

muscle structure, as well as convective and diffusive oxygen delivery.^{10,11} Knee extensor training also conferred improvements in quadriceps muscle strength and health-related QoL. Moreover, the high training compliance suggests that it is a practicable intervention.

We identified evidence gaps including the optimal knee extensor training protocol for HF and its efficacy in HFpEF. Future research evaluating this training paradigm requires consistency in methods and measurement of short- and longer-term outcomes including morbidity and mortality. Assessment of practicality within clinical settings and patient tolerance of the training is also essential.

In conclusion, these results suggest that isolated knee extensor training in HFpEF improves short-term outcomes including whole-body exercise capacity. This training appears to be feasible and, in our opinion, could be applied to rehabilitation and/or home exercise programs using readily available modalities such as knee extensor machines, ankle weights, and resistance bands. Small muscle mass exercise may therefore have a wide application as an alternative or adjunct training intervention for the broad spectrum of individuals with HF due to the decreased demand on the compromised cardiac system.

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ACKNOWLEDGMENT

This study was supported by Gold Coast Health and Gold Coast Hospital Foundation Research Grant Scheme 2017-18 and The Prince Charles Hospital Foundation Innovation Grant 2018-19. The authors express their gratitude to Bonnie Dixon (Librarian, Griffith University) for assistance with the search strategy.

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OPEN

Cardiac Rehabilitation Completion Study: Barriers and Potential Solutions

There is robust evidence supporting cardiac rehabilitation (CR) and its benefits.¹ However, the utilization of CR is suboptimal. There are a large number of studies related to improving CR initiation rates.^{2,3} However, there are a limited number of studies that have explored factors associated with CR completion and potential solutions to increase completion rates (40-60%).³⁻⁵ These studies have generally lacked patient-level details about the underlying challenges patients face in completing a course of CR. We conducted a qualitative study to identify barriers to completion of a CR program and identify factors that help facilitate CR completion.

No financial support or conflicts of interest to disclose.

Supplemental digital content is available for this article. Direct URL citation appears in the printed text and is provided in the HTML and PDF versions of this article on the journal's website (www.jcrpjournal.com).

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DOI: 10.1097/HCR.0000000000000709

METHODS

In this qualitative study, we conducted interviews with two focus groups of patients who had participated in the Mayo Clinic CR program. One group included those who completed the program (≥ 36 sessions), and the other group included those who did not complete the program (< 36 sessions). The study was approved by the Mayo Clinic Institutional Review Board.

PARTICIPANTS

A purposive sampling of the patients who enrolled in the Mayo Clinic CR program between October 1, 2015, and March 1, 2016, was done with the purpose of including a diverse group of patients in our sample based on sex and work status. Up to three telephone calls were attempted per patient until a sample goal of 12 patients was achieved who had completed their CR program (completers) and 12 patients were recruited who had not completed their CR program (noncompleters). While 12 completers agreed during the recruitment telephone call to attend a focus group meeting, only six of them attended.

Because of the difficulty recruiting, noncompleters were recruited to participate in a brief telephone-based interview that explored the same questions as were explored with the participants in focus group meeting. Seven of the 12 noncompleters who were contacted agreed to participate in the telephone interview. Written consent was obtained from all participants.

The in-person focus group was conducted by two of the investigators (K.V.D., J.H.), who were both experienced in carrying out semistructured patient interviews for qualitative research purposes. The telephone interviews of the noncompleters group were conducted by one of the investigators (J.H.). An interview guide was developed and used (see Supplemental Digital Content 1, available at: <http://links.lww.com/JCRP/A404>).

The interview data were recorded, transcribed, and coded by a qualified audio typist and analyst according to a standard qualitative analysis approach. A qualitative software analysis program, NVivo9 (QSR International), was used to facilitate data coding and sorting. Descriptive codes by constant comparison methods were merged to thematic

categories and conceptual frameworks to provide insight to further the enhancement of both CR modalities and barriers towards achieving ideal cardiovascular health. To ensure rigor and accuracy, separate transcription and coding were conducted by independent analysts from the study team (K.V.D. and M.S.P.).

RESULTS

Six patients in the completers group participated in the in-person focus group, and seven patients in the noncompleters group completed the telephone interview. The mean age among all the participants was 60.9 ± 8.9 yr. Of the 13 patients who participated in the completers and non-completers groups, four (31%) were women and six (46%) were employed.

We found that the primary types of barriers, along with solutions identified by participants, differed in the completers and noncompleters groups (Figure). In the completers group, the most common barrier identified was emotional barriers, such as a perception of feeling being overwhelmed with the myriad of issues facing the patients after their cardiovascular event. In the noncompleters group, the most common barrier identified was logistical barriers (eg, scheduling issues etc). Despite not completing CR, it is interesting to note that noncompleters reported receiving benefits from CR participation.

Participants also identified some strategies with the potential to facilitate completion to CR. The first involved the need to better inform and educate patients about the importance of attending CR while in the hospital. Participants were aware of the paradox between their need for information and the tendency toward information overload that is commonly experienced before hospital discharge. A second potential solution was to develop a more tailored CR program that includes more guidance than usual to help tailor the program to patient specific needs and goals. A third potential solution was to increase the level of support to patients, such as a group exercise option that would allow patients to support each other

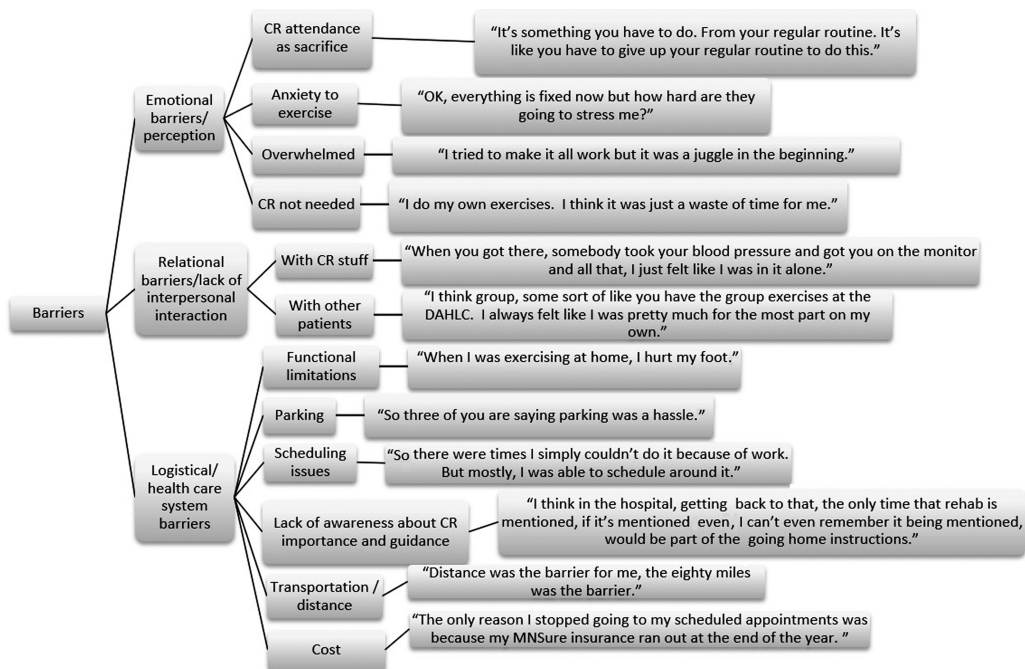


Figure. Patient-reported barriers to cardiac rehabilitation participation. Abbreviation: CR, cardiac rehabilitation.

during exercise sessions, or specific individual or group support sessions with CR staff members.

DISCUSSION

In this qualitative study, we identified challenges to CR program attendance among completers and noncompleters. Some of these challenges include barriers that have been previously reported such as transportation and scheduling issues.⁶⁻⁸ However, we also identified other more novel barriers that are less well known, including a perceived lack of interaction with CR staff and patients; a feeling of anxiety related to exercise participation; and a feeling of being overwhelmed by medical appointments and other responsibilities, all of which lead the patient to view CR participation at a relatively low priority level. These findings suggest the importance of patient education and psychosocial support to help identify and overcome potential barriers to CR participation.

This study was limited by the small sample size and by differing data collection strategies for completers and noncompleters. However, we used a standardized interview guide. A minority of women and employed individuals participated in the study. This may have weakened our ability to collect information from these populations, which along with ethnic minorities and lower income and education attainment, have been shown to be significant disparities in CR utilization.^{9,10}

CONCLUSION

Our study identified psychological and emotional barriers to CR participation for some individuals that have been missed in previous studies. These barriers include a perceived lack of interpersonal interaction with CR staff and patients and a sense of emotional exhaustion when confronting the myriad of health conditions in individuals who have suffered a recent cardiovascular disease event. Future studies should address these barriers through the use of personalized support tools that help identify and manage the various social and emotional determinants of health that exist for CR patients.

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Perspectives of Stroke and Cardiac Clinicians on Cardiac Rehabilitation Post-TIA or Mild Stroke

Stroke is responsible for significant economic and intangible costs to individuals and wider society, approximating \$50 billion annually in Australia alone.¹ Up to 30% of strokes are recurrent events.² Furthermore, during the first 90 d following a transient ischemic attack (TIA), individuals have a 20% risk of suffering a stroke.³

International guidelines recommend that all individuals with cardiovascular disease should be referred to a secondary prevention program, such as cardiac rehabilitation (CR), to prevent recurrent events.⁴ Despite this, people with TIA or stroke account for <2% of Australian CR attendees.⁵ Encouragingly, 60% of Australian CR coordinators agree people with TIA or mild stroke should attend existing CR programs.⁵ Therefore, the aims were to determine whether Australian stroke health professionals referred people with TIA or mild stroke to secondary prevention programs, and to explore the perceptions of Australian stroke and CR health professionals regarding barriers and enablers to CR for people with TIA or mild stroke.

METHODS

An exploratory sequential design was employed between September 2019 and April 2020, including both quantitative

The authors declare no conflicts of interest.

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DOI: 10.1097/HCR.0000000000000729