

1. INTRODUCTION

Lifestyle changes have led to shifts in societal behaviour, ultimately resulting in a transition of disease patterns from infectious to chronic conditions. One of the chronic illnesses currently faced by the community is cardiovascular disease. Cardiovascular disease is a leading cause of death globally (Mozaffarian, 2017). It encompasses coronary heart disease and stroke, which accounted for 17.8 million deaths in 2017, representing about one-third of all fatalities (Kaptoge et al., 2019). Many cardiovascular diseases, especially coronary heart disease, have behaviors such as unhealthy eating patterns, unbalanced nutrition in food, obesity, lack of physical activity, smoking, and alcohol consumption, which can cause increased behavioral risk factors. (Anderson et al., 2017).

Health factors such as cholesterol levels and blood pressure also play an important role in influencing cardiovascular health. There is evidence of the benefits of a healthy diet for various cardiovascular health outcomes and other diseases, by the US Dietary Guidelines Advisory Committee. They state that a healthy diet is dominated by consuming vegetables, fruits, low-fat or non-fat dairy products, whole grains, and nuts (Tsao et al., 2022). Unhealthy eating patterns such as consuming too much red meat and its processed products and consuming foods and drinks with high sugar, high salt, and low vegetable intake will increase the risk of coronary heart disease (Benjamin et al., 2018). Patients with higher health knowledge will find it easier to face lifestyle and dietary challenges with a more confident attitude (Tian et al., 2019). However, patients with a lower level of health knowledge need easily accessible sources of information to understand the proper lifestyle and diet. Therefore, we need a recommender system for selecting food menus to help determine the proper diet for patients with coronary heart disease.

In previous research, it was proven that ontology has an important role as a means of representing knowledge in recommender systems. The results also show that combining ontology knowledge in the recommendation process can improve results that are more accurate and efficient, as well as help overcome weaknesses that often occur in conventional recommender systems, such as data limitations and cold-start problems. Recommendation systems that adopt ontology are recommendation systems that depend on aspects of knowledge, where ontologies represent knowledge about items and users while providing recommendations (Tarus et al., 2018). In addition, the performance evaluation of the dietary recommendation system using the ontology of each individual was compared with the recommendations provided by health advisors, achieving an average accuracy of 87% (Mckensy-Sambola et al., 2021). (Aditya et al., 2023) used ontology with SWRL in developing a recommender system creating food recommendations based on what users like in helping users implement appropriate healthy eating patterns.

In this study, we developed a recommender system based on ontology and SWRL using the Telegram chatbot for patients with coronary heart disease to make it easier for sufferers to determine the appropriate food menu and water requirements. The developed system can determine the amount, type, and time of consumption based on nutritionist advice. This system can also provide information regarding the daily calories needed per meal and the amount of water consumption the user requires.