

***Clustering Analysis of Primary Hypertension Using the K-Means Algorithm at
Padang Public Health Center, Lumajang
Niyalatul Muna, S.Kom., M.T. (Supervisor)***

Chiquita Putri Maharani
Medical Record Study Program
Health Departement

ABSTRACT

Primary hypertension is one of the non-communicable diseases with a prevalence that continues to increase, including at Padang Lumajang Public Health Center. Based on the top ten disease reports in 2024, primary hypertension ranked first with a total of 2,619 cases. Hypertension that is treated but not controlled can increase the risk of cardiovascular complications. This study aims to classify primary hypertension patients based on specific characteristics using the K-Means algorithm. This research is a quantitative descriptive study processed using the Orange data mining tool with the K-Means method. Samples were taken using a simple random sampling technique, resulting in 201 records with six variables: systolic blood pressure, diastolic blood pressure, age, sex, headache, and smoking habits. The results showed that patients were divided into three clusters: Cluster C1 consisted of 52 patients with an average age of ± 55 years and blood pressure ranging from 140–190/80–100 mmHg; Cluster C2 consisted of 128 patients with an average age of ± 59 years and blood pressure ranging from 140–210/80–110 mmHg; and Cluster C3 consisted of 21 patients with an average age of ± 61 years and blood pressure ranging from 140–207/80–200 mmHg. The clustering model produced a Silhouette Coefficient value of 0.426. The output of this study is a Google Script-based application used as a clustering form for primary hypertension patients. The clustering results help identify patient groups that require lifestyle modification, pharmacological therapy, intensive medical intervention, and complication evaluation. Health workers are expected to develop cluster-based educational programs, such as targeted counseling for high-risk groups or healthy lifestyle guidance.

Keywords : Data Mining, Primary Hypertension, Clustering, K-Means, Orange