ABSTRACT

Muscles function as motion regulators, enabling relaxation and contraction. The electrical signals generated by muscles during contractions are measured using electrodes connected to an electromyography sensor. These electrodes are placed on the skin's surface to detect electrical signals, which are then utilized to record condition-specific data based on their placement. Currently, electromyography devices lack direct integration via websites or applications and are unable to automatically store patient data digitally. Consequently, data collection is done manually or on-site. However, with the emergence of Internet of Things (IoT)-based muscle signal detection devices, this process becomes more streamlined for medical professionals. They can examine patients' medical records via laptops and save digital record data. The advantage lies in the ability to monitor patients online, allowing medical personnel to easily track daily progress through available digital data records. The electromyography sensor output is processed by the NodeMCU ESP8266 microcontroller and displayed through the integrated Blynk platform connected to the internet. Electromyography testing was conducted on the gastrocnemius muscle and five different subjects. The results revealed that muscle voltage values were higher after load treatment, whether in the biceps or gastrocnemius muscles. The average voltage value for the biceps muscle during extension was 9.746 volts and 17.296 volts during flexion. For the gastrocnemius muscle, the values were 10.685 volts during extension and 18.028 volts during flexion. The magnitude of these voltage values is influenced by several factors, including muscle strength and body weight.

Keywords: *Blynk, Electromyography, Electrode, Internet of Things, Muscle*