



## Short Communication

## Cardiac rehabilitation knowledge, awareness, and practice among cardiologists in India



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## ABSTRACT

Cardiac rehabilitation (CR) use is extremely low in India, and beyond. The reasons are multifactorial, including healthcare provider factors. This study examined CR perceptions among cardiologists in India. Attendees of the 2017 Cardiology Society of India conference completed a survey. Of 285 respondents, just over one-fourth had a CR program at their institution, with a similar proportion reporting someone dedicated to providing CR advice to their patients. Only 11 (3.9%) were correct in their responses to 4 multiple choice questions regarding secondary prevention. On average, cardiologists referred 20–30% of their patients, with the greatest barrier to referral being patient disinterest.

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## 1. Introduction

Cardiovascular diseases (CVDs) are among the leading burdens of mortality and morbidity worldwide,<sup>1</sup> including India.<sup>2</sup> With the epidemiological transition and hence increasing burden of CVD, the need for chronic CVD care is also growing.<sup>3</sup>

Cardiac rehabilitation (CR) is an outpatient secondary prevention program comprised of structured exercise training as well as comprehensive education and counseling.<sup>4,5</sup> Participation in CR has been shown to reduce morbidity and mortality by 20%,<sup>6</sup> in a cost-effective manner.<sup>7,8</sup>

Despite the well-established benefits<sup>9</sup> and clinical practice guideline recommendations to refer CVD patients,<sup>10</sup> CR is grossly under-used,<sup>9</sup> including in India.<sup>11</sup> The reasons cardiac patients do not access CR are multifactorial, including healthcare system, provider, and patient-related (e.g., financial, geographic) factors.<sup>12,13</sup> One of the major contributory factors is lack of physician referral, which can be due to low CR knowledge/awareness.<sup>14</sup> Indeed, several studies have now investigated physician referral practices and associated barriers, however, only two studies stem from low or middle-income countries (one in Iran<sup>9</sup> and one in Latin

America<sup>10</sup>) where the context of cardiac care is very different. The objective of this study was then, to investigate CR knowledge, awareness, and practice among cardiologists in India.

## 2. Methods

Herein, the results of a survey of a convenience sample of cardiologists attending the Cardiology Society of India conference (<https://csicon2017.org>; November–December 2017, Kolkata) is presented. The design was cross-sectional and observational. The confidential survey was administered online. Respondents participated voluntarily, and no incentives were provided.

The survey was developed in conjunction with the USV Pharma team and reviewed by cardiologists and CR experts (authors). The 12 items were all forced-choice, with multiple choice, yes/no and Likert-type scales for response options.

SPSS version 24.0 was used (IBM Inc 2016, NY). Descriptive statistics were first computed. Inferential statistics, namely chi-square and Student's *t*-tests as applicable, were then run to test the associations among knowledge, awareness and practice.

## 3. Results

Two hundred and eighty-five cardiologists completed the survey. Table 1 presents the results of the knowledge assessment. Respondents were least informed about management of CVD

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**Table 1**  
Cardiac Rehabilitation Knowledge Among Indian Cardiologists (N = 285).

	n (%)
1. According to the ACC and AHA, what class of recommendation is CR for patients with MI, and CABG surgery, or post-PCI?	
a. Class IIa	71 (24.9%)
b. Class I <sup>a</sup>	151 (53.0%)
c. Class IIb	50 (17.5%)
d. Class III	13 (4.6%)
2. Studies have shown that risk reduction with CR after an MI are:	
a. 5%	15 (5.3%)
b. 10%	87 (30.5%)
c. 15%	95 (33.3%)
d. >20% <sup>a</sup>	88 (30.9%)
3. Please with an ejection fraction of less than 30% should not exercise	
a. True	48 (16.8%)
b. False <sup>a</sup>	237 (83.2%)
4. Patients with CHD should aim for a HbA1C of:	
a. <6%	37 (13.0%)
b. 6.5%	172 (60.4%)
c. 7% <sup>a</sup>	61 (21.4%)
d. >7%	15 (5.3%)

ACC: American College of Cardiology; AHA: American Heart Association; CR: cardiac rehabilitation; MI: myocardial infarction; CABG: coronary artery bypass grafting; PCI: percutaneous coronary intervention; CHD: coronary heart disease; HbA1C: haemoglobin A1c or glycated haemoglobin test.

<sup>a</sup> Correct response.

patients with comorbid diabetes, and regarding the magnitude of benefit achieved by CR participation. On average, respondents answered  $1.88 \pm .98$  (standard deviation) of the 4 questions correctly. Only 11 (3.9%) respondents answered all four questions correctly, and 20 (7.0%) did not answer any questions correctly.

As shown in Table 2, over one-fourth of respondents had dedicated staff to provide CR advice to indicated patients, and the same proportion had a CR program at the institution where they practiced. Those with CR programs were more likely to provide CR advice to patients ( $X^2 = 203.09$ ,  $p < .001$ ).

**Table 2**  
Cardiac Rehabilitation Awareness and Practice Among Indian Cardiologists (N = 285).

	n (%) / mean $\pm$ SD
1. Importance of core CR components for secondary prevention <sup>a</sup>	
a. exercise	4.56 $\pm$ 0.66
b. nutrition	4.47 $\pm$ 0.66
c. psychosocial well-being	4.59 $\pm$ 0.66
d. medication adherence	4.80 $\pm$ 0.46
2. Have CR program at clinic hospital (% yes)	78 (27.4%)
3. Have dedicated staff to provide CR advice to patients (% yes)	82 (28.8%)
4. Major hindrances to implementing CR in cardiac patients (% yes)	
a. illiteracy	56 (19.6%)
b. rurality	39 (13.7%)
c. low socio-economic status	74 (26.0%)
d. patient disinterest	116 (40.7%)
5. Percentage of cardiac patients referred	
a. 10–20%	30 (10.5%)
b. 20–30%	147 (51.6%)
c. 30–40%	41 (14.4%)
d. >50%	67 (23.5%)
6. Percentage of patients who are non-adherent to secondary prevention medications?	
a. 10–20%	67 (23.5%)
b. 20–30%	147 (51.6%)
c. 30–40%	58 (20.4%)
d. >50%	13 (4.6%)
7. Perceived utility of online training in CR to improve secondary preventive care of cardiac patients <sup>b</sup>	3.66 $\pm$ 0.61
8. Perceived importance of availability of trained personnel to deliver CR <sup>b</sup>	3.69 $\pm$ 0.59

CR: cardiac rehabilitation; SD: standard deviation.

<sup>a</sup> Rated on a scale from 1 “not important to 5 “extremely important”.

<sup>b</sup> Rated on a scale from 1 “disagree” to 4 “strongly agree”.

Cardiologists' CR awareness and practice are also displayed in Table 2. With regard to awareness, all four core components of CR were considered highly important. Respondents most often reported referring only 20–30% of their patients to CR, with the most highly-endorsed barrier to referral (respondents were asked to select one) being patient disinterest, followed by socioeconomic factors. Most cardiologists did not perceive their patients were adherent to secondary prevention medications, suggesting more need for CR where adherence is advocated. The perceived value of training is also shown.

Finally, the associations of knowledge with awareness and practice were evaluated. Cardiologists that recommended CR to more than 50% of their indicated patients had significantly greater CR knowledge ( $2.4 \pm 0.9/4$  items correct) than those that recommend CR to fewer of their patients ( $1.7 \pm 1.0/4$ ;  $p < .001$ ). Cardiologists with greater total knowledge scores also rated the importance of the following CR components significantly higher than those with lesser knowledge: exercise (Pearson's  $r = 0.21$ ;  $p < .001$ ), nutrition ( $r = 0.17$ ;  $p = .004$ ), and psychosocial well-being ( $r = 0.21$ ;  $p < .001$ ); they also rated the importance of CR training for themselves ( $r = 0.17$ ;  $p = .005$ ) and other providers ( $r = 0.12$ ;  $p = .044$ ) as significantly more important when compared to those with less knowledge.

#### 4. Discussion

Use of CR in India is very low,<sup>11</sup> despite robust evidence of clinical efficacy and cost-effectiveness.<sup>6–8</sup> This was the first study to assess cardiologists', the main CR referrers and deliverers,<sup>15</sup> perceptions about CR in India, where the CVD burden is epidemic.<sup>2</sup> Results showed that most cardiologists are not involved in CR, with less than one-fourth working at an institution with a program. Moreover, they have poor knowledge about CR, although were aware of the importance of its' core components for secondary prevention. Despite serving patients who were largely non-adherent to secondary prevention medications, less than one-fourth practiced at an institution where there was someone dedicated to referring patients to CR where adherence is promoted, and less than one-third of their patients were even referred. The main reason cited for non-referral was patient disinterest.

Like the study of physicians in Iran,<sup>9</sup> CR knowledge was very limited, and referral rates were low. Reasons cited included lack of insurance coverage and lack of programs themselves. The study of providers from Latin America revealed variation in CR knowledge, awareness and practice based on whether providers worked at an institution with CR, and whether the services were publicly or privately-funded.<sup>10</sup> More research is needed to understand barriers to CR availability and capacity, factors affecting physician referral (including reimbursement issues), and to overcome patient-related barriers to enrolment such as disinterest (given this was the most common reason for lack of referral) in the Indian context.<sup>11</sup>

The study of providers in Iran revealed very few had access to continuing medical education regarding CR.<sup>9</sup> Indeed, cardiologists in India desired more CR training for themselves and other providers. Those with more knowledge were more likely to refer, and to understand the value of CR, again highlighting the importance of education. The International Council of Cardiovascular Prevention and Rehabilitation has recently developed an online certification program covering the foundations of delivering all core CR components for secondary prevention in low-resource settings (<http://globalcardiacrehab.com/training-opportunities/certification/>). This may serve as a valuable resource to augment CR human resources, and hence capacity as well as utilization in India.

Caution is warranted in interpreting the results of this study. The chief potential limitation of this study is selection bias. It is

unknown whether the findings are sufficiently generalizable, as a convenience sample was recruited. Those who elected to participate may have been more familiar with CR than those who did not. Second, the design was cross-sectional and therefore no causal conclusions should be drawn. Third, the items were not validated, and therefore there may be measurement error. Fourth, socio-demographic or occupational information was not collected from cardiologists – including sex, years of practice, specialty, type of institution where they work, patient volumes – so other factors that could potentially impact physician knowledge, awareness and practice could not be considered.

In conclusion, most cardiologists in India are not working in an institution with CR nor are they ensuring their patients get referred. Cardiologists' knowledge regarding CR and secondary prevention is low, despite understanding the value its' core components. Barriers to secondary prevention included patient disinterest, which can be overcome with physician endorsement,<sup>16</sup> and medication non-adherence. Training is needed for cardiologists in India to increase their knowledge and awareness of CR, which in turn should promote greater referral and ultimately utilization by patients.

#### Key message (one line)

Training is needed for cardiologists in India to increase their knowledge and awareness of CR, to promote greater referral and ultimately utilization by patients.

#### Conflict of interest

All authors have none to declare.

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