

ABSTRACT

Real-time monitoring of a patient's vital signs is becoming an important aspect of healthcare in modern times. It is used to monitor the early signs of disorders such as fever, increased heart rate (tachycardia), or decreased oxygen levels in the blood. This research develops a wearable device-based health monitoring system with IoT integration through the Blynk platform, which is able to measure three vital parameters in real-time: body temperature, heart rate (BPM), and blood oxygen levels (SpO₂). The device is designed using the MLX90614 sensor for body temperature, MAX30100 for BPM and SpO₂, and the Wemos D1 Mini microcontroller. The measurement limits used are normal body temperature (36.5-37.5°C) and fever category if $\geq 38^{\circ}\text{C}$; normal BPM (60-100 bpm) and tachycardia if > 100 bpm; and normal SpO₂ (95-100%) and abnormal if $< 95\%$. Based on test results, the average measurement accuracy for body temperature is 97.53%, heart rate 97.62%, and SpO₂ 99.07% when compared to comparable medical devices (thermometer gun and oximeter). With the ability to display and send data directly to a smartphone application, this device is effectively used to monitor patient conditions so that it can speed up the monitoring process without the need for intensive direct contact.

Keywords: *Blynk, Vital Sign, Wearable device*