ABSTRACT

Hypercholesterolemia is a condition characterized by elevated levels of low-density lipoprotein (LDL) cholesterol in the blood, increasing the risk of cardiovascular diseases such as coronary heart disease and stroke. Effective management requires a personalized diet that considers individual preferences, dietary restrictions, and medical needs. While previous studies have utilized ontologies and Semantic Web Rule Language (SWRL) in nutrition recommender systems, few have specifically addressed hypercholesterolemia. To fill this gap, this study presents a personalized nutrition recommender system leveraging ontology and SWRL to provide tailored dietary recommendations for hypercholesterolemia patients. The system integrates with a Telegram chat-bot to offer user-friendly interaction and accessibility. By analyzing patient-specific data, including demographic profiles, health conditions, and dietary preferences, the system generates recommendations to improve cholesterol management. Performance evaluation using precision, recall, and F-Score metrics demonstrated its effectiveness, achieving a precision of 0.889, recall of 1, and F-Score of 94.1% across 135 recommended menus. Despite these promising results, the study highlights limitations, including the need to expand datasets to encompass diverse cultural preferences and nutritional needs. Future research will focus on integrating real-time patient feedback, enhancing dataset diversity, and ensuring the system's adaptability to changing health conditions. These improvements aim to enhance the system's effectiveness in managing hypercholesterolemia and supporting broader applications in personalized nutrition management.

Keywords: *nutrition recommender system, ontology, Semantic Web Rule Language, chatbot based recommender system*