

# Consider BMI change when evaluating nutrition intervention impact on eating competence: Findings of an intervention with eating competence constructs for adults

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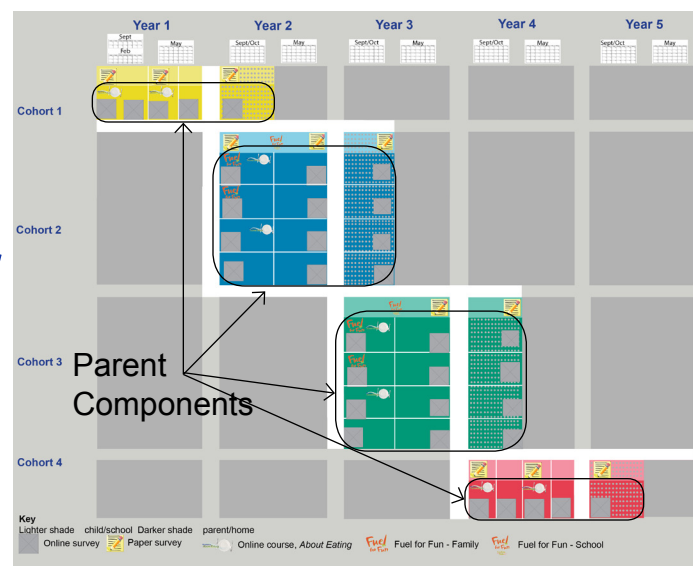


BACKGROUND

Eating competence (EC) is “a comprehensive model addressing eating attitudes and behaviors that focuses not on nutrients, portion size, or food groups, but rather on enjoying food and eating, paying attention to variety in the diet, attending to signals of hunger and satiety, and preparing meals and snacks regularly with some attention to nourishing food and the environment in which it is consumed.”<sup>1</sup> Instilling EC is important because studies show that being eating competent is a proxy for many practices associated with a healthful lifestyle, e.g., being more physically active, better sleep quality, less emotional and uncontrolled eating, feeling less stressed, lower BMI, and lower blood pressure.<sup>2</sup> However, few interventions have been developed to enhance EC and traditional nutrition education does not usually address EC tenets. Additionally, the limited studies of intervention impact on EC<sup>3,4</sup> as assessed by the validated<sup>2</sup> Satter Eating Competence Inventory (ecSI 2.0™), identify temporal and confounder issues, e.g., amount of time between intervention conclusion and assessment, food security status.

OBJECTIVE

The purpose of this project was to examine change in adult EC over a 12 month period following participation in a controlled 7-month nutrition education intervention<sup>5</sup> theoretically aligned with the Satter Eating Competence Model.



Parents of 4<sup>th</sup> grade youth in a cluster-randomized impact assessment of a 7 month school-based culinary and physical activity intervention were assigned to 1 of 4 incrementally complex treatments that included some components congruent with EC tenets. An online survey included the ecSI 2.0™ and validated or tested measures of physical activity, stress, diet quality, modeling of dietary behaviors, self-efficacy (SE) to offer fruits and vegetables, and self-reported height/weight. EC was defined as ecSI 2.0™ ≥ 32. Measures were completed at baseline (BL), 7 months post-intervention (FU1) and 5 months later (FU2). SPSS 24.0 analyses included repeated measures general linear modeling, means testing, chi square, Pearson correlation.

METHODS

### PARENT INTERVENTIONS

#### About Eating Groups (includes EC tenets)

1. *About Eating* - a 6-lesson online curriculum with eating competence tenets that focused on weight acceptance, food variety, eating enjoyment, physical activity, contextual skills of food and meal management, internal cues of hunger and satiety. (n=111)
2. *About Eating* and Family Component (n=104)



#### Groups without About Eating (does not include EC tenets)

3. Family Component- A family-based intervention including a blog, action packs from school to family, recipes, twice yearly family fun nights at school including physical activity and cooking. (n=30)
4. No intervention (n=171)



RESULTS-SAMPLE

Sample Description at baseline (n=416)  
~Female - 86%  
~Age 39.1 ± 5.9  
~94% white; 8% Hispanic  
~94% Some college or more; 30% postgraduate studies  
~48% overweight or obese  
~29% used 1 or more income-based assistance program  
~18% SNAP participants  
~16% often or always worry about \$ for food  
EC tenets were supported with baseline ecSI 2.0™ scores associated with less stress, lower BMI, less overweight/obesity, greater physical activity, greater self-efficacy and modeling behaviors (all P<0.01). At both FU1 (n=220) and FU2 (n=221) ecSI 2.0™ scores were higher with less stress, lower BMI, greater self-efficacy and modeling behavior (all P<0.01) and greater physical activity (P=0.001 FU1, P=0.09 FU2). At baseline, 53% were considered EC, with 57% EC at FU2.

RESULTS-CHANGE IN EATING COMPETENCE

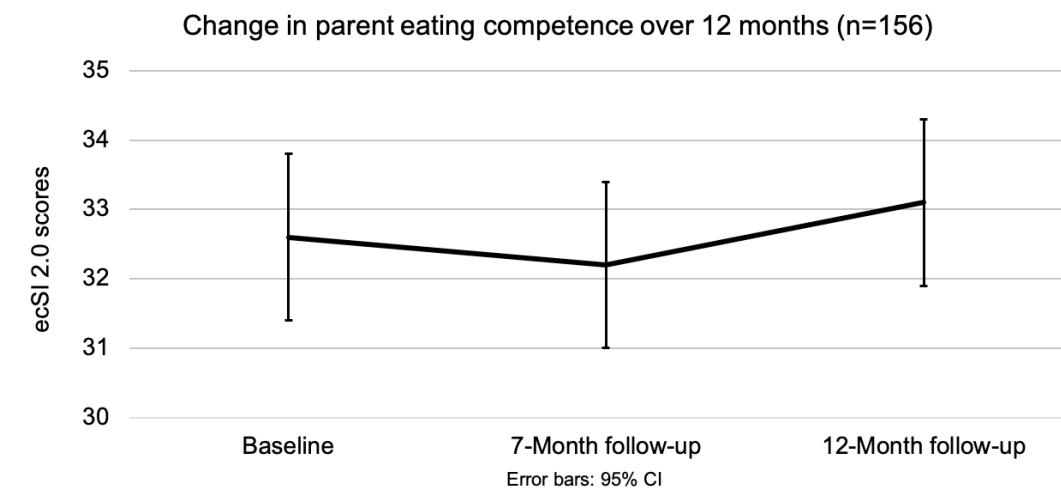


Figure 1. Overall, pattern of change in the 156 completing BL, FU1 and FU2 was similar to earlier studies<sup>3,4</sup> with an initial decline, then rebound, but not overall statistically significant (P=0.09).



Figure 2. A non-significant (P=0.2) difference in pattern of change was observed between parents in the *About Eating* groups (*About Eating* or *About Eating* + Family) vs the non-*About Eating* groups (Family or No Treatment)

As shown in Table 1, change in ecSI 2.0™ from baseline to 12-month follow-up was significantly greater for parents in *About Eating* than those assigned to other groups. Parents in the non-*About Eating* groups had a significantly greater increase in BMI than parents in the *About Eating* groups. However, when controlling for change in BMI, the group differences in ecSI 2.0™ score changes were not significant.

Table 1. Change from Baseline to 12 months

	About Eating (n=110)	Non-About Eating (n=109)	P
ecSI 2.0™	1.27 ± 4.75	-0.29 ± 5.95	0.038
BMI	.00 ± 1.57	0.41 ± 1.4	0.047

RESULTS-CHANGE IN EATING COMPETENCE

BL to FU2 ecSI 2.0™ change was not significant when controlling for changes in stress or physical activity. However, compared to those with increased FU2 BMI, ecSI 2.0™ tended (P=0.06) to increase when BMI was decreased or unchanged, even when controlling for BL BMI. Pattern of change in eating competence differed between *About Eating* and non-*About Eating* groups when status of BMI change was considered (P=0.003).

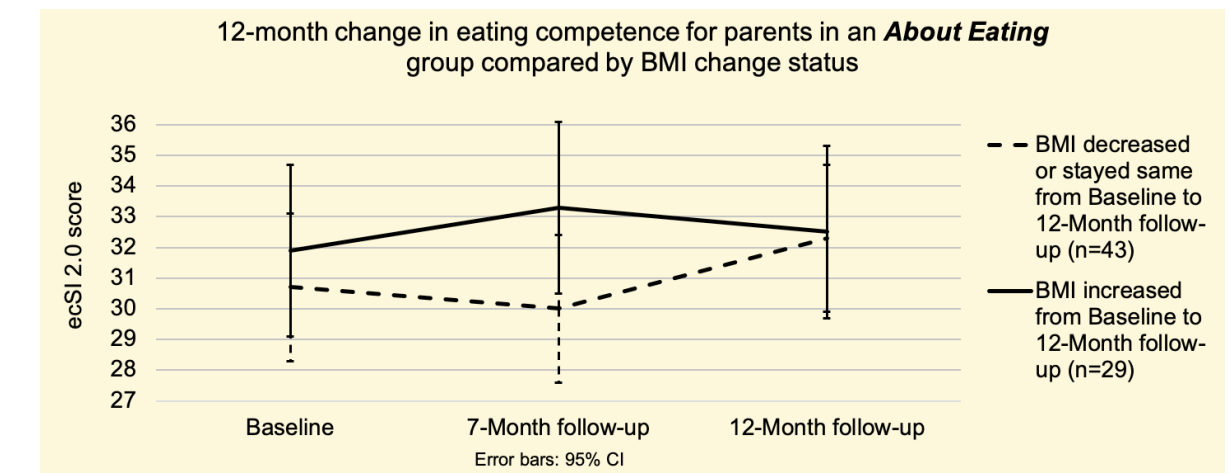


Figure 3

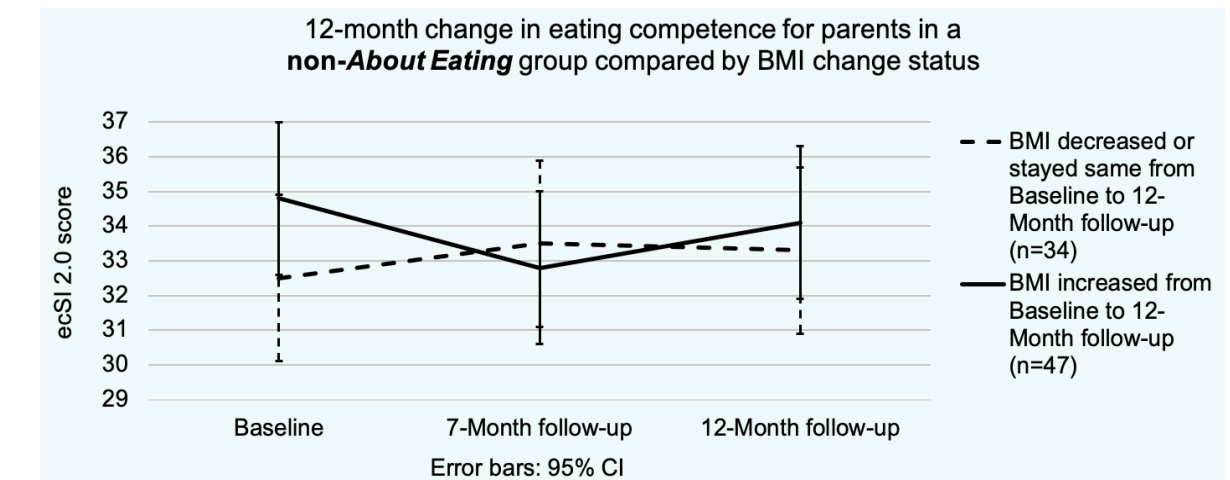


Figure 4

BL to FU2 ecSI 2.0™ change was inversely related to BMI change (r= -0.17, P=0.015, n=206). ecSI 2.0™ tended to decrease for control, but increase for intervention parents (P=.07; - .34 vs. 1.05), but not when controlling for BMI change.

CONCLUSIONS

~ An intervention with attention to EC congruent tenets showed modest effect on ecSI 2.0™ suggesting that successful programs require attributes that directly align with EC.  
~ These programs may be uniquely different from traditional nutrition education.  
~ Accurate EC intervention assessment required consideration of BMI change.

REFERENCES

1. Satter E. Eating competence: definition and evidence for the Satter Eating Competence model. *J Nutr Educ Behav.* 2007;39(suppl 5):S142-S143.
2. Godleski S, Lohse B, Krall J. Confirmatory factor analyses support a 4-factor structure of the Satter Eating Competence Inventory™ and migration of an internal regulation item to the eating attitudes subscale. *J Nutr Educ Behav.* 2019;51(8):1003-1010.
3. Lohse B, Krall JS, Psota T, Kris-Etherton PM. Impact of a weight management intervention on eating competence: Importance of measurement interval in protocol design. *Am J Health Promot.* 2018; 32(3):718-728.
4. Lohse B, Belue R, Smith S, Wamboldt PM, Cunningham-Sabo L. About Eating: An online program with evidence of increased food resource management skills for low-income women. *J Nutr Educ Behav.* 2015;47(3):265-272.
5. Cunningham-Sabo L, Lohse B, Smith S, Browning R, Strutz E, Nigg C, Balgopal M, Kelly K, Ruder E. Fuel for Fun: A cluster-randomized controlled study of cooking skills, eating behaviors, and physical activity of 4th graders and their families. *BMC Public Health.* 2016. 16:444; DOI: 10.1186/s12889-016-3118-6. <http://www.biomedcentral.com/1471-2458/16/444>.

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