Chapter 10
Continuous Stress Assessment:
Mobile App for Chronic Stress Prevention

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ABSTRACT

Chronic stress is a spreading disease that affects millions of individuals with an enormous economic and social impact. Its prevention is, increasingly, a fundamental aspect for the improvement of the quality of life of individuals and the overall society. This chapter aims to understand how stress can be continuously monitored with the goal of predicting and alerting the occurrence of chronic or pathological stress and burnout situations. For this purpose, a non-invasive individual measurement instrument was developed to measure biometric signals through a wearable device that is connected to a mobile device. The prototype consists of a mobile application that gets the signals from a smartband and sends the data to an information system, tracking the individual physical condition to calculate the risk of entering the state of chronic stress. Continuous assessment of signs of stress is a key aspect for early detection of distress and effective intervention.

DOI: 10.4018/978-1-5225-5270-3.ch010

INTRODUCTION

In the Horizon 2020 Research and Innovation Program, the European Commission (EC) has proposed to invest more than €2 billion for providing better health for all (European Commission, 2017). This work addresses one of the main goals of this challenge: to improve the ability to monitor health and to prevent, detect, treat and manage disease.

To prevent and detect disease, we need a continuous monitoring approach, which is not compatible with invasive and disturbing measuring instruments. It requires a measuring instrument that becomes "transparent" to the user. Wearable devices are used increasingly, especially for fitness purposes, and their accuracy and reliability is improving. Enhanced quality and a higher number of biometric sensors are turning wearable devices suitable for health purposes.

This work aimed to develop a mobile application, to be used in smartphones or tablets for collecting data from a wearable device and integrate it in a Quality of Life Information System (QoLIS). The data will be processed for producing a set of reports to be made available to health professionals and users, i.e., the individuals under stress assessment.

Healthcare professionals will get access to the data generated by the wearable device by requesting their permission to the user under assessment. The data will be provided in an easily understandable format for supporting the decision-making of health professionals. The QoLIS platform will allow the continuous monitoring of each individual enabling an effective treatment in case early detection of pathological stress.

It is intended to provide to the user relevant data, in a friendly and perceptible format, about his/her health condition, including the current stress level. The mobile application will also inform the user about the appropriated procedures to keep the stress values at a recommended level interval. A good stress level can have a positive impact on the health condition, the quality of life, the professional performance and in the family and social relationships.

Of course, data collection is only important if the data are analysed with consequent production of results for the individual and health professionals. Since the perception of chronic stress is not immediate, continuous assessment of signs of stress is a key aspect for early detection of distress and efficient intervention when the individual is at risk of chronic stress. The mobile application will present information about the stress level using appropriated dashboards, considering the health professionals and users feedback about the data formats and user interface. Users and professional will have access to distinct dashboards. The aggregated results of this projects will be shared with health professionals to ensure the quality of the process used and data collected.