

ABSTRACT

Hypertension is a chronic disease with increasing prevalence and is often not detected early, making it important to detect and treat it quickly. Early warning of this disease is needed to enable more timely intervention. This study aims to develop a hypertension severity classification system using the Multilayer Perceptron (MLP) algorithm and identify the most influential factors in the prediction process. The method used follows the CRISP-DM framework, which includes the stages of business understanding, data understanding, data preparation, modeling, evaluation, and deployment, with medical record data from Al-Ihsan Bandung Regional Hospital collected during the period January to December 2024. The testing process was carried out by dividing the data at a ratio of 90:10, 80:20, and 70:30, accompanied by hyperparameter tuning to obtain optimal results. Model evaluation was performed using the lowest accuracy and test loss metrics. The best performance was obtained at a data split ratio of 70:30, with an accuracy of 98.7% and a test loss of 6.1%. This study also identified the most influential risk factors in the hypertension classification model through feature importance analysis. The results showed that systolic and diastolic blood pressure are the two main factors that influence the prediction of hypertension. In the final stage of this research, the deployment of the prediction model into a dashboard is carried out. This dashboard is designed to provide easy access for the public and medical personnel in monitoring and identifying potential hypertension risks. With the dashboard, users can obtain real-time information about their health status and receive early warnings related to hypertension risk. This research supports the implementation of faster early diagnosis and data-driven clinical decision-making, as well as providing early warnings to the public to be more aware of the risk of hypertension.

Keywords—*CRISP-DM, hypertension, medical records, multiclass classification, multilayer perceptron*