BRIEF RESEARCH REPORT

Enrollment Barriers in Hybrid Cardiac Rehabilitation

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ABSTRACT

Background: Hybrid (i.e., combined center-based with home/community-based) cardiac rehabilitation (HYCR) programs using telehealth have gained interest to improve access to care. The purpose of this analysis is to describe reasons patients were either ineligible to participate or declined enrollment in a trial that involved HYCR.

Methods: This is a sub-study of the *improving ATTENDance to cardiac rehabilitation* (iATTEND) trial, currently randomizing subjects to traditional center-based cardiac rehabilitation (CBCR) versus HYCR. This analysis used screening data from the first 23 months of this trial. Data from patients excluded or who declined enrollment was used to review enrollment barriers.

Results: Between March 2019 and January 2021, 3,708 patients were referred to cardiac rehabilitation. Of these, 887 (24%) attended a cardiac rehabilitation orientation at a site in the city of Detroit or at one of 2 suburban locations. Among these, 63% (554/887) were ineligible per study criteria, 3% (29/887) lacked access to a smart device, and 14% (128/887) lacked access to exercise equipment. Overall, 23% (205/887) of referred patients declined participation in the trial, and of these, 12% (103/887) declined because they preferred center-based cardiac rehabilitation over HYCR. Among the 157 patients unable to participate due to lack of a smart phone or exercise equipment, the percentage was not significantly different ($P = 0.204$) between those attending cardiac rehabilitation orientation within Detroit and the suburban locations.

Conclusion: Lack of access to a smart device did not represent a meaningful barrier (3%) to participate in a trial involving HYCR. Access to exercise equipment represented a potential barrier (14%). *J Clin Exerc Physiol*. 2023;12(2):54–57.

Keywords: telehealth, virtual, iATTEND, smart device

INTRODUCTION

Cardiac rehabilitation (CR) is a crucial component in the care model for patients with cardiovascular disease. As a Class IA recommendation, referral to CR is 1 of 9 performance measures for secondary prevention established by the American Heart Association and American College of Cardiology for patients diagnosed with eligible cardiovascular conditions (1). The benefits of CR are numerous, ranging from decreased mortality and decreased hospitalizations to improvements in functional capacity, glycemic control, depression, and overall quality of life (2). The clinical benefit of CR has been attributed to the increase in fitness within a structured and supervised exercise program and the favorable physiologic effects of exercise on coronary endothelial function, insulin resistance, blood pressure, inflammatory markers, and fibrinolytic state (3). In addition to their physiologic effects, CR programs influence secondary prevention through disease management strategies and patient education that addresses medical adherence, weight management, smoking cessation, hypertension management, and coping mechanisms for chronic conditions (3).

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Despite the benefits of CR, most eligible patients do not participate. Depending on insurance type, participation rates for traditional center-based CR (CBCR) range from as low as <30% (Medicare) to an average of 30% to 40% (commercial insured) in the United States for eligible patients. Notably, this participation rate is well below the Million Hearts goal of 70% (4). Part of this is due to low referral rates to CR, which have been reported to be a large contributor to poor use (5). There also may be a lack of understanding of the benefits of CBCR by both potential referring physicians and potential participants. There are also a multitude of barriers that affect enrollment in CBCR, including barriers at the personal/patient level (transportation issues, dependent care responsibilities, time constraints, professional/work obligations), system level (hours of operations, operating capacity, fragmented care about various health systems), and policy level (copayments, insurance and financial limitations) (6).

The recent COVID-19 pandemic has further influenced CR enrollment, with a substantial drop in the number of patients participating, particularly during times of high community infection spread (7,8). With recent advances in phone and other smart device technology via communication platforms (e.g., Zoom, Webex, etc.), which was enhanced during the COVID-19 pandemic, hybrid (i.e., combined center-based with home/community-based) CR (HYCR) programs using telehealth have improved the ability for patients to access care. Various telehealth and communication models to deliver HYCR have been developed and include both synchronous and asynchronous communication. Asynchronous communication represents a model in which the patient and CR staff communicate at times other than when the patient is exercising, conversely synchronous HYCR uses communication strategies between the patient and CR staff that occurs in real time, supervising the patient while they are exercising (9). The iATTEND study used both synchronous and asynchronous communication. Regardless of the communication model, HYCR has the potential to address some of the barriers associated with participation in a CBCR model.

Initial papers assessing outcomes among patients participating in HYCR compare favorably with traditional CR models in terms of impact on hospitalizations, quality of life, and cost (9). The National Institutes of Health is sponsoring a study trial that is addressing adherence, changes in exercise capacity, and satisfaction (10). Despite the availability of a HYCR program, some patients still choose not to (or are unable to) participate. This study sought to describe patient reasoning and barriers preventing participation in a HYCR program using recruitment data from an ongoing trial.

METHODS

This project is an analysis of enrollment data from the initial 23 months of recruitment in the iATTEND (improving ATTENDance to CR) trial. iATTEND is a single-site study funded by the National Heart, Lung, and Blood Institute (NCT identifier: 03646760) currently randomizing subjects to traditional CBCR versus HYCR. The study was reviewed and approved by the Henry Ford Health System Institutional Review Board. Inclusion criteria for the project were having experienced a CR qualifying cardiac event and were ≥18 years of age. This study is randomizing patients to either CBCR or HYCR, that latter of which includes supervised exercise via telehealth while at home or in the community.

The CBCR group performs traditional outpatient CR delivered in a hospital facility or medical center setting where patients and CR staff are in the same location, exercise is directly implemented and observed by clinical staff (i.e., clinical exercise physiologists), and education and counseling occur in-person. The HYCR group uses a combination of center-based and home/community-based CR via telehealth (synchronous with voice and video), which includes supervised monitoring of exercise and patient education delivered using a commercial platform (i.e., Webex). Although the primary endpoint for iATTEND is the total number of CR visits completed, baseline data from patients who were excluded or declined enrollment in the trial despite attending CR orientation (CRO) provides an opportunity to describe barriers for not participating in HYCR.

At the time of data analysis, the iATTEND trial had identified 3,708 patients eligible for CR between March 2019 and January 2021. One site for participation in CR was located within the city of Detroit (medical fitness center setting) and 2 sites in suburban locations (one within a hospital and the other in a large multispecialty ambulatory care clinic). Patients who were scheduled for the CRO were screened for study eligibility criteria, which included: experienced a CR qualifying cardiac event, were ≥18 years of age, demonstrated connectivity to the internet via smart device for telehealth CR sessions, and access to personal or community-based exercise equipment. Patients were excluded from the study because of: implantation of a left ventricular assist device; receiving inotropic support or currently on dialysis; experiencing angina at low functional capacity; or unable to exercise independently.

Analysis was performed on the subset of patients who were referred for CR and subsequently attended CRO and were either ineligible for the study or declined enrollment (Figure 1). A comparison involving all 3 participation sites was completed using Kruskal-Wallis tests and χ^2 test for categorical variables regarding race and sex. Comparison analysis was performed among the subset of patients stratified by which CRO site the patient attended.

RESULTS

A total of 887 of the 3,708 (24%) with a qualifying condition and referred for CR attended an orientation session. Among these 887 patients, 63% were deemed ineligible per study criteria, 23% declined participation in the trial, and 14% consented to participate (Figure 1). The demographics for these 63% (554 patients) are shown in Table 1; of the total number of patients assessed across the 3 sites, only 32% were black at the 2 suburban sites compared to 85% at the Detroit location. Among the 887 patients who were referred

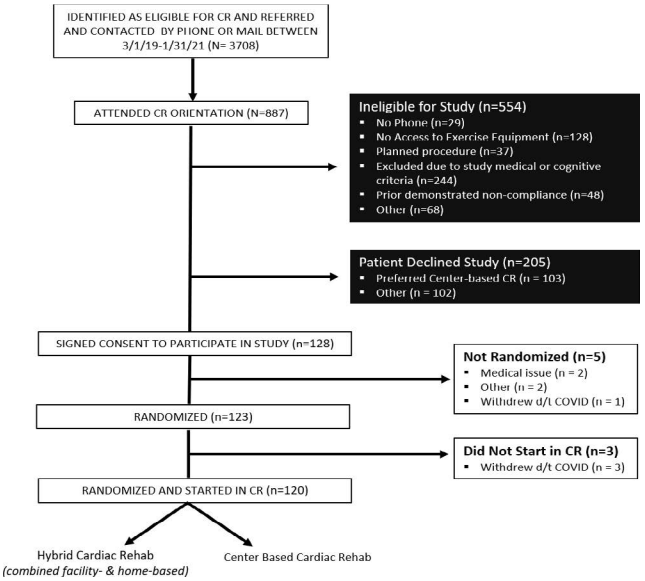

FIGURE 1. Study design of iATTEND trial; note the boxes shaded in black are the subset of patients who were the focus of this research report.

and attended a CRO, 29 (3%) were ineligible due to lack of access to a smart device technology/connectivity, and 14% ineligible due to lack of access to personal or community-based exercise equipment.

Among the 157 patients unable to participate in iATTEND because of lack of access to either smart phone or exercise equipment, there was no difference (P = 0.204) between those patients who attended their CRO within the City of Detroit (17% = 107/641) and those who attended CRO at a suburban location (20% = 50/246). Among all patients attending a CRO, 103 (12%) declined because they preferred CBCR over HYCR. Two of the main reasons given for preferring CBCR were (a) the communal aspect of CBCR and (b) fear of exercising independently using during HYCR.

DISCUSSION

While lack of access to technology (i.e., smart device and internet connectivity) to participate in telehealth visits didn't represent a meaningful barrier (3%) to participate in the iATTEND trial, access to personal or community-based exercise equipment was a greater barrier (14%). Additionally, a subset (12%) of patients declined trial participation in a project involving HYCR because they preferred attending CBCR only. There was no significant difference in those patients who were unable to participate when comparing different orientation sites (urban vs. suburban).

A main benefit of HYCR is broader access to the delivery of CR to eligible patients by overcoming common barriers that impede a patient's participation in CBCR. Some of these barriers include limitations in transportation, scheduling/time constraints, and the lack of a convenient CBCR location for the patient (1). HYCR does not have the exact same list of barriers to participation as CBCR and presents a unique set of issues that this study sought to examine. Interestingly, lack of access to exercise equipment is a greater barrier than lack of access to technology (i.e., smart device and Wi-Fi access), in part because of the greater availability of wireless internet and greater access to computers and smart cellular devices. Our data demonstrates that there appears to be no difference for these barriers between a suburban or urban setting.

While this study focused on HYCR barriers that exist in an urban and suburban population, other populations may have different and unique barriers (i.e., a rural patient population may have greater limitations with internet connectivity and thus lack of access to technology may be the primary barrier for that community).

Some limitations of this study include the retrospective nature of this analysis, small sample size and lack of variability among patients from different geographic areas (all patients were within metro-Detroit area and were referred within a single health system).

CONCLUSION

Determining barriers to enrollment in HYCR in each patient population is necessary to address such barriers and increase and encourage participation and overall cardiac health. With greater advances in technology and greater patient access to the needed delivery platforms, HYCR delivered via telehealth has the potential to increase and expand the reach of CR. We appear to be the first to report data on lack of phone or exercise equipment availability. Further studies are needed to expand on HYCR delivery models and ways to increase participation in CR.

TABLE 1. Baseline patient demographics across orientation sites for patients ineligible for iATTEND trial (N = 554).

Demographic	Detroit Site	Suburban Site 1	Suburban Site 2
Age, mean ± SD, y	58.4 ± 12.8	65.2 ± 12.6	68.7 ± 11.6
Race			
Black, % (n/total)	85 (305/359)	37 (41/111)	11 (3/27)
White, % (n/total)	15 (54/359)	63 (70/111)	89 (24/27)
Sex (% Female), (n/total)	42 (159/377)	37 (43/119)	31 (9/29)

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