Smart Wearable System for Diabetes High Risk Group: Screening Tool by Subject's Electrochemical Skin Conductance and Heart Rate

Laboy-Torres, Angelik

The prevalence of Diabetes Mellitus Type 2 is very high in Latin Americans; it is one of the diseases that triggers a major number of deaths annually. This population has a 25% higher risk of developing the disease because of a genetic risk factor. Diabetes causes damage to the eyes, kidneys, blood vessels and nerves. Diabetic neuropathy is a derived condition in which the communication between the nerves of the body’s limbs is damaged. To avoid such long term complications, it is imperative to diagnose patients at early stages. This study aims to find an alternative screening tool, such as a Smart Wearable Technology, by sensing biological indicators between the healthy and the high risk subjects. Twenty subjects were divided in four groups, based on their previous diagnosis (Type 2 diabetes, pre-diabetes, healthy, and high risk) and were tested for their electrochemical skin conductance and heart rate using a wearable technology device with a physicochemical detector. The data obtained from the device was used to establish a comparison range between the pre-diagnosed groups and a high risk group. Most of the high risk subjects tested were within the corresponding assigned range for pre-diabetes or diabetes. After analyzing the results, the device showed effectiveness in the screening of high risk diabetes subjects. Also, the data analysis suggests a correlation between electrochemical skin conductance and heart rate within subjects groups. Therefore, the Wearable Technology Design to Measure Chronic Diseases, provides a simple, quick and non-invasive alternative screening tool for diabetes.

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