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COPDHelper

USE OF A SMARTPHONE FOR SELF-MANAGEMENT OF PULMONARY DISEASES

Telemedicine and telemonitoring have been gaining interest as solutions to the global challenge of providing home care and encouraging patients to become more involved in the management of their own health condition. COPDHelper is a mobile monitoring application, integrated in the Smart Companion, capable of assisting and guiding the user in the diverse fields of managing a pulmonary disease.

Motivation

Chronic Pulmonary Obstructive Disease (COPD) is a serious health problem which places a significant economic burden on health system worldwide. In 2012, COPD was the third leading cause of death worldwide, and represented the larger fraction of health services total costs (58%). This reality is mostly due to the occurrence of exacerbations, which are acute events characterized by a significant worsening of lung functions and symptoms, that lead to hospitalizations. The idea of using telemonitoring systems to help patients prevent these events and improve the management of their disease is an attractive alternative to the most widely spread strategies.

Fig1. COPDHelper main menu display.

Monitoring System

COPDHelper is a mobile application specially design to address the needs of COPD patients regarding guidance and assistance in the management of the disease.

By gathering two different modules based on pulmonary rehabilitation programs and integrating already implemented features of the Smart Companion, COPDHelper supports the patient in their daily activities, monitors symptoms' progression and vital signs, and educates on nutrition and medication intake.

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Mobile Application

Aimed to assist and guide COPD patients in the different aspects of disease management, COPDHelper is composed by two major module: (1) monitoring and (2) counseling and education.

Features

- Integration with Smart Companion
- Monitoring of vital signs
- Educational videos on how to take medication properly
- Track of symptoms' progression
- Respiratory exercises
- Nutritional support

Usability test

A group of 13 COPD patients, with ages ranged between 29 and 70 years, tested the system's learnability and usability.

Fig2. Illustrative example of the COPDHelper features.

By using a biomedical sensor, the monitoring module can track the patient's oxygen saturation and generate an alert every time an abnormal value is collected. This module also tracks the symptoms' progression by means of 8 routine questions and promptly alerts the patients whenever an abnormal result is achieved.

With the interaction with the counseling and education module, the user can learn respiratory exercises to improve pulmonary function, get advice on healthy nutrition, and can also learn the proper way to use an inhaler.

Conclusions

A successful mobile monitoring system was developed, capable of assisting and guiding COPD patients in order to diminish the occurrence of exacerbations and improved their health quality.

The COPDhelper usability was tested and confirmed by the use of a questionnaire. A positive usability evaluation renders the system's acceptability easier, as it improves and facilitates the interaction between the user and the system, thus reducing the natural lack of interest that is associated to highly complex and non-intuitive software.