

Advanced Strategies for Dietary Recommendations in Liver Disease: A Comprehensive Literature Review

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The global prevalence of non-alcoholic fatty liver disease (NAFLD), driven by unhealthy dietary habits and uncontrollable genetic factors is closely associated with obesity, diabetes, and high cholesterol, and can progress to life-threatening cirrhosis. This creates a significant health challenge, especially because currently there is no approved medications or targeted pharmaceutical treatments for NAFLD, underscoring the critical importance of diet and exercise in managing the disease. This paper presents a comprehensive literature review to which explored advanced methods for developing a food recommendation system tailored to liver disease patients. The review evaluated various methodologies, including Machine Learning (ML), Deep Learning (DL), and ontology-based AI. Through a structured approach involving literature review, expert consultation, and the application of inclusion and exclusion criteria, the results highlight the superiority of the ontology-based approach. This approach integrates key parameters such as BMI, blood sugar levels, disease stage, and food preferences to offer personalized dietary recommendations for liver disease patients. The study's novelty lies in bridging the gap in expert knowledge integration and developing a Smart Nutrition System for fatty liver disease that accommodates both vegetarian and non-vegetarian options. The review also identifies limitations in existing systems, such as insufficient expert knowledge integration and inadequate consideration of individual dietary needs. Future work aims to build a comprehensive ontology-based food recommendation system to enhance patient outcomes and improve quality of life.

Keywords: *non-alcoholic fatty liver disease, food recommendation system, deep learning, machine learning, ontology-based artificial intelligence*