

PERANCANGAN ALAT PENGUKURAN TINGGI DAN BERAT BADAN BERBASIS *INTERNET OF THINGS* UNTUK DETEKSI STUNTING PADA BAYI USIA 1-12 BULAN DI POSYANDU (STUDI KASUS GAMPONG RAYEUK KAREUNG)

ABSTRAK

Stunting merupakan salah satu permasalahan kesehatan serius yang dihadapi Indonesia, khususnya pada anak usia dibawah lima tahun. Kondisi ini disebabkan oleh kekurangan gizi berkepanjangan sejak masa kehamilan hingga usia dua tahun, yang berdampak pada pertumbuhan fisik, kemampuan kognitif dan produktivitas anak dimasa depan. Berdasarkan data Kementerian Kesehatan RI, prevalensi stunting di Indonesia masih tinggi yaitu 24,4% pada tahun 2021 dan menurun menjadi 21,6% pada 2022. Di tingkat lokal, data Puskesmas Blang Mangat per 30 November 2024 menunjukkan bahwa di Gampong Rayeuk Kareung terdapat 8 anak terjangkit stunting. Kondisi ini menegaskan perlunya sistem pemantauan pertumbuhan yang lebih akurat dan cepat sebagai garda terdepan pelayanan gizi anak. Di Gampong Rayeuk Kareung, proses pemantauan pertumbuhan anak di Posyandu masih menggunakan dua alat konvensional secara terpisah untuk mengukur tinggi dan berat badan, serta pencatatan data secara manual yang menyebabkan proses menjadi lambat, kurang efisien dan rawan kesalahan. Penelitian ini bertujuan merancang alat pengukuran tinggi dan berat badan bayi berbasis *Internet of Things* yang dapat melakukan pengukuran dan mengirim data secara *real time*. Metode yang digunakan meliputi perancangan perangkat keras dan lunak, pengambilan data primer dari hasil pengukuran langsung pada bayi, serta pengolahan data menggunakan metode Z-score berdasarkan standar WHO untuk klasifikasi status gizi. Hasil pengujian menunjukkan bahwa sensor load cell memiliki rata-rata *error* sebesar 6,34%, sedangkan sensor ultrasonic memiliki rata-rata *error* 2,9%. Hasil implementasi alat bahwa dari 23 bayi yang diukur sebanyak 18 bayi memiliki status gizi normal, 2 bayi mengalami stunting, dan 3 bayi tergolong stunting berat. Sistem ini dilengkapi dengan fitur pengiriman notifikasi pesan WhatsApp kepada orang tua berisi laporan hasil pengukuran, status gizi anak serta rekomendasi makanan agar bisa membantu orang tua dalam mencegah maupun mendukung perbaikan kondisi anak. Penerapan sistem ini mampu meningkatkan efisiensi pemantauan pertumbuhan bayi di Posyandu secara akurat, cepat dan terintegrasi.

Kata Kunci: *Stunting, IoT, Posyandu, ESP32, Z-score*

**DESIGN OF AN INTERNET OF THINGS-BASED HEIGHT AND
WEIGHT MEASUREMENT DEVICE FOR STUNTING DETECTION
IN INFANTS AGED 1-12 MONTHS AT THE POSYANDU (A CASE
STUDY OF GAMPONG RAYEUK KAREUNG)**

ABSTRACT

Stunting is a serious public health issue in Indonesia, particularly among children under the age of five. It is caused by chronic malnutrition starting from pregnancy up to the first two years of life, which affects a child's physical growth, cognitive development, and future productivity. According to the Ministry of Health of the Republic of Indonesia, the prevalence of stunting in the country remained high at 24.4% in 2021, decreasing to 21.6% in 2022. At the local level, data from Blang Mangat Public Health Center as of November 30, 2024, reported that 8 children in Gampong Rayeuk Kareung were identified as stunted. This condition emphasizes the need for a more accurate and efficient growth monitoring system as a frontline service in child nutrition care. In Gampong Rayeuk Kareung, child growth monitoring at the Posyandu (integrated health post) still uses two separate conventional tools for measuring height and weight, along with manual data recording. This process is slow, inefficient, and prone to human error. This study aims to design an Internet of Things (IoT)-based device for measuring infants' height and weight, capable of performing real-time measurements and transmitting the data directly. The method includes hardware and software development, primary data collection from direct infant measurements, and data processing using the Z-score method based on WHO standards for nutritional status classification. The test results showed that the load cell sensor had an average error rate of 6.34%, while the ultrasonic sensor had an average error rate of 2.9%. From the implementation involving 23 infants, 18 were found to have normal nutritional status, 2 were stunted, and 3 were severely stunted. The system is equipped with a WhatsApp notification feature that sends parents the measurement results, the child's nutritional status, and dietary recommendations to help them prevent or improve their child's condition. The implementation of this system has proven to improve the accuracy, speed, and integration of infant growth monitoring at the Posyandu.

Keywords: *Stunting, IoT, Posyandu, ESP32, Z-score*