Early Detection System for Hypertension Using the K-Nearest Neighbor (KNN) Algorithm at the Panarukan Community Health Center

Bakhtiyar Hadi Prakoso, S.Kom., M.Kom (*Supervisor*)

Nida Luthfiyyah Yuliasri
Health Information Management Program
Health Department

ABSTRACT

Hypertension ranks fourth among the ten most common diseases and contributes significantly to morbidity and mortality. This study aimed to classify hypertension using the K-Nearest Neighbor (KNN) method at Panarukan Community Health Center. This research employed a quantitative approach using the K-Nearest Neighbor (KNN) data mining algorithm. Data were collected through observation by obtaining 540 raw medical records of patients diagnosed with hypertension. After the preprocessing stage, 198 clean records were obtained for analysis. The independent variables included age, sex, family history, diastolic and systolic blood pressure, body weight, body mass index (BMI), heart rate, diabetes mellitus, and cholesterol level, while the dependent variable was the hypertension grade. The results showed that the proposed early detection system achieved an accuracy of 84.81%. The highest precision of 100% was obtained for Grade 3 hypertension classification, while the highest recall of 96% was achieved for Grade 1 hypertension. These findings indicate that the K-Nearest Neighbor method is effective for classifying hypertension grades using medical record data at Panarukan Community Health Center. The hypertension early detection system should be used as a clinical decision support tool and can be further developed into a web-based or mobile application to improve its accessibility and usability.

Keywords: *community health center, hypertension, KNN, medical records, early detection system*