Abstract

Malnutrition in toddlers remains a serious public health issue, especially in remote areas such as Kalijambe. This study utilizes supervised machine learning techniques to classify the nutritional status of children under five years old using three anthropometric indicators: weight-for-age (BB/U), height-for-age (TB/U), and weight-for-height (BB/TB). Two algorithms K-Nearest Neighbors (K-NN) with k = 3 and Support Vector Machine (SVM) were evaluated based on accuracy, precision, recall, and F1 score. K-NN (k = 3) achieved an accuracy of approximately 81.8 %, precision 84.4 %, recall 81.8 %, and F1 score 83.0 %, indicating robust aggregate prediction performance on clean, representative data. In contrast, SVM recorded higher precision at about 89.0 %, while its overall accuracy and recall were slightly lower it is 76.8 % and F1 score stood at 81.3 %. This suggests that K-NN is well-suited for broad classification tasks, whereas SVM excels in reducing false positives and sensitively detecting minority cases. Future work will incorporate data balancing methods like SMOTE, hyperparameter tuning, and ensemble/hybrid modeling to enhance sensitivity to rare malnutrition cases while maintaining high global accuracy. These models have strong potential to strengthen early malnutrition detection systems in primary health care settings such as Puskesmas, enabling faster interventions and reducing the burden of malnutrition in toddlers.

Keywords: ***Toddler malnutrition, Machine learning, Anthropometric indicators, Support Vector Machine (SVM), K-Nearest Neighbors (K-NN)***