

A DATA-DRIVEN VIEW OF ENGAGEMENT WITH HOME-BASED DIGITAL SELF-MANAGEMENT SYSTEM FOR OLDER ADULTS WITH CHRONIC CONDITIONS

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INTRODUCTION

Across the world, populations are ageing, as people are living longer. In the European Union (EU), by 2060 30% of the population, or 151.5 million people, will be over 65 years old (Giannakouris et al., 2008). In the same way, 20.2% of the population of the US will be over 65 years by 2050 (Vincent et al., 2010).

There were more than 26 million people living with HF worldwide in 2014 (Ponikowski et al., 2014) and every year, there are over one million new diagnoses of HF made (Kell et al., 2015). In addition, older people with HF typically have a number of other co-occurring comorbidities, for example, coronary heart disease, hypertension, chronic obstructive pulmonary disease (COPD), diabetes mellitus, chronic kidney disease, sleep apnea etc.

Digital home-based self-management systems involve using information and communication technologies (ICT) and sensing technologies to monitor and support people's daily life and daily activities in relation to their health and wellbeing, in their homes (Senescienciacia, 2018).

Poor engagement with a digital health system may be due to individual barriers to change not being adequately identified and incorporated into interventions at the early design stage, such as financial resources, comfort with technology and social support (Mulvaney et al., 2011).

MATERIALS AND METHODS

The ProACT dataset consists of data collected from 60 older adults with two or more chronic conditions (including HF) who monitored symptoms and lifestyle parameters over a 12-month period. As such, this reduced the focus on examining solely ambient data, and prompted more of a focus on symptom monitoring and physical activity, as such data was available within the dataset.

The data set was cleaned and analysed using the R language and the R package of ggplot2 was mainly used to generate graphs. The following Section outlines the first set of research questions that were examined and the results.

Following data cleaning, the first stage of data analyses focused on the following research questions:

Q1. What is the distribution of user tenure for submission of data?

Q2. What are the frequencies (times per week) at which participants submit their data?

Q3. What is the average and standard deviation of the intervals (in days) between each submission?

Q4. What hours of the day do people submit BP, Pulse, BOL, BG and Weight readings?

RESULTS

Here is the result of research question one:

Figure 1 shows most of the participants use ProACT at least 200 days. There are two drops shown in the graph.

One is at 200 day point, and the second is at 300 days. There are two different reasons for the drop-off. First, some participants drop out or die during the trial. Second, some participants started later than others, due to difficulties with recruitment, and so their overall number of days in the trial are less than other participants. This meant that some participants stopped using the devices after ten months in the trial, which accounts for the significant drop-off between 300 days and 400 days.

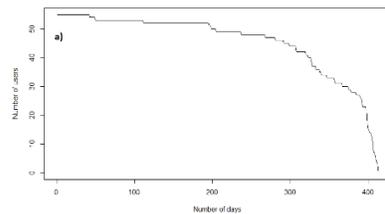


Figure 1. User retention curve of using technology devices

DISCUSSION

There are many different reasons will influence the user engagement. For example, most of participants would like to submit the body parameters such as blood pressure, pulse, from 8 a.m. to 12 p.m. If a notification for blood pressure measuring that reminder people at 9 a.m. might enhance the engagement for participant with health digital interventions.

For next stage of the study here are some more research questions:

Find out what types of users the dataset has in terms of user engagement?

Use Time series analysis to find the patterns in user submission. (analyse the data by seasonality)

Is there a connection between different parameters?

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