عنوان مقاله:

A New Multi-objective Optimization Model for Diet Planning of Diabetes Patients under Uncertainty

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خلاصه مقاله:

Aim: The objective of this paper is to design nutrient-adequate, varied and cost-efficient diets for diabetes patients. Methods: A new multi-objective mixed integer linear programming model under uncertainty is developed to design diet plans for diabetes patients. Findings: The analysis is conducted on the population of 30 years old men and women in 24.99 and 18.5 body mass index, 1.50, 1.65 and 1.80 (m) height categorized in 4 physical activity levels (sedentary, low, active and very active). The objectives of the model are the minimization of the total amount of saturated fat, sugar and cholesterol and the total cost of the diet plans. The constraints of the model are fulfilling the body s nutrient requirements and the diversity control of each patient's diet. In order to get closer to the real world, fuzzy parameters are considered in the model. To solve the model, a new hybrid solution methodology (Jimenez and epsilon-constraint method) is used to offer the optimal Pareto of non-dominated solutions. Each optimal Pareto of the model consists of diet plans that each patient can choose the proper food based on the taste, availability and cost. Conclusion: Mathematical modeling of diet planning and study of its optimal solutions can be considered as a decision support tool for the professionals to design the most proper diet plans.

کلمات کلیدی:

Diet planning problem, Multi-objective fuzzy mixed integer linear programming, Jimenez method, Epsilon-constraint method

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