The Alternate Healthy Eating Index for Taiwan (AHEI-T) score for evaluating dietary behavior and quality in community and clinic

Chang SY[1], Lei WS [1], Chen CY[1], Yang SH*[1], Huang HT[2]
[1]School of Nutrition and Health Sciences, Taipei Medical University [2]Taiwan Adventist Hospital

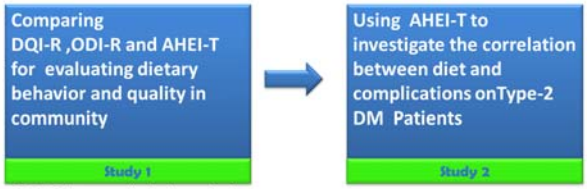
Introduction

Diet was culturally determined, the general dietary habits of a population needed to be considered when the index items and their calculate range were determined. Dietary pattern plays an important role in the development and prevent chronic disease. Diet index is a useful tool that can convert complex dietary data into a single index, and it can represent dietary quality. It is generally based on dietary recommendations designed to reduce the risk of chronic diseases. Alternate Healthy Eating Index for Taiwan (AHEI-T) was constructed which based on AHEI, a dietary index and Dietary Guidelines for Taiwanese

Purpose

To evaluate the correlation between AHEI-T and blood pressure, blood glucose and serum lipid profile in community and Type 2 DM patients in Taiwan.

Subjects and Methods



DQI-R: Dietary quality index-revised
ODI-R: Overal l dietary index-revised

There were 2 studies were conducted; first study recruited 32 subjects from adults participating in the NEWSTART program from July 2008 to January 2009, second study held in Taipei Medical University Hospital from July 2008 to March 2010. Three 24-hour dietary recalls by telephone interviews and 3-day dietary records were used to collect dietary data and compared the changes in components, scores, and total AHEI-T scores.

Results

Table. Comparison of total score of DQI-R, AHEI and ODI-R during dietary changes[1]

Index	Time point[2] (n = 32/time)			
	T_0	T_1	T_2	T_3
DQI-R	71.4 ± 2.1[b]	85.5 ± 0.6[a]	76.9 ± 1.8[b]	74.7 ± 2.1[b]
AHEI-T	50.3 ± 1.7[c]	71.2 ± 0.6[a]	57.2 ± 1.4[b]	54.2 ± 5.3[bc]
ODI-R	67.8 ± 1.6	70.6 ± 0.6	70.8 ± 1.5	68.4 ± 1.8

[1]All values are mean ± SE. In each row, values sharing different superscript letters are significantly different from one another by repeated one way ANOVA and Bonferroni's test at $p < 0.05$.
[2]T_0, before NEWSTART; T_1, during NEWSTART; T_2, first month after NEWSTART; T_3, third month after NEWSTART.

The results suggested that AHEI assess the diet quality during dietary changes more immediately and significantly. A high score of Alternate Healthy Eating Index for Taiwan (AHEI-T) reflected better control of PC-sugar among Type 2 DM patients.

Table 9. Odds ratio of glycemic with good control according to quartiles of AHEI-T score. [a, b, c]

	ADA recommendation	Q1	Q2	Q3	Q4	p for trend
n		49	49	49	49	
AHEI-T score		32.2 ± 4.8	41.9 ± 3.0	50.1 ± 1.3	57.8 ± 4.4	
Range		18.0 - 37.5	37.6 - 46.7	46.8 - 52.5	52.6 - 70.5	
Glycemic						
A1C	<7%	8 (16.3%)	12 (24.5%)	13 (26.5%)	14 (28.6%)	0.6607
Unadjusted		1 (Referent)	1.66 (0.61-4.51)	1.85 (0.69-4.97)	2.05 (0.77-5.46)	
Model A [d]		1 (Referent)	1.32 (0.43-4.10)	1.63 (0.60-4.44)	1.72 (0.64-4.67)	
Model B [e]		1 (Referent)	1.62 (0.47-5.56)	1.22 (0.35-4.22)	1.71 (0.54-5.47)	
AC-sugar	<130 mg/dL	20 (40.8%)	13 (26.5%)	18 (36.7%)	22 (44.9%)	0.8187
Unadjusted		1 (Referent)	0.52 (0.22-1.23)	0.84 (0.37-1.90)	1.18 (0.53-2.63)	
Model A		1 (Referent)	0.49 (0.19-1.24)	0.95 (0.40-2.25)	1.18 (0.48-2.88)	
Model B		1 (Referent)	0.41 (0.15-1.15)	0.94 (0.32-2.76)	1.65 (0.51-5.34)	
PC-sugar	<180 mg/dL	20 (40.8%)	20 (40.8%)	23 (46.9%)	27 (55.1%)	0.0422
Unadjusted		1 (Referent)	1.00 (0.45-2.24)	1.28 (0.58-2.85)	1.78 (0.80-3.96)	
Model A		1 (Referent)	1.02 (0.43-2.44)	1.65 (0.69-4.01)	2.18 (0.91-5.25)	
Model B		1 (Referent)	0.82 (0.33-2.04)	1.36 (0.45-4.09)	3.38 (1.09-10.48)	

a. Values are number (percentage), mean ± SD, and odds ratio with 95% confidence interval.
b. Trend test was calculated by using logistic regression.
c. AHEI-T = Alternate Healthy Eating Index for Taiwan, ADA = American diabetes association, A1C = glycated hemoglobin, AC-sugar = preprandial blood glucose, PC-sugar = postprandial blood glucose, HDL-C = high-density lipoprotein cholesterol, LDL-C = low-density lipoprotein cholesterol.
d. Model A = sex and age (quartiles) adjusted.
e. Model B = Model A + energy (quartiles).

Table 9. Odds ratio of glycemic with good control according to quartiles of AHEI-T score. [a, b, c]

	ADA recommendation	Q1	Q2	Q3	Q4	p for trend
n		49	49	49	49	
AHEI-T score		32.2 ± 4.8	41.9 ± 3.0	50.1 ± 1.3	57.8 ± 4.4	
Range		18.0 - 37.5	37.6 - 46.7	46.8 - 52.5	52.6 - 70.5	
Glycemic						
A1C	<7%	8 (16.3%)	12 (24.5%)	13 (26.5%)	14 (28.6%)	0.6607
Unadjusted		1 (Referent)	1.66 (0.61-4.51)	1.85 (0.69-4.97)	2.05 (0.77-5.46)	
Model A [d]		1 (Referent)	1.32 (0.43-4.10)	1.63 (0.60-4.44)	1.72 (0.64-4.67)	
Model B [e]		1 (Referent)	1.62 (0.47-5.56)	1.22 (0.35-4.22)	1.71 (0.54-5.47)	
AC-sugar	<130 mg/dL	20 (40.8%)	13 (26.5%)	18 (36.7%)	22 (44.9%)	0.8187
Unadjusted		1 (Referent)	0.52 (0.22-1.23)	0.84 (0.37-1.90)	1.18 (0.53-2.63)	
Model A		1 (Referent)	0.49 (0.19-1.24)	0.95 (0.40-2.25)	1.18 (0.48-2.88)	
Model B		1 (Referent)	0.41 (0.15-1.15)	0.94 (0.32-2.76)	1.65 (0.51-5.34)	
PC-sugar	<180 mg/dL	20 (40.8%)	20 (40.8%)	23 (46.9%)	27 (55.1%)	0.0422
Unadjusted		1 (Referent)	1.00 (0.45-2.24)	1.28 (0.58-2.85)	1.78 (0.80-3.96)	
Model A		1 (Referent)	1.02 (0.43-2.44)	1.65 (0.69-4.01)	2.18 (0.91-5.25)	
Model B		1 (Referent)	0.82 (0.33-2.04)	1.36 (0.45-4.09)	3.38 (1.09-10.48)	

a. Values are number (percentage), mean ± SD, and odds ratio with 95% confidence interval.
b. Trend test was calculated by using logistic regression.
c. AHEI-T = Alternate Healthy Eating Index for Taiwan, ADA = American diabetes association, A1C = glycated hemoglobin, AC-sugar = preprandial blood glucose, PC-sugar = postprandial blood glucose, HDL-C = high-density lipoprotein cholesterol, LDL-C = low-density lipoprotein cholesterol.
d. Model A = sex and age (quartiles) adjusted.
e. Model B = Model A + energy (quartiles).

Conclusion