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REVIEW ARTICLE

Cardiac rehabilitation services for people in rural and remote areas: an integrative literature review

AUTHORS

Patricia E Field[1] MPH (Syd), PhD Candidate *

Richard C Franklin[2] PhD, Associate Professor

Ruth N Barker[3] PhD, Associate Professor, Rehabilitation

Ian Ring[4] FAFPHM, Adjunct Professor, ian.ring@jcu.edu.au

Peter A Leggat[5] MD, Professor

CORRESPONDENCE

*Ms Patricia E Field patricia.field1@my.jcu.edu.au

AFFILIATIONS

[1, 2, 4, 5] James Cook University, College of Public Health, Medical & Veterinary Sciences, Townsville, Qld 4811, Australia

[3] James Cook University, College of Healthcare Sciences, Cairns, Qld 4878, Australia

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ABSTRACT:

Introduction: Morbidity and mortality from heart disease continues to be high in Australia with cardiac rehabilitation (CR) recognised as best practice for people with heart disease. CR is known to reduce mortality, reoccurrence of heart disease, hospital readmissions and costs, and to improve quality of life. Australian Aboriginal and Torres Strait Islanders (Australian First Peoples or Indigenous peoples) have a greater need for CR due to their higher burden of disease. However, CR referral, access and attendance remain low for all people who live in rural and remote areas. The aim of this integrative review was to identify barriers, enablers and pathways to CR for adults living independently in rural and remote areas of high-income countries, including Australia.

Methods: Studies were identified through five online data bases, plus reference lists of the selected studies. The studies focused on barriers and enablers of CR for adults in rural and remote areas of Australia and other high-income countries, in English peer-reviewed journals (2007–2016). A mix of qualitative, quantitative and mixed method studies were reviewed through a modified Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), followed by a critical review and thematic analysis.

Results: Sixteen studies were selected: seven qualitative, four quantitative and five mixed method. Five themes that influence CR attendance were identified: referral, health services pathways and planning; cultural and geographic factors necessitating alternative and flexible programs; professional roles and influence; knowing, valuing, and psychosocial factors; and financial costs – personal and health services. Factors identified that impact on referral and access to CR were hospital inpatient education programs on heart disease and risk factors; discharge processes including CR eligibility criteria and referral to ensure continuum and transition of care; need for improved accessibility of services, both geographically and through alternative programs, including home based with IT and/or telephone support. Also, the need to ensure that health professionals understand, value and support CR; the impact of mental health, coping with change and competing priorities; costs including travel, medications and health professional consultations; as well as low levels of involvement of Australian First Peoples in their own care and poor cultural understanding by non-Australian First Peoples staff all negatively impact on CR access and attendance.

Conclusion: This study found weak systems with low referral rates and poor access to CR in rural and remote areas. Underlying factors include lack of health professional and public support, often based on poor perception of benefits of CR, compounded by scarce and inflexible services. Low levels of involvement of Australian First Peoples, as well as a lack of cultural understanding by non-Australian First Peoples staff, is evident. Overall, the findings demonstrate the need for improved models of referral and access, greater flexibility of programs and professional roles, with management support. Further, increased education and involvement of Australian First Peoples, including Indigenous health workers taking a lead in their own people's care, supported by improved education and greater cultural awareness of non-Australian First Peoples staff, is required.

Keywords:

Aboriginal and Torres Strait Islanders, Australia, barriers, cardiac rehabilitation, enablers, First Peoples, indigenous, pathways.

FULL ARTICLE:

Introduction

Heart disease is the largest single cause of death in Australia and contributes to significant illness, disability, poor quality of life and high healthcare costs[1,2]. Rates of heart disease in rural and remote areas are higher than in urban areas[1,3]. Whilst Australian Aboriginal and Torres Strait Islander First Peoples' (Australian First Peoples/Indigenous peoples)[4] disease rates, including heart disease and complex comorbidities, are higher, this only partially accounts for the disparity in health status between people in rural and remote and urban populations[3,5]. Disparity may be worse than reported due to people with poor health moving to urban areas for better services[5].

There is significant evidence that cardiac rehabilitation (CR) is best practice for people with heart disease[6-8]. However, despite this and known higher levels of heart disease of people living in rural and remote areas, referral and access to CR remain low, and access issues are exacerbated by geographic distance, fewer health services and staff[3,9], compounded by poor telephone and IT services to support alternative programs in rural and remote areas[5].

Cardiac rehabilitation

CR is known to reduce reoccurrence of hospital readmissions, mortality and morbidity from heart disease, and improve general health and quality of life[7,8,10]. WHO describes CR as including physical, mental and social conditions for people with heart disease, so that by their own efforts, together with support through medical or clinical management, they may preserve or resume optimal function[7,10,11]. The term 'cardiac rehabilitation continuum' is preferred by the Heart Foundation of Australia[7], due to the general perception that CR refers to short term, centre based exercise and education programs, usually run by hospitals. The CR continuum is a 'coordinated system of long-term care' necessary to help people with heart disease return to an active and satisfying life, and to prevent the reoccurrence of heart disease or new cardiovascular conditions[7]. This indicates the need for a lifelong individual commitment to healthy lifestyle choices, and adherence to medical advice with health service support[7,11].

Costs and priority

Expenditure for hospital-admitted patient services for coronary

heart disease, stroke and other cardiovascular diseases in 2008–09 was A$4460 million, and accounted for the highest level of healthcare sector spending, with coronary heart disease expenditure of A$1517 million[2]. Other costs associated with coronary heart disease were out-of-hospital medical expenses (A$223 million) and prescription pharmaceuticals (A$311 million). Costs of pharmaceuticals for males were nearly twice that of females, but comparatively similar for other out-of-hospital expenses[2]. Drugs prescribed for lowering cholesterol (statins) account for the highest number of Pharmaceutical Benefits Scheme prescriptions[12] and are major contributors to the cost of all pharmaceuticals. Despite evidence that CR reduces recurrence of heart disease and hospital readmissions and improves general health, it is estimated that only 30% of people hospitalised with heart disease are referred to CR in Australia[13]. A recent cost–benefit analysis that considered the impact of increased CR uptake to the internationally acknowledged standard of 65%[13], and included costs for CR programs, direct inpatient costs, burden of disease, informal care costs, and loss of productivity and earnings, estimated a net financial saving of A$86.7 million per annum[6].

Multidisciplinary teams and staffing

A CR program based on a multidisciplinary team that includes a general practitioner, and if possible a cardiologist, nurse, physiotherapist, dietitian, psychologist and exercise physiologist, is recommended by the Heart Foundation of Australia and Australian Cardiac Rehabilitation Association[7,10]. Realistically, due to lack of resources, such a multidisciplinary team is only available in major centres[14].

A range of issues negatively impact on recruitment and retention of allied health professionals in rural and remote areas. These include a lack of or inadequate (i) information prior to recruitment, (ii) ongoing education opportunities, (iii) career prospects, (iv) rural placements during undergraduate studies, (v) work–life balance, (vi) management and support – which all contribute to high staff turnover[15]. Staffing difficulties have also been identified by nurses in Australia's rural and remote areas in northern Queensland such as excessive working hours, high levels of responsibility and resultant high staff turnover[14,15]. This leads to an increase in staff stress for inexperienced staff who are still learning, and unable to work to full capacity due to the unfamiliar environment[14]. Whilst the majority of health professionals working in these areas are nurses and Indigenous health workers[14], it is likely that these issues impact on all health professionals and subsequently quality of services in rural and remote areas.

Major issues for cardiac rehabilitation services

Whilst it is estimated that throughout Australia only 30% of eligible people are referred to CR, and less attend[10,16], rates cannot be substantiated due to a lack of data[16,17]. Negative impact on service delivery and access to CR due to large geographic regions is significant[3,18,19]. This is compounded by health professionals and potential participants' poor understanding of the benefits of CR[20-22]. Distance and costs are identified as barriers to attendance in rural and remote areas[18,23-25]; however, with changing technology options these barriers may be more readily addressed. The major issues identified were limited and suboptimal CR services in rural and remote areas, with more information required to inform policy, management and organisation of CR for adults with heart disease living in rural and remote areas.

Methods

An integrative review is an established evidence based practice method for reviewing qualitative, quantitative and mixed method research[26,27]. The present integrative review was undertaken through systematic identification, analysis, critique and synthesis of selected peer-reviewed literature to facilitate the identification of a new framework and perspective[26-28] of barriers, enablers and pathways of CR in all adults with heart disease in rural and remote areas of high-income countries, with a focus on Australia.

Searches and selection criteria

Electronic database searches used to identify relevant studies included CINAHL, SCOPUS, Informit, *PsycINFO and* Medline (OVID).

Electronic searches were augmented by reviewing reference lists and citations of selected studies and professional networks (snowballing). Google Scholar was used in this process for forward searching of reference lists and citations to check for additional studies. The 107 articles identified through this process were due to a large meta-analysis[29], identified by the database search. However, the abstract review of these references revealed only 13 studies eligible for critical review and thematic analysis. Following this process, only two extra studies were included for further analysis.

Search terms used were 'cardiac rehabilitation' OR 'secondary prevention' AND 'rural' OR 'remote'; OR 'Aboriginal and Torres Strait Islanders' OR 'Indigenous' AND 'enablers' OR 'barriers'. These key words were varied for specific databases, for example Medline (OVID), which uses medical subject headings (MeSH), which required that the terms 'cardiac disease' OR 'coronary disease' OR 'heart disease' be expanded and combined with 'rehabilitation' to identify articles about CR. Also, the Medline MeSH term 'oceanic ancestry groups' is used for First Peoples. The term 'indigenous' was used as a generic term because it is in common use internationally. The database searches identified a comprehensive range of studies: Medline (OVID) for wide ranging studies, Informit for studies that focused on Australian First Peoples, SCOPUS for international studies, PsychINFO for psychosocial and mental health and CINAHL for allied health. Limitations applied were studies in English, with human subjects and dated 1 January 2007 to 31 December 2016. Supplementary table 1 contains further information about the searches.

Inclusion criteria for papers were:

- published in English in peer-reviewed journals from 1 January 2007 to 31 December 2016
- focusing on cardiac rehabilitation in rural and remote areas of Australia and high-income countries internationally; barriers, enablers and pathways to CR; or First Peoples, indigenous (Australian and global) and general populations.

Exclusion criteria were:

- effectiveness of centre based and home based (technology-supported) CR due to available evidence of effectiveness[7,8,10,17,30,31]
- clinical cardiac procedures, acute treatment and interventions
- non-high-income countries are equated to developing countries, according to the 'List of developing countries as declared by the Minister of Foreign Affairs(2015)'[32]. This is because studies that focus on developing countries are considered to have little relevance in Australia, which is amongst the 10 largest advanced economies in the world, based on International Monetary Fund criteria[33].)
    - programs that include only one component of CR (eg exercise), rather than having a holistic view
    - outside the date limit, to ensure a contemporary basis due to rapid changes in technology that have had a large impact on possibilities for CR in rural and remote areas and due to the recent decentralisation of health services in Queensland, the establishment of primary health networks and their impact on health service delivery.

Whilst this study includes all adults living independently in rural and remote areas of Australia as well as high-income countries, because of the known poor health status of Australian First Peoples[1,3] studies were sought specifically for CR with Aboriginal and Torres Strait Islanders people and/or Indigenous people. Using this strategy, six studies with a primary focus on Australian First Peoples were identified. No international studies were identified specifically for Indigenous people.

Preliminary review and critical appraisal

Principles and processes of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Fig1) was used to describe the collection, review and identification of final studies for analysis[34].

Following screening of abstracts, a full text critical review to assess research quality, outcomes and eligibility was undertaken on the remaining 56 quantitative, qualitative and mixed method studies. A modified process, suitable for critical review of all research methods, was developed based on the premise that all research includes clearly focused research questions, constructs arguments, collects data from appropriate participants, speculates about outcomes of data analysis[35-37] and considers important outcomes and results[38-40]. To achieve this, McMaster's qualitative research guidelines[40], and the Critical Appraisal Skills Program quantitative review guidelines[38], were combined. Studies were assessed according to McMaster's guidelines for study design, type, methods, sampling and data collection[38] and Critical Appraisal Skills Program quantitative research guidelines to assess the research question, including appropriate sampling, equal treatment of all participants, chance minimisation and research rigor, with all results presented to ensure epidemiological and statistical strength[38]. The critical review was further strengthened by a thematic analysis in which key findings were coded and grouped to identify 'patterned responses' or 'themes', to enable extraction of further meaning[36].

Supplementary table 2 provides details of the critical review and thematic analysis carried out by the first author and peer reviewed by the other authors. This process of review and validation continued throughout.

Following the critical review and thematic analysis, a further analysis, evaluation and integration of findings from the 16 final studies that identified barriers, enablers and pathways was undertaken. These are synthesised in the results according to identified themes.

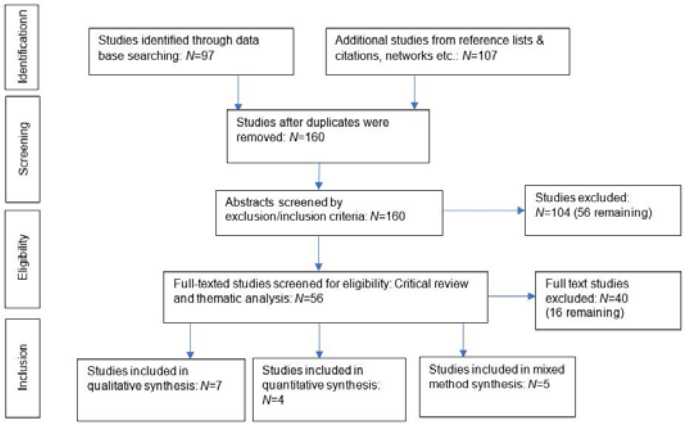

Figure 1: Modified PRISMA chart[34]: Integrative review of studies on cardiac rehabilitation for people in rural and remote areas

Results

The review and analytic process identified 16 studies, from which five themes emerged. Table 1 summarises the pertinent themes including factors that influence failure or success of CR. These factors provided the underpinning criteria for the emergent themes. The themes identified were referral, health service pathways and planning; cultural and geographic factors necessitating alternative and flexible programs; professional roles and influence; knowing, valuing, and psychosocial factors; and financial costs – personal and health services. Embedded in these themes are barriers, enablers and pathways for CR in rural and remote areas by general population and Australian First Peoples.

Table 1: Themes identified through critical analysis and underpinning thematic criteria

Theme	Criteria
Referral to cardiac rehabilitation and continuing along the health pathway	Pathways for continuum of care; transition of care, referrals, eligibility Framework or plan of care Automatic referral, combined with patient education and information systems Communication between health services and health professionals
Cultural and geographic factors necessitating alternative and flexible programs	Distance from services Poor culturally appropriate services with few First Peoples involved Importance of 'yarning' and flexibility especially with First Peoples Need for alternative programs that include telephone, telehealth, written materials, structured support with flexible format Poor IT access and skills Need to include community activities, eg walking groups, healthy cooking classes, using media to promote healthy behaviour, involve local gyms
Professional roles and influence	Opportunistic casual minimal interventions in any environment, eg supermarket, home visits Involving ambulance officers in cardiac rehabilitation programs Involving all health professionals for ensuring referral and attendance Flexibility in professional roles Staff judgemental attitude is a deterrent Low value of cardiac rehabilitation and/or multidisciplinary team Low health service standards
Knowing, valuing, and psychosocial factors	Depression, anxiety, denial, sadness, guilt, grief personal loss often resulting in poor motivation and non-completion of programs Varying education levels and social vulnerability Competing priorities including work and family responsibilities Abandoning medical advice and using alternative therapies Difficulties in changing risky behaviour in home environments (eg families who continue to smoke, poor diet, etc)
Financial costs – personal and health services	Travel, medication, health professional consultations, funding

Referral, health services pathways and planning

General populations: Low levels of referral are commonly identified as barriers to CR[18-21,23,24,41]. Education and information about heart disease risk factors and the benefits of CR are an important part of hospital discharge and referral processes[22-24]. A transition of care framework and care planning, together with systematic assessment to ensure that participants have appropriate, and if necessary, individualised programs, is recommended[21,23] (Table 2).

It is known that there is a lack of data on CR referrals, attendance and completion of centre based or home based programs[16]. At times the studies recommended that people 'eligible' for CR are referred by their treating doctor[18,42]. No eligibility criteria were identified in the selected studies. Many potential CR participants were deemed ineligible without explicit decision-making criteria[18,42]. Other barriers to CR include non-completion or delay in post-hospitalisation referrals, lack of information and prioritisation of CR[21,23,24,41] (Table 2).

Table 2: Final analysis, evaluation and integration – general populations[18-24,41-43]

Author/(country)	Purpose	Study design	Barriers	Enablers/pathways
Beasley C, Dixon R [20] (New Zealand)	The perceptions and experiences of nurses involved with the delivery of CR in a rural healthcare setting in Northland Region of New Zealand	Qualitative – descriptive, exploratory Limitations: Not generalisable; only one meeting with Maori people weakens applicability for Maori people	Distance and travel; cost; work and family; client motivation; lack of role models and local attitudes not supporting cardiac CR; lack of a coordinated multidisciplinary team approach	Support groups; local knowledge: rapport with clients; need an effective home based alternative and better-informed health professionals on CR programs and benefits Pathways: Need a clear transition of care, referral and framework or plan of care
Fernandez S, Davidson P, Griffiths R, et al [24] (Australia)	To assess the perspective of CR coordinators regarding patient-related barriers to implementing the evidence-based guidelines after an acute cardiac event	Qualitative – interviews, focus groups and thematic analysis Limitations: Not generalisable; specific to the geographic regions; medical officers not included	Not accepting a diagnosis of heart disease or seriousness; cost, including medications, travel and visits to health professionals, using alternative therapies and not adhering to prescribed treatment; families continuing to smoke; taking time off work	Efforts directed to increase participation in CR and supporting behaviour change. Changes to health service policies that address identified barriers Pathways: Nil identified
Fernandez S, Davidson P, Griffiths R, et al [21] (Australia)	To explore the strategies used by CR coordinators to overcome the obstacles to implementation of the Heart Foundation of Australia's evidence-based *Reducing risk in heart disease guidelines*	Qualitative – interviews, focus groups and thematic analysis Limitations: Not generalisable specific to the geographic regions; medical officers not included	Greater focus on acute care rather than health promotion; lack of participation in CR is compounded by geographic location; low-level referrals	Media; opportunistic casual minimal interventions; home visits; community activities, eg walking, healthy cooking, lobby restaurants to provide healthy food choices; ambulance officers teach cardiopulmonary resuscitation; involve local gyms; flexibility in roles and programs; communication with general practitioners Pathways: Develop automatic referral/information/education system
Fernandez S, Davidson P, Griffiths R, et al [41] (Australia)	To explore the perceptions of CR coordinators relating to challenges, including guideline implementation for improving the delivery of CR services	Qualitative – interviews, focus groups and thematic analysis Limitations: Not generalisable; specific to the geographic regions; medical officers not included	Funding; distance; difficulty in accessing health professionals and their lack of knowledge of prioritisation of CR; poor communication within health services/health professionals; slow and/or low rate of referrals. General practitioners consider themselves as a 'one stop shop'; lack of planning	No enablers or pathways presented
Jackson AM, McKinstry B, Gregory S, et al [19] (Scotland)	To explore why people do not participate in CR and coronary heart disease self-help groups, and their rehabilitation experience without these resources	Qualitative – interviews, focus groups and thematic analysis. Explored experiences of people recently hospitalised with coronary heart disease, and their 'significant others', and non-use of CR and experiences of recovery without these resources. A demographic profile of the group was included	CR not offered; perception of no benefit; transport issues; dislike of groups; unnecessary; no benefit because of age and co-morbidities; not appropriate; work patterns; physical discomfort; judgemental staff; lack of motivational support for instigating or maintaining lifestyle changes; inadequate information and support for emotions, eg uncertainty, anxiety, non-acceptance of myocardial infarction and consequences, sadness, guilt; social vulnerability, depression, mood swings, irritability	'Heart manual' home-based rehabilitation resource – increased confidence in recovery; encouraged independence; initially people may feel they don't need support, however with education and opportunity this perception may change Pathways: Nil identified
Brual J, Gravely S, Suskin N, et al [18] (Canada)	To assess whether clinical and geographic factors were related to use of either a centre based or home based program	Quantitative – cross-sectional secondary analysis of clinical data extracted through a patient questionnaire which was repeated 9 months later Limitations: A high number of potential participants deemed ineligible, raising questions about referral practices	Geographic distance, lack of CR services and referral of higher risk patients to home based programs	High functioning clients more likely to complete either program Pathways: Nil identified
De Angelis C, Bunker S, Schoo A [23] (Australia)	(i) Establish baseline data on CR programs in south-western Victoria, (ii) identify local barriers and enablers for CR for both decliners and attendees, (iii) explore preferred options	Mixed method – quantitative descriptive statistics: assessment of CR risk factors pre- and post-program (paired *t*-tests, $p < 0.05$) Qualitative – focus groups and 'yarning' Limitation: Only one carer interviewed; CR decliners are likely to be under-represented as lower than average; decliners completed the questionnaire and not interviewed. Geographically limited	Distance, transport, costs; lack of available alternative programs, eg home based with telephone support; stoic self-reliant rural attitude; dislike of groups; anxiety and depression; difficulty in acknowledging the need for lifestyle changes, lack of information about CR; negative view from experience or misinformation; women's carer role and possible inability to drive	Health professionals and family supporting CR; alternative programs, eg home based, telephone support; positive attitude, motivation, enjoy groups, welcoming staff; home visits; CR manual, and phone contacts. Pathways: Early referral and personal contact from the local general practitioner and CR coordinator
Sangster J, Furber S, Phongsavan P, et al [42] (Australia)	To examine the risk profile and participation in CR of rural and urban residents with cardiac disease who enrolled in a telephone coaching program	Quantitative – prospective descriptive data collection by telephone questionnaire Limitations: Only 30% eligible were referred to CR and a 'large proportion' (no number) declined to participate. Not generalisable as participants from two urban and two rural areas	Difficulties such as lack of affordable transport or not feeling well enough to attend a group program	Alternative methods of CR program delivery make CR more accessible to people who find it difficult to access outpatient CR and/or dislike group Pathways: Nil identified
Scane K, Alter D, Oh P, et al [49] (Australia)	1. To compare adherence of patients in a CR home based with a centre based program. 2. To compare clinical and demographic profiles and changes in cardiovascular fitness	Quantitative – retrospective audit of patient files and data base for centre based program and home based programs Limitations: Non-experimental design; no random assignment, women under-represented; self-efficacy and motivation not considered	Geographic distance (≥30 km) to centre based programs, younger, fitter, employed males less likely to attend centre based programs	Home programs more acceptable for younger, fitter, employed; more time efficient, better for women with family responsibilities Pathways: Nil identified
Shanmugase-garam S, Oh P, Reid R, et al [22] (Canada)	To examine barriers to participation in CR by program type (centre based or home based), and their links to program participation and exercise behaviour	Quantitative – cross-sectional, in-hospital sociodemographic survey, based on clinical data from case notes. A follow-up survey 1 year later Limitations: Low number of home based participants	Centre based programs: Distance, cost, weather Centre based and home based programs: Poor participant energy, other health problems; family responsibilities; perception no need; no doctor doesn't support; too old; not aware of CR, referral too late and/or no follow-up	Minimal travel and costs. Home based programs for people who prefer self-care and exercise programs that can be integrated into home routines Pathways: Early referral and follow-up

CR, cardiac rehabilitation.

Australian First Peoples: Lack of data on referral rates and poor discharge planning were identified as barriers to CR for Australian First Peoples[43,44]. Lack of services, low levels of involvement of Australian First Peoples staff and culturally inappropriate services are identified as contributory factors to low rates of CR referral and access[43,45-47]. In one community in Western Australia, the number of people who attended CR was reported as being augmented by self-referral of people interested in learning more about health and risk factors rather than formal referrals or involvement in CR[46,47] (Table 3).

Table 3: Final analysis, evaluation and integration – Australian First Peoples[43-48]

Author	Purpose	Study design	Barriers	Enablers/pathways
Taylor K, Smith J, Dimer L, et al [45]	To examine barriers to Australian First Peoples' participation in CR in Western Australia	Qualitative – interviews, focus groups and thematic analysis Limitation: Small study of urban First Peoples limits generalisability; no impartial verification	Family responsibilities; standard CR programs not culturally appropriate; programs connected with colonialism; younger First Peoples and health status have negative media statistics	Need for a shift in media and public health campaigns from 'shock' headlines and statistics to a focus on strengths and successes, inspiring the groups involved and supporting them to make changes Pathways: Nil identified
DiGiacomo M, Thompson S, Smith J, et al [48]	To describe health professionals' perceptions of Australian First Peoples' access to CR services and the role of institutional barriers in implementing the NHMRC guidelines *Strengthening CR and secondary prevention for Aboriginal people*	Qualitative – interviews, focus groups and thematic analysis Limitations: Health professionals' perspective only; no impartial verification	A lack of awareness of First Peoples' needs as patient; low level of cultural awareness training for health professionals	First Peoples' health staff to facilitate access for Australian First Peoples' patients; all staff to have an increased knowledge of the NHMRC guidelines *Strengthening CR and secondary prevention for Aboriginal people* Pathways: Nil identified
Davey M, Moore W, Walters J [47]	To evaluate the uptake and effectiveness of a Tasmanian Aboriginal centre CR and pulmonary rehabilitation program for Australian First Peoples with chronic heart or respiratory disease or at high risk	Mixed method – quantitative descriptive and qualitative study – interviews, focus groups and thematic analysis Limitations: No impartial verification	Established disease sufferers were less likely to attend than people with risk factors only. Transport was anticipated as being a barrier; 48% of participants used transport provided all the time and 15% sometimes	Positives for Aboriginal health workers: making a difference; concentrating on one program; part of multidisciplinary team. Positives for participants: learning new skills; community interaction and comradeship. Positive for non-Australian First Peoples' staff gaining cultural insight, feeling valued and assisting people to improve skills and functioning Pathways: Word-of-mouth recommendations
Dimer L, Dowling T, Jones J, et al [46]	The initial purpose was to conduct a secondary prevention program. The high level of community interest in primary and secondary cardiovascular health information resulted in broadening the program to engage the family and broader community to address the burden of chronic disease in Australian First Peoples populations through primary and secondary prevention, in Western Australia	Mixed method – quantitative cross-sectional assessment of cardiovascular risk factors pre- and post-program (paired *t*-tests, $p < 0.05$). Qualitative interviews, focus groups and thematic analysis and 'yarning' Limitations: Qualitative methodology not fully described; sufficient verbatim quotations provided to substantiate the conclusions	Western medical practices are ineffective in taking accurate medical histories of First Peoples; poor understanding of medication regimes and use of prescribed medications; reluctance to call an ambulance due to the possible costs; lack of CR services	Cultural security of Aboriginal medical services; cross-cultural benefits; strong relationships and trust between staff and participants; engaging the family and broader community; including both primary and secondary prevention, flexibility and 'yarning'. Pathways: Self-referral from word of mouth, with community elders being a strong referral source
Thompson S, DiGiacomo M, Smith J, et al [43]	To describe health professionals' awareness, implementation, and perspectives of barriers to implementation of the NHMRC guidelines *Strengthening CR and secondary prevention for Aboriginal and Torres Strait Islander Peoples*	Mixed method – predominantly qualitative study which included quantitative descriptive methods with quantifiable close-ended questions combined with semi-structured interviews, allowing for exploration of issues and thematic analysis Limitations: Small number of interviews (average 1.4 per organisation), may not be representative of the whole organisation	Tensions between standard medical care and secondary prevention and the needs of First Peoples. Discharge processes are lacking with Australian First Peoples often not identified; poor inter-health service communication	Implementation of NHMRC guidelines and recommendations (integrated models of care) including awareness, communication, coordination, involvement of Aboriginal medical service; post-discharge estimated time of arrival; transportation; family commitments; the interplay between physical and mental concerns; social vulnerability; family links; community education; follow-up and support; strengthen cultural skills of non-Australian First Peoples staff; management support for policy changes and practice; strategies to reduce staff turnover and subsequent staff shortages Pathways: Nil identified
Hamilton S, Mills B, McRae S, et al [44]	To investigate the provision of CR and secondary prevention by Aboriginal medical services in Western Australia with a focus on rural, remote and Indigenous populations	Mixed method – qualitative – interviews, focus groups and thematic analysis Quantitative descriptive methods reporting continuous and categorical data Limitations: Lack of verification of qualitative data, and lack of standard method of collection of quantitative data limits the ability to make direct comparisons between services and report inferential statistics. No data on non-referral of eligible patients	Lack of a minimum dataset to record and monitor CR and secondary prevention in Western Australia to evaluate the quality and outcome of an individual's participation in the core components of CR	Revision of the current Western Australian data set and a review of referral pathways could provide information that would identify possible barriers and enable these to be considered and if necessary modified. Completion rates are high, therefore need to ensure referrals are made and people attend the first session Pathways: A revised referral and data collection system

CR, cardiac rehabilitation. NHMRC, National Health and Medical Research Council.

Cultural and geographic factors necessitating alternative and flexible programs

General populations: A range of studies identified that alternative approaches to CR are required due to low levels of geographic access in rural and remote communities[18,19,23,41,42,49]. It is known that distance from services impacts on access to CR[18,21,23]. Technological or personal support home based programs are identified as alternatives to centre based programs[20,22,23]. There is a demonstrated need for flexible and individualised programs to accommodate factors related to employment, age and gender, supported by community involvement[19,20,24]. The use of a 'heart health' manual combined with home visits has been shown to be of benefit[19]. Innovative management policies are recommended to enable alternative and flexible models necessary to meet individual and local needs[23,24] (Table 2).

Australian First Peoples: Studies repeatedly found that First Peoples programs must be of high standard, culturally appropriate, holistic, flexible and include family and community[43,45,48]. Indigenous health workers are identified as an essential part of the health service team, which needs strong relationships and trust within the team and program participants[46,48]. Strong links with mainstream health services are necessary whilst retaining flexibility and individuality, such as 'yarning' or storytelling to encourage attendance[43,46] (Table 3).

The barrier of distance from services is not identified by First Peoples to the same extent as for the general population[18-23,23-25,41] (Table 2). In one Tasmanian First Peoples study, transport was provided for participants. This was regularly used by 48% of the participants and by 15% 'some of the time'[47] (Table 3).

Professional roles and influence

General population and First Peoples: Medical officers and/or CR coordinators' personal involvement, accessibility and follow-up, together with supportive and non-judgemental attitudes, were found to be enablers for CR attendance[19,20,23]. Further enablers identified included health professionals' knowledge and prioritisation, their willingness to share information and work as part of a coordinated multidisciplinary team, as well as ensuring effective interhealth services communication[47] (Table 2).

There is evidence that professional relationships between Australian First Peoples and general population staff are strengthened when they are based on trust and respect, with Australian First Peoples in primary professional roles[43,46,48]. Improved cultural skills of general population staff are of primary importance in this process. These are identified as core components for effective CR and secondary prevention for Australian First Peoples[43,46]. Two studies involving Australian First Peoples also identified multidisciplinary teams as being important, together with flexibility of professional roles[45,48] (Table 3).

Knowing, valuing, and psychosocial factors

General population: Public perception generally demonstrated that CR is unnecessary for younger, fitter people[49], or not suitable for people with comorbidities or advanced disease[24,42]. Lack of information, few positive role models, negative local attitudes, poor experience or misinformation, and insufficient health professional support, have all been identified as limiting the perceived value[19,20]. It is also noted that people experience difficulty in acknowledging the need for lifestyle changes, especially if families continue with risky behaviour such as smoking[24]. People may opt to deny the need for risk modification, cease taking their prescribed medications and seek alternative therapies[21] (Table 2). Depression, anxiety, denial, sadness, guilt, grief and personal loss have been found to result in poor motivation and non-completion of programs[23] (Table 2).

Australian First Peoples: Inequities in First Peoples health services are compounded by 'Western' medical practices reported to be ineffective in taking accurate medical histories[43,46] and to mirror a 'power inequity that resembles colonialism'[42,47,48]. The need for flexible and innovative programs that consider all aspects of chronic disease risk factor minimisation, with a possible focus on primary and secondary prevention and consideration of mental as well as physical health, to address these barriers has been identified[43] (Table 3).

Financial costs – personal and health services

General populations: On a personal level, travel costs, medications, visits to health professionals and potential loss of income due to work commitments are identified as significant barriers to CR[19,21-23] (Table 2).

Australian First Peoples: Current studies do not identify the same financial issues for First Peoples, who largely attend local Indigenous medical services or government health services, which, whilst accessible, provide few CR or secondary prevention services[43,46] (Table 3).

Limitations

The methodological quality of articles was assessed and demonstrated validity in research methods, with some limitations (Tables 2,3). The majority of qualitative and mixed method studies used purposive sampling and semi-structured interviews[19-21,24,41,43,44,46-48], with data analysed and themes identified using NVivo software. However, many studies were limited in their generalisability due to specific geographic location of data collection[19,20,23,41]. Other limitations were non-inclusion of essential representatives (eg medical officers, carers and local indigenous people (Maori of New Zealand) [20,23,24,41,49]), and lack of data verification[45,47]. Three quantitative studies were limited by lack of exclusion criteria (CR eligibility)[18,43,50], with one sample not randomised[45]. One mixed method study relied on a small and possibly non-representative sample[43].

Results are assimilated according to themes, barriers, enablers and pathways to provide information as a basis for developing a

revised framework and perspective for CR referral and access models that will ultimately improve health and quality of life for all people with heart disease in rural and remote areas (Tables 4,5).

Table 4: Themes, barriers, enablers and pathways – general populations[18-25,41,42,49]

Theme	Barriers	Enablers	Pathways
Referral: health service pathways and planning	Low level referrals [18,20,23,24,41] Not aware of CR [24] CR not offered [19]	Develop automatic referral/information/education system [24] Early referral and personal contact from the local general practitioner and CR coordinator [19,24]	Need a clear transition of care, referral and framework or plan of care [21]
Cultural and geographic factors necessitating alternative and flexible programs	Distance and lack of CR services [18,19,23,24 41,42,49] Poor participant energy; family responsibilities [22] Taking time off work [19,21] Stoic self-reliant rural attitude; dislike of groups; anxiety and depression [23] Women's carer role and possible inability to drive [23]	Support groups; local knowledge: need an effective home based alternative [23,24] Media; opportunistic casual minimal interventions; home visits community activities eg walking, healthy cooking, lobby restaurants to provide healthy food choices [24] Family support [23] Range of alternative programs eg home based, telephone support; positive attitude, motivation, groups for people who enjoy; welcoming staff; home visits; CR manual, and phone contact/support [23] Home based programs are time efficient and more acceptable for younger, fitter and employed people and those who have family responsibilities [49]	Nil identified
Professional roles and influence	Lack of a coordinated multidisciplinary team approach [20] Poor support from health professionals [21,24,41] General practitioners consider themselves 'one stop shop' [41]	Better-informed health professionals on CR programs and benefits [20] Rapport with clients; a supporting behaviour change [20,24] Ambulance officers teach cardiopulmonary resuscitation; involve local gyms: flexibility in programs and roles; communication with general practitioners and health professionals [21]	Directing efforts at increasing participation in CR. Changes to health service policies that address identified barriers, eg extended and flexible roles [21]
Knowing, valuing, and psychosocial factors	Lack of role models and local attitudes not supporting CR [20] No benefit, too old; other health problems [19,22] Using alternative therapies and not adhering to prescribed treatment; families continuing to smoke [24] Younger, fitter, employed males less likely to attend centre based programs [49] Lack of information about CR; negative view from experience or misinformation [23] Difficulty in acknowledging the need for lifestyle changes [23] Depression, anxiety, denial, sadness, guilt, grief personal loss, often resulting in poor motivation and non-completion of programs [22,23]	Heart manual home based rehabilitation resource – increased confidence in recovery and provided encouragement to manage independently [19] Home programs more acceptable for younger, fitter, employed and requiring home based; more time efficient, also better for women who have family responsibilities [49] Alternative methods of CR program delivery make CR more accessible to people who find it difficult to access outpatient CR and/or who dislike groups [23,42]	Nil identified
Financial costs – personal and health services	Costs – transport, time off work, cost of health professional visit and medications [19,20,41,42] Varying education levels and social vulnerability [19] Competing priorities including work and family responsibilities [20-23, 25,49]	Home based and alternative, flexible, individualised programs [23,49]	

CR, cardiac rehabilitation.

Table 5: Themes, barriers, enablers and pathways – Australian First Peoples[43-48]

Theme	Barriers	Enablers	Pathways
Referral: health service pathways and planning	Discharge processes are lacking, with Australian First Peoples often not identified as such [43] Lack of a minimum dataset to record and monitor CR referrals and outcomes in Western Australia [44]	Revision of the current Western Australian data set and a review of referral pathways [44] High completion rates indicate the need to ensure people are referred and attend the first session [44]	Word of mouth recommendations, and self-referral [46,47]
Cultural and geographic factors necessitating alternative and flexible programs	Not culturally appropriate, programs connected with colonialism [48] Family responsibilities and commitments [43,45] Western medical practices are ineffective in taking accurate medical histories of Australian First Peoples [46] Negative perceptions and media of Australian First Peoples [45] Interplay between physical and mental concerns [43] Lack of services [46]	Cultural security of Aboriginal medical services [43,46] Cross-cultural benefits [47] Engaging the family and broader community; including both primary and secondary prevention, flexibility and 'yarning' [46] Community education, follow-up and support [43] Strengthen cultural skills of non-Australian First Peoples [43] Management support for policy changes and practice [43]	Revised referral and data collection system [49] Develop more services [47]
Professional roles and influence	Low level of cultural awareness training for health professionals [47,48] Western medical practices are ineffective in taking accurate medical histories of australian first peoples [46] Tensions between standard medical care and secondary prevention and the needs of indigenous people [43]	Aboriginal health workers part of multidisciplinary team and involvement of Aboriginal medical services [43,46,47] Increased knowledge of the NHMRC guidelines *Strengthening CR and secondary prevention for Aboriginal people* [43] Non-Australian First Peoples staff gaining cultural insight, feeling valued and assisting people to improve skills and functioning [47] Strong relationships and trust between staff and participants [46]	Management support for policy changes and practice [43] Strategies to reduce staff turnover and subsequent staff shortages [43]
Knowing, valuing, and psychosocial factors	Established disease suffers were less likely to attend than people with risk factors only [47] Poor understanding of medication regimes and correct use of prescribed medications; reluctance to call an ambulance due to the possible costs [46] Varying education levels and social vulnerability [43] Family commitments [43,46]	Participants learning new skills; community interaction and comradeship [47] Strengthen the cultural skills of non-Australian First Peoples staff [43,47] Family involvement [43,46]	
Financial costs – personal and health services	Nil identified in the studies reviewed for Australian First Peoples		

CR, cardiac rehabilitation. NHMRC, National Health and Medical Research Council.

Discussion

CR is known to be effective in improving quality of life, reducing mortality, morbidity and hospital readmissions[7,8,10], and consequently reducing costs for hospital treatment for heart disease[7-10,51,52]. The true value of CR is not realised in rural and remote areas due to poor access and/or attendance to CR services[18-21,23,24,41]. Whilst this integrative review provides information on barriers, enablers and pathways to models of referral and access to CR, there remain many unanswered questions, including why referral and attendance rates continue to be low despite the significant evidence of CR effectiveness. Whilst the reason for this is not completely understood, contributing factors identified in the selected studies include poor understanding of the benefits of CR by health professionals and potential attendees, compounded by low levels of referral[19,21,23,24,42]. Whilst some pathways of referral and transition of care planning are reported, referral rates are not known in many areas of Australia.

Early results of a recently instituted Queensland Health CR database are insufficient to draw conclusions about referral rates in

Queensland. It is anticipated that as data collection increases, this information will become available[16,53].

Australian First Peoples experience many of the same barriers as the general population, compounded by cultural issues, lower socioeconomic and educational levels, and greater geographic isolation[1,3]. However, they have a greater need for CR, primary and secondary prevention due to higher levels of heart disease and comorbidities[1,54,55]. To provide Australian First Peoples adequate and effective CR, their increased involvement, together with non-Australian First Peoples' improved cultural awareness, mutual trust, respect and two-way learning is required, as well as improved support and access to specialist services[43,46-48]. Many of these issues are not well investigated and described.

Costs associated with recurring heart disease are high and it is known that these costs can be reduced with improved systems that facilitate referral, accessibility and CR attendance[6]. To improve services, more information is required about hospital discharge and CR referral processes, including eligibility, inpatient education, perceived benefit and meeting participant needs.

The current situation demonstrates weak or poorly implemented systems. These include models of health services delivery, referral processes as well as inconsistent knowledge and value by health professionals and potential participants[14,15,19,23,40,48], plus a range barriers to access and appropriateness of services. Many of the issues identified are common to health service provision and access to services in rural and remote areas of Australia[56]. As such, findings of this integrative review potentially have broad applications. To address the deficits, the following priorities need to be considered.

Referral, health services, pathways and planning

A systematic referral process based on well-defined criteria, individualisation of CR, personal contact, trust, information and support from health professionals[13,22-24,46,49] needs further investigation. The systematic referral process, based on eligibility criteria, education on heart disease and risk factors, needs to commence prior to hospital discharge[20,22,57].

Cultural and geographic factors necessitating alternative and flexible programs

Flexibility in CR is essential because of the diversity of demographic profiles, geographic location and health status in rural and remote areas[23,41,47,48]. Alternative models of CR, including home based programs with telephone support, such as Queensland Health's Coaching Patients on Achieving Cardiovascular Health (COACH)[17], telehealth, purpose designed apps and community involvement, are all known enablers for CR[31,41]. However, attendance rates remain low[10,16,17]. In Australia there is little evidence of CR being provided by Aboriginal/Indigenous medical services, compounding poor access to CR by Australian First Peoples who live in remote area communities. This highlights the need for further advocacy and a review of systems of health care for Australian First Peoples in remote area communities. In line with a holistic and culturally appropriate approach and scarcity of resources, consideration of an integrated, flexible primary and secondary prevention model that is appropriate for Australian First Peoples as well as the general population needs further investigation.

Professional roles and influence

Key issues identified include ongoing staff shortages[14,15], indicating the need for increased professional role flexibility and modified multidisciplinary team models, supported by appropriate management policy[15,43]. A further priority is including a primary role in CR, supported by further education, for Indigenousl health workers working with Australian First Peoples[43,45,47]. These are all key issues that need further consideration to work towards optimal effectiveness of CR in rural and remote areas.

Knowing, valuing, and psychosocial factors

Poor understanding of the concepts and benefits of CR contributes to low attendance rates[19,21,23,25,41,57,58]. This is exacerbated by the general perception that acute care health services are of greater importance than primary and secondary prevention services[24]. Lack of knowledge and negative perceptions of CR need to be addressed. Mental as well as physical health issues are of primary importance and currently not prioritised in many CR programs[19,21,23]. A holistic approach to CR, primary and secondary risk factor prevention and use of resources need further consideration[46].

Financial costs – personal and health services

Through effective CR it is known that healthcare costs can be significantly reduced through a reduction in reoccurrence of heart disease and hospital readmissions[6]. To achieve increased CR participation, improved professional understanding and support is essential[41]. The cost factors for general populations include travel, loss of work, cost of health services, professional consultations and medications[19,23,24,42]. It is also reported by James Cook University, Cairns and Apunipima Indigenous health services (unpublished internal report, 2016) that Australian First Peoples are faced with financial costs, practical and cultural barriers when attending centralised specialist services that require them to travel and stay away from their families and community. The overall low level of health services in rural and remote areas results in poor access and overloaded services, and resultant staff turnover and cost implications[14,15,42,59]. Reconsideration of the system, current health services and resource allocation is required.

Limitations

Due to the predominantly qualitative or mixed method research the results are not outcome focused and have limited generalisability due to the specific geographic areas and small purposive contextual samples of the studies. Therefore, conclusions drawn by this integrative review on health service systems and services are based in part on selected studies' discussions, findings and conclusions, and subject to the limitations of the study. No northern Queensland or Northern

Territory studies on CR were identified in this integrative review. These are extensive regions of Australia with large rural and remote areas. This and the overall low number of studies indicate the need for further research to improve information that will facilitate decision making and identify further CR enablers and pathways and minimise barriers specific to rural and remote areas of Australia, so that service improvements can be achieved.

Conclusion

The purpose of this integrative review was to explore barriers, enablers and pathways for access to CR, with the aim of optimising services, improving health and quality of life for all people living independently in rural and remote areas. The review indicates that CR services are fragmented and lack a systematic policy driven approach, with resultant low levels of referral and access. Even when alternative services are offered in Australia (eg COACH), attendance rates remain low.

To address this, the following elements for improved referral and access to CR need further investigation and development:

- referral systems and eligibility criteria
- availability and access to flexible centre based and home based CR programs including telephone/personal support and technology based programs via telephone apps, with distance support
- education/awareness/training on CR for providers and potential participants, family/significant others
- information systems for CR referral and access
- improved education and training for general populations staff on Australian First Peoples' cultural issues
- improved workplace support and education for Indigenous health workers
- greater flexibility and extended professional roles supported by management policy and protocols
- consideration of combined CR primary, secondary prevention and risk factor management
- improved funding.

CR works to improve health status and reduce costs, and there are a range of ways to provide effective services for more people. These include a systematic, policy driven approach that includes referral, eligibility and access. This is necessary if CR is to fulfil its role as a valuable tool in substantially lowering coronary heart disease morbidity and mortality. Understanding and addressing these factors has the potential to reduce costs, through reduced cardiac events and hospital readmissions as well as improved quality of life and contribute to improved CR and/or secondary prevention services and ultimately health outcomes for all people living independently in rural and remote areas of Australia.

REFERENCES:

1 Australian Institute of Health and Welfare. *Trends in coronary heart disease mortality: age groups and populations.* 2014. Available: http://www.aihw.gov.au/publication-detail/?id=60129547046 (Accessed 10 March 2017).

2 Australian Institute of Health and Welfare. *Health-care expenditure on cardiovascular diseases 2008–09.* 2014. Available: http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129546379 (Accessed 11 March 2017).

3 Australian Institute of Health and Welfare. *Impact of rurality on health status.* 2017. Available: http://www.aihw.gov.au/rural-health-impact-of-rurality (Accessed 21 May 2017).

4 Cape York Institute for Policy and Leadership (editor) Report to the Referendum Council. *Uluru: First Nations voice in the Constitution.* 2017. Available: https://www.referendumcouncil.org.au/sites/default/files/2017-07/ReporttotheReferendumCouncil-FirstNationsVoiceDesignReport_0.pdf (Accessed 19 January 2018).

5 Phillips A. Health status differentials across rural and remote Australia. *Australian Journal of Rural Health* 2009; **17(1):** 2-9. https://doi.org/10.1111/j.1440-1584.2008.01029

6 De Gruyter E, Ford G, Stavreski B. Economic and social impact of increasing uptake of cardiac rehabilitation services 2013: a cost benefit analysis. *Heart, Lung and Circulation* 2014; **25(2):** 175-183. https://doi.org/10.1016/j.hlc.2015.08.007

7 Heart Foundation of Australia. *Secondary prevention of cardiovascular disease. 2010* Available: https://www.heartfoundation.org.au/images/uploads/publications/Secondary-Prevention-of-cardiovascular-disease.pdf (Accessed 11 November 2017).

8 Goble A, Worcester M. *Best practice guidelines for cardiac rehabilitation and secondary prevention. 1999* Available: http://hna.dhs.vic.gov.au/phd/9905015/contents.htm (Accessed 25 March 2017).

9 Australian Cardiac Rehabilitation Association. *Queensland cardiac rehabilitation heart failure service directory. 2017* Available: http://www.acra.net.au/cr-services/cr-directory (Accessed 12 August 2017).

10 Woodruffe S, Neubeck L, Clark R, Gray K, Ferry C, Finan J, et al. Australian Cardiovascular Health and Rehabilitation Association (ACRA): core components of cardiovascular disease secondary prevention and cardiac rehabilitation. *Heart, Lung & Circulation* 2015; **24(5):** 430-441. https://doi.org/10.1016/j.hlc.2014.12.008

11 Williams M, Kaminsky L. Healthy lifestyle medicine in the traditional healthcare environment: primary care and cardiac rehabilitation. *Progress in Cardiovascular Diseases* 2014; **59(5):** 448-454. https://doi.org/10.1016/j.pcad.2017.01.008

12 Mabbott V, Storey P. *Australian Statistics on Medicines.*

Available: https://www.pbs.gov.au/statistics/asm/2015/australian-statistics-on-medicines-2015.pdf (Accessed 25 November 2017).

13 Heart Foundation of Australia. *Cardiac rehabilitation factsheet for health service planners, program directors and clinical staff. 2017* Available: https://www.heartfoundation.org.au/images/uploads/publications/HF.Cardiac_Rehab_Factsheet_WEBHR.pdf (Accessed 30 August 2017).

14 Birk M, Mills J, Francis K, Coyle M, Jones J. Models of health service delivery in remote or isolated areas of Queensland: a multiple case study. *Australian Journal of Advanced Nursing* 2010; **19(1):** 36-45. Available: http://www.ajan.com.au/Vol28/28-1_Birks.pdf (Accessed 16 August 2017).

15 Durey A, Haigh M, Katzenellenbogen J. What role can the rural pipeline play in the recruitment and retention of rural allied health professionals? *Rural and Remote Health* 2015; **15(3):** 3438. Available: https://www.rrh.org.au/journal/article/3438 (Accessed 20 April 2018).

16 Kidby K. *Principal Project Officer, Healthcare Improvement Unit, Quality Improvement Program.* Brisbane: Queensland Health, 2016.

17 Ski C, Vale M, Bennett G, Chalmers V, McFarlane K, Jelinek V, et al. Improving access and equity in reducing cardiovascular risk: the Queensland Health model. *Medical Journal of Australia* 2015; **202(3):** 148-152. https://doi.org/10.5694/mja14.00575

18 Brual J, Gravely S, Suskin N, Stewart D, Grace S. The role of clinical and geographic factors in the use of hospital versus home-based cardiac rehabilitation. *International Journal of Rehabilitation Research* 2012; **35(3):** 220-226. https://doi.org/10.1097/MRR.0b013e328353e375

19 Jackson AM, McKinstry B, Gregory S, Amos A. A qualitative study exploring why people do not participate in cardiac rehabilitation and coronary heart disease self-help groups, and their rehabilitation experience without these resources. *Primary Health Care Research and Development* 2012; **13(1):** 30-41. https://doi.org/10.1017/S1463423611000284

20 Beasley C, Dixon R. Phase II cardiac rehabilitation in rural Northland. *Nursing Praxis in New Zealand* 2013; **29(2):** 4-14.

21 Fernandez R, Davidson P, Griffiths R, Salamonson Y. Cardiac rehabilitation coordinators' perceptions of patient-related barriers to implementing cardiac evidence-based guidelines. *Journal of Cardiovascular Nursing* 2008; **23(5):** 449-457. https://doi.org/10.1097/01.JCN.0000317450.64778.a0

22 Shanmugasegaram S, Oh P, Reid R, McCumber T, Grace S. A comparison of barriers to use of home- versus site-based cardiac rehabilitation. *Journal of Cardiopulmonary Rehabilitation Prevention* 2013; **33(5):** 297-302. .https://doi.org/10.1097/HCR.0b013e31829b6e81

23 Angelis C, Bunker S, Schoo A. Exploring the barriers and enablers to attendance at rural cardiac rehabilitation programs. *Australian Journal of Rural Health* 2008; **16(3):** 137-142. https://doi.org/10.1111/j.1440-1584.2008.00963.x

24 Fernandez R, Davidson P, Griffiths R, Salamonson Y. Overcoming barriers to guideline implementation: the case of cardiac rehabilitation. *Quality and Safety in Health Care* 2010; **19(6):** e5. https://doi.org/10.1136/qshc.2008.029587

25 Wakerman J, Humphreys JS, Wells R, Kuipers P, Entwistle P, Jones J. Primary health care delivery models in rural and remote Australia – a systematic review. *British Medical Journal Health Services Research* 2008; **8(1):** 276. https://doi.org/10.1186/1472-6963-8-276

26 Torraco R. Writing integrative literature reviews: guidelines and examples. *Human Resource Development Review* 2005; **4(3):** 356-367. https://doi.org/10.1177/1534484305278283

27 Whittemore R, Knafl K. The integrative review: updated methodology. *Journal of Advanced Nursing* 2005; **52(5):** 546-553. https://doi.org/10.1111/j.1365-2648.2005.03621.x

28 Grant M, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. *Health Information and Libraries Journal* 2009; **26(2):** 91-108. https://doi.org/10.1111/j.1471-1842.2009.00848

29 Clark A, King-Shier K, Duncan A, Spaling M, Stone J, Jaglal S, et al. Factors influencing referral to cardiac rehabilitation and secondary prevention programs: a systematic review. *European Journal of Preventive Cardiology* 2013; **20(4):** 692-700. https://doi.org/10.1177/2047487312447846

30 Scalvini S, Zanelli E, Comini L, Dalla Tomba M, Troise G, Febo O, et al. Home-based versus in-hospital cardiac rehabilitation after cardiac surgery: a non-randomized controlled study. *Physical Therapy* 2013; **93(8):** 1073-1083. https://doi.org/10.2522/ptj.20120212

31 Varnfield M, Karunanithi M, Lee C, Honeyman E, Arnold D, Ding H, et al. Smartphone-based home care model improved use of cardiac rehabilitation in postmyocardial infarction patients: results from a randomised controlled trial . *Heart* 2014; **100(22):** 1770-1779. https://doi.org/10.1136/heartjnl-2014-305783

32 Department of Foreign Affairs. *List of developing countries as declared by the Minister for Foreign Affairs.* 2015. Available: http://dfat.gov.au/about-us/publications/Pages/list-of-developing-countries-as-declared-by-the-minister-for-foreign-affairs.aspx (Accessed 29 April 2018).

33 International Monetary Fund. *World economic and financial surveys: world economic outlook database.* 2015. Available: http://www.imf.org/external/country/index.htm (Accessed 7 July 2017).

34 Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Annals of Internal Medicine* 2009; **151(4):** 264-269. http://doi.10.7326/0003-4819-151-4-200908180-00135

35 Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 2006; **3(2):** 77-101. https://doi.org/10.1191/1478088706qp063oa

36 Onwuegbuzie A, Leech N. On becoming a pragmatic researcher: the importance of combining quantitative and qualitative research methodologies. *International Journal of Social Research Methodology* 2005; **8(5):** 375-387. https://doi.org/10.1080

/13645570500402447

37 Sechrest L, Sidani S. Quantitative and qualitative methods. *Evaluation and program planning* 1995; **18(1):** 77-87. https://doi.org/10.1016/0149-7189(94)00051-X

38 Lee P. Understanding and critiquing quantitative research papers. *Nursing Times* 2006; **102(28):** 28-30. Available: https://www.nursingtimes.net/Journals/2013/04/10/m/i/n/060711Understanding-and-critiquing--quantitative-research-papers.pdf (Accessed 16 January 2017).

39 Lee P. Understanding and critiquing qualitative research papers. *Nursing Times* 2006; **102(29):** 30-32. Available: https://www.nursingtimes.net/journals/2013/04/10/o/e/n/060718understanding-and-critiquing--qualitative-research-papers.pdf (Accessed 10 January 2017).

40 Letts L, Wilkins S, Law M, Stewart D, Bosch J, Westmorland M. Guidelines for critical review form: qualitative studies (version 2.0). *Qualitative Review Form Guidelines* 2007; 1-12. Available: https://www.canchild.ca/system/tenon/assets/attachments/000/000/360/original/qualguide.pdf (Accessed 20 March 2017).

41 Fernandez R, Davidson P, Griffiths R, Salamonson Y. Improving cardiac rehabilitation services – challenges for cardiac rehabilitation coordinators. *European Journal of Cardiovascular Nursing* 2011; **10(1):** 37-43. https://doi.org/10.1016/j.ejcnurse.2010.03.007

42 Sangster J, Furber S, Phongsavan P, Allman-Farinelli M, Redfern J, Bauman A. Where you live matters: challenges and opportunities to address the urban-rural divide through innovative secondary cardiac rehabilitation programs. *Australian Journal of Rural Health* 2013; **21(3):** 170-177. https://doi.org/10.1111/ajr.12031

43 Thompson S, DiGiacomo M, Smith J, Taylor K, Dimer L, Ali M, et al. Are the processes recommended by the NHMRC for improving cardiac rehabilitation (CR) for Aboriginal and Torres Strait Islander people being implemented?: An assessment of CR services across Western Australia. *Australia and New Zealand Health Policy* 2009; **6(29):** 1-6. https://doi.org/10.1186/1743-8462-6-29

44 Hamilton S, Mills B, McRae S, Thompson S. Cardiac rehabilitation for Aboriginal and Torres Strait Islander people in Western Australia. *BMC Cardiovascular Disorders* 2016; **16(1):** 150. https://doi.org/10.1186/s12872-016-0330-3

45 Taylor K, Smith J, Dimer L, Ali M, Wilson N, Thomas T, et al. 'You're always hearing about the stats... death happens so often': new perspectives on barriers to Aboriginal participation in cardiac rehabilitation. *Medical Journal of Australia* 2010; **192(10):** 602.

46 Dimer L, Dowling T, Jones J, Cheetham C, Thomas T, Smith J, et al. Build it and they will come: outcomes from a successful cardiac rehabilitation program at an Aboriginal Medical Service. *Australian Health Review* 2013; **37(1):** 79-82. https://doi.org/10.1071/AH11122

47 Davey M, Moore W, Walters J. Tasmanian Aborigines step up to health: evaluation of a cardiopulmonary rehabilitation and secondary prevention program. *British Medical Council: Health Services Research* 2014; **14(1):** 349. https://doi.org/10.1186/1472-6963-14-349

48 DiGiacomo M, Thompson S, Smith J, Taylor K, Dimer L, Ali M, et al. 'I don't know why they don't come': barriers to participation in cardiac rehabilitation. *Australian Health Review* 2010; **34(4):** 452-457. https://doi.org/10.1071/AH09803

49 Scane K, Alter D, Oh P, Brooks D. Adherence to a cardiac rehabilitation home program model of care: a comparison to a well established traditional on-site supervised program. *Applied Physiology, Nutrition and Metabolism* 2012; **37(2):** 206-213. https://doi.org/10.1139/H11-151

50 DiGiacomo M, Davidson P, Taylor K, Smith J, Dimer E, Ali M, et al. Health information system linkage and coordination are critical for increasing access to secondary prevention in Aboriginal health: a qualitative study. *Quality in Primary Care* 2010; **18(1):** 17-26. Available: https://hdl.handle.net/20.500.11937/32805 (Accessed 16 December 2016).

51 Meshgin N, Canyon S. Cardiac rehabilitation: reducing hospital readmissions through community based programs. *Australian Family Physician* 2008; **37(7):** 575-577.

52 McDonall J, Botti M, Redley B, Wood B. Patient participation in a cardiac rehabilitation program. *Journal of Cardiopulmonary Rehabilitation and Prevention* 2013; **33(3):** 185-188. https://doi.org/10.1097/HCR.0b013e318282551a

53 Pashley L. *Referral to cardiac rehabilitation.* Cairns, Qld: Cairns Hospital, 2017.

54 Australian Institute of Health and Welfare. *Coronary heart disease and chronic obstructive pulmonary disease in Indigenous Australians.* 2014. Available: http://www.aihw.gov.au/publication-detail/?id=60129547716&tab=3 (Accessed 22 August 2016).

55 Ring I, Dixon T, Lovett R, Al-Yaman F. Are Indigenous mortality gaps closing: how to tell, and when? *Medical Journal of Australia* 2016; **205(1):** 11. https://doi.org/10.5694/mja16.00185

56 Humphreys J, Wakerman . *Primary health care in rural and remote Australia: achieving equity of access and outcomes through national reform: a discussion paper.* 2008. Available: http://www.health.gov.au/internet/nhhrc/publishing.nsf/Content/16F7A93D8F578DB4CA2574D7001830E9/ (Accessed 1 February 2017).

57 Meillier L, Nielsen K, Larsen F, Finn B, Mogens L. Socially differentiated cardiac rehabilitation: can we improve referral, attendance and adherence among patients with first myocardial infarction? *Scandinavian Journal of Public Health* 2012; **(25 May).** https://doi.org/10.1177/1403494812443600

58 Redfern J, Briffa T, Ellis E, Freedman S. Choice of secondary prevention improves risk factors after acute coronary syndrome: 1-year follow-up of the CHOICE (Choice of Health Options In prevention of Cardiovascular Events) randomised controlled trial. *Heart* 2009; **95(6):** 468-475. https://doi.org/10.1136/hrt.2008.150870

59 Echeverri R, Winters C. Barriers to participation in cardiac rehabilitation: a rural perspective. *Clinical Nurse Specialist* 2007; **21(2).** Available: https://journals.lww.com/cns-journal/Citation