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The measurement accuracy of digital body sensor networks for early detection of infection risk: Pilot study

The problem of hospital acquired infections is still high and nurses as grass root services in hospitals have a high burden and play an important role in overcoming these problems. For this reason, a tool is needed to detect infection problems in patients. Aim: A pilot study to measure the accuracy of Digital Body Sensor Networks for early detection infection risk. Methods: pre-experimental design with post-test only. The data was analyzed using the measurements of the accuracy of the data. Results: in the trial of the research instrument, uses MLX90640 as a sensor module that detects body temperature. The data obtained were long-distance measurements of body temperature maximum measured at a temperature of 35.6°C for a distance of 1m, and 37.3°C of 3cm, the same as using a thermal gun as a comparison, which is body temperature at 34.5°C on the distance 1m and 36.8°C on the distance 3cm. The body temperature error value ranged from 0.05 to 4,36% accuracy based on the variation of measurement distance but not real time results. In the measurements for the parameters of pulse rate and oxygen saturation uses MAX30102 module, ID Card RFID-Tag and ESP32 as a microcontroller module that functions via a Bluetooth connection. The accurate and real time results are obtained, where in every first 4 seconds and 1 minute onwards the pulse rate data appear accurate on average the error value was 0.02 to 0.34% and for oxygen saturation it was 0.12 to 0.63% accurate in real time. Conclusion: the using of sensors from the MLX90640, MAX30102 and ESP32 microcontroller module can help detect the risk of infection early for parameters of body temperature, pulse and oxygen saturation so as to ease the workload of nurses. It is necessary to retest the capabilities of the remote sensor using the MLX90640 to achieve more body temperature detection.
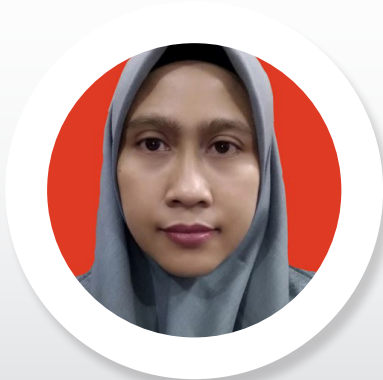
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Biography

Diah Arruum is currently a student of Doctoral Program in Faculty of Nursing, Universitas Indonesia, who has experience and interested in publishing articles about patient safety, nosocomial infections. Her dissertation focuses on nursing technology and currently developing tools for early detection of risk of infection or Health Associated Infections (HAIs) that are supervised by experienced lecturers from University of Indonesia toward her study.

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