Effect of Artificial Intelligence Technology in Dietary Management: A Systematic Review of Trials

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ABSTRACT

Introduction: Artificial intelligence (AI) is expected to provide diet-planning solutions via automatic and practical application of professional knowledge, addressing the complexity of optimal diet design. This study aimed to perform a systematic review to evaluate the effect of AI technology in dietary management.

Search Strategy: This study was conducted according to the PRISMA protocol. A comprehensive online search was performed in PubMed-Medline, Scopus, Web of Science, Embase databases, Google Scholar, and the World Health Organization databases from 2014 to September 2024. After searching all databases, 3,893 articles were identified at this stage. Subsequently, after removing 1,078 duplicate articles, 2,815 remained for primary screening. Then after reviewing the titles and abstracts, 34 articles remained to be reviewed for their full text. In the end, in terms of the inclusion criteria, 11 articles were included in this systematic review. The following keywords were used in the search pattern: "Artificial intelligence" OR "Machine learning" AND "Nutrition" OR "Diet" OR "Body weight". We included all English clinical trials and semi-experimental studies to explore the effect of AI technology on dietary management. Exclusion criteria were as follows: (1) in vitro and animal studies, (2) review articles, (3) conference abstracts or other studies lacking full texts, duplicates, letters, and case reports, (4) ongoing studies, and (5) studies whose full text was not available in English.

Results: In the prese review, we investigated 11 clinical trial and semi-experimental studies involving 5,366 participants across intervention and control groups. Two studies were conducted on healthy individuals, one study on obese children, five studies on obese adults, two studies on patients with diabetes, one study on patients with irritable bowel syndrome, and one study on patients receiving bariatric care. The findings from all studies indicated that AI, dietitians, and nutrition researchers were associated with improved weight management.

Conclusion and Discussion: The effect of AI on weight loss and health improvement is undeniable, and numerous studies have proven its effects. AI can facilitate the work of dietitians and nutrition researchers in dietary treatment for obesity and diabetes.

Keywords: Artificial intelligence, Diet, Machine learning

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