DELIVERING CARDIAC REHABILITATION REMOTELY USING A DIGITAL HEALTH PLATFORM – A PROTOCOL FOR A PRAGMATIC RANDOMIZED CONTROLLED TRIAL

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INTRODUCTION

Cardiovascular disease (CVD) remains the number one cause of death globally, resulting in 3.9 million deaths per year in Europe and costing the European economy €210 billion per annum (Wilkins et al., 2017). Cardiac rehabilitation (CR) is recognised as a core component of CVD management and is generally prescribed to individuals post coronary angioplasty or coronary artery by-pass graft, as well as to those with chronic heart failure. It typically includes nutritional counselling, risk factor management, psychosocial interventions, lifestyle modification and education programmes, as well as physical activity and exercise training. Active participation in the exercise training component of CR has been shown to be an effective tool in reducing all-cause and cardiovascular mortality (Heron et al., 2016, Taylor et al., 2004).

Traditionally, CR take place in hospitals, but despite the reported benefits, the rate of uptake and attendance at CR exercise classes is low. Home based CR has been advocated as an alternative for those who have barriers to participation. The coronavirus 2019 (COVID-19) pandemic has also had a severe impact upon CR participation. To control the spread of COVID-19 many CR services temporarily ceased classes and moved online.

This project seeks to develop and evaluate an interactive digital health platform which can support and monitor people with CVD as they participate in a virtually delivered CR exercise programme in their own home.

MATERIALS AND METHODS

A pragmatic randomized controlled trial comparing outcomes between an intervention group and a control group will be conducted to assess the efficacy of a digital health platform designed to support virtual CR. A sample of convenience (n=20) of participants eligible to participate in community-based CR will be recruited. Both study groups will perform the same exercise programme, consisting of twice weekly sessions of 60 minutes, over an eight week intervention period. Participants in the intervention group will partake in virtually delivered CR exercise classes in their own home. The virtual exercise classes will be delivered to participants using a videoconferencing platform. Participants in the control group will attend the research centre for their CR exercise classes.

Intervention group participants will receive a custom developed digital health platform for monitoring during the class and for self-management during the intervention period. The platform consists of a mobile application and digital devices connected to the application.

Outcomes will be assessed at baseline, following the eight-week intervention period, and at six-month follow-up. The primary outcome will be exercise capacity as assessed using a six-minute walking test. Other outcome measures will include heart rate, blood pressure, weight, percentage body fat, blood lipid profile, balance, muscle strength, and quality of life. Semi-structured interviews will also be conducted with a subset of participants to explore their experiences of using the digital platform.

All study materials and procedures have been reviewed and approved by the Human Research Ethics Committee in Dundalk Institute of Technology. Written informed consent will be obtained from all study participants prior to their enrolment in the study.

RESULTS AND DISCUSSION

Participant recruitment and data collection for this study is anticipated to begin in March 2021. Dissemination of study results in peer-reviewed journals is expected in Spring 2022.

The benefits of participating in CR exercise is well documented with positive effects on both the individual and the health care system. The cessation of CR programmes due to the current COVID-19 pandemic means many CR exercise classes are now taking place online. Consequently, now more than ever, it is important to develop solutions to support people with CVD to undertake their CR exercise programme virtually at home.

REFERENCES

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