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The Experiences of Patients Undertaking a 'Virtual' Cardiac Rehabilitation Program

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Abstract. Cardiac rehabilitation programs (CRP) are medically supervised, multidisciplinary programs that provide secondary prevention aimed at addressing risk factors and improving lifestyle behaviours for patients following an acute cardiac event. CRPs have been demonstrated to be a cost-effective and evidence-based mechanism to improve patient outcomes, but despite the known benefits of these programs, uptake remains poor. Poor attendance has been linked to many factors, but geographical accessibility is a key concern, since many CRPs are limited to hospitals in urban areas. The widespread availability of the Internet has made it possible to provide virtual health services to populations that may have previously been hard to access. This paper examines the qualitative findings from a 16-month mixed methods randomized controlled trial examining the impact of a virtual CRP (vCRP). The vCRP was revealed to be an accessible, appropriate, convenient and effective way to deliver cardiac rehabilitation services, with patients experiencing both clinical improvements and a high level of satisfaction. To understand the experience of patients undertaking the vCRP, semi-structured interviews were undertaken with a purposive sample of 22 participants. An analysis of the qualitative interviews revealed that the vCRP improved participants' access to healthcare professionals, supported them to make healthy choices, and enhanced feelings of accountability due to greater surveillance. Barriers to participation, such as computer literacy, and general perceptions of a vCRP were also examined. Further investigation into the use and long-term effectiveness of virtual programs across a broader range of healthcare settings is warranted, particularly in those with multiple chronic diseases and those located in rural and remote communities.

Keywords. Cardiac rehabilitation, virtual, telehealth, qualitative, patient experiences, rural and remote.

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Introduction

Cardiovascular disease (CVD) continues to be a major global health concern and the biggest cause of morbidity and mortality among men and women [1]. Rates of CVD are rising, in part due to the ageing population, but also due to the burgeoning effects of chronic disease and obesity [2]. The management of CVD is complex and patients typically require ongoing clinical management, multiple medications and educational programs to support risk factor modification [3,4].

Cardiac rehabilitation programs (CRP) are medically supervised, multidisciplinary structured programs that provide secondary prevention aimed at addressing risk factors and improving lifestyle behaviours [5,6]. CRPs are typically offered following an acute cardiac event, such as a myocardial infarction, and have been demonstrated as a cost-effective and evidence-based mechanism to improve patient outcomes [7-10]. These programs are commonly offered in the community and hospital settings and comprise patient education, supervised exercise, monitoring and support. Despite the known benefits of these programs, the uptake of CRPs remains poor, with only 10-35% of eligible patients attending. Poor attendance has been linked to a number of factors, including female gender, accessibility (including geographical location and transport availability), employment status and perception of health status [11,12]. Geographical accessibility is a key concern, since many CRPs are limited to hospitals in larger metropolitan areas, with rural dwelling patients having more limited access to this resource [13]. The proliferation of low-cost communication technology and the widespread availability of the Internet has made it possible to provide virtual health services to populations that may be hard to access. While there has been a growth in remotely delivered healthcare services, the evidence to support them is sparse and largely limited to feasibility studies [14-17].

To examine the impact of a virtual cardiac rehabilitation program (vCRP), we undertook a 16-month mixed methods randomized controlled trial with blinded outcome assessment consisting of a four-month vCRP with a 12-month sustainability follow-up on exercise capacity and risk factor reduction compared to usual care in patients living in small urban and rural communities without access to standard CRP [18]. In addition to clinical outcomes, we undertook qualitative interviews with a purposive sample of 22 vCRP participants to explore the acceptability and uptake of the program. Incorporating the qualitative component enables a broader examination of some of the contextual, health services and patient factors that can impact upon its development and implementation [19]. This paper will focus upon the qualitative outcomes of this mixed methods study and will provide valuable insights into the development and uptake of the vCRP in rural communities.

1. The Study

The vCRP was designed to mimic a standard hospital-based CRP included on-line intake forms (medical, risk factor and lifestyle forms), scheduled one-on-one chat sessions with the program nurse case manager, exercise specialist and dietician (three times each during the 12 weeks), weekly education sessions, and data capture for the exercise stress test and blood test results. The program was informed by best practice guidelines and was pilot tested. Consecutive adult in-patients with acute coronary syndrome or following a revascularization procedure from two rurally located hospitals

in British Columbia were recruited. To be eligible, prospective participants were required to speak English and have regular Internet access. Patients with any physical limitations to exercise, significant co-morbidities, or previous experience of a CRP were excluded.

78 participants were enrolled in the study and 38 were randomized to the intervention group. Participants in the control group received routine care from their primary care provider. Those in the intervention group received an orientation to the vCRP as well as training on the heart rate and blood pressure monitoring devices. Upon accessing the program, participants were provided with a list of activities to complete for the week. The program lasted four months in duration and a final semi-structured interview was undertaken with a purposive sample of 22 participants to explore satisfaction and to provide feedback on the vCRP. Participants were selected to provide a cross-representation of gender, level of vCRP usage and geography, and sampling was discontinued once no new major themes emerged. Interviews were conducted by a trained research coordinator and transcribed verbatim. Data were analyzed using a qualitative description and coded thematically to garner in-depth descriptive summaries of events or situations [20,21]. Peer checking of the ongoing analysis was undertaken to promote accuracy and rigor [22]. This study was registered at ClinicalTrials.gov (registration number: NCT00683813) and approved by the Simon Fraser University, Providence Health Care and Northern Health Authority Research Ethics Boards. All participants provided informed consent.

2. Summary of Study Findings

An analysis of the study findings revealed that the vCRP was an accessible, convenient and effective way to deliver cardiac rehabilitation services. Data analysis revealed a good overall uptake of the program activities, with participants averaging 27 logins to the website (range 0-140) and 122 individual chat sessions between the vCRP participants and either the nurse, dietician or exercise specialist (mean 3.6 per participant). Those allocated to the intervention group also demonstrated statistically significant improvement in exercise capacity, along with other improvements in total cholesterol, LDL-C, and saturated fat intake. Likewise, an analysis of the interview data identified that the vCRP was an accessible and acceptable form of cardiac rehabilitation. A descriptive analysis of the qualitative data revealed five core themes. These are: accessibility, making healthy choices, surveillance, barriers to participation and perceptions of the vCRP.

2.1. Accessibility

The vCRP was seen as providing easy access to key healthcare professionals, including a cardiac nurse, exercise specialist and dietician. The program helped the participants to have greater awareness of their condition and supported them to work towards their healthcare goals. Many of the participants were satisfied with the virtual format as this could be accessed at a convenient time and negated the need for travel. In particular, the virtual delivery enabled them to recover in their own community. For example, one participant stated that the *"... convenience of fitting into your lifestyle is big. Access to numerous experts in one location is also handy. You can ask questions anytime they pop into your head through email."*

2.2 Making Healthy Choices

The participants reported greater awareness and motivation to manage their health condition and adopt healthier lifestyle choices as a result of their participation in the vCRP. This included a greater recognition of the need to maintain a healthy diet, to undertake regular exercise with suitable intensity, and to monitor their health condition appropriately. One participant commented: *"You just pay more attention, and it's more upfront and not in the back of your mind … you are more aware of what's happening and what you can do about it."*

2.3 Surveillance

During the interviews, many of the participants explained how having ongoing surveillance from healthcare providers, as well as support for self-management activities, helped them to adhere to their recommended program. These participants reported that they felt more accountable for their progress and confident in their recovery. One participant explained: *"You know I had stents four years ago, and you start off with the best of intentions, but nobody looks over your shoulder and you peter out. At this time, I felt this is a nifty program … somebody's watching it and I better do it. Keeps you honest, keeps you focused."*

2.4 Barriers to Participation

While high levels of engagement in the vCRP were common, some participants reported low-to-moderate levels of involvement. Reasons for this included lack of time, infrequent access to the Internet or computer, lack of motivation, and poor computer literacy. Challenges related to the use of the computer were commonly reported, however, these were largely isolated to the initial set up and were resolved with greater familiarity or direct support from the research team or others.

2.5 Perceptions of the vCRP

Overall, the participants were enthusiastic about their progress during the vCRP, with many reporting that they felt healthier as a result. Importantly, some of the participants highlighted that the program gave them more confidence when interacting with healthcare professionals. One participant highlighted: *"it helped with knowing which questions to ask … it probably helped [family doctor] because I wasn't asking random questions.*"

Conclusion

The vCRP was revealed to be an accessible, appropriate, convenient and effective way to deliver cardiac rehabilitation services, with patients experiencing both clinical improvements and a high level of satisfaction [18]. An analysis of the study findings strongly support the use of virtual programs for patients following a cardiac event and are revealed as a viable alternative to traditional programs for those located in rural and remote areas. More widespread integration of such programs could provide a cost

effective means to help address the growing challenges faced by many global healthcare systems, including the increasing prevalence of chronic diseases and obesity, growing health disparities and more limited access to healthcare services in rural and remote communities.

Further mixed methods research is warranted to explore long-term outcomes of the vCRP. This should include studies to explore the more widespread integration of the program in settings across Canada, including Aboriginal communities, and globally. Insights from caregivers and healthcare providers would also be a useful addition. Finally, expanding this model to other patient groups, including those with multiple complex chronic diseases, would provide important insights and opportunities.

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