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Assessing Facilitators and Barriers to Enrolling in Cardiac Rehab

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Abstract: Heart disease has been a leading cause of death since the early 1900s (Heron & Anderson, 2016). Americans are at higher risk for heart disease if they have high blood pressure, high cholesterol, are overweight, inactive, and smoke, among other risk factors (CDC, 2019). If a person already has heart disease or has had a cardiac intervention (such as a stent), they may be referred to a local cardiac rehab program. Bryan Health in Lincoln, NE, currently offers two methods of delivering cardiac rehab: in-person or home-based. Research has not yet been done to assess enrollment facilitators and barriers specific to Bryan Health's cardiac rehab programs. The fact that heart disease has been a leading cause of death for this long solidifies the importance of decreasing barriers and increasing cardiac rehab enrollments. Bryan Health's cardiac rehab program, other Nebraska cardiac rehab program sites, and cardiac patients would all benefit from learning the results of this study.

1. Introduction

Specific Aims:

This qualitative study aims to assess facilitators and barriers to cardiac rehab participation at Bryan Health in Lincoln, NE. Both traditional in-person and virtual home-based cardiac rehab enrollment at this location is evaluated in this study. Traditional in-person cardiac rehab will now be referred to as "in-person," and virtual home-based will be called "home-based" throughout the rest of this document.

Significance:

Heart disease has been a leading cause of death since the early 1900s (Heron & Anderson, 2016). Americans are at higher risk for heart disease if they have high blood pressure, high cholesterol, are overweight, inactive, and/or smoke, among other risk factors (CDC, 2019). A cardiac rehab program is one of the most critical interventions after someone experiences a cardiac event.

The American Heart Association defines cardiac rehab (CR) as "a medically supervised program designed to improve your cardiovascular health if you have experienced a heart attack, heart failure, angioplasty or heart surgery" (2016). Several options for cardiac rehab include in-person or home-based sessions. Both programs aim to provide a customized outpatient program that includes exercise, education, and support (Mayo Clinic, 2020). The difference between the two offerings is how they are delivered to the patient. In-person cardiac rehab involves the patient physically going to the medically supervised location where cardiac rehab sessions are held. During these sessions, the patient will work with and be monitored by a team of medical professionals, including nurses, exercise specialists, and dieticians (Mayo Clinic, 2020). In

contrast to in-person rehab sessions, home-based cardiac rehab "relies on remote coaching with indirect exercise supervision and is provided mostly or entirely outside of the traditional center-based setting" (Thomas et al., 2019). This option assumes that the patient exercises alone at home and is in contact with a provider via a virtual source. Therefore, a home-based cardiac rehab option is typically more appropriate for "clinically stable low- to moderate-risk patients who are eligible for CR but cannot attend a traditional center-based CR program" (Thomas et al., 2019). Low- to moderate-risk patients have qualities such as having a less invasive procedure (ex. stent versus an open-heart surgery), being at optimal body weight, being younger, having a high exercise threshold, and having blood pressures and cholesterol numbers under control.

Cardiac rehab has a class 1A recommendation (which signifies a strong recommendation) after heart surgery, heart attack, or coronary intervention (Simon et al., 2018). While it is dependent on the coverage the patient has, most patients qualify to attend cardiac rehab for a total of thirty-six sessions and go to classes for an average of 3 months (Simon et al., 2018). Cardiac rehab sessions have three main components to strengthen the heart and improve quality of life: exercise, heart-healthy diet education, and stress management (AHA, 2016). The benefits of cardiac rehab have been found to reduce mortality and risk factors (i.e., high blood pressure, high cholesterol levels, obesity, inactivity, etc.) and improve quality of life through increased functional capacity and additional support from staff and other participants (Simon et al., 2018).

While cardiac rehab is highly recommended, it is still underutilized (Simon et al., 2018). Unfortunately, lack of insurance, limited transportation, or schedule conflicts may limit a patient's ability to attend in-person cardiac rehab sessions (ACC, 2021). The American College of Cardiology states that patient cost is one of the more significant deterrents for patients (2021).

"Cost and adequate insurance coverage typically come in at, or close, to the top of the list of barriers to referral and enrollment" (ACC, 2021).

> "For Medicare patients who have supplemental insurance, some portion of the co-pay responsibility may be covered, but supplemental coverage for the service and how much may be covered varies widely. Out-of-pocket cost is a barrier for low- and fixed-income patients, and it may deter referral if assisting patients to find access to financial assistance is complex and time-consuming" (ACC, 2021).

Home-based cardiac rehab programs and telehealth appointments, in general, have become more prevalent due to the COVID-19 pandemic (ACC, 2020). Examining the facilitators and barriers to participation in in-person and home-based cardiac rehab programs is extremely important, especially for Bryan Health, since research has not yet been done. There are deficiencies in the research, mainly because home-based cardiac rehab programs are newer. Bryan Health has recently started offering a home-based, asynchronous cardiac rehab program. Since this is a brand-new service offered at Bryan Health, data collection on enrollment rates has not been possible for home-based patients. Data have been collected for in-person cardiac rehab participation, but it is not openly available to the public.

The Bryan Health cardiac rehab program would benefit from learning the results of this study. Staff could review the study to see if adjustments needed to be made to increase participation rates for both programs. Other potential Nebraska sites that offer both in-person and home-based cardiac rehab programs would be interested in learning the findings of this study. This study would help them determine what their programs could do to decrease cardiac patients' barriers and increase enrollment rates.

2. Literature Review

Research has previously been done on the facilitators and barriers to cardiac rehab within the United States. The results from these studies can assist with the creation and implementation of new and innovative models of cardiac rehab, including home-based programs. In literature, home-based cardiac rehab is occasionally referred to as HBCR.

In a qualitative study that the Veterans Health Administration completed, 56 people were interviewed across 30 VA facilities across the United States. They interviewed a combination of VA patients (15 patients total, ten cardiac rehab participants and five nonparticipants), clinical providers (11), and cardiac rehab managers (30). The study's goal was to investigate attitudes and knowledge toward cardiac rehab. After the interviews were complete, six themes were identified as barriers and five facilitators to participating in cardiac rehab. The barriers fell within the following categories: travel, willingness to participate, hospital system issues, cost, lack of provider knowledge, and poor inter-provider communication (Schopfer et al., 2016). The top barrier was travel/distance, with 68% of all the study participants mentioning travel or distance as a major barrier (Schopfer et al., 2016). It was found that the facilitators to participating in cardiac rehab were system factors (such as a dedicated staff member), provider knowledge about cardiac rehab, patient interest in improving their health, positive patient feedback about cardiac rehab, and necessary communication between providers (Schopfer et al., 2016). The most-reported facilitator was a "clinical champion."

> "Almost half of the providers reported that referral of patients to CR programs was due to 1 key staff member who systematically identified appropriate patients and referred them to onsite or community programs. Clinical program managers said that an "opt-out" referral process, in which eligible patients are automatically referred for assessment by

> the CR team, was much better than an "opt-in" process, in which the provider must initiate a referral for each eligible patient" (Schopfer et al., 2016).

In conclusion, this study suggested that travel and distance-related barriers must be reduced to increase cardiac rehab utilization.

In another study involving the Veterans Health Administration, the creation and dissemination of a home-based cardiac rehab program were examined. The goal was to determine facilitators and barriers to implementing home-based cardiac rehab. Sixteen VHA facilities implemented the home-based cardiac rehab model, and qualitative and quantitative data was gathered over three years. "Each approved site received the HBCR tool kit materials, initial training, monthly mentoring calls, SharePoint site access, and ongoing consultation from the Iowa City VA HBCR staff" (Wakefield et al., 2019). All the programs within this study had external funding to get their home-based programs up and running. Results showed the difference between whether they had high program uptake or not depended on readiness for implementation, planning, and engaging leadership (Wakefield et al., 2019). Programs that efficiently utilized the resources they received and combined with existing resources at their site had higher home-based cardiac rehab adoption rates.

One specific study conducted in Omaha, NE, in 2018 observed the accessibility and utilization of smart devices and the internet for older adults. Study participants were among attendees of four cardiac rehab programs in Omaha and completed a voluntary survey consisting of 28 items. One hundred sixty-nine people completed the survey. It was found that access to the internet and smart devices were not significant barriers to participating in home-based cardiac rehab.

> "The major findings of our study are: (1) The majority of CR attendees had Internet access, and device ownership was high (85% in general, and 47% for smart phone); (2) Despite three quarters of CR attendees reporting no perceived barriers, only 18% used the Internet for DHI; and (3) Consistent with the general population, younger age, college education, and higher income predicted greater use of the Internet and less perceived barriers" (Saadi et al., 2020).

This study concluded that while accessibility to the internet and smart devices is no longer a major barrier to home-based cardiac rehab, these resources are still not used for health-related applications (Saadi et al., 2020).

Another study done in Omaha, NE (which is geographically close to Lincoln, NE) examined the experiences of cardiac rehab patients. The main objective of this study was to investigate perceptions of cardiac rehab after completing the 3-month program. After completion of cardiac rehab, 11 couples (cardiac patients and their spouses) were interviewed. Themes were identified and fell within three categories: exercise, education, and environment. Exercise themes were related to benefiting from exercise and feeling held back due to not having much say in exercise equipment or intensity (Yates et al., 2018). The identified education themes were connected to receiving basic education and wanting more personalized information (Yates et al., 2018). "CR environment themes were as follows: (1) developed confidence; (2) made social comparisons; and (3) helped to have partner there" (Yates et al., 2018). Overall, the consensus of the patients and their spouses was that they benefitted from traditional cardiac rehab, although they did want more personalized educational information (Yates et al., 2018).

In summary, previous studies have identified facilitators and barriers for in-person and home-based cardiac rehab programs. Significant barriers to cardiac rehab include cost, travel,

patient willingness to participate, lack of provider knowledge, and underutilization of home-based programs. Several facilitators consist of dedicated staff members getting eligible patients enrolled, good communication between providers, and positive feedback from cardiac rehab participants. Cardiac rehab is viewed to be an extremely valuable resource for patients. Therefore, additional efforts need to be put towards decreasing barriers so that more patients can enroll and participate in cardiac rehab.

3. Methods

A total of 14 cardiac patients and staff members were recruited to be interviewed for the study. Individual interviews were done with five in-patient cardiac patients, five cardiac rehab patients, and four cardiac rehab nursing staff members. In-patient cardiac patients are patients in the hospital after their cardiac event/procedure and have not yet been discharged. Cardiac rehab patients are already enrolled and participating in the in-person cardiac rehab program. The cardiac rehab nursing staff are all nurses that work in both the in-patient and out-patient settings. There are three phases of cardiac rehab: inpatient, outpatient, and on your own (Cleveland Clinic, 2021). This study included getting patients' opinions within the first two phases of cardiac rehab (inpatient and outpatient), along with the nursing staff that works with these patients.

A convenience sampling approach was utilized as the researcher currently works within the cardiac rehab program at Bryan Health as an Exercise Specialist. All individual interviews throughout the study took around 15 minutes per participant. Interviews were completed with in-patient cardiac patients in the patient's hospital room. The cardiac nurse was also in the room during in-patient interviews, and several of the patients also had family members within the room. Interviews with current cardiac rehab patients were done in offices around the cardiac rehab exercise area and were done immediately before or after their cardiac rehab session. Interviews with the nursing staff occurred in an office space when only the researcher and nurse were present. During all the patient and nurse interviews, the researcher utilized an iPad to type the participant responses to questions asked. Age, gender, and race were gathered for all participant groups. Cardiac intervention information was also collected for the cardiac patient groups.

Each group of participants was asked a different set of questions. In-patient cardiac patients were asked the following five questions: What first comes to mind when considering if you'll be participating in CR? How important is participating in CR to you on a scale of 1-5 (5 being very important)? What are the main barriers for you to participate in CR? What plans do you have to learn about and implement heart-healthy habits? (If doing home-based) What concerns do you have regarding being able to complete the assignments from the nurse?

Current cardiac rehab participants were asked six questions: What factors went into your decision to participate in cardiac rehab? What made participating in cardiac rehab an accessible option for you? What barriers, if any, did you experience before enrolling? On a scale from 1 - 5 (with 5 being very important), how valuable do you think it is to participate in a cardiac rehab program? What do you think are the top reasons others don't participate in a cardiac rehab program? Had you been offered to do a home-based cardiac rehab program instead of in-person, do you think that would've made participating more convenient, and/or would it have been preferred?

Finally, the nursing staff was asked five questions: What do you think the main determining factors are when a patient is deciding if they will participate in cardiac rehab or not? What would you consider to be the top barrier for patients eligible for cardiac rehab? What would you consider to be the top facilitator? If a patient decides to decline traditional cardiac rehab due to barriers, how likely are you to offer home-based cardiac rehab (on a scale of 1-5, with 1 being never and 5 being always)? What recommendations do you have to increase either traditional or home-based cardiac rehab enrollment and make it more accessible to all populations?

After all the interviews were completed, the researcher found common themes within each group of participant interviews. Themes were found by the researcher manually coding participant interviews. Based on study findings, recommendations on how to decrease barriers to cardiac rehab enrollment were made.

4. Results

Common themes were identified for each question asked within all three participant interview groups (in-patient patients, current cardiac rehab participants, and staff members). Findings will be discussed within each of these groups.

When the in-patient patients were asked, “What first comes to mind when considering if you’ll be participating in CR?” answers were commonly related to insurance or cost, physical limitations, and scheduling. The question “How important is participating in CR to you on a scale of 1-5 (5 being very important)?” prompted one patient to answer 1 (not important) since they weren’t going to be enrolling. The rest answered with a rating of 4-5. Additional comments associated with being healthy, staying alive, and getting back to their normal selves were reasons 80% of patients thought participating in cardiac rehab was important. Physical limitations, time, transportation, and weather were the themes identified when examining patient responses to “What are the main barriers for you to participate in CR?”. The fourth question within the in-patient interview was, “What plans do you have to learn about and implement heart healthy habits?”. Attending cardiac rehab, getting support from family members, and getting help from other medical professionals were frequently mentioned. Finally, the last question for the in-patient interviews was, (if doing home-based) “What concerns do you have regarding being able to complete the assignments from the nurse?”. This question was irrelevant for all the in-patient participants due to none of them being offered home-based. Therefore, the question was not asked to any of the interview participants since most (4 out of 5) enrolled in a cardiac rehab program, and the other wanted to “just do his treadmill at home.”

Next, the findings of the current cardiac rehab patient interviews will be reviewed. The first question current cardiac rehab patients were asked was, “What factors went into your

decision to participate in cardiac rehab?". Doctor or cardiologist recommendations, improved health (such as endurance and decreased shortness of breath), and accountability were themes identified for this question. When asked, "What made participating in cardiac rehab an accessible option for you?" schedule availability and insurance covering it were commonly mentioned by interview participants. The third question, "What barriers, if any, did you experience before enrolling?" triggered answers related to location and physical limitations. When cardiac rehab patients were asked to rate how valuable they thought cardiac rehab was on a scale from 1-5, with 5 being very important, 80% answered with a 5, and 20% responded with 4. Additional comments about these ratings were that exercise was valuable and cardiac rehab helps with consistency. "What do you think are the top reasons others don't participate in a cardiac rehab program?" was the fifth question the patients were asked. Themes associated with this question were costs related to insurance and the rising cost of gas, transportation, limited motivation, and location. The final question asked to current cardiac rehab patients was, "Had you been offered to do a home-based cardiac rehab program instead of in-person, do you think that would've made participating more convenient and/or would it have been preferred?". Most of the participants, 80%, responded with no, and one replied with "maybe." Of the participants that said no, answers were associated with it being easier to make excuses not to do exercise if they were enrolled in home-based and they did not like doing things on their phone. The participant who said "maybe" mentioned that they knew what to do and had all the equipment at home but liked the support that comes along with being in a group setting.

Along with getting input from both groups of cardiac patients, feedback was also gathered from the nursing staff that works both in the in-patient and in-person cardiac rehab settings at Bryan Health. First, the staff was asked: "What do you think the main determining

factors are when a patient is deciding if they will participate in cardiac rehab or not?". Their answers fell within the themes of transportation, physical limitations, schedule, mindset/motivation, and location. The second question, "What would you consider to be the top barrier for patients eligible for cardiac rehab?" provoked answers related to insurance coverage, times available/convenience of program, location, physical limitations, and transportation. When nursing staff was asked what they thought the top facilitator for cardiac rehab to be, the themes of their answers were insurance coverage, being monitored by a nurse, and patients receiving motivation. Then, nurses were asked to rate how likely they were to offer home-based cardiac rehab on a scale of 1-5, with 1 being never and 5 being always. The average of answers given was 3.4. Themes of the comments made along with their ranking were associated with the appropriateness of the patient for home-based, age of the patient, and location. The nursing staff's final question was, "What recommendations do you have to increase either traditional or home-based cardiac rehab enrollment and make it more accessible to all populations?". Replies for this question fell under the following themes: additional/satellite location, increased coverage via grants, additional class times, following up with patients that initially decline cardiac rehab, and streamlining a way to inform patients of home-based.

5. Discussion

Results from this qualitative study are comparable to previous study findings completed in other geographic locations. When examining the themes found in all interview groups, several are repeated and overlap between groups. All themes identified fall within three categories: facilitators, barriers, and recommendations.

The consensus about cardiac rehab was that most patients thought it was important to enroll and participate. Patients expressed that they believed cardiac rehab helped to improve overall health. Having a doctor's recommendation, getting support and motivation from staff, having accountability, being monitored by a registered nurse, and having insurance coverage and no or little copay were all considered facilitators.

Barriers to cardiac rehab participation at Bryan Health included: the high cost (no insurance coverage or high copays), physical limitations, limited transportation, busy personal schedules, inconvenience of the program (class times and location of the facility), and limited participant motivation. To expand on barriers specific to in-person cardiac rehab, current class times at Bryan Health are during normal business hours, making it difficult for patients who are still working to attend in-person sessions. The setting of Bryan Health's in-person cardiac rehab program is at Bryan LifePointe, which is located on the southwest side of Lincoln. This location makes it inconvenient for patients that don't live near the facility. Barriers targeted at home-based cardiac rehab enrollment consisted of it being easy not to engage, smartphones not being the preferred method to complete tasks, and the home-based program not being mentioned by staff.

In examining the facilitators and barriers to cardiac rehab enrollment, Bryan Health is doing an excellent job of capitalizing on facilitators to enroll patients in cardiac rehab. Although, a few recommendations could be made to help decrease barriers and enroll additional patients in their cardiac rehab programs. Offering program classes at additional Bryan Health locations throughout Lincoln would help reach individuals that don't live near Bryan LifePointe. Presenting class times outside of the traditional business hours would encourage more patients within the working class to participate. Applying for aid/grants to help cover costs for people who don't have insurance coverage or have high copays would also help reach underserved populations. Following up with patients that initially declined cardiac rehab would be beneficial to see if they have changed their minds. At times, there is so much going on in the hospital setting that it is difficult for the patient to think about cardiac rehab along with everything else. In some instances, waiting until there are fewer distractions, and the patient has had some time to process what is going on with their health would be an ideal time to discuss cardiac rehab. Lastly, a protocol should be made to clarify how, when, and if patients are informed about the home-based cardiac rehab option. Doing this will make the process consistent among all cardiac nursing staff. In addition, more patients that are appropriate for the home-based option will be offered the opportunity to participate.

Limitations:

Several limitations have been identified for this qualitative study. First, Bryan Health has had a limited number of home-based patients. Since beginning their home-based cardiac rehab program, four patients have enrolled, and only two have completed the program. Completion of the home-based cardiac rehab program is defined as the patient being enrolled for 12 weeks (about 3 months).

Therefore, with the low number of current home-based patients, this group was not interviewed during this study. This would be a beneficial group to include in future studies.

Another limitation of this study was that responses to interview questions were typed on an iPad instead of being recorded. The reasoning behind this method was that the cardiac rehab department manager requested patient interviews not be recorded. This was requested because additional releases/documentation from the patient would not need to be gathered. Having the patient complete an additional task on top of dealing with everything else associated with their heart condition would be avoided. While several benefits of utilizing this method could be found, restrictions on typing interview responses open the potential of missing portions of what the participant said by not being able to type word-for-word what was said.

Lastly, an additional possible limitation of this study is that the researcher currently works for Bryan Health in the cardiac rehab department as an Exercise Specialist. Being an employee in the cardiac rehab setting may influence the ability to interpret study results.

Conclusion:

In conclusion, this study assessed the facilitators and barriers to cardiac rehab enrollment at Bryan Health. This study gathered the perspectives of in-patient cardiac patients, current in-person cardiac rehab patients, and cardiac nursing staff. The identified themes from participant interviews can guide actions to increase cardiac rehab enrollment at Bryan Health. Overall, Bryan Health should continue with its current procedures to enroll eligible patients into their cardiac rehab programs and make additional efforts to decrease barriers for disadvantaged populations.

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Appendices

- In-patient Cardiac Patient Interview Questions/Demographics
- Current Cardiac Rehab Patient Interview Questions/Demographics
- Nursing Staff Interview Questions/Demographics
- Study Themes
- Identified Facilitators, Barriers, and Recommendations

In-patient Cardiac Patient Interview Questions

1. What first comes to mind when considering if you'll be participating in CR?
2. How important is participating in CR to you on a scale of 1-5 (5 being very important)?
3. What are the main barriers for you to participate in CR?
4. What plans do you have to learn about and implement heart healthy habits?
5. (If doing home-based) What concerns do you have regarding being able to complete the assignments from the nurse?

In-Patient Cardiac Patient Demographics					
	Age	Race	Gender	Cardiac Intervention	Cardiac Rehab Enrollment Status
Patient #1	92	White	Male	Stent	Planned to attend a program in Seward, NE
Patient #2	65	White	Male	Stent	Didn't enroll
Patient #3	67	White	Female	Stent	Enrolled in Bryan Health's in-person program
Patient #4	68	White	Female	Stent	Planned to attend a program in Grand Island, NE
Patient #5	75	White	Female	Stent	Enrolled in Bryan Health's in-person program

Current Cardiac Rehab Patient Interview Questions

1. What factors went into your decision to participate in cardiac rehab?
2. What made participating in cardiac rehab an accessible option for you?
3. What barriers, if any, did you experience before enrolling?
4. On a scale from 1 - 5 (with 5 being very important), how valuable do you think it is to participate in a cardiac rehab program?
5. What do you think are the top reasons others don't participate in a cardiac rehab program?
6. Had you been offered to do a home-based cardiac rehab program instead of in-person, do you think that would've made participating more convenient and/or would it have been preferred?

Current Cardiac Rehab Participant Demographics				
	Age	Race	Gender	Cardiac Intervention
Patient #1	63	White	Male	Stent
Patient #2	71	White	Female	Mitral valve repair (MVR)
Patient #3	59	White	Male	Coronary artery bypass graft (CABG)
Patient #4	74	White	Male	Stent
Patient #5	84	White	Female	Stent

Nursing Staff Interview Questions

1. What do you think the main determining factors are when a patient is deciding if they will participate in cardiac rehab or not?
2. What would you consider to be the top barrier for patients eligible for cardiac rehab?
3. What would you consider to be the top facilitator?
4. If a patient decides to decline traditional cardiac rehab due to barriers, how likely are you to offer home-based cardiac rehab (on a scale of 1-5, with 1 being never and 5 being always)?
5. What recommendations do you have to increase either traditional or home-based cardiac rehab enrollment and make it more accessible to all populations?

Nursing Staff Demographics				
	Age	Race	Gender	License
Staff #1	43	White	Female	Registered Nurse
Staff #2	53	White	Female	Registered Nurse
Staff #3	32	White	Female	Registered Nurse
Staff #4	32	White	Female	Registered Nurse

Study Themes

In-Patient Themes
Cost
Physical limitations
Scheduling
Time
Transportation
Weather
Attending cardiac rehab
Getting support
Being monitored by health professionals

Current Patient Themes
Doctor recommendations
Improved health
Accountability
Schedule availability
Insurance coverage
Location
Physical limitations
Exercise is valuable
Consistency
Limited motivation
Expenses

Nursing Staff Themes
Transportation
Physical limitations
Schedule
Mindset/motivation
Location/additional location
Insurance coverage
Convenience of program
Being monitored by a nurse
Appropriateness of patient
Increase coverage
Streamline home-based informational sessions
Patient follow up

Identified Facilitators, Barriers, and Recommendations

Facilitators
Having a doctor's recommendation
Getting support and motivation from family and staff members
Having accountability
Being monitored by a registered nurse
Having insurance coverage
Having little or no copay

Barriers
Limited motivation
High cost (no insurance coverage or high copays)
Physical limitations
Busy personal schedules
Inconvenience of program (class times and location of facility)

Recommendations
Offer cardiac rehab at additional locations
Have class times outside of traditional business hours
Apply for additional aid and grants
Follow up with patients that initially decline cardiac rehab
Develop a protocol for staff to inform patients of the home-based option