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The association between diet quality and anthropometric measurements among non-alcoholic fatty liver disease patients with diabetes: a cohort-based cross-sectional study

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Abstract

Background The quantity and quality of diet are directly associated with the development of obesity and diseases. This study aims to investigate the relationship between the Healthy Eating Index-2015 (HEI-2015) and anthropometric measurements, including body mass index (BMI), body adiposity index (BAI), body roundness index (BRI), visceral adiposity index (VAI), a body shape index (ABSI), lipid accumulation product (LAP) index, and triglyceride glucose index (TyG) index in non-alcoholic fatty liver disease (NAFLD) patients with diabetes.

Methods This is a cross-sectional study that was conducted on the baseline data from Fasa cohort study. The socio-demographic, anthropometric, and dietary data of 384 individuals with diabetes and NAFLD were extracted. Multiple linear regression was used in various models adjusted for potential confounders to determine the associations.

Results Out of the 384 eligible individuals, 74.5% were women. The mean age of men was 55.74 ± 7.85 years, whereas that of women was 54.68 ± 8.54 years. After adjusting for possible confounders, including age, marital status, occupation, education status, smoking status, physical activity, and total energy intake, there was no significant association between the quartiles of HEI score and any of the anthropometric measurements, including BMI, ABSI, BAI, BRI, VAI, LAP index, and TyG index among both men and women.

Conclusion Higher HEI score was not associated with anthropometric indices in NAFLD patients with diabetes, according to our findings. It is recommended that further observational studies should be conducted to clarify the current findings.

Keywords Diet, Healthy eating index-2015, Non-alcoholic fatty liver disease, Diabetes, Body weight

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Table 6 Association of HEI with anthropometric indices and biochemical factors in women

Variables		HEI score			
Women		$\beta \pm SE$	R ²	95% CI	p-value
BAI	Crude	0.00 ± 0.614	0.000	-0.006, 0.005	0.942
	Model 1	-0.001 ± 6.261	0.008	-0.006, 0.005	0.843
	Model 2	0.003 ± 0.002	0.703	0.000, 0.006	0.086
BRI	Crude	-0.001 ± 0.001	0.002	-0.002, 0.001	0.409
	Model 1	-0.001 ± 0.001	0.033	-0.003, 0.001	0.349
	Model 2	0.000 ± 0.000	0.770	-0.001, 0.001	0.533
VAI	Crude	0.000 ± 0.001	0.000	-0.003, 0.002	0.783
	Model 1	0.000 ± 0.001	0.012	-0.003, 0.002	0.773
	Model 2	-0.001, 0.001	0.045	-0.003, 0.002	0.668
ABSI	Crude	1.734E-8 ± 0.000	0.002	0.000, 0.000	0.478
	Model 1	2.052E-6 ± 0.000	0.148	0.000, 0.000	0.370
	Model 2	7.931E-7 ± 0.000	0.246	0.000, 0.000	0.719
LAP index	Crude	-0.009 ± 0.027	0.000	-0.061, 0.043	0.731
	Model 1	-0.011 ± 0.027	0.011	-0.064, 0.041	0.670
	Model 2	0.003 ± 0.027	0.073	-0.050, 0.055	0.925
TyG index	Crude	3.718E-5 ± 0.000	0.000	-0.001, 0.001	0.900
	Model 1	1.832E-5 ± 0.000	0.016	-0.001, 0.001	0.951
	Model 2	-2.294E-5 ± 0.000	0.064	-0.001, 0.001	0.939
BMI (kg/m ²)	Crude	-0.003, 0.002	0.006	-0.008, 0.001	0.176
	Model 1	-0.004 ± 0.002	0.020	-0.008, 0.001	0.122
	Model 2	-0.004 ± 0.002	0.041	-0.009, 0.000	0.064
WC (cm)	Crude	-0.001 ± 0.005	0.000	-0.011, 0.009	0.898
	Model 1	-0.002 ± 0.005	0.029	-0.012, 0.008	0.700
	Model 2	0.005 ± 0.003	0.716	-0.001, 0.010	0.076
HC (cm)	Crude	-0.004 ± 0.005	0.003	-0.015, 0.006	0.385
	Model 1	-0.005 ± 0.005	0.016	-0.016, 0.005	0.297
	Model 2	0.002 ± 0.003	0.728	-0.004, 0.007	0.527
WHR	Crude	-3.7113E-5 ± 0.000	0.006	0.000, 0.000	0.191
	Model 1	-3.406E-5 ± 0.000	0.129	0.000, 0.000	0.206
	Model 2	-3.022E-5 ± 0.000	0.136	0.000, 0.000	0.271

Note: Results obtained from multiple linear regression analysis. Data presented as β coefficients (95%) $\pm$ standard error. Model 1: adjusted for age, marital status, last education degree, number of children, physical activity. Model 2: additionally, adjusted for energy intake, and dietary fibre

the current findings, and it is recommended to conduct them.

Abbreviations

ABSI	A Body Shape Index
BAI	Body Adiposity Index
BMI	Body Mass Index
BRI	Body Roundness Index
FBS	Fasting Blood Sugar
HC	Hip Circumference
HDL	High-Density Lipoprotein
HEI	Healthy eating index
LAP	Index Lipid Accumulation Product Index
NAFLD	Non-alcoholic fatty liver diseases
T2DM	Type 2 diabetes mellitus
TC	Total Cholesterol
TG	Triglyceride
TyG	Index Triglyceride Glucose Index
VAI	Visceral Adiposity Index
WC	Waist circumference
WHR	Waist to Hip ratio

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Author contributions

The research conception and design were carried out by MM, RH and NH. Statistical analysis of data were performed by MM. MM, RH, AFS and NH wrote the manuscript. Revision of the manuscript was carried out by RH and NH. All authors read and approved the final version of the manuscript.

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Data availability

The datasets used are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

According to the Declaration of Helsinki, the ethical committee of Shiraz University of Medical Sciences approved consent to participate in the study