Patient preferences for types of community-based cardiac rehabilitation programme

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ABSTRACT

Introduction Cardiac rehabilitation (CR) improves mortality, morbidity and quality of life of cardiovascular patients. However, its uptake is poor especially in the hospitals due to long travel distances and office hours constraints. Community-based CR is a possible solution.

Objectives To understand the type of community-based CR preferred and identify patient characteristics associated with certain programme combinations.

Methods A cross-sectional survey was administered to a randomised list of patients at risk for or with cardiovascular diseases at two community-based CR centres. Participants were presented with nine hypothetical choice sets and asked to choose only one of the two alternative programme combinations in each choice set. Attributes include support group presence, cash incentives, upfront deposit and out-of-pocket cost. The counts for each combination were tallied and corrected for repeats. Chi-square test and logistic regression were performed to understand the characteristics associated with the preferred CR combination.

Results After correcting for repeats, patients most (85.2%) prefer CR programmes with new group activities, support group, cash rewards, deposit and out-of-pocket cost, and few exercise equipment with physiotherapist presence without the need for monitoring equipment. Patients with more than three bedrooms in their house are less likely (OR 0.367; CI 0.17 to 0.80; P=0.011) to choose the choice with no physiotherapist and few equipment available.

Conclusion This is the first study to explore patients' preferences for different types of community CR. Higher income patients prefer physiotherapist presence and are willing to settle for less equipment. Our study serves as a guide for designing future community-based CR programmes.

INTRODUCTION

Cardiovascular disease such as ischaemic heart disease (IHD) is one of the leading causes of mortality and disability globally,¹ and its disease burden is increasing with an ageing population.² In 2010, there were 62.5 million new cases of cardiovascular disease, of which 24.2 million were from IHD.³ This number is predicted to rise to 84 million new cardiovascular disease cases in 2030.³

Cardiac rehabilitation (CR) is one intervention aimed at controlling the burden of IHD. It features components of behavioural counselling and an exercise programme, designed to maximise physical, psychological and social functioning. Evidence show that CR improves mortality, morbidity and

quality of life for patients with IHD.⁴ However, its uptake throughout the world is poor.⁵ This is even more apparent in the hospital setting where patients have to travel long distances and hospital programmes are only available during office hours.⁶

A potential way to circumvent this issue is to offer community-based CR.^{7,8} However, the uptake rate remains unclear. There is also limited evidence of what constitutes the factors that affect the uptake of such programme.⁹

Hence, the aim of this study is to understand the types of community-based CR programme preferred by patients undergoing CR and to identify patient characteristics that are associated with certain combinations of programme. This would be valuable for future modifications to maximise programme uptake and improve long-term patient outcomes.

METHODS

Participants and setting

An institutional review board–approved survey was administered to patients suffering from or at risk for cardiovascular diseases at two community-based CR centres. Participants were at Phase 3 and Phase 4 of their CR.¹⁰ Trained interviewers took written consent and administered the paper-and-pencil surveys. Interviews were conducted in either English or Mandarin.

Randomisation of sample

A list of active CR participants at two community-based CR centres was collated and assigned a random number from 0 to 1 using Microsoft Excel. After sorting the random assigned numbers in ascending order together with the corresponding names, the first 291 on the list are chosen to be approached by interviewers before or after their next CR sessions. This is to minimise bias during sampling.

Survey structure

The survey first gathers data on sociodemographic characteristics of the participants. Number of bedrooms correlates well with income level¹¹ and are often used as proxies of income in government policies and research studies.¹²

Each participant was then presented with nine hypothetical choice sets (generated using Sawtooth V.9.3.1 software), each consisting of two combinations of programme attributes, and asked to choose the combination they preferred. Participants are given a brief explanation of the various programme features. They will be required to choose only one

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of the two alternative programme combinations for each choice set. This method of surveying is suggested in order to reduce the cognitive burden on participants, as compared with choosing from all the combinations at one go.¹³

The study explored eight attributes (online supplementary figure 1). All attributes and their levels were finalised after a comprehensive systematic review, in-depth interview with patients and the final set of attributes were agreed on with clinicians and physiotherapists.⁹ The attributes were namely new group activities, presence of a support group, availability of exercise equipment, presence of physiotherapist, types of incentives/rewards (cash, sporting equipment or healthy food), presence of monitoring equipment that measure participant vital signs, amount of refundable deposit for a total of 10 sessions and out-of-pocket cost per exercise session.

Quality control of survey

Cognitive interviews were conducted before the start of the surveys. This allowed the survey to be understandable by laypeople and the meaning of the questions understood in a similar way across all interviewees. Participants were presented with seven choice sets in the survey (an example of which is given in online supplementary figure 2), with two additional choice sets for quality control. One of the additional choice sets was for dominance testing (choice set with one combination clearly dominating the other to ensure that participants carefully reviewed the choice sets). The remaining additional choice set was for retesting (repetition of a choice set to assess test–retest reliability).

Statistical analysis

Descriptive statistics were presented in mean (SD) or number (%). To quantify the most popular choice combination, counts were analysed by summing each choice combination by the participants. Repeated combinations were adjusted for by dividing the total counts by the number of times they were repeated in the survey.

Chi-square test was conducted to assess which of the two combinations was preferred within each choice set with the corresponding P value noted. Following which, logistic regression was performed for the choice combination against the various participant characteristics/demographics in order to understand which characteristic/demographic is associated with the preferred combination. The corresponding OR, 95% CI and P value were presented. P values less than 0.05 were considered statistically significant. All analyses were conducted using STATA SE14.0 for Windows.

RESULTS

Participants

A total of 265 participants out of the 291 approached were recruited and all completed the study (table 1). The mean age was 65.7 (8.8) years, with 161 (60.8%) men. Most participants were married (84.5%) and half (49.9%) received at least secondary school education.

Participants' preference for the various combinations

The number of participants who preferred each particular combination are listed in table 2. From simple counting, the top three combinations were combinations 8 (198 participants, 98.4%), 5 (192 participants, 90.6%) and 12 (179 participants, 85.2%) before correction, and combinations 12 (179 participants,

Table 1 Participants' sociodemographic data

Participant characteristics	N=265 No (%)
Age (years)±SD	65.7±8.8
Gender	
Male	161 (60.8)
Female	104 (39.2)
Race	
Chinese	242 (91.3)
Non-Chinese	23 (8.7)
Highest education level	
Secondary and below	134 (50.6)
Above secondary education	131 (49.4)
Marital status	
Married	223 (84.5)
Not married	41 (15.5)
No of bedrooms*	
Three rooms and below	96 (36.4)
More than three rooms	168 (63.6)
Employment status*	
Employed	82 (31.1)
Not employed	182 (68.9)
Hypertension	150 (56.6)
Diabetes	62 (23.4)
Hyperlipidaemia	192 (72.5)
Overweight	70 (26.4)
Valvulopathy	23 (8.7)
Ischaemic heart disease (IHD)	158 (59.6)
Past intervention done	
PCI	73 (27.5)
CABG	51 (19.2)
Type of prevention for IHD	
Primary	107 (40.4)
Secondary	158 (59.6)

*264 participants.

CABG, coronary artery bypass grafting; PCI, percutaneous coronary intervention.

85.2%), 1 (174 participants, 82.1%) and 8 (153.5 participants, 72.4%) after correcting for repeats.

Patients showed a statistically significant preference in all choice sets except for choice sets 3 (P=1) and 5 (P=0.68). The findings are reported in table 2. Participants prefer combination 1 (82.1%) over 2, 3 (73.5%) over 4, 5 (90.6%) over 7, 8 (93.4%) over 10 and 12 (85.2%) over 11, with P <0.001 for each pair of combination.

Participants' prioritisation of cardiac rehabilitation attributes by participant characteristics

Choice 7A includes new group activities, support group, cash rewards, many exercise equipment, deposit and out-of-pocket cost, but no physiotherapist presence or monitoring equipment. Comparatively, choice 7B has physiotherapist presence but less exercise equipment. Patients whose houses have more than three bedrooms are less likely to choose choice 7A (OR 0.37; CI 0.17 to 0.80; P=0.011) over choice 7B.

DISCUSSION

This is the first study to explore patients' preference for different types/combinations of community CR programme. We used a novel method using count analysis of multiple paired choices to

Table 2 Counts of various combinations, results of χ^2 analysis and univariate logistic regression of combinations against participant characteristics

Choice	Q1A	Q1B	Q2A	Q2B	Q3A	Q3B	Q4A	Q4B	Q5A	Q5B	Q6A	Q6B	Q7A	Q7B
New activities	Absent	Present	Present	Absent	Present	Present	Present	Absent	Present	Present	Present	Present	Present	Present
Support group	Absent	Present	Present	Absent	Present	Present	Present	Absent	Present	Present	Present	Present	Present	Present
Monitoring	Present	Absent	Present	Present	Present	Present	Present	Present	Present	Present	Present	Present	Absent	Absent
Physiotherapist	Present	Absent	Present	Present	Present	Present	Present	Absent	Present	Present	Present	Absent	Absent	Present
Availability of equipment	Few	Many	Many	Few	Many	Many	Many	Many	Many	Many	Many	Many	Many	Few
Rewards type	Sports equipment	Healthy food	Cash	Sports equipment	Cash	Healthy food	Cash	Healthy food	Cash	Sports equipment	Cash	Healthy food	Cash	Cash
Deposit for 10 sessions	0	\$540	\$5100	\$50	0	\$540	0	0	0	\$540	0	\$5100	\$5100	\$5100
Cost for one session	0	\$54	\$510	\$510	0	0	0	\$510	0	0	0	\$510	\$54	\$54
Combination no	1	2	3	4	5	6	5	7	8	9	8	10	11	12
Counts	174	38	155†	56†	106	106	192	20	109	103	198	14	31‡	179‡
Corrected counts	174	38	155	56	149	106	149	20	153.5	103	153.5	14	31	179
Chi-square analysis														
P value	<0.0001	<0.0001	<0.0001	1	<0.0001	<0.0001	<0.0001	0.6803	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Univariate logistic regression of participant characteristics against various combinations														
Age	OR 0.99 (0.95 to 1.03) P=0.593	OR 0.99 (0.96 to 1.03) P=0.653	OR 1.00 (0.98 to 1.04) P=0.654	OR 1.00 (0.98 to 1.04) P=0.654	OR 0.99 (0.93 to 1.04) P=0.615	OR 1.00 (0.97 to 1.03) P=0.888	OR 1.01 (0.95 to 1.07) P=0.726	OR 0.99 (0.95 to 1.03) P=0.579	OR 1.00 (0.97 to 1.03) P=0.888	OR 1.01 (0.95 to 1.07) P=0.726	OR 1.01 (0.95 to 1.07) P=0.726	OR 0.99 (0.95 to 1.03) P=0.579	OR 0.99 (0.95 to 1.03) P=0.579	OR 0.99 (0.95 to 1.03) P=0.579
Gender	OR 0.83 (0.41 to 1.69) P=0.609	OR 0.85 (0.46 to 1.58) P=0.613	OR 0.85 (0.46 to 1.58) P=0.613	OR 1.04 (0.60 to 1.80) P=0.889	OR 1.70 (0.63 to 4.62) P=0.296	OR 0.87 (0.51 to 1.51) P=0.629	OR 1.27 (0.41 to 3.94) P=0.676	OR 0.89 (0.41 to 1.95) P=0.776	OR 0.87 (0.51 to 1.51) P=0.629	OR 1.27 (0.41 to 3.94) P=0.676	OR 1.27 (0.41 to 3.94) P=0.676	OR 0.89 (0.41 to 1.95) P=0.776	OR 0.89 (0.41 to 1.95) P=0.776	OR 0.89 (0.41 to 1.95) P=0.776
Race	OR 1.82 (0.40 to 8.28) P=0.437	OR 6.90 (0.90 to 53.08) P=0.064§	OR 1.00 (0.38 to 2.63) P=1	OR 1.00 (0.38 to 2.63) P=1	OR 0.48 (0.13 to 1.83) P=0.282	OR 5.32 (1.49 to 19.00) P=0.010*	OR 1.19 (0.322 to 4.36) P=0.798	OR 1.19 (0.322 to 4.36) P=0.798	OR 5.32 (1.49 to 19.00) P=0.010*	OR 1.19 (0.322 to 4.36) P=0.798	OR 1.19 (0.322 to 4.36) P=0.798	OR 1.19 (0.322 to 4.36) P=0.798	OR 1.19 (0.322 to 4.36) P=0.798	OR 1.19 (0.322 to 4.36) P=0.798
Education	OR 0.74 (0.36 to 1.49) P=0.399	OR 1.35 (0.67 to 2.74) P=0.399	OR 0.93 (0.54 to 1.59) P=0.784	OR 0.93 (0.54 to 1.59) P=0.784	OR 0.77 (0.30 to 1.94) P=0.577	OR 1.12 (0.65 to 1.92) P=0.655	OR 0.96 (0.32 to 2.84) P=0.942	OR 1.53 (0.71 to 3.31) P=0.280	OR 1.12 (0.65 to 1.92) P=0.655	OR 0.96 (0.32 to 2.84) P=0.942	OR 0.96 (0.32 to 2.84) P=0.942	OR 1.53 (0.71 to 3.31) P=0.280	OR 1.53 (0.71 to 3.31) P=0.280	OR 1.53 (0.71 to 3.31) P=0.280
Marital status	OR 1.02 (0.39 to 2.68) P=0.967	OR 1.02 (0.44 to 2.36) P=0.957	OR 1.24 (0.59 to 2.61) P=0.570	OR 1.24 (0.59 to 2.61) P=0.570	OR 1.33 (0.42 to 4.20) P=0.216	OR 1.78 (0.83 to 3.80) P=0.2136	OR 0.40 (0.50 to 3.16) P=0.384	OR 0.73 (0.27 to 1.95) P=0.530	OR 1.78 (0.83 to 3.80) P=0.2136	OR 1.33 (0.42 to 4.20) P=0.216	OR 1.33 (0.42 to 4.20) P=0.216	OR 0.40 (0.50 to 3.16) P=0.384	OR 0.73 (0.27 to 1.95) P=0.530	OR 0.73 (0.27 to 1.95) P=0.530
No of bedrooms	OR 0.98 (0.47 to 2.92) P=0.953	OR 1.78 (0.96 to 3.31) P=0.067§	OR 0.96 (0.55 to 1.68) P=0.887	OR 0.96 (0.55 to 1.68) P=0.887	OR 0.53 (0.19 to 1.52) P=0.239	OR 1.05 (0.60 to 1.83) P=0.861	OR 0.44 (0.12 to 1.62) P=0.216	OR 0.367 (0.17 to 0.80) P=0.011*	OR 1.05 (0.60 to 1.83) P=0.861	OR 0.44 (0.12 to 1.62) P=0.216	OR 0.44 (0.12 to 1.62) P=0.216	OR 0.367 (0.17 to 0.80) P=0.011*	OR 0.367 (0.17 to 0.80) P=0.011*	OR 0.367 (0.17 to 0.80) P=0.011*
Employment status	OR 1.11 (0.52 to 2.38) P=0.782	OR 1.12 (0.58 to 2.18) P=0.719	OR 1.37 (0.76 to 2.48) P=0.294	OR 1.37 (0.76 to 2.48) P=0.294	OR 1.66 (0.64 to 4.28) P=0.294	OR 1.24 (0.69 to 2.23) P=0.472	OR 0.63 (0.17 to 2.33) P=0.486	OR 0.73 (0.33 to 1.64) P=0.448	OR 1.24 (0.69 to 2.23) P=0.472	OR 0.63 (0.17 to 2.33) P=0.486	OR 0.63 (0.17 to 2.33) P=0.486	OR 0.73 (0.33 to 1.64) P=0.448	OR 0.73 (0.33 to 1.64) P=0.448	OR 0.73 (0.33 to 1.64) P=0.448
HTN	OR 0.72 (0.35 to 1.50) P=0.386	OR 0.98 (0.53 to 1.80) P=0.94	OR 1.09 (0.63 to 1.87) P=0.769	OR 1.09 (0.63 to 1.87) P=0.769	OR 1.83 (0.70 to 4.75) P=0.216	OR 1.11 (0.65 to 1.92) P=0.700	OR 0.77 (0.24 to 2.45) P=0.663	OR 0.76 (0.35 to 1.66) P=0.497	OR 1.11 (0.65 to 1.92) P=0.700	OR 0.77 (0.24 to 2.45) P=0.663	OR 0.77 (0.24 to 2.45) P=0.663	OR 0.76 (0.35 to 1.66) P=0.497	OR 0.76 (0.35 to 1.66) P=0.497	OR 0.76 (0.35 to 1.66) P=0.497
DM	OR 1.09 (0.48 to 2.49) P=0.831	OR 1.42 (0.68 to 2.94) P=0.347	OR 0.84 (0.45 to 1.56) P=0.582	OR 0.84 (0.45 to 1.56) P=0.582	OR 1.33 (0.42 to 4.20) P=0.627	OR 1.16 (0.62 to 2.16) P=0.639	OR 0.38 (0.12 to 1.17) P=0.092§	OR 1.84 (0.81 to 4.18) P=0.142	OR 1.16 (0.62 to 2.16) P=0.639	OR 1.33 (0.42 to 4.20) P=0.627	OR 1.33 (0.42 to 4.20) P=0.627	OR 0.38 (0.12 to 1.17) P=0.092§	OR 1.84 (0.81 to 4.18) P=0.142	OR 1.84 (0.81 to 4.18) P=0.142
HLD	OR 0.53 (0.21 to 1.36) P=0.190	OR 0.75 (0.36 to 1.57) P=0.448	OR 0.65 (0.34 to 1.21) P=0.176	OR 0.65 (0.34 to 1.21) P=0.176	OR 1.09 (0.37 to 3.20) P=0.869	OR 0.41 (0.21 to 0.79) P=0.007*	OR 0.24 (0.03 to 1.88) P=0.174	OR 0.73 (0.31 to 1.72) P=0.474	OR 1.09 (0.37 to 3.20) P=0.869	OR 0.41 (0.21 to 0.79) P=0.007*	OR 0.24 (0.03 to 1.88) P=0.174	OR 0.73 (0.31 to 1.72) P=0.474	OR 0.73 (0.31 to 1.72) P=0.474	OR 0.73 (0.31 to 1.72) P=0.474
IHD	OR 1.18 (0.57 to 2.41) P=0.657	OR 1.02 (0.55 to 1.90) P=0.949	OR 0.89 (0.52 to 1.55) P=0.693	OR 0.89 (0.52 to 1.55) P=0.693	OR 1.39 (0.54 to 3.59) P=0.493	OR 0.98 (0.57 to 1.71) P=0.955	OR 0.43 (0.11 to 1.61) P=0.210	OR 1.67 (0.72 to 3.84) P=0.231	OR 1.02 (0.55 to 1.90) P=0.949	OR 0.89 (0.52 to 1.55) P=0.693	OR 0.43 (0.11 to 1.61) P=0.210	OR 1.67 (0.72 to 3.84) P=0.231	OR 1.67 (0.72 to 3.84) P=0.231	OR 1.67 (0.72 to 3.84) P=0.231
Valvulopathy	OR 1.66 (0.363 to 7.60) P=0.513	OR 1.81 (0.50 to 6.56) P=0.365	OR 0.53 (0.19 to 1.49) P=0.227	OR 0.53 (0.19 to 1.49) P=0.227	OR 1.39 (0.54 to 3.59) P=0.493	OR 0.98 (0.57 to 1.71) P=0.955	OR 0.43 (0.11 to 1.61) P=0.210	OR 1.67 (0.72 to 3.84) P=0.231	OR 1.81 (0.50 to 6.56) P=0.365	OR 0.53 (0.19 to 1.49) P=0.227	OR 0.53 (0.19 to 1.49) P=0.227	OR 1.66 (0.363 to 7.60) P=0.513	OR 1.66 (0.363 to 7.60) P=0.513	OR 1.66 (0.363 to 7.60) P=0.513
Obesity	OR 1.35 (0.58 to 3.17) P=0.487	OR 1.28 (0.63 to 2.61) P=0.497	OR 1.31 (0.71 to 2.44) P=0.387	OR 1.31 (0.71 to 2.44) P=0.387	OR 7.09 (0.92 to 54.46) P=0.060§	OR 1.34 (0.72 to 2.49) P=0.351	OR 1.20 (0.32 to 4.51) P=0.792	OR 0.52 (0.19 to 1.43) P=0.206	OR 1.28 (0.63 to 2.61) P=0.497	OR 1.31 (0.71 to 2.44) P=0.387	OR 1.31 (0.71 to 2.44) P=0.387	OR 7.09 (0.92 to 54.46) P=0.060§	OR 1.34 (0.72 to 2.49) P=0.351	OR 1.20 (0.32 to 4.51) P=0.792

Continued

Table 2 Continued

Choice	Q1A	Q1B	Q2A	Q2B	Q3A	Q3B	Q4A	Q4B	Q5A	Q5B	Q6A	Q6B	Q7A	Q7B
PCI	OR 0.99 (0.45 to 2.15) P=0.976		OR 0.98 (0.50 to 1.91) P=0.953		OR 0.65 (0.36 to 1.18) P=0.156		OR 0.90 (0.33 to 2.48) P=0.837		OR 0.95 (0.52 to 1.71) P=0.858		OR 0.65 (0.20 to 2.08) P=0.469		OR 1.73 (0.78 to 3.86) P=0.178	
CABG	OR 1.74 (0.63 to 4.78) P=0.282		OR 0.91 (0.43 to 1.94) P=0.816		OR 1.15 (0.59 to 2.27) P=0.679		OR 1.37 (0.38 to 4.93) P=0.632		OR 0.85 (0.43 to 1.67) P=0.629		OR 0.82 (0.22 to 3.13) P=0.775		OR 0.91 (0.46 to 1.79) P=0.783	

Regression results presented as OR (95% CI).

*P<0.05.

†Total participants for choice set: 211.

‡Total participants for choice set: 210.

§P<0.10.

¶Results omitted in view of collinearity.

CABG, coronary artery bypass grafting; DM, diabetes mellitus; HLD, hyperlipidaemia; HTN, hypertension; IHD, ischaemic heart disease; PCI, percutaneous coronary intervention.

establish a preferred programme and the factors associated with it while reducing cognitive burden to CR patients.¹³

The participants sampled were mostly elderly (81.8%) (defined here above the age of 60 years), who were at higher risk of cardiovascular diseases.¹⁴ Hence, a CR programme would be beneficial for the primary and secondary prevention of cardiovascular diseases. The sociodemographics of our sampled population is also similar to that of Singapore's general population in terms of gender ratio, education level and type of housing,¹⁵ but with a greater proportion of Chinese.

Our study indicates that patients with more than three bedrooms in their house (as a proxy for higher income levels) prefer the presence of a physiotherapist during their sessions and are willing to settle for less equipment in exchange. This finding could serve as a guide during the planning of future CR programme involving higher income participants and thereby improve their long-term adherence to community-based CR.

As CR programme in Singapore is not covered by insurance but paid for by the participants themselves, the cost of the programme may become an important influencing factor and causes respondents to choose the combination that is free. However, as shown in our results in table 2, the most popular combination chosen has a cost involved. Hence, the overall package of attributes still matters.

There are some limitations in our study. First, the relative importance participants gave to each attribute (eg, support group presence) could not be fully understood. This could be further explored in future studies that take the form of discrete conjoint experiments (DCEs),¹⁶ which we are planning for the next phase of our study. Next, the study provided only insight into a limited number of stated attributes whose levels were narrowed in clear definition. This could be corrected by increasing the number of attributes explored in the study, but might come at the cost of increased cognitive burden to survey participants.¹³ Finally, our sample size may be limited and may restrict the generalisability of the results to other patients. However, we are the first study to explore patient preferences for different combinations of CR programme using this unique method and serve as a foundation for future DCE studies.

Despite its limitations, this study provides insight into stated preferences on the type of community-based CR programme and lays the foundation to plan a DCE by understanding our patients better. We acknowledged that it may be more suitable to decrease the number of choice sets but offer more alternative programme combinations in each choice set, and understanding their preferences, but this method had been found to introduce significant cognitive burden and reduce participation rate.

In addition, even though patient preference is important, this must be taken into consideration as a whole with perspective of clinical safety and effectiveness of exercise prescription that is modified as and when required by a qualified cardiopulmonary physiotherapist. These factors may then help to improve adherence and uptake of CR programme.¹⁷

CONCLUSION

The study explores preferences of patients undergoing community-based CR. Higher income patients prefer the presence of a physiotherapist and are willing to settle for less equipment in exchange. This could serve as a guide for designing future community-based CR programmes and advise on the design of future DCE studies.

Key messages

What is already known about this subject?

Cardiac rehabilitation (CR) improves mortality, morbidity and quality of life of cardiovascular patients. However, its uptake is poor especially in the hospitals due to long travel distances and office hours constraints. Community-based CR is a possible solution to this.

What does this study add?

This is the first study to explore patients' preferences for different types of community CR. It aims to understand the type of community-based CR preferred and identify patient characteristics associated with certain programme combinations.

How might this impact on clinical practice?

Our study serves as a guide for designing future community-based CR programmes.

Contributors YHK is the principal investigator of the study while XYW, AFY, HYT and CL are co-investigators. WF and LLL reviewed the articles included for the study. SC is the MD candidate conducting this study. She is responsible for study design, reviewing of articles and presentation of data. The first draft of the manuscript was prepared by SC.

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Competing interests None declared.

Patient consent Detail has been removed from this case description/these case descriptions to ensure anonymity. The editors and reviewers have seen the detailed information available and are satisfied that the information backs up the case the authors are making.

Ethics approval This study has been approved by the National University of Singapore Institutional Review Board (NUS-IRB) guidelines.

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