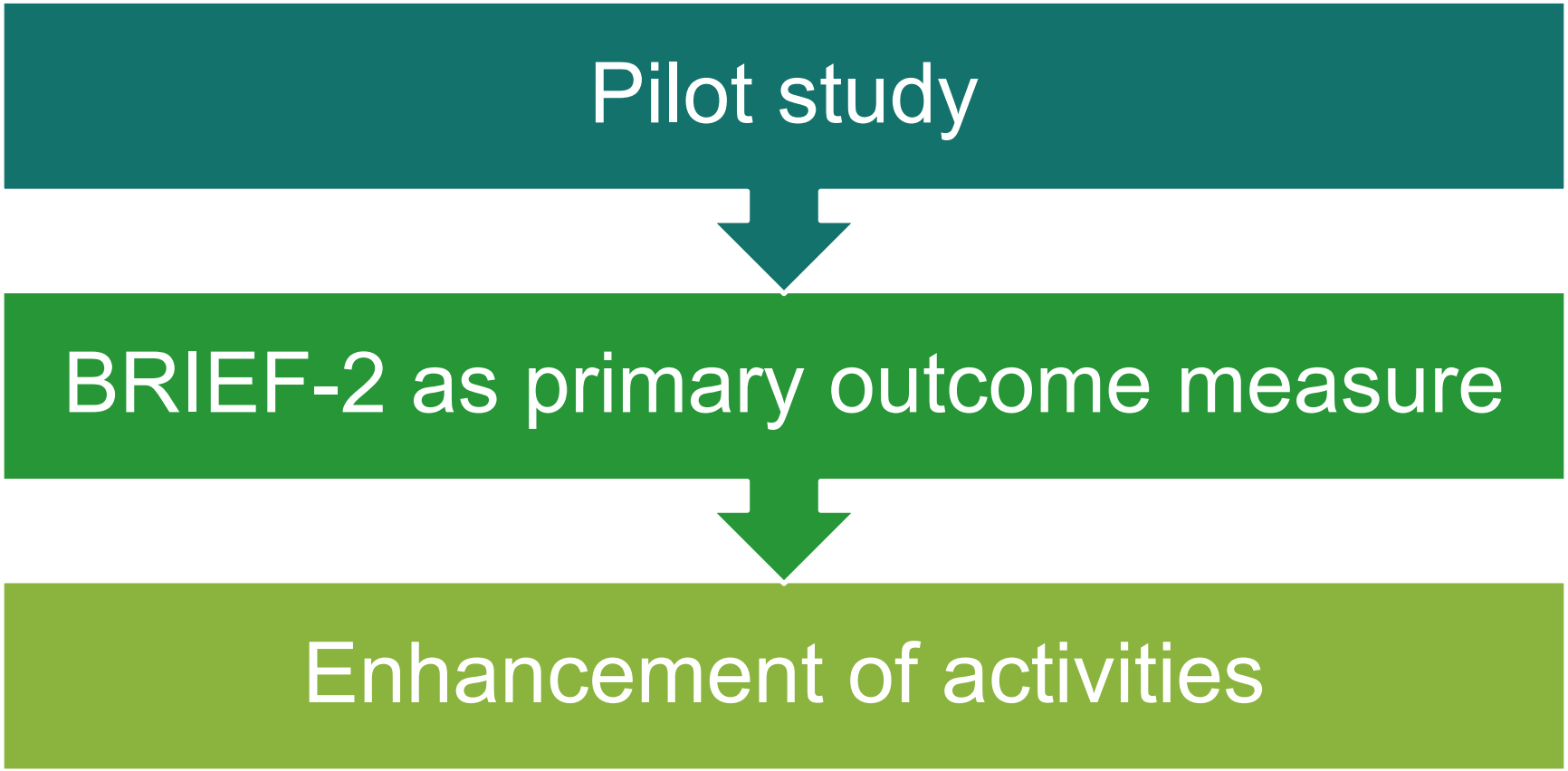
Impact


Pilot study
BRIEF-2 as primary outcome measure
Enhancement of activities

Dissemination

Presentation with CATR staff

Written summary

AOTA special interest section article

Closing

A final thank you to my faculty mentor Dr. Patty Coker-Bolt, my site mentor Anja Cain, and my capstone coordinator Dr. Hazel Breland.

This concludes my doctoral capstone project presentation. I welcome your questions and any feedback.

References

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