PROMOTING SELF-CARE IN HEART FAILURE PATIENTS USING CONSUMER HEALTH TECHNOLOGY

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INTRODUCTION

Living with heart failure places an enormous burden on patients and those who engage in caring activities. Effective self-care is key to the management of the condition and is linked to reduced mortality risk and fewer hospital admissions[1].

Despite the widespread understanding of the importance of effective self-care, previous interventions to promote self-care in heart failure patients have been somewhat inconsistent[2]. One major reason for this is that many of them have failed to implement best-practice methodologies for the design and evaluation of complex interventions, failing to truly understand the 'users perspective' at the design stage[3].

Previous international research has highlighted the key determinants of effective heart failure self-care[2]. Furthermore, recent ECME research has highlighted that appropriately designed digital health technology may provide a means to address these key determinants[4]. This work identified the key design requirements for the development of patient-centred digital health tools, designed to promote self-care in heart failure patients

Therefore, the purpose of this research is to design, develop and evaluate the feasibility of using a consumer device based digital health monitoring, alerting and feedback platform to support self-care in heart failure patients, using design thinking methodologies.

MATERIALS AND METHODS

This research is divided into five stages:

Stage 1: Gather requirements for the prototype system based on the research carried out by Connelly et al[4] and use an Intervention Mapping approach to systematically guide the development of behaviour change strategies to effectively promote self-care[5].

Stage 2: Develop a cross-platform (android/iOS) prototype solution, based on the stage 1 requirements.

Stage 3: A 2-week pilot evaluation in heart failure patients (n = 10) and members of the cardiology care team (n = 5) recruited from the Beacon Hospital, Ireland. A mixed methods approach will be used to examine the usability and acceptability of the prototype solution and facilitate design iterations.

Stage 4: Iterative refinement of the system based on the feedback of the patients and healthcare providers.

Stage 5: A six-month feasibility study in heart failure patients (n = 30) and members of the cardiology care team (n = 5) recruited from the Beacon Hospital, Ireland. A mixed-methods approach will be used to evaluate the acceptability, usability, demand, practicality and observational impact on clinical outcome.

RESULTS

In stage 1, the findings from previously conducted semi-structured interviews[4] and review of the literature were used to identify a series of barriers to heart-failure self-care. These barriers were linked to the trans-theoretical domains framework[6]. Theory informed methods, linked to behaviour change techniques, were selected to operationalise the change objectives into practical applications which could be incorporated into the digital health solution.

In stage 2, a cross-platform mobile application, called Wisp Heart, which links to Fitbit services was developed. Stage 3-5 will commence in 2021.

DISCUSSION

Wisp Heart is designed to support the key skills required for effective self-care in Heart Failure[2, 4]. To support aspects of self-care commonly not addressed, it leverages a suit of targeted educational videos, medication and vital sign tracking, data obtained from a Fitbit activity tracker/smart scales and patient reported outcome measures. To incorporate these activities into daily living, if the patient chooses, Wisp Heart can use reminders to guide medication adherence and key vital sign measurement. Additionally, sleep, physical activity and resting heart rate are monitored through A Fitbit Wearable. To support the identification of changes in their condition, Wisp Heart analyses the collected wearable and smart scales data to identify consistent changes in a patients condition from their personalised baseline profile. This information, alongside targeted patient reported outcome measures designed to contextualise the data are then shared with the cardiology care team, to support timely help seeking behaviours.

Stage 3-5 will see the iterative design and feasibility evaluation of the of the developed digital health solution. It is hoped that the digital tool, developed with design thinking and behaviour change methodologies, will lead to improved quality of life and clinical outcome for patients. Randomised control trial research will be required to evaluate the impact of the solution on self-care behaviours, quality of life and clinical outcomes.

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