ABSTRACT

Currently, cholesterol measuring devices generally use an invasive method, which involves cutting a finger to collect a blood sample. But this method is considered less effective because it causes fear, pain, trauma, and potentially causes infection in the scar. In addition, the waste generated from this method is also dangerous and difficult to decompose. The measurement data is still written manually. Therefore, a new innovation is needed to measure cholesterol levels in the blood, namely with a non-invasive method that does not hurt the body. In this research, a portable device will be developed to measure cholesterol levels using a Max30100 sensor equipped with a photodiode to capture light from an Infrared LED. The read heart rate value will be converted into cholesterol levels, and the measurement results will be displayed through a 20x4 LCD screen. This research will involve ESP32 as a microcontroller and Google Sheets as a web server to store the measurement history data. RFID technology will also be used to identify the user of the cholesterol measuring device. In addition, this prototype is also equipped with a buzzer that will be a marker for each cholesterol category. The results showed that the accuracy produced by the prototype from 10 data samples was 95.32% with an error rate of 4.68%. The error value obtained is influenced by the placement of the finger on the prototype during the measurement process. All data generated by the prototype was successfully sent directly to Google Sheets.

Keywords: *cholesterol, Max30100, heart rate, non-invasive.*