Review

European Journal of Preventive Cardiology

European Journal of Preventive Cardiology
2016, Vol. 23(11) 1141–1150

DOI: 10.1177/2047487316630085
ejpc.sagepub.com

SAGE

Facilitating or getting in the way? The effect of clinicians' knowledge, values and beliefs on referral and participation

Robyn Gallagher[1,2], Lis Neubeck[1], Huiyun Du[3], Carolyn Astley[1,2,4], Narelle M Berry[3], Martha N Hill[5] and Robyn Clark[2,6–8]

Abstract

Background: Despite the compelling evidence of the benefits of cardiac rehabilitation (CR) on risk factor modification, quality of life and mortality reduction, a significant proportion of eligible patients are not referred or do not participate. Factors influencing CR referral and participation are complex and are likely patient, referral system and clinician-related. Little is known about clinician-related factors, which include attitudes, values and beliefs towards CR, or how these factors affect patient referral and attendance. This review examines the current evidence in the literature in relation to clinicians' attitudes, values and beliefs about CR.

Methods: A review of the literature was conducted on studies in relation to clinicians' attitudes, values and beliefs toward CR. An expert consensus methodology was used to develop the concepts presented in this paper.

Results: Besides guidelines, a range of other factors influence clinicians' view about CR. This review suggests that clinicians lacking cardiac qualifications may have limited knowledge and awareness of CR and its benefits. Low agreement among clinicians on who is more likely to benefit from CR was also identified. Clinicians' personal lifestyle and health belief, the availability and quality of local the CR programme, and the lack of a standard administrative process of referral can also hinder the referral of patients to CR.

Conclusions: Clinician-related factors are important to consider in relation to CR referral and participation. Education for clinicians, discussion of local services and the support of an efficacious system at programme and organisation levels are essential.

Keywords

Cardiac rehabilitation, secondary prevention, clinician attitudes, referral, recruitment, participation barriers

Received 7 September 2015; accepted 12 January 2016

Background

Globally, cardiac rehabilitation (CR) is the recommended standard of care for people recovering from a cardiac event.[1] CR is an effective intervention for risk factor modification, improving quality of life and reducing mortality.[2,3] International guidelines recommend that all patients with cardiovascular disease, coronary heart disease, heart failure, arrhythmias, congenital heart disease and valvular heart disease should be referred to CR as an integral component of care. Further, CR should be offered irrespective of age, sex, ethnicity and clinical condition.[1,4]

Despite robust evidence of benefit, endorsement in national and international recommendations,[5–12]

[1]Sydney Nursing School, The University of Sydney, Australia
[2]Faculty of Health, University of Technology, Sydney, Australia
[3]School of Nursing and Midwifery, Flinders University, Australia
[4]Heart Foundation SA, Flinders University, Australia
[5]School of Nursing, The Johns Hopkins University, USA
[6]School of Nursing and Institute of Health and Biomedical Innovation (IHBI), Queensland University of Technology, Australia
[7]Sansom Institute, University of South Australia, Australia
[8]South Australian Health and Medical Research Institute, Australia

Corresponding author:
Robyn Gallagher, Charles Perkins Centre Sydney Nursing School, Room 2210, Level 2, Building D17, The University of Sydney, NSW 2006, Australia.
Email: robyn.gallagher@sydney.edu.au

and decades of effort to improve patients' participation, CR is still underutilised internationally.[13] Poor referral rates contribute to the problem by limiting access and informed choice. Across Europe, less than half of the eligible patients are referred to CR[14] or participate in CR.[15] This pattern is repeated in the USA, with participation rates of 25–31% for men and 11–20% for women,[16,17] and in Australia where CR utilisation is 10–30%.[18,19]

The factors that may influence referral, uptake and participation in CR are multiple, complex and interrelated.[13,20,21] Factors related to patients, clinicians and health systems are all important. Some factors affecting participation have received considerable attention, such as patient-related[16–19] and referral system-related factors.[20,21] Evidence related to other health-care provider factors (both clinician and non-clinician) has had limited synthesis, particularly the role that clinicians take in implementing policy through screening and recruitment processes.

Positive clinician perceptions of CR have been shown to be beneficial for subsequent CR referral.[22] The personal knowledge that clinicians have of CR and the administrative process of referral, can influence the way that they view CR, including whether they consider patients as appropriate candidates for referral. Of greater concern, these perceptions may impact on the timing, strength and persistence in achieving referral and encouragement to attend by clinicians. Furthermore, while policy may specify who should be referred to CR, local availability of resources, including exercise equipment, space for exercise, education sessions and sufficient staffing for screening, promotion and assessment, may influence prioritising of patients for referral.[23] This may manifest in an explicit policy about CR referral, or such an understanding may be implicit. Likely influencers of implicit understanding may include the clinician's values related to who will benefit from CR or who will 'fit' the programme available. The purpose of this review is to synthesise the literature in relation to clinician attitudes, values and beliefs and their effect on CR referral and participation.

Methods

An expert consensus methodology using the nominal group process was used to develop the concepts presented in this paper.[24,25] Consensus methods are being used increasingly to solve problems in medicine and health. The main purpose of these methods is to define levels of agreement on controversial subjects. Advocates suggest that, when properly employed, consensus strategies can create structured environments in which experts are given the best available information, allowing their solutions to problems to be more justifiable and credible than otherwise.

The 'nominal group' for this consensus meeting comprised expert national and international CR leaders, researchers and clinicians, with opinions elicited during a workshop to examine the evidence. To underpin the views of the nominal group, a structured review of the literature was conducted on studies in relation to health professionals' knowledge, values and beliefs about cardiac rehabilitation. The electronic databases Medline, Cumulative Index of Nursing and Allied Health (CINAHL), Science Direct and the World Wide Web using the Google search engine were used. Reference lists of retrieved articles were hand searched for additional references. The key words included were 'cardiac rehabilitation'; 'physician' or 'clinician'; 'referral', 'access to care', and 'barrier'. Publications relevant only to patient-related factors or having samples only of non-clinician providers such as health psychologists and sports scientists were excluded from this review.

Results

The key words search yielded a total of 148 publications from 1995–2015. After de-duplication, 98 publications were then screened for this review. The clinicians described in the studies were diverse and included both health-care providers who had cardiac qualifications (cardiologists, cardiac surgeons, cardiac nurse specialists) as well as those who did not (physicians, family doctors, practice nurses, nurses, physiotherapists, allied health). No study that directly explored clinician's knowledge, values and/or beliefs about CR was identified. The relevant literature on clinician-related factors to CR referral and participation were reviewed. A summary of the key findings from the literature was drafted and refined iteratively. Emerging issues were organised thematically and are presented here. Four key themes emerged: clinicians' knowledge; values; beliefs about CR; and the subsequent effect on CR referral and participation (Figure 1).

Clinicians' knowledge

Clinicians' knowledge of the benefits of CR is key to ensuring promotion of CR to patients. Importantly, knowledge of local eligibility criteria and access pathways to CR programmes increases participation. A lack of knowledge and/or experience with CR has been shown to adversely affect a physician's judgements on who should be attending and who is likely to benefit from CR.[26] Primary care physicians are less likely to refer their eligible patients to CR compared to cardiologists and cardiac surgeons, perhaps due to lack of familiarity with the CR programme and because more barriers to participation are perceived. Some of the barriers are administrative, for example, non-standardised

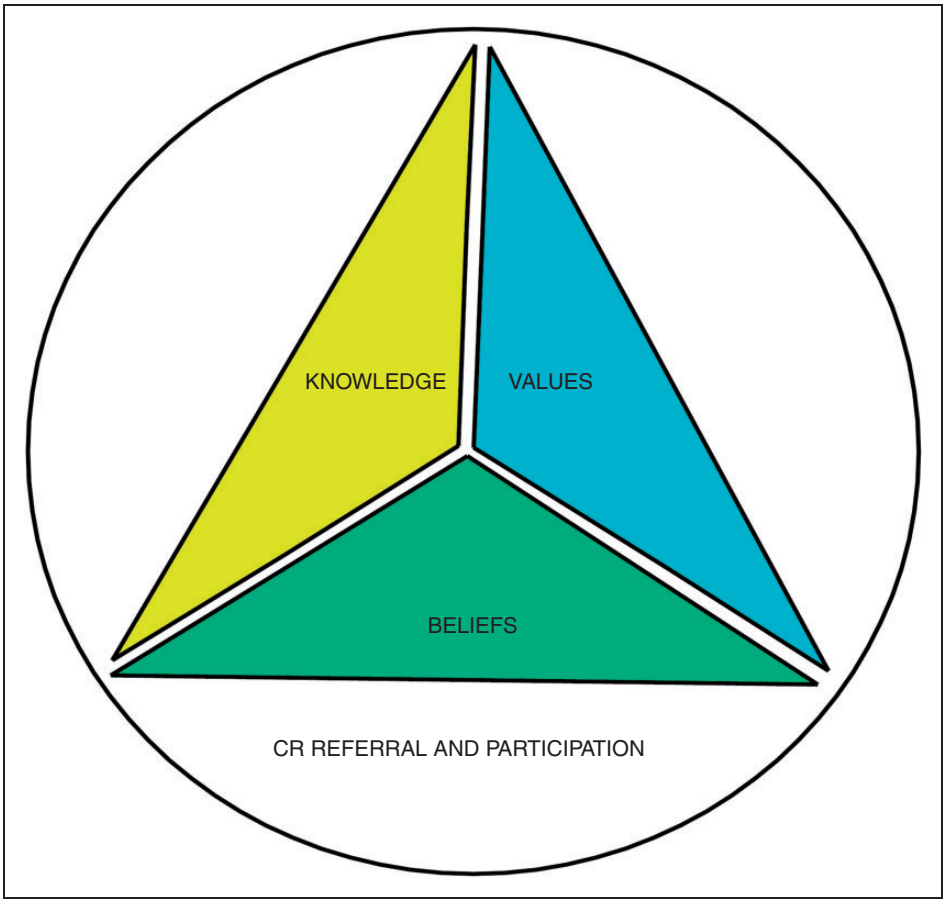

Figure 1. Knowledge, attitudes and beliefs intersect to influence cardiac rehabilitation (CR) referral and participation.

CR referral forms, and unfamiliarity with local CR sites.[27] Completion of formal cardiac qualifications may not be as necessary as being engaged in training and cardiac care, as cardiology residents demonstrate a high referral rate compared to their general medical counterparts (67% vs 4.6%) (Table 1).[19] Cardiology residents, fellows and cardiologists also had better knowledge scores about CR programmes and eligibility criteria, and were more familiar with CR referral guidelines.[28] Similarly, cardiologists, cardiac surgeons and cardiac interns exhibit high levels of knowledge of the benefits of CR,[23] but their referral rates were still moderate at $65.9 \pm 32.0\%$ of eligible patients (Table 1). Clearly other factors may be influential. In this case, the reasons for non-referral were diverse and included: (a) patients' refusal; (b) distance; (c) patients resided in a long-term care facility; (d) unable to ambulate; (e) dementia or cognitive impairment; (f) complex health issues and/or palliative; (g) lack of transportation; (h) return to work; (i) psychiatric co-morbidities; and (j) language barriers.[23] While, these results should be interpreted with caution due to the low response rate, it is clear that an interplay of factors is occurring.[23]

Table 1. Cardiac rehabilitation referral rates for medical training, patient gender and socioeconomic status.

Factor		Referral rate %
Medical training	General medicine residents	4.6[19]
	Cardiology residents	67.0[19]
	Cardiologists	65.9[23]
	Cardiovascular surgeons and physicians (thoracic, rehabilitation, general)	70.0[29]
Patient gender	Female	39.6[30]
	Male	49.4[30]
Socioeconomic status	Low	61.4[31]
	High	68.1[31]

Clinicians' values

Clinicians' values and preferences greatly influence patient behaviour. Engagement in CR will not occur when clinicians do not value the benefits of CR or

have personal reasons for not recommending lifestyle modification.[21] In order to deliver a persuasive and specific recommendation, irrespective of the patient's condition, the clinician must personally value lifestyle modification and have conviction in the benefit of CR, not just in general but delivered in a format tailored to the individual. Clinician experience appears to influence values regarding CR. Physicians with fewer years of experience appeared to be less likely to refer patients with musculoskeletal pain to CR, due to the perception that those patients will derive a lesser benefit from the programme.[32] Paradoxically, clinicians may comply with policy while not having a fundamental belief that CR is effective. In a multi-centre, cross-sectional survey study conducted in Turkey among physicians, nurses, physiotherapists and other allied health professionals ($n = 727$), 68% of the clinicians believed CR was mandatory. Also, 70% of cardiovascular surgeons, and thoracic, general and rehabilitation physicians regularly notified their patients about, and referred their patients to, CR programmes (Table 1).[29] However, only 24% perceived CR was beneficial for the management of cardiopulmonary disease. A small minority (8.1%) of the surgeons and physicians thought cardiopulmonary rehabilitation was unnecessary or were not aware of it.[29] No CR participation rate was provided, which would have helped determine if clinician beliefs ultimately influenced persuasion characteristics.

Individual attitudes of the clinicians regarding the benefits of CR are likely to be influenced by their own health values and individual lifestyle choices. Physicians can be influential role models for their patients and 'practising what we preach' can be an effective and efficient strategy to promote healthy behaviour to patients.[31] However, if the clinician has poor lifestyle behaviours, the level of importance that they place on encouraging patients to make a change may be lower.[34–36] For example, it has been shown that family doctors were eight times more likely to place low importance on alcohol screening and counselling if they consumed more than three drinks per day relative to abstinence,[35] conversely, they were 3.38 times more likely to promote physical activity if they were physically active.[37] Having poor lifestyle behaviours may also decrease the confidence of clinicians to suggest lifestyle modification to patients; for example discussing losing weight with patients if they felt they too were overweight.[38] In addition to decreasing the likelihood of clinicians who are overweight initiating these discussions, it has been shown that people mistrust physicians who are overweight. Indeed, people generally distrust clinicians who are visibly not following their own advice, and this bias is not dependent on the patients' own weight.[39]

Practice nurses with healthy lifestyle behaviours have been shown to view lifestyle changes as more achievable; those with lower body mass index view obesity as more preventable;[40] those who have quit smoking successfully are more likely to encourage others to quit, 'if I can do it [quit smoking], you can do it too'.[34]

Clinicians' beliefs

Clinicians' beliefs about individual's suitability for CR influences their referral and subsequent attendance. This review has revealed that referral is inconsistent and limited, with selection preference evident for specific diagnoses, socio-demographic and motivation characteristics.[29,32–41] Higher referral rates were seen among patients with a diagnosis of myocardial infarction, coronary artery bypass graft (CABG) surgery or unstable angina,[29,39] whereas patients with a diagnoses of heart failure and atrial fibrillation were less likely to be referred, despite the presence of multiple risk factors.[32,41,42]

It is possible that clinicians are 'filtering out' patients on the basis of other criteria, including whether they believe candidates would benefit from, or suit, the type of programme offered. Socio-demographic characteristics such as being married, being younger, having English as the primary language and private insurance increased the chance of referral.[32] Being female (39.6% vs 49.4% for men),[30] and having a lower socioeconomic status (SES) (61.4% for lower SES vs 68.1% for higher SES, $p < 0.01$)[31] decreased this possibility (Table 1).[17,30,43–45] Support for the concept that the low referral rate of female patients is due to clinician belief was found in a study of physicians' judgments of the suitability of patients for CR. This study found that female patients were considered less likely to benefit from CR than males.[32] Similarly, motivation characteristics such as the clinician's belief that an individual patient's motivation to exercise is low have also been identified as limiting CR referral.[27,32,46,47] For example, obese patients were often believed to have very limited motivation to exercise, and were less likely to be referred to exercise-based CR.[27] This belief could result from the significant association between obesity, diabetes and dropout in CR programmes in previous studies.[48,49]

Clinicians' beliefs regarding who would benefit from CR programmes affect their recommendation of CR to their patients, and patients perceive this. Patients who were female, low income, less education, retired and those older than 65 years of age, reported a lower perceived recommendation to participate in CR from their clinician.[50] This finding is not unique to CR, as research into other conditions requiring lifestyle change and health providers' beliefs indicates that if eligible candidates are obese then negative attitudes by the clinician towards obese patients may prevail, including viewing

them as awkward, unattractive, ugly and non-compliant, therefore limiting referral.[51] Similarly, the ability to speak English and cultural background will substantially influence the quality of the doctor-patient relationship.[52] Minority patients are less likely to establish rapport with physicians, receive sufficient information and be encouraged to participate in their treatment decision making.[52]

While there is a high level of agreement among physicians about patient's motivation and their likelihood of benefit from CR, a recent study of 51 Canadian physicians and cardiologists showed a low agreement on other 'cues' among physicians.[32] For example, 42% of the participating physicians believed that bypass patients are less likely to benefit than patients who had undergone percutaneous coronary intervention, while 47% believed the opposite. Most importantly, many of the participating physicians were unaware of the judgements they used when deciding which patient should be referred to CR.[32]

The effect of knowledge, values and beliefs on CR referral

Clinicians may influence participation through the clarity and emphasis used in their referral, as only approximately 50% of referred patients subsequently participate in a CR programme.[26] The strength of the physician's recommendation is one of the most consistent and strongest predictors of CR referral and enrolment.[17,53,54] A study of 1156 inpatients from 11 hospitals across Ontario showed that patients' perceived strength of health-care provider endorsement of CR was 3.75 ± 1.15 (on a five-point Likert scale). Higher perceived strength of the recommendation was associated with higher chance of enrolment in CR (odds ratio (OR)=2.07) and better attendance, particularly for recommendation from medical clinicians as compared to nurses.[50] Patients who are told by their physician that CR is not necessary or not suitable for them are much less likely to attend than those whose physicians tell them that CR is valuable and of benefit.

During a relatively short hospital stay, information on CR may be missed.[55] For instance in a study of 179 myocardial infarction patients, at least one in six patients did not know what CR meant before hospital discharge.[56] Thus, the involvement of a cardiologist before discharge is important and has been associated with improved CR referral and enrolment.[54,57]

It is likely that a strong recommendation by physicians and a sound understanding of CR benefits by patients enables the patient to have a more proactive attitude toward their illness. These illness perceptions include patients' beliefs regarding how and whether the illness could be treated and managed; the expected outcome of the illness and most importantly, the cause of the illness.[58] In this situation, when the messages provided by clinicians regarding CR are reported to be inconsistent, patients are much less likely to change their illness perceptions.[20]

A further barrier to CR referral and patient engagement may be the inconsistent messages that are rife in cardiac care. For example a cardiologist specialising in percutaneous coronary interventions may tell patients they have 'fixed' their artery at the same time as the cardiac nurse specialist advises lifestyle modification to prevent recurrence. When a patient is told by their physician that they are not 'bad' enough to need the CR programme,[20] or that they are 'fixed' it is likely that they will assume that they can manage the problem on their own and participation in CR is not necessary.

Clinician's attitudes, values and beliefs towards CR have not been directly studied for their effects on patients' CR attendance. The referral and facilitation of patients entering CR is dependent on the availability of CR resources, administrative structure and personnel.[59] A survey of a group of family doctors and cardiologists suggested clinicians may not be sceptical of the benefits of CR, but rather the quality of their local programme.[27] Further proof that this is a major issue is that CR coordinators themselves are frustrated with their service inadequacies, such as lack of access to occupational therapies, dietetics, pharmacy services, as well as lack of dedicated funding and equipment.[60] Other problems include lack of standardised referral forms, inconvenient and poor quality programmes and lack of discharge communication to CR from providers.[54] These problems have been known for some time, yet there has been very little change to address the issues, including modifications that could help overcome patient-related barriers to participation in CR.[61–63] The British Association of Cardiovascular Prevention and Rehabilitation conducted a survey of CR programmes to determine how programmes address equity and found that 66% of services (126/191) stated that they promoted CR in at least one of the under-represented groups; 46% of those stated that they promoted attendance in women, 48% in the elderly, 55% in revascularisation patients, and only 34% in ethnic minority groups.[64] Our review suggested that physicians may be reluctant to refer patients from a cultural minority group to a CR programme that is not enabled to provide a culturally sensitive and relevant service.

Discussion

This review has synthesised the evidence on clinician-related factors which may influence referral to, and uptake of, CR. We identified three key themes: clinician

knowledge, values and beliefs. Together, these three interplay to promote, or inhibit, referral to CR. Importantly, clinicians need to have sufficient knowledge to understand the benefits, and to be informed of local options and referral pathways. They need to value the CR service and perceive it as an important part of the continuum of care for a cardiac patient. Moreover, clinicians' personal health beliefs will underpin their recommendations for lifestyle change, with positive health-seeking behaviours of clinicians greatly enhancing the likelihood of recommending lifestyle change to patients. Finally, a clinician needs to believe that CR will be of benefit to their individual patient in order to recommend participation.

The factors which contribute to clinicians' knowledge, values and beliefs about CR may be the hardest things to change, compared to system and patient-related factors. Lack of knowledge about the benefits of CR exists not only among patients but also clinicians, and is a major contributing factor to the underutilisation of CR.[59] While diagnostic biases are common in CR referral, it is perhaps not entirely unexpected since international CR guidelines are most clear in their recommendations for people with acute coronary syndrome and after revascularisation procedures.[65,66] From similar studies in diabetes management, clinicians' knowledge of diabetes management strategies may be more important than their knowledge about the disease itself because of the effect of those strategies on patients' attitudes and their adherence to treatment regimen.[67] Diabetes clinicians who believed diabetes is harder to treat than hypertension indicated their doubt in treatment efficacy, and consequently patients had lower adherence to prescribed therapy. Therefore. we observe that a combined lack of knowledge and belief in low efficacy of treatment can negatively affect patients' empowerment in their self-management.[68]

The solution to lack of CR knowledge and expertise may seem obvious – specialised education with guided experience. However, this solution is not readily available as no specific degree for CR exists internationally and few specialised graduate programmes are available. As a consequence, clinicians undertake graduate courses that are related but not sufficient such as cardiovascular, rehabilitation or chronic disease care, and online courses which may not be accredited. This is an important area needing development as appropriately trained clinicians may make a significant contribution to referral and recruitment as well as secondary prevention globally.

With the increasing demand on clinicians, the lack of knowledge in multiple areas cannot be adequately addressed by education without the support of an efficacious system at the programme and organisation levels. Particular challenges exist if people do not identify or discuss when they believe a local CR programme is not meeting standards; rather they act by not referring. One of the vexing issues facing clinicians is that it is difficult to have faith in benefits and provide strong recommendations for CR programmes that do not meet recommended standards. There is a lack of explicit discussion and proactive approaches to improving substandard CR services. Collection of data on key performance indicators is critical to inform and provide feedback to help meet benchmark standards. Increasing local awareness of CR and implementing performance measures for CR have also been strongly recommended.[59] Similar challenges exist in the evidence-based practice literature. Change agents and clinical champions are needed to challenge entrenched attitudes and beliefs about CR and to reduce the significant gap between what is known about CR and what is commonly practised among clinicians.

Improving CR referral, enrolment and participation has gained a considerable amount of attention in recent years, and many different strategies have been evaluated for improving CR utilisation. Automatic referral is one such strategy, which has been implemented in the USA, Great Britain and in Australia to improve referral rate.[69–71] Automatic referral, within the electronic medical records system, uses an established link to automatically identify and prompt referral to CR for patients who meet the set eligible criteria. This automatic referral process can also be done manually without the involvement of electronic medical records.[72] The current literature on automatic referral systems has shown increased referral rates for both electronic and manual automatic referral systems.[73] The rates for CR referral for 'standard' strategies range from 17–45%, and between 38–45% for automatic referral systems.[73] Initiation of CR referral by clinicians as part of a comprehensive discharge plan is the most commonly used strategy among 71 CR specialists in a Canadian study.[23] Providing CR information to the patient at the bedside by allied health clinicians is the second most commonly used strategy.[23] Besides the liaison type of referral strategy (discussion about CR with an allied health clinician and the patient), an automatic referral system has shown the potential to increase CR referral.

However, a complex interplay of factors is at work. Automatic referral systems may increase the referral rate, yet being referred does not always equate to attendance and completion of the programme. Most studies in the current literature of automatic referral focused on the referral and enrolment rate but not the subsequent participation and/or completion rate,

so outcomes are not as certain as could be expected. For instance, one Canadian study of 5256 patients who underwent CABG, had improved referrals to CR from an automatic referral system, but a significantly lower attendance rate compared to before the system was in operation (48.2% pre vs 65.7% post).[74] This is perhaps not surprising, since it is estimated that half of patients eligible for CR may attribute their illness to non-modifiable factors that are out of their control (such as heredity or a belief that heart attack is unpredictable), so there is little motivation for behaviour change, much less CR participation.[55] Overall, automatic referral systems alone may not be the panacea we expect to increase participation in CR. Indeed, interpersonal contact has a profound impact on subsequent attendance.

Although the liaison type of referral strategy is neither systematic nor considered as cost effective compared to automatic referral, it is more informative for patients. There is sufficient evidence that suggests the strength of a clinician's recommendation is the strongest predictor of CR participation, and clinicians' attitudes and belief in CR is critical in the identification of eligible patients, promotion of, and referral to, CR programmes. Unfortunately, the results of our review suggest that a clinician's recommendation for CR participation to their patients varies and is influenced by many factors, including knowledge and experience, personal health belief and lifestyle, as well as perception of treatment efficacy.

The clinician-patient interaction is essential for patient uptake of medical advice including recommendation to participate in CR. Patients over 70 years of age are more likely than younger patients to be unquestioning of medical advice; and individuals from higher socioeconomic status are more likely to question medical advice than patients with a lower socioeconomic status.[75] Those with established disease, and people who are at risk of a poor or uncertain outcome were more unlikely to doubt medical advice.[75] When confronted with an illness, many patients believe that the clinician knows best, and these patients are more likely to rely on their clinician's opinion to make the decision to participate in CR. This review has highlighted the important influence that clinicians' own attitudes, beliefs, and values have on their patients' attitudes toward treatment and/or management options. Increased clinician awareness of CR programmes, the administrative process of referral, and positive attitudes among clinicians, particularly non-cardiac specialists, are all essential to improve CR utilisation.

Increasing the utilisation of CR should be a combined effort of the many different disciplines in the healthcare team. CR coordinators could play a valuable role in this process.[59] While a physician's recommendation is the strongest predictor of CR enrolment and attendance, in many countries advice on CR is commonly provided by CR nursing staff. After adjusting for the strength of the physician's recommendation, CR nurse advice on CR participation resulted in a higher attendance rate compared to other clinicians or other health-care providers (physiotherapist, social worker, ward nurse), family or friends, or other patients.[76] Similarly, compared to other indicators, patients who underwent CABG perceived better endorsement of CR, possibly due to longer length of hospital stay and more contact with clinicians, particularly the physiotherapist who often promotes physical activity.[50]

Limitations

This review is limited by the data available from the included studies. While a comprehensive search strategy was applied, it is possible that the search terms did not identify all aspects of clinician-related behaviour and some papers may have been missed. Furthermore, the methodology used to develop this paper was qualitative, so few generalisable outcomes can be determined. However, the outcomes of this paper should underpin further research using quantitative methods to measure the impact of health professional knowledge values and beliefs on CR referral and participation. This review does not include non-clinician health providers, important contributors to the multidisciplinary CR team, which should be addressed in future research.

Conclusion

Clinicians' knowledge, values and beliefs play an important role in influencing CR participation. Although automatic referral has increased referral rates, the impact on participation is not assured, and clinicians' recommendations remain the strongest predictor of CR participation. Interventions which influence clinician knowledge, values and beliefs are required to improve CR referral pathways and to ensure all those who are recommended to receive CR are fully engaged in a suitable programme.

Acknowledgments

The authors wish to acknowledge Paul Arbon for his commitment to bring this international and national team of experts together for the purposes of this report.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: The development of this paper was supported by a writers' retreat grant from the School of Nursing and Midwifery, Faculty of Medicine, Nursing and Health Sciences, Flinders University. L Neubeck is supported by an NHMRC Early Career Fellowship (APP1036763).

References

1. Thomas RJ, King M, Lui K, et al. AACVPR/ACC/AHA 2010 update: Performance measures on cardiac rehabilitation for referral to cardiac rehabilitation/secondary prevention services: A report of the American Association of Cardiovascular and Pulmonary Rehabilitation and the American College of Cardiology Foundation/American Heart Association Task Force on Performance Measures. *J Am Coll Cardiol* 2010; 56: 1159–1167.
2. Anderson LJ and Taylor RS. Cardiac rehabilitation for people with heart disease: An overview of Cochrane systematic reviews. *Int J Cardiol* 2014; 177: 348–361.
3. Taylor RS, Brown A, Ebrahim S, et al. Exercise-based rehabilitation for patients with coronary heart disease: Systematic review and meta-analysis of randomized controlled trials. *Am J Med* 2004; 116: 682–692.
4. Department of Health Western Australia. *Cardiovascular rehabilitation and secondary prevention. Quick reference guide for health professionals*. Health Strategy and Networks. Available at: http://www.healthnetworks.health.wa.gov.au/docs/Cardio_CRSP_Quick_Reference_Guide.pdf (2015, accessed 21 January 2015).
5. Aroney CN, Aylward P, Chew DP, et al. 2007 Addendum to the National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand guidelines for the management of acute coronary syndromes 2006. *Med J Aust* 2008; 188: 302–303.
6. Chew DP, Aroney CN, Aylward PE, et al. 2011 Addendum to the National Heart Foundation of Australia/Cardiac Society of Australia and New Zealand Guidelines for the management of acute coronary syndromes (ACS) 2006. *Heart Lung Circ* 2011; 20: 487–502.
7. Steg PG, James SK, Atar D, et al. ESC guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation. *Eur Heart J* 2012; 33: 2569–2619.
8. Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol* 2014; 64: e139–e228.
9. O'Gara PT, Kushner FG, Ascheim DD, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *Circulation* 2013; 127: e362–e425.
10. Hamm CW, Bassand JP, Agewall S, et al. ESC guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: The Task Force for the management of acute coronary syndromes (ACS) in patients presenting without persistent ST-segment elevation of the European Society of Cardiology (ESC). *Eur Heart J* 2011; 32: 2999–3054.
11. Kolh P, Windecker S, Alfonso F, et al. 2014 ESC/EACTS guidelines on myocardial revascularization: The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). Developed with the special contribution of the European Association of Percutaneous Cardiovascular Interventions (EAPCI). *Eur J Cardiothorac Surg* 2014; 46: 517–592.
12. National Clinical Guideline Centre. National Institute for Health and Clinical Excellence. *Guidance. Unstable angina and NSTEMI: The early management of unstable angina and non-ST-segment-elevation myocardial infarction*. London: Royal College of Physicians (UK) National Clinical Guidelines Centre, 2010.
13. Sandesara PB, Lambert CT, Gordon NF, et al. Cardiac rehabilitation and risk reduction: Time to 'rebrand and reinvigorate'. *J Am Coll Cardiol* 2015; 65: 389–395.
14. Kotseva K, Wood D, De Backer G, et al. Use and effects of cardiac rehabilitation in patients with coronary heart disease: Results from the EUROASPIRE III survey. *Eur J Prev Cardiol* 2012. Epub before print 19 June 2012. DOI: 2047487312449591.
15. Bjarnason-Wehrens B, McGee H, Zwisler AD, et al. Cardiac rehabilitation in Europe: Results from the European Cardiac Rehabilitation Inventory Survey. *Eur J Cardiovasc Prev Rehabil* 2010; 17: 410–418.
16. Aragam KG, Moscussi M, Smith D, et al. Trends and disparities in referral to cardiac rehabilitation after percutaneous coronary intervention. *Am Jeart J* 2011; 161: 544–551.
17. Ades PA, Waldmann ML, Polk DM, et al. Referral patterns and exercise response in the rehabilitation of female coronary patients aged ≥62 years. *Am J Cardiol* 1992; 69: 1422–1425.
18. Scott IA, Lindsay KA and Harden HE. Utilisation of outpatient cardiac rehabilitation in Queensland. *Med J Aust* 2003; 179: 341–345.
19. Bunker SJ and Goble AJ. Cardiac rehabilitation: Under-referral and underutilisation. *Med J Aust* 2003; 179: 332–333.
20. Clark AM, King-Shier K, Duncan A, et al. Factors influencing referral to cardiac rehabilitation and secondary prevention programs: A systematic review. *Eur J Prev Cardiol* 2012; 20: 692–700.
21. Neubeck L, Freedman SB, Clark AM, et al. Participating in cardiac rehabilitation: A systematic review and meta-synthesis of qualitative data. *Eur J Prev Cardiol* 2011; 19: 494–503.
22. Grace SL, Gravely-Witte S, Brual J, et al. Contribution of patient and physician factors to cardiac rehabilitation referral: A prospective multilevel study. *Nat Clin Pract Cardiovasc Med* 2008; 5: 653–662.

23. Grace SL, Tan YY, Simpson C, et al. Perceptions of cardiac specialists and rehabilitation programs regarding patient access to cardiac rehabilitation and referral strategies. *J Cardiopulm Rehabil Prev* 2012; 32: 135–140.
24. Jones J and Hunter D. Consensus methods for medical and health services research. *Br Med J* 1995; 311: 376–380.
25. Fink A, Kosecoff J, Chassin M, et al. Consensus methods: Characteristics and guidelines for use. *Am J Public Health* 1984; 74: 979–983.
26. Clark AM, King-Shier KM, Thompson DR, et al. A qualitative systematic review of influences on attendance at cardiac rehabilitation programs after referral. *Am Heart J* 2012; 164: 835–845.
27. Grace S, Grewal K and Steward DE. Factors affecting cardiac rehabilitation referral by physician specialty. *J Cardiopulm Rehabil Prev* 2008; 28: 248–252.
28. Duncan AW, Natarajan M and Schwalm J. Identifying physician barriers to cardiac rehabilitation referral in a tertiary care centre. *Can J Cardiol* 2012; 28: S340–S341.
29. Sarikaya S, Tur BS, Kurtais Y, et al. The awareness of physicians and allied health professionals about cardiopulmonary rehabilitation: A cross-sectional survey study. *TJPMR* 2014; 60: S19–S24.
30. Colella TJF, Gravely S, Marzolini S, et al. Sex bias in referral of women to outpatient cardiac rehabilitation? A meta-analysis. *Eur J Prev Cardiol* 2013; 0: 1–19.
31. Shanmugasegaram S, Oh P, Reid RD, et al. Cardiac rehabilitation barriers by rurality and socioeconomic status: A cross-sectional study. *Int J Equity Health* 2013; 12: 72–80.
32. Beckstead JW, Pezzo MV, Beckie TM, et al. Physicians' tacit and stated policies for determining patient beenfit and referral to cardiac rehabilitation. *Med Decis Making* 2014; 34: 63–74.
33. Oberg EB and Frank E. Physicans' health practices strongly influence patient health practices. *J R Coll Physicians Edinb* 2009; 39: 290–291.
34. Geense WW, van de Glind I, Visscher TLS, et al. Barriers, facilitators and attitudes influencing health promotion activities in general practice: An explorative pilot study. *BMC Fam Pract* 2013; 14: 20.
35. Cornuz J, Ghali WA, Di Carlantonio D, et al. Physicians' attitudes towards prevention: Importance of intervention-specific barriers and physicians' health habits. *Fam Pract* 2000; 17: 535–540.
36. Brown I, Stride C, Psarou A, et al. Management of obesity in primary care: Nurses' practices, beliefs and attitudes. *J Adv Nurs* 2007; 59: 329–341.
37. McKenna J, Naylor PJ and McDowell N. Barriers to physical activity promotion by general practitioners and practice nurses. *Br J Sports Med* 1998; 32: 242–247.
38. Laws RA, Kirby SE, Davies GP, et al. 'Should I and can I?' A mixed methods study of clinician beliefs and attitudes in the management of lifestyle risk factors in primary health care. *BMC Health Serv Res* 2008; 8: 44.
39. Puhl RM, Gold JA, Luedicke J, et al. The effect of physicians' body weight on patient attitudes: Implications for physician selection, trust and adherence to medical advice. *Int J Obes (Lond)* 2013; 37: 1415–1421.
40. Hoppe R and Ogden J. Practice nurses' beliefs about obesity and weight related interventions in primary care. *Int J Obes Relat Metab Disord* 1997; 21: 141–146.
41. Redfern J, Hyun K, Chew DP, et al. Prescription of secondary prevention medications, lifestyle advice, and referral to rehabilitation among acute coronary syndrome inpatients: Results from a large prospective audit in Australian and New Zealand. *Heart* 2014; 10: 1–8.
42. Dalal HM, Wingham J, Palmer J, et al. Why do so few patients with heart failure participate in cardiac rehabilitation? A cross-sectional survey from England, Wales and Northern Ireland. *Br Med J* 2012; 2: e000787.
43. Brown TM, Hernandez AF, Bittner V, et al. Predictors of cardiac rehabilitation referral in coronary artery disease patients. *J Am Coll Cardiol* 2009; 54: 515–521.
44. Banerjee AT, Grace SL, Thomas SG, et al. Cultural factors facilitating cardiac rehabilitation participation among Canadian South Asians: A qualitative study. *Heart Lung* 2010; 39: 494–503.
45. Caulin-Glaser T, Blum M, Schmeizl R, et al. Gender differences in referral to cardiac rehabilitation programs after revascularization. *J Cardiopulm Rehabil Prev* 2001; 21: 24–30.
46. Suter P, Bona S and Suter W. Views of Arkansas physicians on cardiac rehabilitation. *J Cardiopul Rehab* 1992; 12: 32–35.
47. Scott LB and Allen JK. Providers' perceptions of factors affecting women's referral to outpatient cardiac rehabilitation programs: An exploratory study. *J Cardiopulm Rehabil Prev* 2004; 24: 387–391.
48. Marzolini S, Mertens DJ, Oh PI, et al. Self-reported compliance to home- based resistance training in cardiac patients. *Eur J Cardiovasc Prev Rehabil* 2010; 17: 35–41.
49. Marzolini S, Brooks D and Oh PI. Sex differences in completion of a 12-month cardiac rehabilitation programme: An analysis of 5,922 women and men. *Eur J Cardiovasc Prev Rehabil* 2008; 15: 698–703.
50. Tsui CK, Shanmugasegaram S, Jamnik V, et al. Variation in patient perceptions of healthcare provider endorsement of cardiac rehabilitation. *J Cardiopulm Rehabil Prev* 2012; 32: 192–197.
51. Phelan SM, Burgess DJ, Yeazel MW, et al. Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obes Rev* 2015; 16: 319–326.
52. Ferguson WJ and Candib LM. Culture, language, and the doctor-patient relationship. *Fam Med* 2002; 34: 353–361.
53. Grace S, Evindar A, Jaglal SB, et al. Increasing patient-initiation of cardiac rehabilitation referral in female percutaneous coronary intervention patients. *Can J Cardiovasc Nurs* 2005; 15: 23–27.
54. Ghisi GLM, Polyzotis P, Oh P, et al. Physician factors affecting cardiac rehabiliation referral and patient enrollment: A systematic review. *Clin Cardiol* 2013; 36: 323–335.
55. Cossette S, D'Aoust L, Morin M, et al. The systematic development of a nursing intervention aimed at increasing enrollment in cardiac rehabilitation for acute coronary syndrome patients. *Prog Cardiovasc Nurs* 2009; 55: 71–79.

56. Dunlay SM, Witt BJ, Allison TG, et al. Barriers to participation in cardiac rehabilitation. *Am Heart J* 2009; 158: 852–859.
57. Barber K, Stommel M, Kroll J, et al. Cardiac rehabilitation for community-based patients with myocardial infarction: Factors predicting discharge recommendation and participation. *J Clin Epidemiol* 2001; 54: 1025–1030.
58. O'Connell S. Barriers to attending cardiac rehabilitation. *Nurs Times* 2014; 110: 15–17.
59. Arena R, Williams M, Forman DE, et al. Increasing referral and participation rates to outpatien cardiac rehabilitation: The valuable role of healthcare professionals in the inpatient and home health settings. A science advisory from the American Heart Association. *Circulation* 2012; 125: 1321–1329.
60. Fernandez RS, Davidson PM, Griffiths R, et al. Improving cardiac rehabiliation services–challenges for cardiac rehabiiation coordinators. *Eur J Cardiovasc* 2011; 10: 37–43.
61. Dimer L, Dowling T, Jones J, et al. Build it and they will come: Outcomes from a successful cardiac rehabilitation program at an Aboriginal Medical Service. *Aust Health Rev* 2013; 37: 79–82.
62. Look MA, Kaholokula JK, Carvahlo A, et al. Developing a cultural based cardiac rehabiliation program: The HELA study. *Prog Community Health Partnersh* 2012; 6: 103–110.
63. Midence L, Mola A, Terzic CM, et al. Ethnocultural diversity in cardiac rehabilitation. *J Cardiopulm Rehabil Prev* 2014; 4: 437–444.
64. Rees K, Victory J, Beswick AD, et al. Cardiac rehabiliation in the UK: Uptake among under-represented groups. *Heart* 2005; 91: 375–376.
65. Perk J, De Backer G, Gohlke H, et al. European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). *Eur Heart J* 2012; 33: 1635–1701.
66. Krum H, Jelinek MV, Stewart S, et al. 2011 update to National Heart Foundation of Australia and Cardiac Society of Australia and New Zealand guidelines for the prevention, detection and management of chronic heart failure in Australia, 2006. *Med J Aust* 2011; 194: 405–409.
67. Puder JJ and Keller U. Quality of diabetes care: Problem of patient or doctor adherence? *Swiss Med Wkly* 2003; 133: 530–534.
68. Larme AC and Pugh JA. Attitudes of primary care providers toward diabetes: Barriers to guideline implementation. *Diabetes Care* 1998; 21: 1391–1396.
69. Thompson DR and Clark AM. Cardiac rehabilitation: Into the future. *Heart* 2009; 95: 1897–1900.
70. Balady GJ, Williams MA, Ades PA, et al. Core components of cardiac rehabilitation/secondary prevention programs: 2007 update. A scientific statement from the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation. *Circulation* 2007; 115: 2675–2682.
71. Grace SL, Russell KL, Reid RD, et al. Effect of cardiac rehabilitation referral strategies on utilization rates: A prospective, controlled study. *Arch Intern Med* 2011; 171: 235–241.
72. Fischer JP. Automatic referral to cardiac rehabilitation. *J Cardiovasc Nurs* 23: 474–479.
73. Gravely-Witte S, Leung YW, Nariani R, et al. Effects of cardiac rehabilitation referral strategies on referral and enrollment rates. *Nat Rev Cardiol* 2010; 7: 87–96.
74. Martin BJ, Hauer T, Knudtson ML, et al. Lack of impact of automated referral on attendance at cardiac rehabilitation among coronary artery bypass grafting patients. *Circulation* 2012; 126: 677–687.
75. Meyer SB, Ward PR and Jiwa M. Does prognosis and socioeconomic status impact on trust in physicians? Interviews with patients with coronary disease in South Australia. *Br Med J Open* 2012; 2: e001389.
76. Johnson NA, Inder KJ, Nagle AL, et al. Attendance at outpatient cardiac rehabilitation: Is it enhanced by specialist nurse referral? *Aust J Adv Nurs* 2010; 27: 31–37.