

Development and evaluation of a mind-body awareness intervention to enhance self-regulation as a mechanism to promote healthy weight among young children.

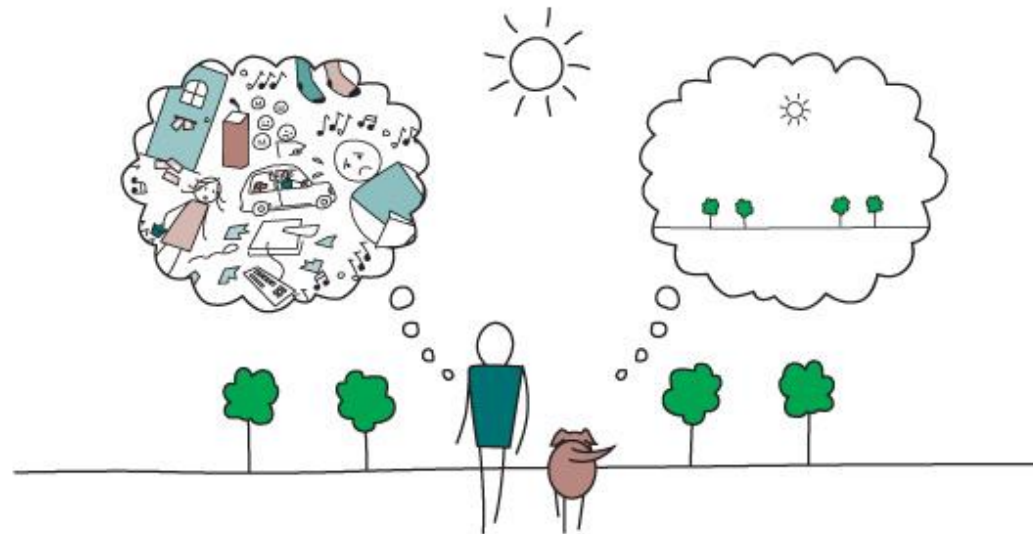


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What is Mindfulness?

o *“Mindfulness means paying attention in a particular way; on purpose, in the present moment, and nonjudgementally.”*

o Jon Kabat-Zinn (1994)



Mind Full, or Mindful?

Mindful Yoga: Background

- Mindfulness-based practice (MBP), including meditation and yoga, share goal of promoting **attention**.
 - effective in promoting SR skills and mental health among adults
 - believed to be feasible among children and adolescents (Greenberg & Harris, 2011).
- Results from rigorously evaluated school-based interventions suggest that MBP can be effective in enhancing EF among older children (Flook et al., 2010; Mendelson et al., 2010).

What is Mindful Yoga?

- Incorporates
 - Hatha Yoga movements to increase flexibility and body awareness
 - Meta cognition (thinking about what you are thinking)
 - Breathing techniques to increase attention, concentration, and self-regulation



Mindful Eating

- Using all your senses in choosing to eat food that is both satisfying to you and nourishing to your body.
- Acknowledging responses to food (likes, dislikes, neutral) without judgement.
- Becoming aware of physical hunger and satiety cues to guide your decision to begin and end eating.

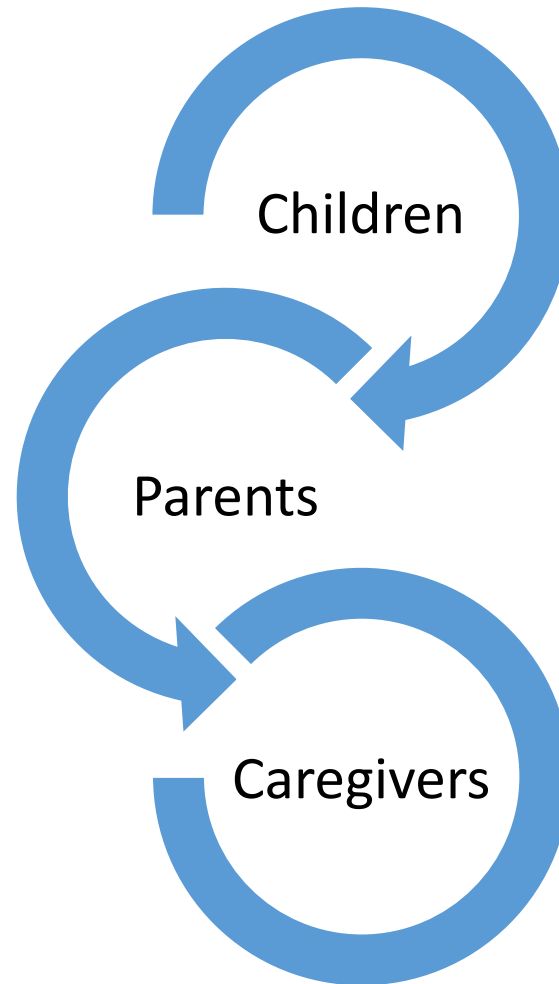


Goal

- Adapt and further develop a MBP involving mindful eating and yoga for use with children aged 3-5 years.
- Sites
 - Child care centers in Onondaga County
 - Intervention: Jewish Community Center CCC
 - Control: Rothschild Early Education and CCC



Participants



Child Measures

Height, Weight,
BMI

Eating in the
Absence of
Hunger (EAH)

Head Shoulders
Knees and Toes
(HSKT)

Eating in the Absence of Hunger Task

I am really hungry!
My belly feels very empty and is rumbling!

I am quite hungry
and my belly feels a little empty.

I feel just right,
not too hungry
and not too full.

I am quite full, but
there is still a little room
in my belly.

I am not hungry at all! My
belly feels very full and I
cannot eat any more
food!

(1) (2) (3) (4) (5)

● - Food in Teddy's belly



Parent Measures

Demographics

Child Eating
Behavior
Questionnaire
(CEBQ)

Behavior Rating
Inventory of
Executive
Function –
preschool
version (BRIEF-P)

Child 3-day
Food Records

Caregiver Measures

Process

Improvements

MBP Intervention – Six Weeks

Mindful Eating

- 1) Mindful Tasting
- 2) Go Foods Slow Foods
- 3) Go Fruits
- 4) Go Vegetables
- 5) Go Grains
- 6) Listening to Our Bodies

Yoga



Participants

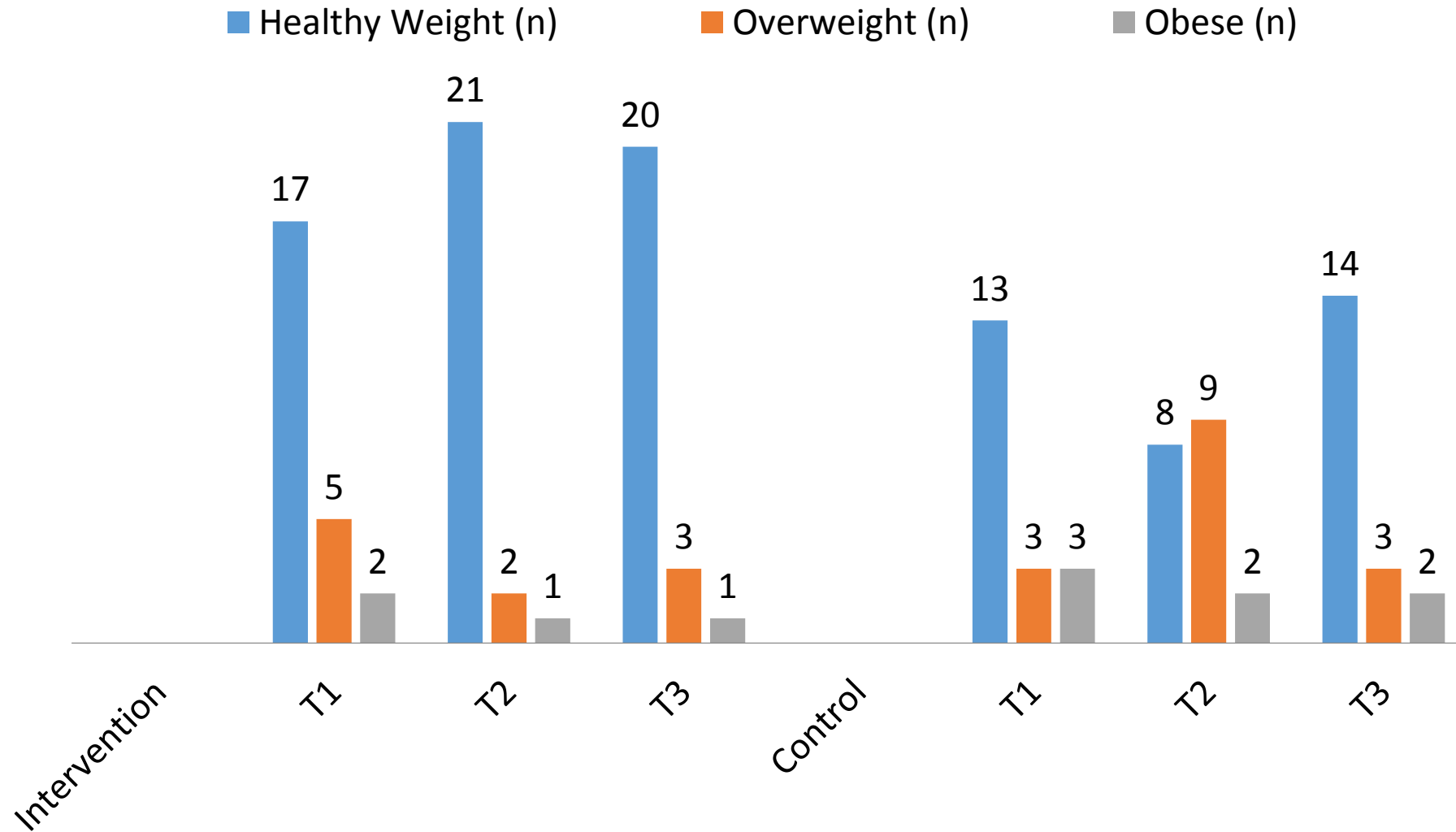
	Children (n)	Parents (n)
Pre-assessment (T1)		
Invention	24	19
Control	19	13
Post-assessment (T2)		
Intervention	24	9
Control	20	10
Follow-up (T3)		
Intervention	24	14
Control	19	12

Results: Weight Status and BMI

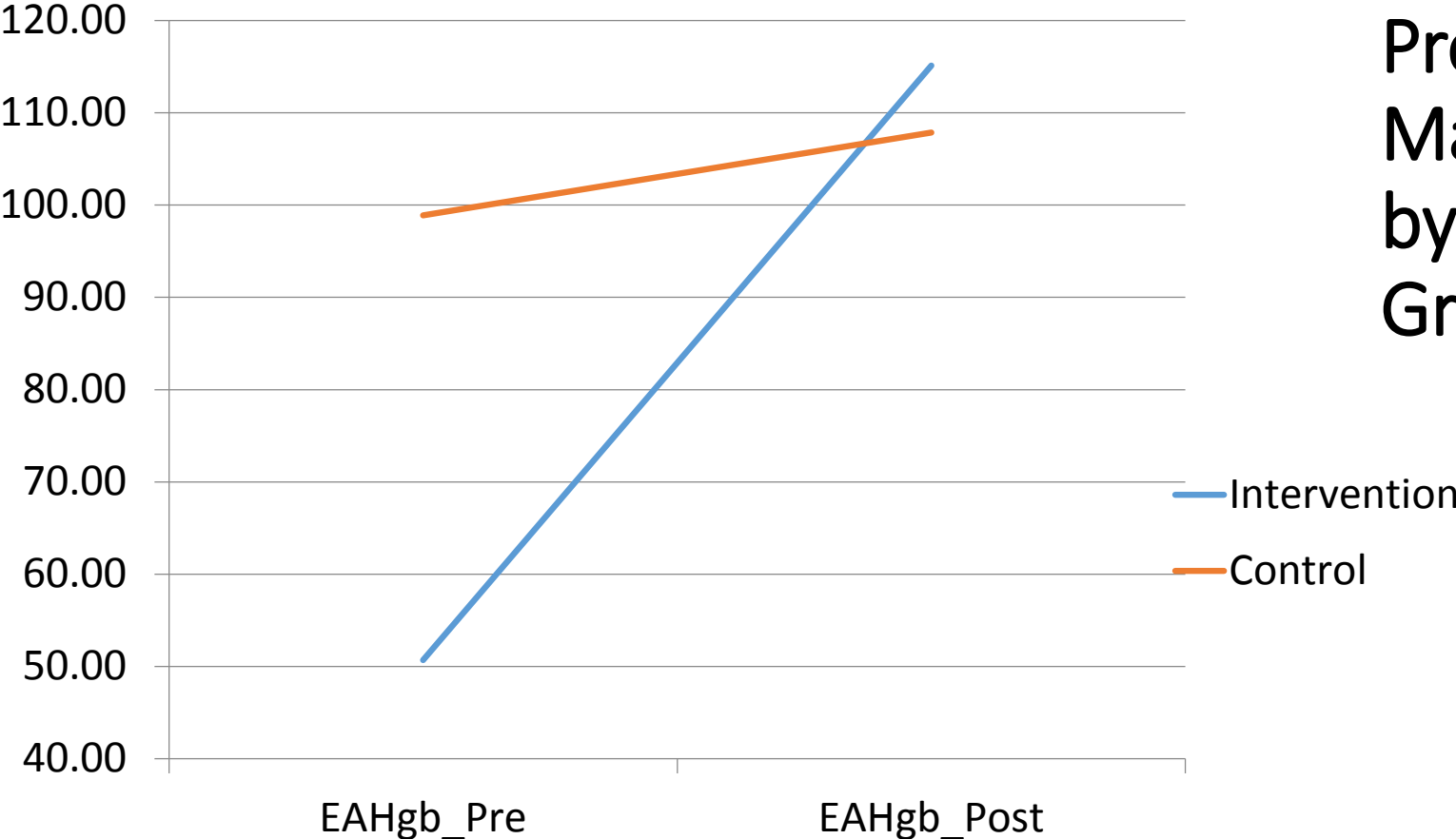
- BMI and weight status
 - No significant changes for either group
 - pre- to follow-up
 - Chi-square analysis revealed significant pre-post differences among the intervention group for weight status with a shift toward healthier weight categories

Table 2	Intervention Pre	Intervention Post	Control Pre	Control Post
Weight average	41.3 (4.8)	43 (5.2)	38 (4)	39 (4.3)
BMI	16.0 (.9)	16.0 (.9)	16.6 (2.1)	16.1 (1.3)
BMI percentile	67 (21)	63 (20)	62 (30)	58 (29)

Figure 1. Weight Status by Group Over Time



Pre-Post EAH(Granola Bar) Matched Participant T-Test by Intervention and Control Group



	EAT T1 w/GB	EAH T2 w/GB	
Intervention (n=24)	51 ± 66	115 ± 75	< 0.001
Control (n=20)	107 ± 83	103 ± 81	0.68

Pre-Post EAH (calories consumed)
Matched Participant T-Test by
Intervention and Control Group

	EAH T1	EAH T2	P-value
Intervention (n=24)	26 ± 20	32 ± 37	0.34
Control (n=20)	42 ± 59	36 ± 25	0.21

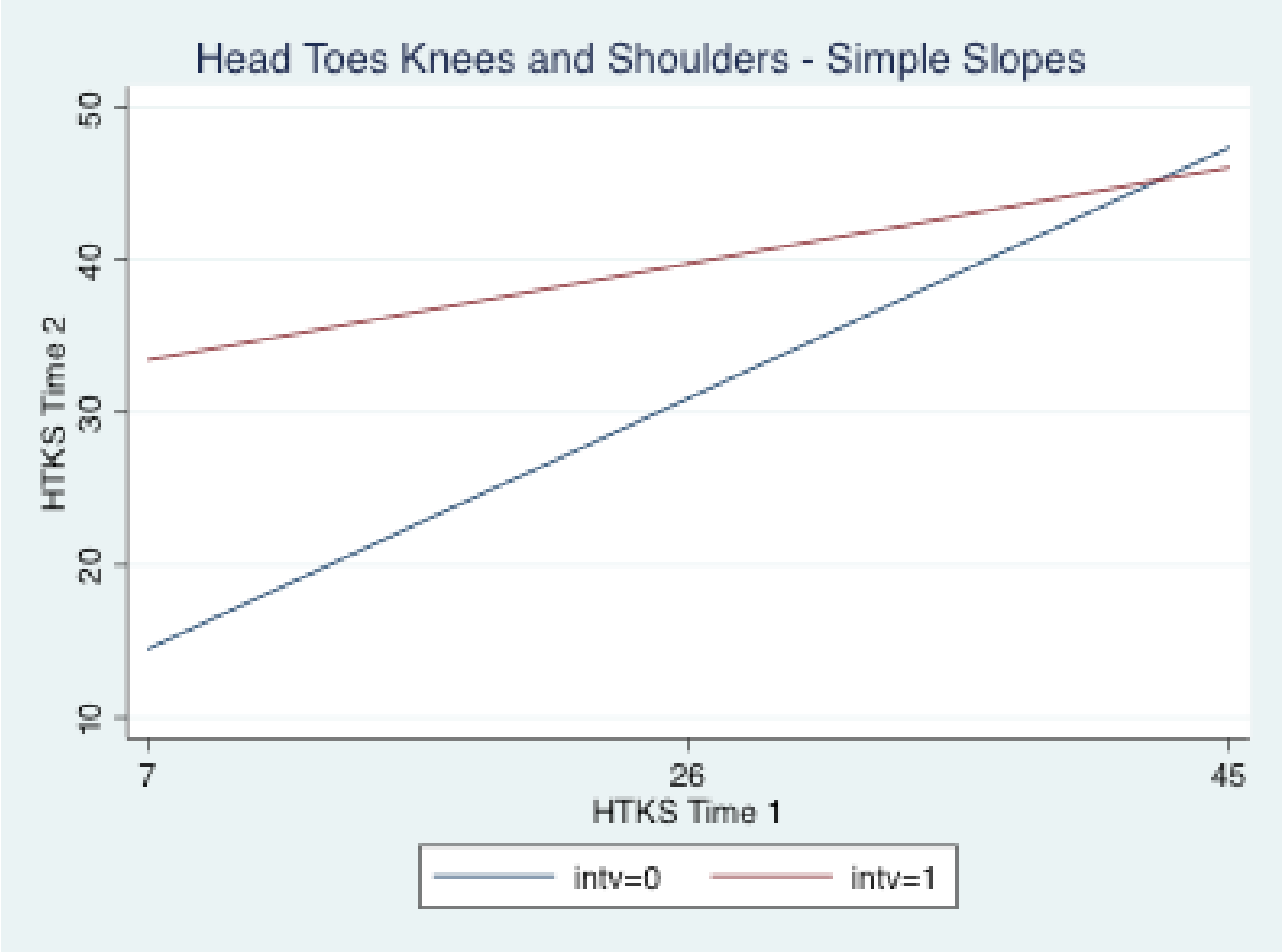
Results: HSKT

- Post-test differences examined via ANCOVA and regression models.
- ANCOVA showed a main effect of the intervention on children's behavioral self-regulation, $F(1, 38) = 4.10, p < .05, \eta^2 = .10$.
- Children's initial score on task was examined as a moderator of the treatment effect via regression
 - the interaction term was significant and had the opposite sign as the main effect of the intervention

Final Regression Model Predicting HTKS Task

Variable	B	SE	β	partial η^2
Group	22.68	6.59	.56***	.24
HTKS time 1	.87	.16	.83***	.43
Sex	-4.84	3.11	-.12	.06
Age	6.62	3.71	.19+	.08
Group x HTKS time 1	-.53	.20	-.58*	.16

+ $p < .10$, * $p < .05$, *** $p < .001$



The intervention was most effective in promoting self-regulation for children with lower levels of initial competence

Results: BRIEF-P

- Raw scores were converted to T-scores based on a standard conversion chart that accounted for child age and sex
- Subscales were combined to form four composite scores:
 - inhibitory self-control
 - emergent metacognition
 - Flexibility
 - global EF
- ANCOVAS did not support significant differences at post-test or follow-up

CEBQ: Means, SD of Selected Subscales

	T1	T2	T3
Food Responsiveness			
Intervention	2.5 (0.6)	2.4 (0.8)	2.6 (0.8)
Control	2.4 (0.8)	2.5 (0.8)	2.9 (0.7)
Satiety Responsiveness			
Intervention	3.0 (0.6)	2.9 (0.5)	3.0 (0.5)
Control	3.2 (0.7)	3.5 (0.5)	3.2 (0.5)
Slowness in Eating			
Intervention	2.9 (0.7)	3.0 (0.9)	2.9 (0.8)
Control	3.2 (0.8)	3.3 (0.7)	3.2 (0.8)

Challenges

- Recruitment time and opportunity
 - We did find two comparable sites to conduct the study
- Parent attrition
 - Contact to the parents went through the child care centers and this lack of direct contact made data collection more difficult
- Teacher participation
 - No teachers participated in the online survey



Next Steps

- Finalize manuscript (*Journal of Nutrition Education and Behavior*)
 - Additional analyses examining association between BRIEF and CEBQ (at baseline for all)
- Grants
 - R21 Exploratory/Development Research Grant application targeting child obesity
 - Private Foundation opportunities



- David B. Falk College of Sport and Human Dynamics Research Center
- Mentor: Katie McDonald
- Yoga Instructor: Julie Daniel
- Research assistants
 - Ashley Russo
 - Kimberly Raymond
 - Rachel Martin
 - Patricia Exy
- Teachers and Staff at the JCC and RECC
- Parents and Children at the JCC and RECC

