Comparing dietary diversity score (DDS) with healthy eating index (HEI) using data mining techniques

Fatemeh Karimimanesh\textsuperscript{1}, Mohammad Davarpanah Jazi\textsuperscript{2}, Nooshin Mohammadi\textsuperscript{3}

2. Ph.D. in Software Engineering, Assistant Professor, Department of Computer and Information Technology, Foulad Industrial Institute of Higher Education, Fouladshahr, Isfahan, Iran.
3. Ph.D. in Nutrition, Isfahan Cardiovascular Research Center, Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran.

Abstract

Background & Objective: Health databases contain a large amount of clinical data. Investigating the relationships and patterns in these databases can lead to new medical knowledge. Nutrition indicators are designed to evaluate the dietary quality in communities. Metabolic syndrome is a set of risk factors which may increase the risk of heart disease. Inappropriate diet is one of the most important factors in the occurrence of metabolic syndrome. The health industry is constantly producing a large amount of data in medical areas which requires a technique to disclose useful information and important relationships. The aim of this study was to compare the dietary diversity score (DDS) with healthy eating index (HEI) in terms of nutrient intake and assessing the association with metabolic syndrome with the approach of data mining.

Methods: A total of 1019 teenagers between the ages of 11 to 18 years were enrolled in this study. Data were collected using a past 24-hour food frequency questionnaire (FFQ). Nutrition data collection and determination of anthropometric characteristics and medical examinations were performed in Isfahan Cardiovascular Institute. Data were analyzed by TANAGRA data mining tool.

Results: Statistical, regression and classification techniques were used for data exploration. The average score of DDS was 3.98 ± 1.10, while the HEI average was 59.23 ± 8.84 and the prevalence of metabolic syndrome was 17.39%. The average of DDS provided a better nutritional value in comparison to HEI. HEI was more robust in controlling received energy and carbohydrates. DDS was not significantly correlated with any of the components of metabolic syndrome, while HEI was weakly correlated with high waist circumference. High quartiles of HEI could predict a lower risk of metabolic syndrome, while high quartiles of DDS can predict higher risk of metabolic syndrome.

Conclusion: The findings of this study revealed that the DDS score may result in better nutrition uptake while adhering to the HEI was more effective in reducing the risk of metabolic syndrome.

Key words: healthy eating index (HEI), dietary diversity score (DDS), Nutrition uptake, metabolic syndrome, Data mining

Corresponding Author: Fatemeh Karimimanesh
Address: Foulad Industrial Institute of Higher Education, Fouladshahr, Isfahan, Iran.
E-mail: fateme.karimimanesh@gmail.com