ABSTRACT

HEALTH MONITORING SYSTEM FOR OXYGEN SATURATION, HEART RATE, AND BODY TEMPERATURE BASED ON IOT (Case Study: Students of Telkom Institute of Technology Purwokerto)

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Students often experience irregular sleep patterns due to academic demands, stress, and an unbalanced lifestyle. Poor sleep patterns can affect physiological conditions, such as decreased oxygen saturation, unstable heart rate, and suboptimal body temperature. Unfortunately, there is still a lack of practical self-monitoring efforts to directly evaluate the impact of sleep patterns on health. This study aims to design an Internet of Things (IoT)-based health monitoring system capable of measuring three vital parameters: oxygen saturation, heart rate, and body temperature. The system is built using MAX30100 and MLX90614 sensors integrated with the NodeMCU ESP8266. Measurement data is displayed on an LCD and sent in real-time to a web-based database. The system is equipped with a "body condition" feature that automatically analyzes and classifies the user's health status into categories such as "good," "fair," or "needs attention," allowing users to understand their condition without manual interpretation. Testing results show that the system operates with high accuracy: 97.4% for heart rate, 96.8% for oxygen saturation, and 98.2% for body temperature. Comparative analysis between students with adequate and insufficient sleep times reveals significant differences in all three parameters. This system functions not only as a monitoring tool but also as an educational medium to raise students' awareness of the importance of sleep patterns and overall health.

Keywords: students, oxygen saturation, heart rate, body temperature.