

CHAPTER I

INTRODUCTION

The research background, research questions, aims, advantages, and study scope are all covered in this chapter.

1.1. Background

Children's nutritional needs are a critical aspect that must be addressed, since they have an immediate effect on kids' development. The goal is to lower Indonesia's stunting rate from 21.6% to 14% by 2024, according to the 2022 Indonesia Nutrition Status Survey (SSGI). This situation implies that stunting is still an issue that requires attention. Long-term malnutrition can impede a child's growth, a condition known as stunting. To guarantee a good quality of life and promote a better generation in the future, it is essential to keep an eye on infants' growth and development. Addressing stunting is crucial because it will affect children's physical, mental, and emotional development in the future.

Given that stunting can hinder a child's growth, early intervention is necessary to prevent its occurrence. One approach is to classify toddler data. This classification process groups toddlers into categories of stunting or non-stunting based on variables required to detect stunting. While the SVM algorithm may categorize toddler data into stunting or non-stunting classes based on their features, the KNN technique can be employed in the classification process depending on how similar the data is to training data. The use of these two algorithms is based on their effectiveness in previous studies. These two algorithms have been used in a number of earlier investigations.

In a previous study conducted in 2022 by Aina Damayunita et al., three algorithms were tested to identify individuals with cardiac disease: Naive Bayes, KNN, and SVM. According to the study's findings, Naive Bayes had the lowest accuracy of 88%, while the SVM method using a Radial Basis Function (RBF) kernel had the best accuracy of 92% [1].

Rapinder Kaur carried out a follow-up investigation (2019). The study's objective was to predict diabetes using a data mining classification method. partitioning the dataset into training and test sets, preprocessing the data, and applying the KNN algorithm for predictive analysis were the techniques employed in this work. The results showed an SVM accuracy of 80% and a KNN accuracy of 83.16%. These results indicate that the KNN algorithm yields higher prediction accuracy and faster execution time compared to SVM. A diabetes dataset with data on blood glucose, body mass index, blood pressure, and other factors associated with diabetes risk was one of the data needed for this investigation [2].

Although various studies have compared the KNN and SVM algorithms in the health field, each dataset has different characteristics, such as class distribution, data volume, and feature variation, which can affect algorithm performance. These differences in characteristics result in classification results that are not always consistent across all cases. To date, no study has specifically analyzed the performance of KNN and SVM algorithms on data regarding stunting in young children in the vicinity of Patianrowo Community Health Center (Puskesmas). Within order to close this gap, a thorough assessment of both algorithms' performance based on the features of the local dataset was carried out. Furthermore, it is anticipated that the findings of this study will be incorporated into a web-based system to help with the more effective and efficient early diagnosis of stunting using a system-based approach.

Based on several previous studies, the KNN and SVM methods were selected for use in this investigation. "Performance Analysis of the KNN and SVM Algorithms in Stunting Classification Based on Anthropometric Standards" is the title of this paper. The study's objective is to assess how well the two approaches work in terms of attaining the best stunting classification accuracy.

Additionally, the stunting dataset may exhibit class imbalance between stunted and non-stunted infants. This condition can affect the performance of classification algorithms, particularly those using distance-based methods like KNN and margin-based methods like SVM. Therefore, a more in-depth analysis of how these two algorithms handle such datasets is necessary. In addition to

comparing accuracy, this analysis assesses model performance using additional measures like precision, recall, and F1-score.

1.2. Research Question

The following research questions have been developed in light of the background information given in the study "Performance Analysis of the KNN and SVM Algorithms in Stunting Classification Based on Anthropometric Standards":

1. How is the KNN algorithm applied for stunting classification at the Patianrowo Community Health Center?
2. How is the SVM algorithm applied for stunting classification at the Patianrowo Community Health Center?
3. How does the KNN algorithm's classification performance stack up against the SVM algorithm's?

1.3. Research Objectives

The goal of this study is to evaluate and compare the accuracy, precision, recall, and F1-score of the KNN and SVM algorithms in order to identify the optimal model for stunting categorization based on these research topics.

1.4. Research Benefits

The following are some advantages that this study can provide:

1. To provide information regarding stunting by classifying data on stunted infants using methods that can produce more accurate results.
2. To assist health workers in classifying stunting at the Patianrowo Subdistrict Health Center

1.5. Scope of the Study

Considering the the stated research problem, there are several research limitations used to define the scope of the study “Analysis of KNN and SVM Algorithm Performance in Stunting Classification Based on Anthropometric Standards” as follows :

1. The dataset used is derived from 2024 measurement data of infants and toddlers aged 0–60 months collected at the community health center in Patianrowo Subdistrict
2. Two methods were used in this study: KNN and SVM
3. The study aims to identify which of the two methods yields the best performance