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## Exploring patient experiences and perspectives of a heart failure telerehabilitation program: A mixed methods approach



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## ABSTRACT

**Objectives:** To describe patient experiences and perspectives of a group-based heart failure (HF) telerehabilitation program delivered to the homes via online video-conferencing.

**Background:** Limited information currently exists on patient experiences of telerehabilitation for HF. Patient feedback and end-user perspectives provide important information regarding the acceptability of this new delivery model which may have a substantial impact on future uptake.

**Methods:** We used mixed-methods design with purposive sampling of patients with HF. We used self-report surveys and semi-structured interviews to measure patient experiences and perspectives following a 12-week telerehabilitation program. The telerehabilitation program encompassed group-based exercise and education, and were delivered in real-time via videoconferencing. Interviews were transcribed and coded, with thematic analysis undertaken.

**Results:** Seventeen participants with HF (mean age [SD] of 69 [12] years and 88% males) were recruited. Participants reported high visual clarity and ease of use for the monitoring equipment. Major themes included motivating and inhibiting influences related to telerehabilitation and improvement suggestions. Participants liked the health benefits, access to care and social support. Participants highlighted a need for improved audio clarity and connectivity as well computer training for those with limited computer experience. The majority of participants preferred a combined face-to-face and online delivery model.

**Conclusion:** Participants in this study reported high visual clarity and ease-of-use, but provided suggestions for further improvements in group-based video telerehabilitation for HF.

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**Abbreviations:** HF, heart failure; COPD, chronic obstructive pulmonary disease; NYHA, New York Heart Association functional classification; SD, standard deviation; TECH model, TELEhealth in CHronic disease model.

**Ethics approval:** This project has received ethics (HREC/12/QPCH/86 and The University of Queensland 2013000796) and site-specific approvals at the Princess Alexandra Hospital (AU/3/FDD1118) and The Prince Charles Hospital (AU/3/3501113). All participants gave written informed consent before data collection began.

**Trial registration:** This trial was registered with the Australian and New Zealand Clinical Trials Registry (ACTRN12613000390785).

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## Introduction

As the number of patients with heart failure (HF) is predicted to grow with our aging population,<sup>1</sup> the ability to optimize service delivery in this patient group is vital. In a review of systematic reviews, there appears to be promising evidence of high patient satisfaction with telemedicine, including telerehabilitation across various patient groups.<sup>2</sup> Telerehabilitation is defined as the delivery of rehabilitation services at a distance via telecommunication technologies,<sup>3</sup> such as telephone, internet and videoconference. This emerging delivery model can potentially empower patients, promote confidence and deepen understanding of their condition, thereby leading to improved health outcomes.<sup>2</sup>

While there is some evidence to support the efficacy of telerehabilitation in improving exercise capacity and quality of life in patients with cardiac conditions,<sup>4–6</sup> little is known about patient experiences and perspectives for the HF group. Current literature on telerehabilitation in HF populations has mainly consisted of quantitative studies that report changes in clinical outcomes such as exercise capacity and health-related quality of life, rather than patient experiences and perspectives. However, there are a few studies exploring patient perspectives toward telerehabilitation in other patient groups. For instance patients with chronic obstructive pulmonary disease (COPD) reported that telerehabilitation provided via web-portal and videoconferencing led to health benefits, increased self-efficacy and motivation.<sup>7–9</sup> Similarly, patients with joint replacements highlighted the fact that they developed a strong therapeutic relationship with clinicians during the video-based telerehabilitation program.<sup>10,11</sup> Other studies also found that patients were generally satisfied with the video-based telerehabilitation program, but experienced some technological usability issues.<sup>8,9,12</sup> Despite these generally positive comments, the uptake of telerehabilitation into clinical practice remains slow. It is therefore important to better understand the experiences and perspectives of patients who have received this program delivery model so that services can be tailored to their needs.

Given the expansion of telerehabilitation services for people with HF, a need exists to develop a comprehensive understanding of patient perspectives and experiences with telerehabilitation by collecting both quantitative and qualitative data.<sup>13,14</sup> Using this approach, we will be able to converge and corroborate the two forms of data to bring greater insight into complex interventions such as telerehabilitation than would be obtained by either type of data separately.<sup>15,16</sup> Therefore, the aim of this mixed methods study was to explore patient experiences and perspectives related to a HF telerehabilitation program delivered into the homes via online videoconferencing.

## Methods

### Design

This study was part of a larger multi-centered trial investigating the effects of a HF telerehabilitation program conducted in tertiary hospitals in Queensland, Australia. In brief, the larger trial recruited patients with stable CHF, who were enrolled in a 12-week comprehensive HF disease management program. Participants were randomized either to a 12-week real-time video-based telerehabilitation program delivered twice-weekly, or a control group of traditional center-based HF rehabilitation program of the same duration and frequency.

Participants for this study were considered if they had attended at least two of the twenty-four available telerehabilitation sessions. Purposeful, maximum variation sampling was adopted. A convergent mixed methods design was used, where quantitative and

qualitative data were collected in parallel, analyzed separately and then merged into an overall interpretation.<sup>15,16</sup> The study was approved by the Human Research Ethics Committees of participating hospitals and university, and included in the Australian Clinical Trials Registry (ACTRN12613000390785).

### Participants

To ensure that we had a range of age, gender, experience with rehabilitation programs and using technology, the sample included at least two patients from each of the following categories: gender; age (under 60 years old, between 60 and 80 years and over 80 years); previous and no previous experience with center-based cardiac rehabilitation programs (to allow comparison between two different program delivery models); previous and no previous experience with computers; and previous and no previous experience with exercise. Patient experience with technology and exercise were self-reported. Patient characteristics such as age and confidence with technology have been suggested to have an impact on how telehealth can affect outcomes.<sup>17</sup> Participants were recruited concurrently with data analysis and recruitment continued until data saturation was reached.

### Intervention

The telerehabilitation program in the randomized controlled trial consisted of a 12-week group-based exercise and education intervention delivered into the patient's home twice-weekly, using an online videoconferencing platform (Adobe Connect 9.2). The program is consistent with the Telehealth in CHronic disease (TECH) model,<sup>17</sup> that includes a focus on patient and clinician engagement and effective chronic disease management for facilitating the best chance of success for telehealth interventions. For instance, we implemented engagement strategies through information booklets, demonstration sessions and introductory letters. The project facilitated chronic disease management through self-monitoring and goal setting; actively delivering exercise-based rehabilitation; and fostering partnerships through regular communications with the primary healthcare providers and specialists. A videoconferencing approach enabled clinicians to observe the participants exercising in real-time; provide feedback and modification as required; and facilitate peer support. Educational topics were delivered as PowerPoint presentations with voice narrations. As listed in [Table 1](#), topics included nutritional and physical activity counseling, in line with recommended core components of cardiac rehabilitation.<sup>18</sup> A 15-min interaction period was held at the start of each telerehabilitation session to facilitate group discussions of these educational topics.

Telerehabilitation equipment was loaned to the participants as required. Participants received a demonstration session, either in-person at the hospital or during a home visit, to become familiar with the equipment. An equipment information booklet with written and pictorial instructions was also supplied. Participants were guided to self-monitor and verbally report their vital signs at the beginning and end of each telerehabilitation session. Telephone contact details of the clinicians were included in the event that participants needed additional assistance or encountered technical difficulties. Safety strategies included exercise safety checklist, availability of a support person during the telerehabilitation session, and a protocol for managing adverse events.

### Data collection

We collected quantitative and qualitative data via surveys and interviews respectively. More specifically, we collected the

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