Prototyping and Testing an IoT-Based Solar Rechargeable Wound Care Monitoring System Using a Lilypad Arduino

Garcia - Torres, Endrick (School: Colegio Rosa-Bell)
Ducret - Santana, Savdiel (School: Colegio Rosa-Bell)

Skin wounds, either minor or chronic, can quickly become a serious health risk (Kruse, et. al., 2019; Sattar, et. al., 2019). A variety of traditional wound care methods exist; however, approaches are limited, expensive, inaccurate assessing wounds, and cause skin damages (Sun, et al. 2021). There is an urgent need for real-time and multi-functional monitoring based on intelligent wearable sensors for wounds (Cheng, et. al. 2021). Within this context, the researchers proposed to build and test the efficiency of an IoT Based Solar Rechargeable Wound Care Monitoring System using a Lily Pad Arduino to assess the physical sensing parameters (peri wound temperature, humidity, and pressure) in a wound. The prototype was programed using Arduino IDE software, includes a solar panel to recharge the battery, and LED lights outputs according to the limits established in each parameter. The parameters detected in a fake arm with the wound simulations were measured, transferred, and transmitted via wireless technology to a mobile device. Visual graphics were generated by the device during the wound monitoring and analyzed by the serial plotter in the application. Based on the data collected and the analysis, the hypothesis was retained. The system responded efficiently by providing real-time wound care monitoring, easy management, and data accessibility. Making it a valid and effective alternative to complement treatments and prevent major health complications in patients with wounds. Future efforts should transform the prototype into a wireless portable wearable device to complement any traditional wound treatment and transmit to devices over different ranges of distance.

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