

Pilot Study about a Multifactorial Intervention Programme in Older Adults with Technological Devices Based on GeriaTIC Project [†]

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Abstract: This pilot study was carried out with a sample of six older persons in a residential center in A Coruña. It is a “quasi-experimental” study, directed to assess the effect of an intervention on a given population, performing “pre” and “post” intervention measurements, but without comparison with a control group. The multifactorial intervention had a duration of 3 months, which includes the use of technological devices, like a wristband of physical activity and sleep.

Keywords: aged; participatory health; participatory medicine; quality of life; technological development; and wearables

1. Introduction

Worldwide, nowadays, we are present to the population progressive ageing, more strong in Japan and some of European Union countries. Despite of the fact that ageing is not a pathology or illness, it is considered as the higher vital stage when appears a pathology of chronic disease. Agree with the World Organization of Health, it is considered to detect and treat illness on time, with the purpose of reduce the consequences, throw an integral system of primary attention [1–3].

Urinary incontinence, falls and sleep disorders are included into the more frequent geriatric syndromes. This pilot study is focus on falls and sleep disorders.

In the field of health, more technological companies are positioned to develop wearable devices and applications to monitoring daily people, which allows to follow-up the health status of the users and their benefits. The use of these devices, permit quantify movement and body parameters as: pulsation, cardiac rhythm, respiratory rhythm, blood pressure, glucose level, oxygen saturation level, temperature, sweating, etc. Currently exist numerous commercial solutions for monitoring health parameters of the users through technological sensors, capable to transmit collected data to other devices as mobile phone or a computer. There are different solutions as activity trackers quantifying physical activity and/or sleep, scale, glucose quantifier, blood pressure quantifier, pulsation quantifier, etc. [4].

Nowadays, exists different solutions that would be use in this project. However, the geriatric syndromes that are focused the project on, don't have commercial devices to treat it. A significant part of the research labor in this project is to define low-cost fiable sensor devices without wasting efficiency [5].

This project is based on the use of wearable devices employed to the quantification of different biomedical parameters, which use to monitor and analyse aspects as sleep, physical activity and others. In this research, it has been developed a web application where people register some daily life details every week. Both of the use of wearables and the web register are agree with participatory

health and participatory medicine. In this way, people become active agents to the own management of health [6].

2. Objectives

The main objective of this study is determine the impact in the quality of life of a multifactorial intervention programme, based on Geria-TIC project, developed to institutionalized older adults with sleep disorders and falls. Specifically, benefit the reduction of the symptoms and signs of these syndromes, analyse the changes produced in older adult's participant's occupations, empower the use of technological devices in the daily life of older adults and the own health management, and promote major responsibility and active participation of the older adult in their own health and ageing process.

3. Material and Methods

This pilot study is a quasi-experimental research developed in A Coruña (Spain) during 3 months. The participants of the study are older than 65 years old, users of a residential home. It includes those people who are at risk of falling due to a previous fall in the last year or fear of falling. On the other hand, the vertical of sleep disturbances includes those people who present a diagnosis of insomnia and/or hypersomnia or, failing that, who present the signs and symptoms during a continuous period.

The technological development of the project began in October 2016, and the changes and adaptations made to date continue. Prior to contact with potential participants, approval was requested by the ethics committee of the protocol designed, obtaining a favorable report from the Autonomous Committee of Research Ethics of A Coruña-Ferrol (2017/106).

The beginning of this pilot study was in March and the end was in July 2019. In this period, there were the initial assessment, the intervention development and the final assessment.

The tools of the assessment that were used were the EuroQol-5D-5L to evaluate the quality of life, the Index of Barthel to assess the degree of independence, and the Mini-Mental Examination Test to assess cognitive impairment.

In the case of sleep disorders, the Oviedo Sleep Questionnaire and the Pittsburgh Sleep Quality Index [7,8] have been administered. In terms of the fall vertical, the Tinetti Scale, the Time Get Up and Go Test and the Falls Efficacy Scale International [9] have also been administered.

A multifactorial intervention programme was developed with a duration of 3 months. This programme includes the use of a bracelet to record physical activity and sleep, and the use of a mobile application on the tablet for the registration of occupations, and the advice on the performance of occupations, physical activity, and relaxation.

Regarding the materials used in the study, it is important to note that an application web was being developed called ClepiTO. This application is a health manager, thus promoting participatory medicine, in which participants will make a daily and fortnightly record of different occupations and/or relevant information on urinary incontinence, sleep disorders and the risk of falling. This application will be linked to ClepIO. This is an online health application aimed at managing the medical history and the personal health record, as well as carrying out the control of the treatments received.

4. Results and Conclusions

For the time being, no results are available to draw definitive conclusions about the impact of this pilot study based on Geria-TIC project. Even so, the observation that is being made during the intervention reflects that the participants show a high level of motivation, interest and involvement towards the activities developed. However, it is necessary to wait for the final collection of data and its subsequent analysis, as well as future tests with larger samples, to determine if the project has a real impact on the quality of life. According to the data obtained through the activity wristbands, there has been a noticeable increase in the steps taken per day, and show great acceptance and

incorporation of physical activity in their day to day. It is expected that the data obtained on the quality of life will be maintained or that the score will be increased.

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