



Adolescents with Higher Alternate Healthy Eating Index For Taiwan (AHEI-T) Scores Have Less Obesity Risk

Yu-Pin Hsu, De-Zhi Weng, Pin-Chen Kuo, Pei-Yu Wu, Shwu-Huey Sherry Yang
School of Nutrition and Health Sciences, Taipei Medical University

Introduction

Obesity is one of the major public health issues and a preventable risk factor of diabetes and cardiovascular disease (CVD). The obesity adolescents have significantly higher risk being obesity adults in the future than those with body weight in the normal range.

Diet is the main cause of obesity. It is more reasonable that multiple dietary components contribute to obesity, but not only a single dietary component. Alternate Healthy Eating Index (AHEI) is a simple tool to assess the diet quality, and is modified from national dietary guideline. We modifies the AHEI according to the latest dietary guideline in Taiwan and names it as Alternate Healthy Eating Index for Taiwan (AHEI-T). In the past, we have showed that the AHEI-T score could represent the dietary quality and is negatively associated with CVD risk factors in Taiwan adults.

Objective

To find out if the correlation between AHEI-T score and the prevalence of obesity.

Methods

Six hundred and twenty-eight junior high school students in north Taiwan were recruited. The anthropometric data and self-reported dietary records were collected. Subjects with body mass index (BMI) more than 24 kg/m², or waist circulation more than 80 cm in girl and 90 cm in boy, or body fat more than 30% in girl and 25% in boy was considered obesity. Fifty subjects completed their dietary records.

The scores of AHEI-T were calculated by self-reported 3-days dietary records (2 weekdays and 1 weekend). The range of score was from 2.5 to 97.5. Besides, dietary energy, protein, carbohydrate and fat were evaluated by the Database for Taiwan Area Food Nutritive Subjects were dichotomy by AHEI-T score. The odds ratio was calculated to determine the effect of AHEI-T score on obesity. p < 0.05 was considered as statistically significant.

Table 1. The number of obesity adolescents

Obesity criteria	n
Body mass index > 24 kg/m ²	24
Body fat	
Male > 25%	9
Female > 30%	9
Waist circumference	
Male > 90 cm	9
Female > 80 cm	10

Results and Discussion

Fifty subjects completed the study, and twenty-four subjects were boys. Twenty four adolescents had overweight, and it was the major obesity problem among this population (table 1).

The table 1 showed that the AHEI-T score was significantly negative correlated with body weight, BMI, body fat percentage, and the circumference of waist (p < 0.05). The previous studies show the inverse associations with body weight, BMI, and waist circumference for whole grains and cereal fiber. The cereal fiber is one of the nine components in AHEI-T. The dietary fiber could increase feelings of fullness that may contribute to lower energy intake and less obesity risk.

The cut-point score of AHEI-T was 42.9 (table 2). Subjects with AHEI-T ≥ 42.9 were 4.2 times as likely to have BMI < 24 kg/m², and 2.7 times as likely to have lower body fat percentage (girl < 30%, boy < 25%) compared with others with AHEI-T < 42.9 (p <0.05). Forty two point nine of AHEI-T score may be a good predictor of lower obesity risk. Obesity is a well known CVD risk factor. The AHEI score is documented to predict the risk of CVD.

Conclusion

Adolescents with higher AHEI-T score had less obesity risk. AHEI-T may also be a good dietary index for evaluating the improvement of obesity in adolescents.

Table 2. The correlation between AHEI-T score and the anthropometric variables¹

	BW	BF	WC	HC	WH	BMI
AHEI-T	-0.37*	-0.33*	-0.33*	-0.34*	-0.28	-0.31*

¹AHEI-T= the Alternate Healthy Eating Index for Taiwan, BW=Body weight, BF=Body fat, WC=Waist circumference, HC= Hip circumference, WH=Waist-hip ratio, BMI=Body mess index.
*p < 0.05, statistical analyzed by Spearman rank correlation.

Table 3. Odds ratio of different non-obesity criteria according to AHEI-T score was more than 42.9^{1, 2}.

Recommendation		AHEI-T		p for trend ³
		< 42.9	≥ 42.9	
n		25	26	
AHEI-T		38.6 ± 0.5	48.4 ± 1.1	
Range		33.2 - 42.8	42.9 - 69.1	
Body fat (%)	♀ < 30 ♂ < 25	1 (reference)	3.7 (1.10-12.70)	0.03
BMI (kg/m ²)	< 24	1 (reference)	5.2 (1.44-18.81)	0.02
WC (cm)	♀ < 90 ♂ < 80	1 (reference)	3.1 (0.94-10.22)	0.07

¹Mean ± SE, and odds ratio with 95% confidence interval.
²AHEI-T= the Alternate Healthy Eating Index for Taiwan, BMI= Body mess index, WC=Waist circumference.
³Statistical analyzed by logistic regression.