

MOBILE-BASED EXPERT SYSTEM FOR DIAGNOSING SEVERE MALNUTRITION IN TODDLERS USING NAIVE BAYES METHOD

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ABSTRACT

Malnutrition in toddlers is one of the major public health problems that can affect physical growth, cognitive development, and increase the risk of illness and mortality. Limited parental knowledge and delays in identifying nutritional problems often result in inadequate early intervention. This study aims to design and implement a mobile-based expert system to assist in the early diagnosis of toddlers' nutritional status using the Naïve Bayes method. The system was developed using Flutter for the mobile application, Laravel for the administrator website, Python for the classification process, MySQL as the database, and REST API for communication between system components. The dataset consisted of toddler anthropometric data, including age, gender, weight, and height, using the weight-for-height (WFH) anthropometric indicator based on the Indonesian Ministry of Health Child Anthropometric Standards 2020. The classification results were limited to two categories, namely well-nourished and malnourished. Model evaluation was conducted using the Confusion Matrix and Classification Report with a 90:10 training and testing data split. The experimental results showed that the Naïve Bayes method achieved an accuracy of 79% in classifying toddlers' nutritional status. Functional testing using the Black Box Testing method demonstrated that all system features operated successfully with a 100% success rate. Validation by a nutrition expert also confirmed that the diagnostic results generated by the system were consistent with the national anthropometric standards, indicating that the system is suitable as a decision-support tool for early nutritional assessment. Therefore, the developed system can assist parents, community health workers, and healthcare professionals in performing early detection of toddlers' nutritional status more quickly, easily, and effectively.

Keywords: expert system, malnutrition, Naïve Bayes, toddler nutritional status.