International Journal of Integrated Care ISSN 1568-4156

Volume 13, 20 November 2013
Publisher: Igitur publishing
URL: http://www.ijic.org
Cite this as: Int J Integr Care 2013; T&T Conf Suppl; URN:NBN:NL:UI:10-1-115714

Conference Abstract

Monitoring habits and physiological data in the frail elderly

Malcolm Clarke, *Brunel University, United Kingdom*

Hulya Gokalp, *Brunel University, United Kingdom*

Joanna Fursse, *Chorleywood Health Centre*

Russell Jones, *Chorleywood Health Centre*

Correspondence to: ***Joanna Fursse,*** *Chorleywood Health Centre, United Kingdom, E-mail: jo.fursse@live.co.uk*

Abstract

Introduction: There is a need for new models of care enabled by technology to support long-term and independent living of the elderly. Integrating telecare and telehealth technologies can be used to provide innovative support in an unobtrusive way. inCASA is a European Commission funded project that uses an integrated platform to monitor both health and habits data in the frail elderly and demonstrate the concept of integrated health and social services through pilot trials. This paper presents the joint analysis of habits and clinical data from the UK pilot.

Aims and Objectives: The aim of the analysis is to determine the correlation between change in habits behaviour, change in physiological data and deterioration in the condition of the patient.

Methods: 40 participants registered at Chorleywood Health Centre who are over the age of 65 and who have been assessed as frail have been recruited to participate in the project. Participants have been given a combination of physiological devices such as blood pressure, weight , SpO2 and blood glucose monitor according to their condition, together with telecare devices such as PIR, bed and chair sensors, and medication dispenser. All data is automatically transmitted wirelessly from the devices to the home gateway and then wirelessly to the remote server. The data is processed in order to detect deviations from the norm and notify clinicians by means of a clincial portal for possible intervention. Two types of thresholds were used for the clinical data: an absolute threshold taken from clinical assessment protocols (e.g. 140/85 mmHg for systolic/diastolic BP) and subject specific thresholds (mean+/-2SD). Habits data processing is divided into two main parts: training and detecting deviations. We divide a day into four periods: 00:00-06:00, 06:00-12:00, 12:00-18:00, 18:00-24:00. We count the number of movements for each of these periods, and calculated their average and standard deviations (SD) over 15-20 days. Using the mean and SD of each period, period-specific thresholds were set to detect deviations from normal pattern: mean+/-2SD for major deviation alerts and mean+/-1.5SD for minor deviation alerts. Deviation from the norm is then detected by comparing the number of movements in a period with the threshold values for that period. We investigated whether activity is correlated with pysiological parameters.

Results: Using the method described above it was possible to establish a habits pattern for participants and to detect deviations from normal behaviour. For example, absence of one subject for 2 days (staying with a relative from Dec 24 to Dec 26) was clear from the activity data, and was detected via absence of activity and the high number of major under-activity alerts generated. There was associated over-activity in the morning of the Dec 24th, which was attributed to the preparation for the visit. For one hypertensive patient, the BP data was over the absolute threshold level for most of the time, but did not exceed the subject specific threshold. PIR data (motion from passive sensors) have been reliable. Compliance with submitting physiological data measurement varied from subject to subject.

Conclusions: We have collected and analysed data from combined habits and health data for 40 frail elderly participants. We have detected deviations from normal activity and in the physiological data. As data collection continues we will determine long term trends and by capturing clinical events we hope we will be able to correlate change in habits and health data and gain new knowledge for telecare and telehealth systems.

Keywords:

telehealth, telecare, integrated platform, frail elderly, chronic disease

---

Presentation available at**:** http://www.kingsfund.org.uk/events/third-annual-international-congress-telehealth-and-telecare