

ABSTRACT

Failure of prolonged breathing causes low oxygen concentration values in the blood, which results in brain damage and leads to death. This event was marked by a decrease in SpO₂. The purpose of this study was to design an apnea monitor using the SpO₂ parameter. The contribution of this study is that the system not only provides an alarm but is equipped with treatment when apnea occurs. In premature babies, apnea is treated with tactile stimulation in the form of squeaks on the soles of the feet, and so on. This research replaced tactile stimulation with a vibrating motor. In the process, infrared and redlamp are transmitted through the surface of the finger to the photodiode sensor. Photodiode converts light signals into electrical signals and is calculated by Arduino to determine the SpO₂ and BPM values of patients. When the SpO₂ value drops 5% within 5 seconds from the baseline it indicates apnea and triggers the operation of the motor shakes. SpO₂ signals and alarms are sent to the PC nurse station via bluetooth HC-05. The SpO₂ test results showed a 2% error in the measurement of 2 subjects with BION pulse oximetry comparison. While the results of BPM testing using a calibrator obtained an error 0.01% at BPM 120, the error value approached 0% at BPM 30 and 60. The results of BPM testing using the subject have an error of 4.54%. Vibrating motor works well. The results showed that measurements using subjects tended to have high error values. The results of the study can be implemented in patient monitors to improve patient safety and reduce the workload of nurses or doctors.

Keywords: *apnea monitor, SpO₂, tactile stimulation.*