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The possible relationship between the healthy eating index-2015 and the 10-year risk of cardiovascular diseases

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Abstract

Background Cardiovascular diseases (CVDs) remain the leading cause of mortality worldwide. This underlies the need to evaluate different targets, such as diet quality. In this regard, we conducted the present study to find whether the healthy eating index-2015 (HEI-2015) score is associated with a 10-year risk of CVDs based on Framingham Risk Score (FRS) and QRISK3 in different body mass index (BMI) groups.

Methods This cross-sectional study was performed based on Shiraz University of Medical Sciences Employees Health Cohort Study (SUMS EHCS) data in April 2020. A total of 764 participants met the inclusion criteria. An expert performed demographic, anthropometric, and dietary evaluations. A semi-quantitative food frequency questionnaire (FFQ) was applied to assess the diet quality, and FRS and QRISK3 were used to evaluate the 10-year risk of CVDs.

Results Based on the results, many components of HEI-2015 indicated an increasing trend through quartiles ($p < 0.001$). However, the consumption of refined grains in higher quartiles showed a decreasing trend ($p < 0.001$). The consumption of added sugar and saturated fatty acids (SFAs) in higher quartiles revealed an increasing trend ($p < 0.001$). In addition, lower HEI-2015 scores and lower whole grain consumption were significantly associated with higher BMI ($p < 0.05$). Also, lower consumption of fruits showed a significant relationship with higher risk scores of Framingham and QRISK3 ($p < 0.05$). Higher added sugar and SFAs intake was significantly related to lower FRS ($p < 0.05$). A significant reverse association between HEI-2015 and QRISK3 and Framingham risk scores was seen ($p < 0.05$).

Conclusion Our findings support dietary recommendations to increase fruit and whole grains intake to prevent CVD and obesity. Moreover, a significant inverse association between HEI-2015 and QRISK3 and Framingham risk scores was observed. Since the results for added sugars and SFA intakes were controversial, further studies are needed.

Keywords Body mass index, Cardiovascular disease, Framingham risk score, QRISK3, Healthy eating index

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Abbreviations

CVDs	Cardiovascular diseases
WHO	World health organization
FRS	Framingham risk score
HEI	Healthy eating index
SUMS EHCS	Shiraz university of medical sciences employees health cohort study
BMI	Body mass index
HDL	High-density lipoprotein cholesterol
LDL	Low-density lipoprotein cholesterol
FFQ	Food frequency questionnaire
SFA	Saturated fatty acid
PUFA	Polyunsaturated fatty acid
MUFA	Monounsaturated fatty acid
SD	Standard deviation
IQR	Interquartile range
CHD	Coronary heart disease

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Authors' contributions
Mohammad Hassan Eftekhari conceived and supervised the study. Pegah Ahmadijoo analyzed and interpreted the data. Seyed Jalil Masoumi conducted and supervised the study and data collecting. Pegah Ahmadijoo, Maryam Ranjbar Zahedani, and Farzaneh Mohammadi wrote the manuscript. All the authors critically revised the manuscript.

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Availability of data and materials
The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
This study was approved by the Ethics Committee of Shiraz University of Medical Sciences, Shiraz, Iran (Code: IR.SUMS.REC.1399.482). The study was also conducted in accordance with the Helsinki Declarations of Ethics. The informed consent form was completed for all the patients.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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