

Abstract

Cardiovascular diseases (CVDs) are among the leading causes of mortality worldwide, and their prevalence is rapidly increasing in the Gujarat region of India. A major factor in managing cardiovascular health is adhering to a heart-healthy diet, which often presents challenges for patients in balancing nutritional needs with personal food preferences. To address this issue, this research introduces a *Nutrition-Based Recommendation System (NBRS)* aimed at providing personalized dietary guidance for individuals with heart-related problems. The NBRS leverages machine learning techniques to generate food recommendations that are not only nutritious but also aligned with individual tastes, daily calorie requirements, and cultural contexts, specifically focusing on the dietary habits of Gujarat.

The foundation of this research lies in a thorough analysis of both primary and secondary data sources. Primary data was collected using a detailed questionnaire distributed to individuals with cardiovascular conditions. This questionnaire sought to capture their dietary habits, preferences, and ratings for various food items on a scale from 1 to 10. A dataset of over 90 distinct foods was compiled, each categorized into 15 groups such as fruits, vegetables, staple meals, and specific regional dishes like roti, bhakhri, thepla, dal, and rice. For each food item, nutritional parameters including fat, fiber, protein, carbohydrates, serving size, and calorie content were meticulously recorded. The secondary data included established nutritional guidelines for cardiac patients, emphasizing foods with high fiber and low fat. By integrating these insights, the dataset was structured to facilitate effective analysis and recommendation generation.

A significant aspect of this model is its focus on *seasonal availability* of foods, ensuring that recommendations are practical and accessible. For instance, fruits like mangoes and apples were included, but their suggestions were aligned with their seasonal production to enhance freshness and nutritional value. This seasonal consideration allows the NBRS to remain relevant and adaptive throughout the year, providing users with timely options that are both heart-healthy and regionally appropriate.