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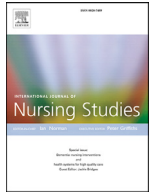
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# Factors that influence adherence to treatment plans amongst people living with cardiovascular disease: A review of published qualitative research studies

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## ABSTRACT

**Background:** Treatment plan adherence is recognized as a worldwide health issue, particularly important in the management of cardiovascular patients. Healthcare professionals are the primary sources of information and support for people diagnosed with CVD and those who have experienced a cardiac event, yet we know little about how healthcare professionals contribute to the process of adherence to treatment plans that aim to prevent and/or reduce disease and adverse events. Qualitative evidence that explores factors that influence adherence to treatment plans is limited.

**Objective:** This systematic review identified and synthesised the best available evidence on factors that influence adherence to treatment plans amongst people living with cardiovascular disease.

**Design:** Systematic review and qualitative synthesis.

**Methods:** Data were collected from Medline, Web of Science, CINAHL, PsychINFO, Embase- Non-Medline, Scopus, Cochrane Library, ProQuest Central (Grey Literature). Pre-defined keywords and MeSH terms were used to identify qualitative methods English-language studies published between 2001 and 2018. Quality appraisal of each paper was completed using the JBI Critical Appraisal Checklist and two reviewers extracted the data independently.

**Results:** Twenty-two articles were included. Eight key themes were identified that related to facilitators and barriers to adherence to treatment plans. Facilitators were identified as engaging in exercise, having support and mentorship, lifestyle modification, and the perceived value of taking medication. Barriers were identified as a perceived lack of support, concerns about taking medication, and lack of engagement in exercise and lifestyle changes.

**Conclusions:** The findings highlight the factors that support adherence and healthcare professionals can build on also the areas that can be targeted to support and improve adherence to treatment plans. Nurses can play an important role in enhancing the provision of information pre hospital discharge and support in the community on taking medication, the value of physical activity and dietary changes.

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## What is already known about the topic?

- Support from Healthcare professionals has been demonstrated to facilitate adherence.
- The rate of treatment adherence remains low and progression of disease symptoms and further cardiac events is high amongst those who do not adhere to treatment plans.

## What this paper adds

- There are several facilitators and barriers that are amenable to interventions within the clinical practice setting both pre and post hospital discharge to enhance adherence to treatment plans and improve health outcomes for people who have experienced a cardiovascular event.

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## 1. Introduction

Cardiovascular disease is the leading cause of mortality worldwide; resulting in an estimated 17.9 million deaths in 2016 (WHO, 2009). Although CVD is a progressive disease, the rate of progression can be reduced through adherence to recommended treatment and lifestyle associated changes (WHO 2009). Adherence is defined as “the extent to which a person’s behaviour, corresponds with the agreed recommendations of a health care provider” (WHO 2003). Adherence is an umbrella term applied to embrace therapeutic components and to follow professional recommendations to enhance well-being (Wahl et al., 2005). Key domains of treatment plans for people living with include undertaking exercise, taking medication as prescribed, and following the recommended diet and lifestyle (Keenan, 2017; Aslani et al., 2011). Nevertheless, adherence to treatment plans remains low implicated in significant burden of morbidity, mortality, and hospitalisation (Keenan, 2017; Aslani et al., 2011). McKenzie et al. (2015) reported non-adherence rates to be between 14 and 43% amongst the ageing population in the Australian context(6). A systematic review by Laba et al. (2013) found that 50% of CVD patients in developed countries do not take their medications as prescribed (Tracey-LeaLaba et al., 2013). Adherence to a treatment plan is associated with positive health impacts including, symptom control and rehospitalization (Lehane et al., 2008; Attebringa et al., 2005). These benefits are, in turn, associated with improved quality of life, survival rates and increase in productivity (Traywick and Schoenberg, 2008; Wyer et al., 2001). Adhering to a treatment plan has also been associated with the opportunity to develop a stronger relationship with healthcare providers particularly nurses who can provide a supportive network which, in turn plays an important role in maintaining treatment adherence (Keenan, 2017; Costa et al., 2015; AndreasFors et al., 2016).

Health professionals plays a significant role in facilitating treatment adherence (Hannan et al., 2018; Woodruffe et al., 2015). Providing information about prescribed medication and undertaking exercise, attending cardiac rehabilitation and dietary changes can help people living with CVD to gain a better understanding of the benefits associated with adhering to a treatment plan (Hannan et al., 2018; Woodruffe et al., 2015). Health care professionals have been identified as the primary sources of information and support for patients (Hannan et al., 2018; Woodruffe et al., 2015). Given the importance of adhering to treatment plans and the knowledge that many people do not follow treatment plans (Hannan et al., 2018; Woodruffe et al., 2015; Kolandaivelu et al., 2014), an exploration of factors that influence adherence has the potential to improve care and outcomes. Factors influencing treatment adherence are often complex, because adherence is a multi-factor phenomenon and is not dependant on a single factor (Kolandaivelu et al., 2014). Understanding the factors that influence adherence can inform the development of strategies to improve adherence (Aslani et al., 2011). To date, the factors related to adherence to treatment plans amongst people living with CVD has not been undertaken, systematic reviews have focused on medication adherence (Mckenzie et al., 2015; Al-Ganmi et al., 2016; Cutrona et al., 2010; Bowry et al., 2011), cardiac rehabilitation programs (Taylor et al., 2011) and one systematic review examined healthcare system barriers and facilitators to medication adherence (Banerjee et al., 2016). No review to date has synthesised qualitative research findings to explore factors that influence treatment adherence. Qualitative studies allow for an exploration of peoples’ lived experiences, beliefs, values and feelings which reveal details and meanings that are not identified through quantitative methods (Ormston et al., 2014). Therefore, this review aims to synthesise qualitative studies that identify factors that influence adherence to treatment plans amongst people living with CVD.

## 2. Methods

We conducted a systematic review in accordance with the Joanna Briggs Institute (JBI) methodology for systematic reviews of qualitative evidence (D. Moher et al., 2009, p.122).

### 2.1. Search strategy

The initial search strategy aimed to identify peer-reviewed published literature as well as grey literature. However, after a discussion with the research team, we decided to include only peer-reviewed publications. The searches were conducted CINAHL, Cochrane, Web of Science, Embase (Non-MEDLINE), Scopus, PsycINFO, CINAHL and Proquest Central from 2001 to 2018, using keywords and Medical Subject Headings (MeSH) Terms to identify relevant literature. The search strategy was constructed using key terms relevant to cardiovascular diseases (CVD, angina, etc.) and treatment (drug, exercise, medication, rehabilitation, etc.), facilitator and inhibitors. We restricted the publication language to English only. These keywords were entered as MeSH terms to the selected database and were also modified for use in each database. An example search strategy is given in Appendix 1.

### 2.2. Study selection and inclusion criteria

A priori eligibility criteria identified in the published protocol was used to identify studies for inclusion (Appendix 2). In the initial stage, we exported all the citations identified in the searches to EndNote and removed the identified duplicates. These studies were peer-reviewed. Two reviewers screened the titles and abstracts of the full text for their relevance against the eligibility criteria set out in the protocol; studies meeting the eligibility criteria were exported into JBI SUMARI. We considered studies with qualitative data that examined perspectives of patients with CVD regarding facilitating and inhibiting factors for treatment plan adherence amongst patients with cardiovascular disease. We included studies with patient populations of adults aged 18 and over, residing in developed countries with a diagnosis of cardiovascular disease. The definition of adherence according to the WHO (2003) was used to guide study screening and the inclusion criteria “the extent to which a person’s behaviour – taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider”.

The review considered studies conducted in the hospital, healthcare, community, and cardiac rehabilitation settings. The research team considered all qualitative study designs in the review such as phenomenology, grounded theory, ethnography, action research, qualitative description or mixed methods with qualitative data. Only studies published in English were included due to lack of access to translation services. Only articles published between 2001 and 2018 were included because the preliminary searches indicated an upsurge in the discourse on treatment adherence 2001 onward.

We excluded any studies with patients who had undergone include open heart surgery or any cardiac procedures. Studies comprising of patients with non-ischaemic heart failure were also excluded. We also excluded any studies that focused on hypertension, high cholesterol or other risk factors associated with CVD or comorbidities, where qualitative data could not be extracted for CVD. Studies that related to patients with cardiovascular disease and mental health conditions were also excluded. We excluded full texts of the studies that did not have illustrative quotations and did not meet the inclusion criteria. We also excluded any studies conducted in developing countries to allow for closer comparison of the factors underpinning adherence.

### 2.3. Quality appraisal and data extraction

Two independent reviewers assessed the methodological quality of the included studies using the Joanna Briggs Institute Qualitative Assessment and Review Instrument. Any disagreements that arose between the reviewers were resolved by discussion. In the event of lack of consensus, a third reviewer intervened to assist in the decision-making process. We extracted qualitative data from the included articles using the standardized data extraction tool from JBI SUMARI. Extracted included specific details about the populations, context, culture, geographical location, study methods, and the phenomena of interest relevant to the aim, objective, and questions of the review.

### 2.4. Data synthesis

The qualitative research findings from the included studies were pooled using JBI SUMARI. This involved aggregation or synthesis of findings to create a set of categories that represent aggregation, through collecting the findings, which rated according to their quality. The primary and secondary reviewers of the team examined each extracted finding based on three levels of credibility, including unequivocal, credible and unsupported (Munn et al., 2014). "Unequivocal: findings accompanied by an illustrations beyond a reasonable doubt, therefore not open to challenge, credible: findings accompanied by the illustrations that are plausible and inferred from the date, therefore open to challenge and unsupported: findings not supported by the data" (Munn et al., 2014, p.4). The highest level of credibility amongst the quotations was considered when there was more than one quotation for a finding, while findings with no quotation were disregarded from further analysis. Subsequently, the findings were deemed unequivocal or credible, which they grouped into categories by the primary reviewer based on the similarity in meaning and concepts. These categories were discussed by the second reviewers until the agreement was reached. Furthermore, these categories examined by the primary reviewer to aggregate those with commonality into synthesized categories, which represented conclusions based on the findings that could be used as a basis for evidence-based practice. The synthesized findings discussed by the review team and refined to ensure consensus prior to finalization. The categories were developed inductively through the analysis of the findings of the included studies.

### 2.5. Assessing confidence

The final synthesized findings were graded according to the ConQual approach for establishing confidence in the output of qualitative research synthesis (Munn et al., 2014), which presented in Appendixs 3 and 4. This process was based on the dependability and credibility of the findings, which presented in each synthesis statement. The dependability and credibility scores were applied to the findings, which rated as high, moderate and low. Dependability was established by answering 5 questions (Q2, Q3, Q4, Q6, and Q7) on the JBI Critical Appraisal Checklist for Qualitative Research. A high level of dependability was considered for those studies which met 4 or more of the criteria, the medium level was given to those that satisfied 2 or more of criteria and low or very low for those that met 1 or more of the criteria. Twelve papers (Lehane et al., 2008; Attebringa et al., 2005; Traywick and Schoenberg, 2008; Wyer et al., 2001; Day and Batten, 2006; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Mccorry et al., 2009; Webster et al., 2002; Herber et al., 2017; White et al., 2011) included in this review received a high dependability rating and 10 papers (White et al., 2011; Gambling, 2003; Tolmie et al., 2009; Condon and McCarthy, 2006; Frohmader et al., 2016; Galdas et al., 2012; Bryant et al., 2013; Gregory et al., 2005; L. Junehag et al.,

2014; L. Junehag et al., 2014) were considered having a moderate level of dependability. Credibility was also established by assessing the congruency between the author's interpretation and illustration. In this review, unequivocal findings were graded as high, a combination of unequivocal and credible findings were rated as moderate and inclusion of only credible findings were considered as low. The credibility of the findings in this review have been downgraded from a high level of credibility to a moderate level.

## 3. Results

### 3.1. Study inclusion

Fig. 1 illustrates each stage of the study selection process for inclusion in the systematic review. A total of 9649 records were identified through a systematic search. Duplicates ( $n = 3117$ ) were excluded. The remaining articles underwent title and abstract screening against the inclusion criteria. A total of 131 studies were exported into JBI Sumari; titles and abstracts were examined to screen for relevance to the review question. Two independent reviewers carried out the full-text screening of these 131 studies for inclusion in the synthesis, of these 22 were retained for quality appraisal after exclusion of 108 articles. Full-text screening of these 23 studies, yielded 22 studies to be included in the synthesis. One study was excluded from the data synthesis due to the identification of major methodological issues during critical appraisal (Beattie, 2007).

### 3.2. Methodological quality of included studies

The assessment of the methodological quality of the studies is presented in Appendix 5. Methodological quality ranged from low to high. One study achieved an appraisal score of zero and was excluded from the data synthesis (Beattie, 2007). Twenty-two studies scored between seven and nine out of ten (Lehane et al., 2008; Attebringa et al., 2005; Traywick and Schoenberg, 2008; Wyer et al., 2001; Day and Batten, 2006; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Mccorry et al., 2009; Webster et al., 2002; Herber et al., 2017; White et al., 2011; Gambling, 2003; Condon and McCarthy, 2006; Frohmader et al., 2016; Galdas et al., 2012; Bryant et al., 2013; Gregory et al., 2005; L. Junehag et al., 2014; L. Junehag et al., 2014; White et al., 2010). Apart from 7 studies (Lehane et al., 2008; Attebringa et al., 2005; Webster et al., 2002; White et al., 2011; Tolmie et al., 2009; Condon and McCarthy, 2006; Bryant et al., 2013), the remaining studies identified the philosophical perspective underpinning the research design. All included studies (Lehane et al., 2008; Attebringa et al., 2005; Traywick and Schoenberg, 2008; Wyer et al., 2001; Day and Batten, 2006; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Mccorry et al., 2009; Webster et al., 2002; Herber et al., 2017; White et al., 2011; Gambling, 2003; Tolmie et al., 2009; Condon and McCarthy, 2006; Frohmader et al., 2016; Galdas et al., 2012; Bryant et al., 2013; Gregory et al., 2005; L. Junehag et al., 2014; L. Junehag et al., 2014; White et al., 2010) had congruity between the research methodology and the research question or objectives, which they applied the appropriate methods for both collecting data and representing data. Only one studies (Day and Batten, 2006) indicated that a cultural or theoretical perspective in relation to the research. The influence of the researcher on the research and vice-versa was identified in 13 studies (Lehane et al., 2008; Attebringa et al., 2005; Traywick and Schoenberg, 2008; Wyer et al., 2001; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Mccorry et al., 2009; Webster et al., 2002; Herber et al., 2017; White et al., 2011; Bryant et al., 2013). With the exception of one study (Gambling, 2003), ethical approval for all included studies (Lehane et al., 2008; Attebringa et al.,

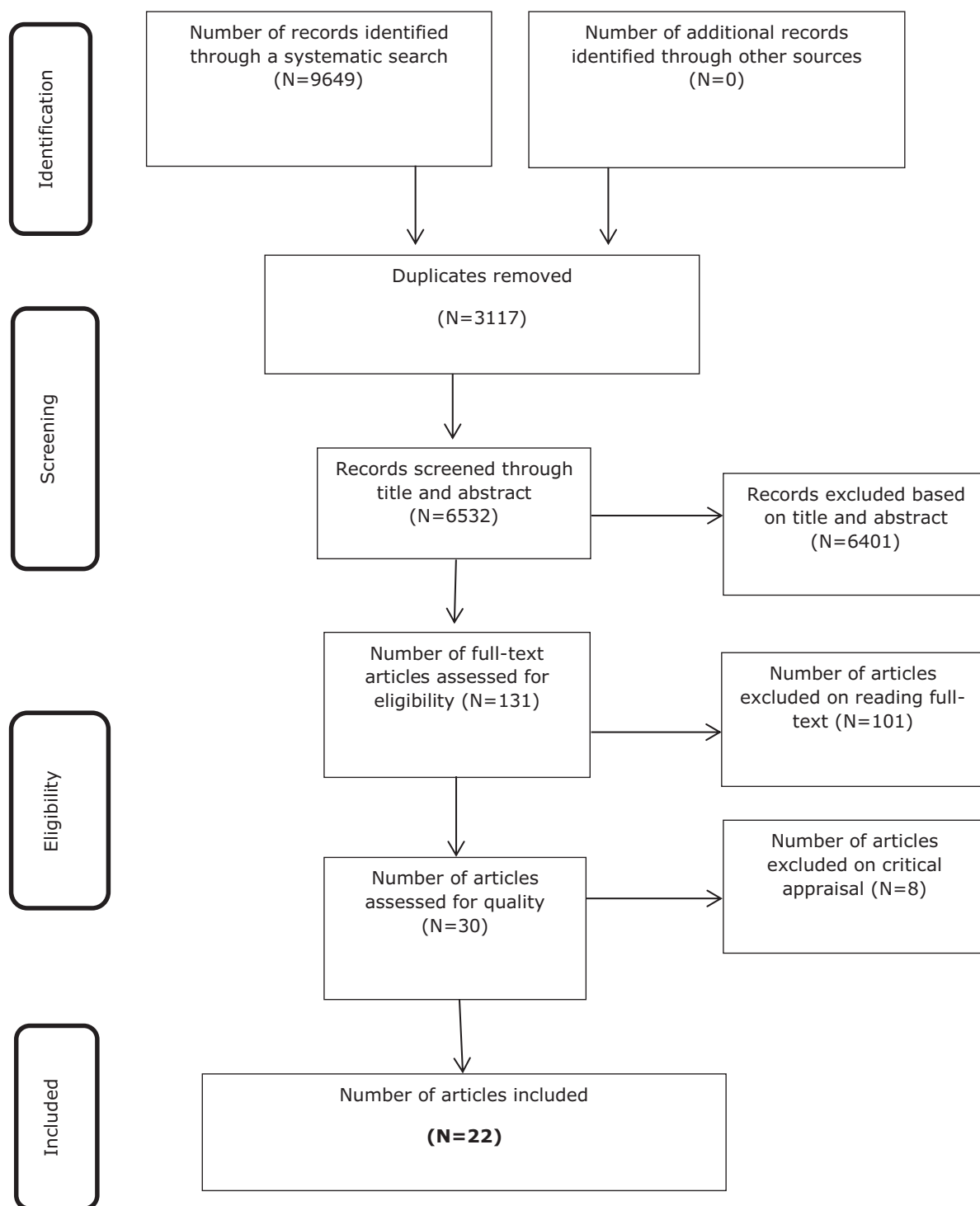


Fig. 1. Study Selection and PRISMA flow diagram (D. Moher et al., 2009).

2005; Traywick and Schoenberg, 2008; Wyer et al., 2001; Day and Batten, 2006; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Mccorry et al., 2009; Webster et al., 2002; Herber et al., 2017; White et al., 2011; Tolmie et al., 2009; Condon and McCarthy, 2006; Frohmader et al., 2016; Galdas et al., 2012; Bryant et al., 2013; Gregory et al., 2005; L. Junehag et al., 2014; L. Junehag et al., 2014; White et al., 2010) has been reported.

### 3.3. Characteristics of included studies

Of the 22 studies included in the review, 16 studies identified factors that facilitate adherence to treatment plans and

17 studies identified barriers that impeded adherence to treatment plans. The sample size of individual studies ranged from five (Little and Lewis, 2006) to 200 (Gambling, 2003). One study (Martine and Woods, 2012) collected data using focus groups, 19 studies used face-to-face interviews. One study conducted telephone interviews (Frohmader et al., 2016) and one study combined focus groups and face-to-face interviews (Gregory et al., 2005). Eight studies were conducted in England (Wyer et al., 2001; Cooper et al., 2005; Little and Lewis, 2006; Webster et al., 2002; White et al., 2011; Gambling, 2003; Tolmie et al., 2009; White et al., 2010), four studies in Ireland (Lehane et al., 2008; Martine and Woods, 2012; Herber et al., 2017; Condon and Mc-



**Table 1**  
Themes and categories.

Synthesised Finding One Facilitators				
Studies	Engaging in exercise	Having Support	Value of taking medications	Lifestyle modification
Attebring et al. (2005)			✓	
Bryant et al. (2013)			✓	
Condon & McCarthy (2006)		✓		
Cooper et al. (2005)	✓			
Day & Batten (2006)				
Frohmader et al. (2016)		✓		
Galdas et al. (2012)				
Gambling (2003)				✓
Gregory, Bostock & Backett-Milburn (2006)				
Herber et al. (2017)	✓	✓		✓
L. Junehag, Asplund, & Svedlund (2014a)	✓			
L. Junehag, Asplund, & Svedlund (2014b)		✓		
Lehane et al. (2008)			✓	
Little and Lewis (2006)	✓			
Martine & Woods (2012)	✓	✓		
McCorry et al. (2009)				
Tolmie et al. (2009)				
Traywick & Schoenberg (2008)	✓	✓		
Webster et al. (2002)				
White et al. (2010)	✓		✓	
White et al. (2011)				✓
Wyer et al. (2001)	✓	✓		✓

Carthy, 2006), three studies in Sweden (Attebring et al., 2005; L. Junehag et al., 2014; L. Junehag et al., 2014), two in New Zealand (Day and Batten, 2006; Bryant et al., 2013), and two in Scotland (Herber et al., 2017; Gregory et al., 2005) and one study each in Australia (Frohmader et al., 2016), Canada (Galdas et al., 2012) and the United States (Traywick and Schoenberg, 2008). Nineteen studies were conducted in either community cardiac rehabilitation or hospital outpatient cardiac rehabilitation settings (Lehane et al., 2008; Attebring et al., 2005; Traywick and Schoenberg, 2008; Wyer et al., 2001; Day and Batten, 2006; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Mccorry et al., 2009; Herber et al., 2017; White et al., 2011; White et al., 2011; Gambling, 2003; Condon and McCarthy, 2006; Frohmader et al., 2016; Galdas et al., 2012; L. Junehag et al., 2014; L. Junehag et al., 2014; White et al., 2010), one study in a pharmacy setting (Bryant et al., 2013), one study in the community setting (Webster et al., 2002). One study combined samples from the GP setting and the coronary care unit (Gregory et al., 2005). Findings are presented as synthesised findings with illustrative quotes from the included studies. See Appendix 6 for the list of study findings, including synthesised findings and illustrations.

### 3.4. Review findings

Two synthesised findings were identified which in total consisted of 9 categories and 78 findings from 22 papers (Table 1 and 2).

#### 3.4.1. Synthesised finding 1: facilitators enhancing adherence

This synthesised finding was derived from four categories and 31 findings. The four categories were engaging in exercise, perceived support, value of taking medications and lifestyle modification.

#### 3.4.2. Engaging in exercise

Findings from eight studies (Traywick and Schoenberg, 2008; Wyer et al., 2001; Cooper et al., 2005; Little and Lewis, 2006; Martine and Woods, 2012; Herber et al., 2017; L. Junehag et al., 2014; White et al., 2010) contributed to this category. Exercise

through a cardiac rehabilitation programme was described as an important facilitator in changing lifestyle. Cardiac rehabilitation programmes were described as providing a safe place in which to exercise. In two studies (Martine and Woods, 2012; White et al., 2010) people described feeling reassured that the exercises they were undertaking were appropriate and that support was on hand if needed: “you feel safe, particularly at the beginning, you could take it a bit further because you knew there were people there who knew what they were doing” (Martine and Woods, 2012, p.140). Participants also described feeling reassured that the exercises would help them to meet to meet fitness goal and to live longer along with a reduction in the chance of recurrence: “I’m going to get fit because I don’t want to go yet, its about living longer and preferably not having” (Wyer et al., 2001, p.184). “It helps me maintain my body, myself . . . because I like living and exercise is part of maintaining” (Traywick and Schoenberg, 2008, p.64). Cardiac rehabilitation helped to create an exercise routine through the scheduling of sessions at set times and days. This encouraged people to consider exercise as part of their routine and to make the commitment to attend: “sets target to keep fit at set hours on Tuesday and Thursday I never make any other commitments” (Martine and Woods, 2012, p.140). The structured nature of cardiac rehabilitation programmes allowed people to get involved in weekly exercise at which they identified their strengths and their weakness: “I liked it because it was planned, you knew roughly what you were going through every week, you know what you were good at and what you weren’t good at, you knew what you had to improve on and things like that” (Herber et al., 2017, p.3537).

Viewing exercise as a part of the treatment regime programme rather than an optional extra was described as mechanism underpinning behaviour change: “yes, I think really from my point of view it is a necessary follow up it is all part of the get-well process. I can assure you now; I do want to go because I view that as part of the treatment, now I view the rehab as a continuation of that treatment. I want to do it” (Cooper et al., 2005, p.91). Valuing exercise led to the creation of new regimes and habits: “I’ve started to go out for a walk more, that is a change, that I have started taking a walk, that’s the biggest difference’ actually, this has got me thinking of life in a much more positive way and to have time in the morning has become important to me” (L. Junehag et al., 2014, p.293). Monitoring

**Table 2**  
Themes and categories.

Synthesised Finding Two Inhibitors				
Studies	Engaging in exercise	Lack of Support	Concerns about taking medications	Lifestyle modification
Attebring et al. (2005)		✓	✓	
Bryant et al. (2013)			✓	
Condon & McCarthy (2006)		✓		
Cooper et al. (2005)	✓			
Day & Batten (2006)				✓
Frohman et al. (2016)				
Galdas et al. (2012)	✓	✓		
Gambling (2003)	✓			✓
Gregory, Bostock & Backett-Milburn (2006)		✓		✓
Herber et al. (2017)	✓			
L. Juneag, Asplund, & Svedlund (2014a)				✓
L. Juneag, Asplund, & Svedlund (2014b)		✓		
Lehane et al. (2008)				
Little and Lewis (2006)	✓			
Martin & Woods (2012)				
McCorry et al. (2009)	✓			
Tolmie et al. (2009)	✓			
Traywick & Schoenberg (2008)	✓	✓		
Webster et al. (2002)	✓			
White et al. (2010)				✓
White et al. (2011)				
Wyer et al. (2001)	✓			

the outcome of undertaking exercise encouraged people to maintain their physical activity: *"a big incentive was that they check your body fat. After 10 weeks and a lot of walking mine dropped to 30% - which was absolutely phenomenal to me"* (Little and Lewis, 2006, p.546). Understanding the benefits of changing lifestyle through the incorporation of exercise as an ongoing process was described as *"an insurance policy to make sure we're not back in the stage that we just left . . . and a very important safeguard to keep us on the straight and narrow"* (Martine and Woods, 2012, p.141).

#### 3.4.3. Perceived support

Seven studies (Traywick and Schoenberg, 2008; Wyer et al., 2001; Martine and Woods, 2012; Herber et al., 2017; Condon and McCarthy, 2006; Frohmader et al., 2016; L. Juneag et al., 2014) discussed the link between perceived support and treatment adherence. Social support from health professionals and/or family was described as a significant factor in encouraging adherence to the treatment plan. Support to maintain recommended levels of physical activity was described: *"well, I think it's very important because my doctor has absolutely insisted and he was the one who got me started here and I'm still doing it three times a week"* (Traywick and Schoenberg, 2008, p.66). Support was also described in relation to the provision of information and the ability to seek further information if needed: *"I am happy with the support and I asked a lot of questions while I was in hospital and got the literature and feel happy enough and educated enough. I feel I could ring up the hospital if I needed to know anything"* (Condon and McCarthy, 2006, p.41). Health professionals were described as the best sources of support during follow up: *"as well as that I suppose in a way it was support after leaving the hospital. The cardiac nurse was brilliant, she phoned me every week"* (Herber et al., 2017, p.3537), *"my consultant said are you going on the 'rehab.'? Yes oh yes, he said good that will do you good"* (Wyer et al., 2001, p.185). Emotional support provided an opportunity for people to discuss their fears or any concerns about their treatment plan with health professionals: *"Oh they (health professionals in hospital) are very good. . . they assured me anytime I want to find out anything I only have to ring them to find out and ask. . . sure I couldn't ask for more"* (Condon and McCarthy, 2006, p.41), *"I found the team was so nice and they made you so welcome, their eyes don't glaze over if you*

*talk about your problems"* (Martine and Woods, 2012, p.140). Peer social support was described as a valuable factor in two studies (Traywick and Schoenberg, 2008; Herber et al., 2017). Peer support provided mutual moral support that supported people to continue despite discomfort or pain. Family and friends encouraged physical activity and improved motivation: *"I still walk. I feel it's important. I feel much better when I do it than I do if I'm on a trip and not doing it regularly. I have a friend and we walk every day. I never do it alone, although I have a treadmill here. I usually walk with someone"* (Traywick and Schoenberg, 2008, p.66). Two studies (Frohman et al., 2016; L. Juneag et al., 2014) noted that a mentor was the most appropriate form of support and through facilitation helped people to adhere to their treatment plan. The provision of timely and ongoing encouragement during recovery was described as important in meeting health goals (Frohman et al., 2016; L. Juneag et al., 2014). Meeting health goals enhanced participants' views on their ability to undertake activities at home: *"She encouraged us [participant and partner] to do the home rehab programme together, to motivate us I think. She was big on having the desire to get up and get going again and that is what we have done."* (Frohman et al., 2016, p.46). Mentorship also assisted people to cope with the period of adjustment after discharge from hospital through nurses listening to concerns, clarifying hospital procedures, providing information about CVD and organising an individualized plan for follow up: *"She helped me get ready to leave the hospital and told me about what I had to do to get better and what to do each day. We put stuff in my diary so I wouldn't forget what I had to do"* (Frohman et al., 2016, p.45).

#### 3.4.4. Value of taking medication

Four studies discussed the value of taking medication (Lehane et al., 2008; Attebring et al., 2005; Bryant et al., 2013; White et al., 2010). People living with CVD described taking medication as part of their routine and fear of the consequences that may occur related to missing doses described as sometimes driving behaviour: *"I have never missed a dose. I'm too scared to in case my heart stops. This is what I've been told. You get so used to taking them. It was initially a big deal. It isn't anymore"* (Bryant et al., 2013, p.31). Two studies (Lehane et al., 2008; White et al., 2010) indicated that developing routines could act as

a reminder and helped them to remember to take their medication and particularly to recall the correct number and type of medication at the right time: *"there's a routine.....the dog and the cat go out, lights go off, the bottle of water is normally by the bedside and the last thing before going up the stairs is to get the tablets. And in the morning the first thing before the bran-flakes are poured out you have the tablets..."* (Lehane et al., 2008, p.135). Awareness of the negative consequences of non-adherence to medication from peers encouraged people to take medication: *"I said I can't see myself taking tablets. But a friend of mine who had a triple bypass, after 6 months gave up his tablets, he got a heart attack and he has to go for another double bypass. So I looked at him and I said I'm going to go down that road (if I don't take them) so first thing every morning its medication now"* (Lehane et al., 2008, p.134). Medication was described by some as a tool which enhanced a sense of security and created protection against relapse: *"I have an illness that can reoccur but at the same time I have eliminated these thoughts a little in that I have medicines that deal with the immediate situation"* (Attebringa et al., 2005, p.156) and also protection against negative outcomes or consequences: *"I'm very happy about taking them because I feel (pauses) taking the tablets I have a safeguard, I had this thing in my head that em (pause) these tablets were keeping me alive, if I took them away, I wouldn't last too long"* (Lehane et al., 2008, p.136).

#### 3.4.5. Lifestyle modification

Lifestyle modification was described in four studies (Wyer et al., 2001; Herber et al., 2017; White et al., 2011; Gambling, 2003). Understanding the important benefits of reducing fat, losing weight or eating less were in motivating people to strive for a healthier diet: *"I'm cutting things out, puddings and sugary things, fatty things so I'm being more careful with my diet ... You carry on your lifestyle, your body's saying look I'm not happy I've got a problem, if you don't address the problem it will happen again won't it ... I want to make sure I don't have another one"* (White et al., 2011, p.124). The fear of becoming unwell again drove behaviours: *"I quit smoking. Having the heart attack put the fear of God into me and my doctor said that if I did not quit, I would have another one and I didn't want that to happen so I just stopped there and then"* (Gambling, 2003, p.73). Two studies (Wyer et al., 2001; Herber et al., 2017) commented that advice from health professionals could encourage people to maintain a healthy diet: *"they've given me good advice and I dictate my lifestyle from now on. I've no intention of putting on weight"* (Wyer et al., 2001, p.182).

#### 3.4.6. Synthesised finding 2: inhibitors

The synthesised finding of inhibitors to adherence was derived from four categories and 47 findings. The four categories included engaging in exercise, perceived lack of support, concerns about taking medication and lifestyle modification.

#### 3.4.7. Engaging in exercise

Ten studies identified issues that inhibited the ability to engage in exercise. (Traywick and Schoenberg, 2008; Wyer et al., 2001; Herber et al., 2005; Little and Lewis, 2006; Mccorrey et al., 2009; Webster et al., 2002; Herber et al., 2017; Gambling, 2003; Tolmie et al., 2009; Galdas et al., 2012). People with pre-existing morbidities such as spine or knee injuries described being unable to engage in exercise: *"I've got joint problems, knee and ankle problems. I've had some accidents. Exercise is something I can't do. I broke my shoulder. I still have a little tenderness"* (Traywick and Schoenberg, 2008, p.63). Two studies (Little and Lewis, 2006; Tolmie et al., 2009; Galdas et al., 2012) reported that experiencing symptoms including fatigue, weakness and shortness of breath post recovery

restricted people's ability to engage in physical activity. For example: *"I used to say you'll need to [slow] the music down, it's going too quick for me...to tell you the truth I really enjoyed it, but when I came out of there, I couldn't walk...I was crying...with the pain. Oh you've no idea the pain....I'm too frightened to try again to tell you the truth"* (Tolmie et al., 2009, p.1883). Uncertainty around determining what constituted safe exercise was described in two studies (Webster et al., 2002; Galdas et al., 2012). One patient believed that *"I don't do anything. I haven't done any walking because I said if I walk, I might get another heart attack. I have to rest"* (Webster et al., 2002, p.71). Also, lack of information around what exercise and intensity of exercise it was safe to complete lead to concern amongst some people about the negative consequences of exercise (Cooper et al., 2005; Mccorrey et al., 2009; Herber et al., 2017). One participant stated: *"my difficulty is at the minute, if I did do the half hour, I would suffer considerable discomfort, and then I don't know whether I'm doing myself any harm, or whether I'm doing myself any good"* (Mccorrey et al., 2009, p.927). In three studies (Traywick and Schoenberg, 2008; Cooper et al., 2005; Gambling, 2003) participants who were employed described feeling unable to control their schedules, keep their job and maintain physical activity *"work is a factor, because you see if I do have to go to something like that, my company at the moment, they are getting very strict, it does is create more stress for the person involved"* (Cooper et al., 2005, p.92). In relation to cardiac rehabilitation program, a lack of information on the content of the program, including the purpose of the program, what the sessions entailed and what was expected of individuals discouraged some people from engaging in exercise (Wyer et al., 2001; Cooper et al., 2005; Herber et al., 2017). One participant reported: *"If they'd laid out the programme, if they'd told me what was, what to expect, it would have helped I would imagine. What types of exercises were involved"* (Herber et al., 2017, p.3536). Traywick and Schoenberg indicated that the weather and perceived lack of safety created a barrier to engaging in exercise that took place in outdoor spaces *"just got to be so much of a problem for me to be so cold and then to go outside in all kinds of weather, I don't have a convenient place to do it and I live on a little street. It's around the lake and it's sort of up and down"* (Traywick and Schoenberg, 2008, p.66–67). Age was a barrier raised by some participants who claimed that they were too old to undertake physical exercise *"exercise at my age. I mean I'll be 81 and I'm in pretty good shape and I'm not gonna change and do something that might mess things up,"* and *"[I don't exercise] because of my old age"* (Traywick and Schoenberg, 2008, p.65).

#### 3.4.8. Perceived lack of support

Findings from six studies informed this category (Attebringa et al., 2005; Traywick and Schoenberg, 2008; Condon and McCarthy, 2006; Galdas et al., 2012; Gregory et al., 2005; L. Juneag et al., 2014). Two studies (Galdas et al., 2012; Gregory et al., 2005) reported that the need for greater support was described as important to provide reassurance that behaviours and actions were in line with medical advice: *"it is not easy. I think it would be easier if there was somebody else, the right person there. Saying you should do this and that"* (Gregory et al., 2005, p.223). The need for more frequent contact with health care providers and continuity of follow-up was described. Encounters with health care providers post discharge from hospital was described as minimal: *"well, you get a paper [discharge information] and such things . . . However, it might be good to talk to somebody, get advice . . . to manage my eating habits. If I had been aware of that, maybe I could have managed it better"* (L. Juneag et al., 2014, p.26). The opportunity to discuss the treatment plan in enough depth to meet the needs of the individual was described in two studies as not meeting people's needs (Attebringa et al., 2005;



L. Junehag et al., 2014). One participant described: *"I feel that I have not yet really talked with any doctor that has described more precisely where my infarction is located, what I shall do in my life and what is suitable for me. I need to discuss these things with somebody"* (Attebringa et al., 2005, p.157). Achieving a balance between support and feeling overprotected was described in one study (Condon and McCarthy, 2006). Some people felt frustrated at being overprotected by their partner or families. Some felt that this resulted in being unable to regain and maintain independence to undertake everyday activities: *"I find that when they (family) are overprotective it is very frustrating because I have always been active (long pause), the first day I came out of the hospital they were after blowing the washing machine over there and they didn't even want me to open the plug you know" can you believe that"* (Condon and McCarthy, 2006, p.41).

#### 3.4.9. Concerns about taking medication

Two studies (Attebringa et al., 2005; Bryant et al., 2013) contributed to this category. Concern about the efficacy of the medication was perceived as a barrier and discouraged people from adhering to their medication plan: *"I don't know what would help me. I'm not sure medications will help. I don't want to rely on them"* (Attebringa et al., 2005, p.156). Having to take medication on a regular basis was also considered an intrusion on daily life by some: *"When taking the pills, I think about whether this situation will continue all my life?"* (Attebringa et al., 2005, p.156). Forgetting to take the medication and being out of routine were reported as factors that could impact on taking medications as instructed: *"I forget to take my medicines quite often, especially the lunchtime ones. I get far too busy and forget. The other day we had to go out... we planned to come home at 12 o'clock, but we actually came home at four in the afternoon, so I missed my tablets"* (Bryant et al., 2013, p.30). Side effects were described as contributing to the discontinuation or adaptation of medication plans (Attebringa et al., 2005). Concern about the adverse effects of medication and particularly experiencing side effects impacted negatively on adherence with medication plans: *"the medication resulted in my stomach feeling bloated, which in turn led to pressure over my chest"* (Attebringa et al., 2005, p.155).

#### 3.4.10. Lifestyle modification

Findings from five studies contributed to this category (Day and Batten, 2006; Gambling, 2003; Gregory et al., 2005; L. Junehag et al., 2014; White et al., 2010). Information on modifying lifestyle was sometimes described as feeling standardised rather than individualised. In some studies, (Mccorry et al., 2009; Gambling, 2003; Gregory et al., 2005; White et al., 2010) contradictions in the information received were described: *"you do get contradictory advice. On the one hand you are told that you shouldn't be putting too much strain. Then, I wanted to go and do some work, like manual work in a timber yard, not a problem, he [GP] said. Just carry on as normal"* (Gregory et al., 2005, p.222). Some described difficulty making lifestyle changes and the challenges of maintaining change (Day and Batten, 2006; Gambling, 2003; L. Junehag et al., 2014), for example *"I would have tried to lose weight, but it's easier said than done... after one or 2 days I've forgotten, then I'm there again"* (L. Junehag et al., 2014, p.293). Lifestyle changes were described as multifactorial and the need to change diet, lose weight, stop smoking and take up exercise described by some as overwhelming (Gambling, 2003; L. Junehag et al., 2014). Others setting what was perceived as unrealistic goals was a barrier to change and the focus on one goal at a time described by some as a more reasonable approach: *"I took it one step at a time. Giving up smoking was such a mammoth task I felt that I had to focus on that first, before I could think about my diet. In fact my diet got worse when I gave up because I gave myself treats"* (Gambling, 2003, p.72).

## 4. Discussion

The purpose of this qualitative systematic review was to explore factors that influence adherence to treatment plans amongst people living with CVD. After conducting a comprehensive search of the literature, 22 papers were included in the review that met the inclusion criteria.

Sixteen studies identified facilitator to adhering to the treatment plan developed and 17 studies identified barriers facilitators. This review found that even when people were willing to engage in exercise, through cardiac rehabilitation, factors such as lack of information and detail on the content of the program, notably, when it was first introduced to them, impacted negatively on engagement. Although understanding of cardiac rehabilitation programs was not reported in the majority of included studies, this review suggests that the elements of the cardiac rehabilitation program, including the presence of specialised staff, developing a routine and establishment of treatment option were considered to be facilitators for sustaining physical activity and positive exercise behaviour.

An understanding of the benefits of creating healthy behaviour patterns was described as facilitating adherence to treatment plans. Other facilitators included providing information and more broadly, the communication of information by health professionals. Providing information about follow up care was an essential component for managing and promoting adherence, and the findings suggest that health professionals can deliver this information in a more meaningful way. These findings are echoed in earlier studies (Hannan et al., 2018; Woodruffe et al., 2015) that highlight the importance of sufficient information to convey the importance of behaviour change. Lack of understanding of the role cardiac rehabilitation can play and its benefits has been linked to low adherence and reported as contributing to the perception that exercise can be harmful or can exacerbate symptoms leading to a decrease in physical exercise (Sunamura et al., 2017; Servey and Stephens, 2016). This review found that perceived barriers to engaging in exercise included pre-existing physical illness, misconceptions and lack of information about the role of exercise in recovery, lack of time and the physical environment. The difficulty of balancing lifestyle changes and notably undertaking exercise when the participant returns to work was reported (Stendardo et al., 2018).

This review has shown that social support from a health professional and family members can support treatment recovery and improve treatment adherence. This support seems to be an essential component of treatment adherence and was described in the majority of the studies in this review. Social support has been identified as a facilitator in similar reviews, in which they indicated that obtaining consistent and timely support from health professionals and family support motivation to maintain a healthy lifestyle, daily routines, and healthy behaviour (Keenan, 2017; Costa et al., 2015). The availability of a safe and supportive network of health professionals provided positive energy, emotional closeness, and kept people engaged in treatment (Keenan, 2017; Costa et al., 2015; AndreasFors et al., 2016). Conversely, a perceived lack of support impacted on treatment adherence. In the absence of social support, it was difficult for people to follow medical advice, undertake exercise regularly, attend cardiac rehabilitation sessions, and take medication as prescribed. A related study highlighted the concept of overprotection post myocardial infarction (Petriček et al., 2017) and this has also been described by people living with heart failure (Whitehead, 2017) as a barrier to independence and increased anxiety (Petriček et al., 2017). In three studies (Lehane et al., 2008; Bryant et al., 2013; White et al., 2010), the development of a medication routine was an effective strategy

that helped people to take medication consistently as instructed and reduce the number of missed doses. Also, in this synthesis, the perception of being protected against undesirable or possible outcomes was discussed in various ways, one of the most important factors supporting treatment adherence, especially when linked to reducing the risk of relapse. However, it was clear from studies in this review that concern about the efficacy of medication and adverse effects could impact on the likelihood of participants taking medication as prescribed (Brown and Bussell, 2011; Shang et al., 2019).

Despite the importance of lifestyle modification, only three studies included in this review reported on this area. This is surprising, given the importance of maintaining lifestyle changes, especially following myocardial infarction (Leifheit-Limson et al., 2010). This review indicated that contradictory information regarding healthy diet made it difficult for some to follow the advice of health professionals. The challenges of maintaining change were described. However, this review found that an understanding of the positive benefits of changing diet on health and the prevention of further cardiac events promoted sustained lifestyle change. A few studies in this review have shown that mentorship from health professionals has a positive impact. Mentorship was described as providing additional support and assisted in regaining and maintaining a healthy lifestyle, independence, and adherence to the treatment plan. The role of health professionals as mentors in assisting individuals to make changes and sustain these is important. Further work to understand how health professionals can take on this role in a way that is sustainable is an area for further study (Aslani et al., 2011).

## 5. Strengths, limitations of the review and future research

This is the first review that brings together studies exploring factors that influence adherence to treatment plans amongst people living with CVD. A comprehensive search strategy sought to identify all relevant peer-reviewed articles and the data extracted were rich and provided insight across populations and settings. Although we made every effort to ensure the systematic review was conducted with significant methodological rigour in accordance with the guidelines and recommendations of the Joanna Briggs Institute (JBI) for qualitative reviews, the review may have some limitations. The exclusion of quantitative studies could have limited generalisability of the findings to a broader context. The studies included in this review were all conducted in developed countries. The decision to include only studies from developed countries was made to promote comparison between the factors that influence adherence where health provision is comparable to some degree and lifestyle factors are similar in terms of living conditions. An additional review is required to focus on developing countries, and the results could be compared for similarities and differences. Lastly, in this review, only studies reporting the perspectives of people living with CVD were included. Further research examining health professionals' perspectives would enable the development of a complete and more comprehensive picture of this topic.

## 6. Implication for practice

The education and social support provided by health professionals, particularly nurses in the hospital setting were highly

valued by people living with CVD. Follow-up support that includes concerns about taking medication and challenges to making lifestyle modification post discharge may be particularly valuable. Consideration of the home setting and routine of people living with CVD need to be explored in order to support people to develop a routine and sustain healthy behaviours that are relevant and sustainable for individuals. Opportunities to enhance communication and support post discharge need further exploration. Some evidence suggests (Thomas et al., 2019) that follow up in the home setting through remote contact is comparable to face to face interventions and could be an option for those unable or unwilling to attend traditional cardiac rehabilitation programs (Thomas et al., 2019).

## 7. Conclusion

This review has described the factors that facilitate and inhibit adherence to treatment plans amongst people living with CVD. Based on the discussion of the findings, information on taking medications, undertaking regular physical activity and maintaining a healthy diet would be best undertaken through a model of co-construction between the patient and the health professional. Also, this review indicated that well supported and educated patients were able to understand their condition and treatment resulting in higher adherence compared to those who lacked support and information. There is a need to focus efforts on both development of treatment adherence programs and facilitating and inhibiting factors that influence treatment adherence, combined with opportunities to maintain treatment adherence in an effort to improve the health and well-being of people living with CVD.

## Declaration of Competing Interest

The authors declared that there is no conflict of interest.

## Author contribution

The authors AR and PK conceived the review and oversight for all stages of the review provided by LW. AR and PK undertook the initial database search, data extraction was undertaken by AR and PK. AR and PK screened the included papers and conducted the quality appraisal and analysed the data and wrote the first draft of the manuscript. All authors revised the manuscript and provided substantial contributions and all authors approved the final version of the manuscript.

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## Appendices

**Table A1**

Medline search Strategy.

Medline search Strategy #	Query	Limiters/Expanders
S37	S12 AND S25 AND S35	Limiters - Date of Publication: 20,010,101–20,180,531; English Language
S36	S12 AND S25 AND S35	
S35	S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34	
S34	"perception"	
S33	"enablers"	
S32	"facilitators"	
S31	"barriers"	
S30	"inhibitors"	
S29	"affecting factor"	
S28	"facilitating factor"	
S27	"inhibiting factor"	
S26	"influencing factor"	
S25	S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24	
S24	"Cardiac rehabilitation"	
S23	(MM "Motor Activity")	
S22	(MM "Exercise")	
S21	(MM "Sedentary Lifestyle")	
S20	(MM "Life Style")	
S19	(MM "Diet")	
S18	(MM "Diet, Carbohydrate-Restricted")	
S17	(MM "Diet, Fat-Restricted")	
S16	(MM "Diet, Sodium-Restricted")	
S15	(MM "Self Medication")	
S14	(MM "Medication Therapy Management")	
S13	(MM "Medication Adherence")	
S12	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11	
S11	(MM "Heart Failure")	
S10	(MM "Myocardial ischaemia")	
S9	(MM "Acute Coronary Syndrome")	
S8	(MM "Coronary Disease")	
S7	(MM "Cardiovascular Diseases")	
S6	MH "Hypertension+/DH/DT/RH/NU"	
S5	MM "Angina, Unstable+/DH/DT/RH/NU"	
S4	MM "Myocardial Infarction+/DH/DT/RH"	
S3	(MH "Angioplasty, Balloon, Coronary")	
S2	(MM "Coronary Stenosis")	
S1	(MM "Coronary Artery Disease")	
Cochrane Search Strategy ID	Search	
#1	MeSH descriptor: [Coronary Artery Disease] explode all trees	
#2	MeSH descriptor: [Coronary Stenosis] explode all trees	
#3	MeSH descriptor: [Angioplasty] explode all trees	
#4	MeSH descriptor: [Myocardial Infarction] explode all trees	
#5	MeSH descriptor: [Angina, Unstable] explode all trees	
#6	MeSH descriptor: [Hypertension] explode all trees	
#7	MeSH descriptor: [Cardiovascular Diseases] explode all trees	
#8	MeSH descriptor: [Coronary Disease] explode all trees	
#9	MeSH descriptor: [Acute Coronary Syndrome] explode all trees	
#10	MeSH descriptor: [Myocardial ischaemia] explode all trees	
#11	MeSH descriptor: [Heart Failure] explode all trees	
#12	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11	
#13	MeSH descriptor: [Medication Adherence] explode all trees	
#14	MeSH descriptor: [Medication Therapy Management] explode all trees	
#15	MeSH descriptor: [Self Medication] explode all trees	
#16	MeSH descriptor: [Diet, Sodium-Restricted] explode all trees	
#17	MeSH descriptor: [Diet, Carbohydrate-Restricted] explode all trees	
#18	MeSH descriptor: [Diet, Fat-Restricted] explode all trees	
#19	MeSH descriptor: [Treatment Adherence and Compliance] explode all trees	
#20	MeSH descriptor: [Life Style] explode all trees	
#21	MeSH descriptor: [Sedentary Lifestyle] explode all trees	

(Continued on next page)

**Table A1**  
(Continued).

Medline search Strategy #	Query	Limiters/Expanders
#22	MeSH descriptor: [Exercise] explode all trees	
#23	MeSH descriptor: [Cardiac Rehabilitation] explode all trees	
#24	Cardiac rehabilitation*	
#25	MeSH descriptor: [Cardiovascular Diseases] explode all trees	
#26	MeSH descriptor: [Cerebrovascular Disorders] explode all trees	
#27	#13 or #14 or #15 or #16 or #17 or #18 or #19 or #20 or #21 or #22 or #23 or #24 or #25 or #26	
#28	influencing factor*	
#29	inhibiting factor*	
#30	facilitating factor*	
#31	affecting factor*	
#32	inhibitors	
#33	barriers	
#34	facilitators	
#35	enablers	
#36	perceptions	
#37	#28 or #29 or #30 or #31 or #32 or #33 or #34 or #35 or #36	
#38	#12 and #27 and #37 Publication Year from 2001 to 2018	

**Table A2**

Inclusion and exclusion criteria used for study selection.

	Inclusion	Exclusion
Population	<ul style="list-style-type: none"> <li>• All adults (18 and over) diagnosed with CVD, irrespective of sex</li> </ul>	<ul style="list-style-type: none"> <li>• Patients with hypertension, high cholesterol or other risk factors associated with CVD or comorbidities (wherein qualitative data cannot be isolated)</li> <li>• Patients who underwent or other procedures (wherein qualitative data cannot be isolated)</li> <li>• Patients with mental health problems</li> </ul>
Phenomena of Interest Context	<ul style="list-style-type: none"> <li>• Facilitators and Barriers of treatment adherence</li> <li>• Cardiovascular Rehabilitation, Hospital/Healthcare Settings</li> <li>• Developed countries</li> </ul>	
Types of Studies	<ul style="list-style-type: none"> <li>• All published qualitative research studies (phenomenology, grounded theory, ethnography, action research, qualitative description or mixed methods)</li> <li>• Published in English</li> <li>• Studies published between 2001 and 2018</li> </ul>	<ul style="list-style-type: none"> <li>• Grey Literature</li> </ul>

**Table A3**

Dependability scores for included studies.

Citation	Dependability score					Dependability score
	Is there congruity between the research methodology and the research question or objectives	Is there congruity between the research methodology and the methods used to collect data?	Is there congruity between the research methodology and the representation and analysis of data?	Is there a statement locating the researcher culturally or theoretically?	Is the influence of the researcher on the research, and vice-versa, addressed?	
Attebring et al. (2005)	Yes	Yes	Yes	No	Yes	4/5 High
Bryant et al. (2013)	Yes	Yes	Yes	No	No	3/5 Mod
Condon & McCarthy (2006)	Yes	Yes	Yes	No	No	3/5 Mod
Cooper et al. (2005)	Yes	Yes	Yes	No	Yes	4/5 High
Day & Batten (2006)	Yes	Yes	Yes	Yes	No	4/5 High
Frohmader et al. (2016)	Yes	Yes	Yes	Unclear	No	3/5 Mod
Galdas et al. (2012)	Yes	Yes	Yes	Unclear	Unclear	3/5 Mod
Gambling (2003)	Yes	Yes	Yes	Unclear	Unclear	3/5 Mod
Gregory, Bostock, & Backett-Milburn (2006)	Yes	Yes	Yes	No	No	3/5 Mod
Herber et al. (2017)	Yes	Yes	Yes	Unclear	Yes	4/5 High
L. Juneag, Asplund, & Svedlund (2014a)	Yes	Yes	Yes	No	No	3/5 Mod
L. Juneag, Asplund, & Svedlund (2014b)	Yes	Yes	Yes	No	No	3/5 Mod
Lehane et al. (2008)	Yes	Yes	Yes	Unclear	Yes	4/5 High
Little & Lewis (2006)	Yes	Yes	Yes	Unclear	Yes	4/5 High
Martin & Woods (2012)	Yes	Yes	Yes	Unclear	Yes	4/5 High
McCorry et al. (2009)	Yes	Yes	Yes	Unclear	Yes	4/5 High
Tolmie et al. (2009)	Yes	Yes	Yes	Unclear	Unclear	3/5 Mod
Traywick & Schoenberg (2008)	Yes	Yes	Yes	Unclear	Yes	4/5 High
Webster et al. (2002)	Yes	Yes	Yes	Unclear	Yes	4/5 High
White et al. (2010)	Yes	Yes	Yes	Unclear	Unclear	3/5 Mod
White et al. (2011)	Yes	Yes	Yes	Unclear	Yes	4/5 High
Wyer et al. (2001)	Yes	Yes	Yes	Unclear	Yes	4/5 High



**Table A4**

Calculation of ConQual score.

<p>Synthesized finding 1: Facilitator</p> <p>Dependability</p> <p>Attebring et al. (2005) (H)</p> <p>Bryant et al. (2013) (M)</p> <p>Condon &amp; McCarthy (2006) (M)</p> <p>Cooper et al. (2005) (H)</p> <p>Frohmader et al. (2016)(M)</p> <p>Galdas et al. (2012) (M)</p> <p>Gambling (2003) (M)</p> <p>Herber et al. (2017) (H)</p> <p>L. Junehag, Asplund, &amp; Svedlund (2014a) (M)</p> <p>L. Junehag, Asplund, &amp; Svedlund (2014b) (M)</p> <p>Lehane et al. (2008) (H)</p> <p>Little &amp; Lewis (2006) (H)</p> <p>Martin &amp; Woods (2012) (H)</p> <p>Tolmie et al. (2009) (M)</p> <p>Traywick &amp; Schoenberg (2008) (H)</p> <p>Webster et al. (2002) (H)</p> <p>White et al. (2010) (M)</p> <p>White et al. (2011) (H)</p> <p>Wyer et al. (2001) (H)</p> <p>Dependability is moderate: downgraded 1 level due to a mixture of dependability amongst findings (10 high, 9 moderate)</p>	<p>Credibility</p> <p>50 findings, 5 categories</p> <p>15 Unequivocal</p> <p>35Credible</p> <p>Credibility of findings is moderate: downgraded 1 level due to a mixture of unequivocal and credible findings</p>	<p>ConQual score</p> <p>Confidence in the findings is low: downgraded 2 levels due to moderate dependability and moderate credibility</p>
<p>Synthesized finding 2: Barriers</p> <p>Dependability</p> <p>Attebring et al. (2005) (H)</p> <p>Bryant et al. (2013) (M)</p> <p>Condon &amp; McCarthy (2006) (M)</p> <p>Cooper et al. (2005) (H)</p> <p>Day &amp; Batten (2006) (H)</p> <p>Frohmader et al. (2016)(M)</p> <p>Galdas et al. (2012) (M)</p> <p>Gambling (2003) (M)</p> <p>Gregory, Bostock, &amp; Backett-Milburn (2006)</p> <p>Herber et al. (2017) (H)</p> <p>L. Junehag, Asplund, &amp; Svedlund (2014a) (M)</p> <p>L. Junehag, Asplund, &amp; Svedlund (2014b) (M)</p> <p>Lehane et al. (2008) (H)</p> <p>Little &amp; Lewis (2006) (H)</p> <p>Martin &amp; Woods (2012) (H)</p> <p>Tolmie et al. (2009) (M)</p> <p>Traywick &amp; Schoenberg (2008) (H)</p> <p>Webster et al. (2002) (H)</p> <p>White et al. (2010) (M)</p> <p>White et al. (2011) (H)</p> <p>Wyer et al. (2001) (H)</p> <p>Dependability is moderate: downgraded 1 level due to a mixture of dependability amongst findings (12 high, 10 moderate)</p>	<p>Credibility</p> <p>57 findings, 4 categories</p> <p>27 Unequivocal</p> <p>30 Credible</p> <p>Credibility of findings is moderate: downgraded 1 level due to a mixture of unequivocal and credible</p>	<p>ConQual score</p> <p>Confidence in the findings is low: downgraded 2 levels due to moderate dependability and moderate credibility</p>

**Table A5**  
Methodological quality of studies.

Citation	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Score /10
Attebring et al. (2005)	N	Y	Y	Y	Y	N	Y	Y	Y	Y	8/10
Bryant et al. (2013)	N	Y	Y	Y	Y	N	Y	Y	Y	Y	8/10
Condon & McCarthy (2006)	N	Y	Y	Y	Y	N	N	Y	Y	Y	7/10
Cooper et al. (2005)	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	9/10
Day & Batten (2006)	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	9/10
Frohmader et al. (2016)	Y	Y	Y	Y	Y	U	N	Y	Y	Y	8/10
Galdas et al. (2012)	Y	Y	Y	Y	Y	U	U	Y	Y	Y	8/10
Gambling (2003)	Y	Y	Y	Y	Y	U	U	Y	N	Y	7/10
Gregory, Bostock, & Backett-Milburn (2006)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10
Herber et al. (2017)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9/10
L. Juneag, Asplund, & Svedlund (2014a)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10
L. Juneag, Asplund, & Svedlund (2014b)	Y	Y	Y	Y	Y	N	N	Y	Y	Y	8/10
Lehane et al. (2008)	U	Y	Y	Y	Y	U	Y	Y	Y	Y	8/10
Little & Lewis (2006)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9/10
Martin & Woods (2012)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9/10
McCorry et al. (2009)	N	Y	Y	Y	Y	U	Y	Y	Y	Y	8/10
Tolmie et al. (2009)	N	Y	Y	Y	Y	U	U	Y	Y	Y	7/10
Traywick & Schoenberg (2008)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9/10
Webster et al. (2002)	N	Y	Y	Y	Y	U	Y	Y	Y	Y	8/10
White et al. (2010)	N	Y	Y	Y	Y	U	U	Y	Y	Y	7/10
White et al. (2011)	N	Y	Y	Y	Y	U	Y	Y	Y	Y	8/10
Wyer et al. (2001)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	9/10

Y, yes; N, no; U, unclear.

Questions:.

1. Is there congruity between the stated philosophical perspective and the research methodology?.
2. Is there congruity between the research methodology and the research question or objectives?.
3. Is there congruity between the research methodology and the methods used to collect data?.
4. Is there congruity between the research methodology and the representation and analysis of the data?.
5. Is there congruity between the research methodology and the interpretation of the results?.
6. Is there a statement locating the researcher culturally or theoretically?.
7. Is the influence of the researcher on the research, and vice-versa, addressed?.
8. Are participants, and their voices, adequately represented?.
9. Is the research ethical, according to current criteria, or for recent studies, and is there evidence of ethical approval by an appropriate body?.
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?.

**Table A6**

Characteristics of included studies for methodological review.

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Attebring et al. (2005)	The study explored patients' experiences of secondary prevention after a first AMI. All patients that had undergone a first time myocardial infarction and who visited the cardiac preventive nurse during March to September 2002 were included in the study. The exclusion criteria were not being able to communicate due to e.g. stroke or dementia or not being able to speak Swedish. Patients with myocardial infarction who had undergone by-pass surgery were also excluded. Tape-recorded interviews with a narrative approach were conducted; which were later transcribed verbatim. A hermeneutic approach was used to analyse the interviews.	Sweden	Patients' experiences after a first time myocardial infarction in relation to secondary prevention.	Cardiac rehabilitation-hospital	$n = 20$ (12 men and 8 women, aged 34–79 years).	Two main themes emerged from the analysis- Impact of medication: patients interpreted bodily sensations as a consequence of being medicated rather than as a result of their heart attack. The medication led to feelings of being intruded upon but also to positive feelings of security. Impact of health professionals: communication with health professionals resulted in confusion about both treatment and the severity of the coronary disease. Patients expressed a need of being reassured by their physician regarding their physical status. Conclusions: Health professionals need to consider the impact of pharmacological treatment on patients' life, at least in patients who suffer from a first AMI. The point of departure in secondary preventive work must be patients' beliefs about their condition and the treatment they receive. Nurses and physicians must be aware of the information each patient has been given, and from this starting point, they have to be in concordance with one another. From the patients' perspective, it is deemed necessary for the physicians to discuss the disease and the consequences it may have, both in the near future and in the long run, as soon as possible.
Bryant et al. (2013)	A semi-structured interview was conducted in a private consultation room at the pharmacy. Interviews were audiotaped and transcribed into the qualitative data software NVivo. Student researchers collectively explored trends and	New Zealand	Views of CVD patients (already taking multiple cardiovascular medicines) on a polypill that could reduce the number of tablets they would need to take.	Pharmacy Setting	$n = 49$ . Slightly more female participants (53%) were interviewed, with the majority of participants aged 61–80 years. Age range: 41– >80. 61% Europeans, 6% Maori, 12% Asian, 21% others.	The participants considered that the polypill would be very convenient, especially when travelling and would reduce the pill burden. If the polypill was subsidised by the government, they would have reduced dispensing fee costs. There were concerns around the inflexibility of dosing of individual components of the polypill and some concerns about safety and efficacy. Medical practitioners were identified as having an essential role in influencing participants about the acceptability of the polypill.

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Table A6 (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Condon & McCarthy	This descriptive qualitative study aimed to explore patients' perspectives of making lifestyle changes following AMI. Inclusion criteria: patients over 18 years of age, able to speak fluent English, with a diagnosis of a first AMI and had commenced phase 1 cardiac rehabilitation in hospital. Using a descriptive qualitative approach, participants were interviewed six weeks following discharge about their experiences. Data were collected using in-depth interviews and analysed using thematic analysis. Audiotaped interviews and field notes.	Ireland	Patients' perspectives of making lifestyle changes following AMI	Cardiac Rehabilitation-hospital, participants' homes	$n = 10$ , 9 males and 1 female. Mean age=23 years, age range= 38–75 years	Four themes emerged: lifestyle warning signs, taking responsibility for lifestyle changes, professional support and looking forward to the future. The findings offer insight into the everyday realities, which patients experience regarding lifestyle changes particularly about smoking cessation and stress management. The difficulties encountered by participants 6 weeks following discharge reflect the implementation of too many life style changes at once as well as the lack of professional help in the community to support participants in their endeavours to make lifestyle changes. Also, overprotection by family members was a source of frustration and aggravation for participants. The study highlights the need for the development of primary care services and cardiac rehabilitation programmes to support patients as well as providing information to families to reduce anxiety and fear.
Cooper et al. (2005)	The study described patients' beliefs about the role of the cardiac rehabilitation course following myocardial infarction. Inclusion criteria: Patients who had been admitted to a regional cardiothoracic centre with acute myocardial infarction; were currently waiting to begin their cardiac rehabilitation course during an eight-week period when the interviews were to take place. A qualitative study using in-depth semi-structured interviews was conducted and audiotaped. Qualitative interpretative phenomenological analysis was conducted to analyse transcribed audiotapes and themes were identified.	England	Patients' beliefs about cardiac rehabilitation that may act as barriers to attendance.	cardiac rehabilitation	$n = 13$ (four women, nine men). Age range: 37–79 years. Seven patients were retired and six patients were employed.	Themes identified included: the content of cardiac rehabilitation, perceptions of exercise, benefits of cardiac rehabilitation, explicit barriers to attendance and cardiac knowledge. Whilst some patients viewed cardiac rehabilitation as an important and necessary part of recovery others expressed doubt that it was appropriate for them. Some patients were uncertain of the course content and misunderstood the role of exercise and its perceived effects. Misconceptions with regard to cardiac knowledge were also apparent. The combination of erroneous beliefs about cardiac rehabilitation and cardiac misconceptions seemed to result in doubts regarding attendance. Prior to course attendance, some patients hold erroneous beliefs about the course content, especially the exercise component. Co-existent cardiac misconceptions are also apparent. Further research is needed to clarify the extent to which these beliefs may contribute to the decision not to attend cardiac rehabilitation.

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**Table A6** (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Day & Batten (2006)	Semi-structured in-depth interviews; interviews were audio-taped with permission from subjects. Field notes were then used as data. Data were also obtained through the use of theoretical memos during data analysis. Data from these interviews were analysed using Glaserian grounded theory.	New Zealand	Women's perceptions of the contribution of CR to their recovery from an MI.	Hospitals, referral for phase two of CR.	Ten women who had experienced one or more MI participated in the study. Age ranged from 50 to 89 years old. Three participants had experienced more than one MI.	The core category that emerged from the data was 'regaining everydayness'. Participants worked to regain their 'everydayness' through a basic social process of 'reframing'. Reframing involved coming to terms with what they had experienced and fitting it into their lives. Other categories related to symptom recognition and recovery. Cardiac rehabilitation programs contributed to overall recovery from a myocardial infarction in different ways for each participant. Although programs provided information for participants, they failed to provide the type of support needed to effectively aid reframing and recovery.
Frohmader et al. (2016)	Thirteen patients recovering from myocardial infarction who were unable to attend a hospital-based or affiliated outpatient cardiac rehabilitation programme were interviewed by telephone at the completion of the programme and asked to describe the relationship with their assigned nurse mentor and their perception of the audiovisual used in the programme. Thematic analysis was used to analyse the data.	Australia	Long-term thoughts and perceptions of the Aussie Heart Guide Programme (AHGP) including the role of the mentor, held by patients recovering from MI. The AHGP was adapted from the Heart Manual a home-based CR programme developed in the United Kingdom and modified for the Australian setting by a committee of CR practitioners from the Australian Cardiovascular Health and Rehabilitation Association in 2008. The AHGP is an audiovisual resource facilitated by nurse 'mentors' providing CR to people who are unable to attend hospital-based CR programme via telephone calls. After meeting with participants in hospital, mentors routinely contacted their patients within 1–2 days of leaving hospital and then weekly for approximately 6 weeks to provide individualized guidance, support and clarification of any issues arising from discharge.	CR-Rehabilitation, community, rural-remote Australia	$n = 13$ . Ages of the participants ranged from 46 to 69 years with the majority living between 50 and 100 km from the nearest hospital-based outpatient CR programme. Seven males and six females	Three themes emerged; assisting me to cope, supporting me and my family and tailoring the programme to my needs. Patients were satisfied with the programme and appreciative of the supportive and caring relationships provided by mentors during their hospitalization through to their discharge from the programme.

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Table A6 (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Galdas et al. (2012)	The study explored Punjabi Sikh patients' perceived barriers to engaging in physical exercise following myocardial infarction. A qualitative, interpretive descriptive study design was used to guide data collection and analysis; philosophically aligned with interpretive hermeneutic traditions and primarily involves understanding phenomena from the perspective of the subject and context of individuals' lives. Inclusion criteria: Individuals were eligible to take part in the current study if they were 19 years of age or older; diagnosed with MI in the past 12 months; able to speak Punjabi or English; and self-identifying as Punjabi Sikh. Semi-structured interviews were conducted in Punjabi, lasting approximately 1 hr. Data was collected until data saturation was achieved. Data were analysed using an interpretive thematic approach that involved the iterative process of coding and constant comparison.	Canada	Perceived barriers to engaging in physical activity amongst Canadian Punjabi Sikh patients who have had a myocardial infarction.	hospital based cardiac rehabilitation; participants' homes	n = 15. 10 men and 5 women. Age range: 48 - 80 years	Four key factors emerged that related to participants' perceived barriers to sustained engagement in physical activity: (WHO 2009) difficulty in determining safe exertion levels independently; (WHO 2003) fatigue and weakness; (Wahl et al., 2005) preference for 'informal' exercise; and (Keenan, 2017) migration-related challenges. The findings have implications for the design and delivery of health promotion strategies aimed at Punjabi Sikh patients' post-MI that is contingent on the use of 'formal' exercise settings to promote regular physical activity. The willingness amongst Punjabi Sikh patients to practise brisk walking offers a positive direction that public health nurses and other healthcare professionals may want to capitalize on in the delivery of exercise-related health promotion.
Gregory, Bostock, & Backett-Milburn (2006)	To identify views and experiences of people recovering from myocardial infarction, specifically barriers to, and facilitators of, following advice about lifestyle change and maintenance. Focus groups and interviews were undertaken with men and women discharged from hospital two/three years previously.	England	elicit the views and experiences of men and women about their recovery from a heart attack (MI), with a view to identifying barriers to and facilitators for lifestyle change and maintenance within the family setting.	a coronary care unit and patients' GPs.	A total of 53 people (35 men and 18 women) took part,	

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Table A6 (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
<a href="#">Gambling (2003)</a>	The overall aim of this study was to assess the informational needs of patients diagnosed with CHD to develop a health education prototype. The specific aim of this discussion was to investigate the understanding of the factors perceived important in reducing CHD risk factors. Inclusion criteria: patients attending coronary heart rehabilitation self-help group Focus groups were undertaken, sessions were tape-recorded and later transcribed. Themes were analysed using a cross-sectional data analysis technique by <a href="#">Mason, 1996</a> .	England	patients' understanding of the issues perceived to be important in reducing CHD risk factors	coronary heart rehabilitation self-help group	cardiac rehab group ( $n > 200$ ), age range: 32–85 years. Male to female ratio: 5:1	The findings highlighted the complex interaction between participants' beliefs and appraisal of their health. During the early stages of the disease process, patients had difficulty assimilating health information. However, they also defined their own management strategies at this time based on their own perceptions of risk. Later in the disease process, patients appraised their own risk factors and modified their behaviour accordingly. They also differed in their perception of the control they felt they had over their condition. Regarding information provision, the findings highlight the importance of individualising information as far as possible to help patients understand their own risk factors and take personal action. The timing of information is also crucial as the patients demonstrated readiness for information at different points in the disease process. Good-quality individualised information should, therefore, be available for patients to access when required.
<a href="#">Herber et al. (2017)</a>	Patients diagnosed with ACS, recruited between March 2012–July 2014 from three hospital sites in Scotland. Semi-structured face to face interviews were conducted and analysed using thematic analysis.	Scotland	Reasons for patterns of participation or nonparticipation in cardiac rehabilitation programmes and how future uptake could be enhanced.	Cardiac Rehabilitation	$n = 25$ . Non-attenders: 5 males 2 females, age range: 49–78 years Non-completers: 5 males 3 females, age range: 44–78 years Completers: 8 males 2 females, age range: 51–76 years	Three major influences of participation were identified: ( <a href="#">WHO 2009</a> ) personal factors, ( <a href="#">WHO 2003</a> ) programme factors and ( <a href="#">Wahl et al., 2005</a> ) practical factors. A significant barrier to attending cardiac rehabilitation programmes is that participants perceived themselves to be unsuitable for the programme alongside a lack of knowledge and/or misconceptions regarding cardiac rehabilitation. The responses of non-attenders and non-completers revealed misconceptions related to programme suitability, the intensity of exercise required and the purpose of a cardiac rehabilitation programme. These misconceptions impact attendance. The lack of perceived need for cardiac rehabilitation results from a poor understanding of the programme, especially amongst non-attenders and non-completers and subsequently an inability to comprehend possible benefits.

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Table A6 (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
L. Junehag, Asplund, & Svedlund (2014a)	Semi-structured interviews with patients 1 year after an AMI (<75 years). Content analysis was used to analyse the data.	Sweden	Individual perceptions of their lifestyle and support, 1 year after an AMI, with or without mentorship	Cardiac rehabilitation, recovery.	$n = 20$ (14 males and six females). Age range: 46 and 73 years. Mean age 62.2 years: those with a mentor, Mean age 60.3 years: those without a mentor	Those with and without mentors had similarities and tendencies to variation in their perceptions, with both a positive and negative view of life. The participants were aware of the necessity of living a healthy lifestyle but some resisted doing so. They wished to live as before, and all saw the future positively. Having a mentor with the same experience could be valuable for some people, but more research is needed to understand the lack of motivation to make beneficial lifestyle changes after a serious health event as AMI.
L. Junehag, Asplund, & Svedlund (2014b)	Qualitative interviews with patients who underwent AMI.	Sweden	Perceptions of the psychosocial consequences of acute myocardial infarction and access to support one year after the event	Cardiac rehabilitation	$n = 20$ (14 males and six females)	Themes identified: having a different life, having to manage the situation and having access to support. Eleven sub-themes: During their recovery, the participants experienced psychosocial consequences, consisting of anxiety and the fear of being afflicted again. Most mentees appreciated their mentor and some of those without mentors wished they had received organised support. Participants were often more dissatisfied than satisfied with the follow-up during recovery.
Lehane et al. (2008)	Semi-structured interviews with patients (35–75 years) with a primary diagnosis of CAD, currently prescribed medication for > 6 months, who were self-caring about medication management. Recruitment continued until data saturation was achieved. Interviews were audiotaped. Field notes documenting self-reflections, participants' reactions and the interview process were also recorded. A reflective journal was also maintained. The interviews were subsequently transcribed verbatim. Data analysed using content analysis techniques detailed by Burnard.	Ireland	CAD patient perspectives relating to medication adherence/compliance	Cardiac rehabilitation	$n = 10$ , seven males and three females. Age range: 51–69 years.	Three key dimensions to medication-taking were identified: "Keeping track"-ways of taking tablets; Reasoning about medications and Social/Professional influences on medication-taking. Research results add to the existing body of knowledge on patients' perspectives on medication-taking. They provide clinicians with an insight into the different dimensions and complex interactions involved.

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**Table A6** (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Little & Lewis (2006)	Elderly patients (65–75 years) with a diagnosis of acute MI and having been discharged from hospital with a programme of rehabilitative exercise approximately 12 months before the interview. Elderly patients were excluded because of the likelihood of their developing multiple disabilities that would prevent participation in exercise long-term. Patients awaiting heart surgery were also excluded on the basis that they may relapse to an earlier stage of therapeutic exercise. A qualitative approach based on positivism was followed. Individual interviews were conducted 4–6 weeks later at the patients' local cardiac rehabilitation centre. Interviews were audiotaped and transcribed. A template analysis of patients' responses was conducted.	UK	Attitudes, social support and barriers influencing long-term exercise adherence amongst older patients with cardiovascular disease.	Cardiac rehabilitation-local NHS trust	$n = 5$ , (65–75 years)	Results found that patients understood and valued the benefits of health-related exercise, thereby demonstrating positive exercise attitudes. Some patients, however, were unsure of the recommended guidelines for producing exercise benefits. Introducing into exercise rehabilitation programmes strategies to assess knowledge of exercise guidelines may prove useful in confirming patients' understanding of these guidelines. Future research into the effectiveness of such strategies is recommended. Support from family, friends, and health professionals was found to be important in long-term exercise adherence. Some patients, however, were unhappy with the nature of support provided. While doctors encouraged patients to exercise, not all prescribed exercise because they knew little about the referral schemes available. This suggests the need to evaluate service provision to ensure that doctors are informed and active in prescribing exercise. Barriers, such as poor health and lower body limitations, did not prevent exercise per se, however, they did prevent patients exercising at levels recommended to protect against disease progression.
Martin & Woods (2012)	Five focus-group sessions with patients with regular attendance (averaging two sessions/week) at the cardiac rehabilitation program for the previous six months or longer with a lapse no greater than one month within that period. Each focus group was transcribed verbatim before the next one commenced. Constant comparative analysis was undertaken to analyse the collected data.	Ireland	Factors explaining medium- to long-term adherence to community-based physical activity after a cardiac event.	Community based cardiac rehabilitation	$n = 24$ . 15 males, 9 females; Age: $67.7 \pm 16.7$ years	Referral procedures, social support, and knowledge of health benefits were important in influencing uptake and adherence to community based cardiac rehabilitation. The routine of a structured class and task-, barrier-, and recovery-specific self-efficacy were necessary to sustain long-term adherence for this specific clinical group. Older adults themselves provide rich information on how to successfully support their long-term adherence to structured exercise sessions. Further research into how to build these components into an exercise program is necessary.

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Table A6 (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
McCorry et al. (2009)	Semi-structured interviews with patients who had an MI between February 2005 and November 2006, who had not attended CR. They were tape-recorded and transcribed verbatim. Thematic analysis was undertaken, in tandem with data collection and recruitment. Recruitment continued until data saturation was achieved.	Ireland	Patient beliefs regarding exercise for recovery from MI with the cardiac rehabilitation context amongst those who did not attend formal CR programme.	Cardiac Rehabilitation, hospital based	$n = 14$ (8 males and 6 females), age range: 34–82 years, mean age: 64 years	Non-attending CR patients did not recognize the cardiovascular benefits of exercise and perceived keeping active through daily activities as sufficient for health. Health professionals were perceived to downplay the importance of exercise and CR, and medication was viewed as being more important than exercise for promoting health. CR uptake could be promoted by better communication and explanation of these relationships, especially the health benefits of exercise. This communication should demonstrate to potential participants that significant others, especially health professionals, consider exercise important and valuable. These findings can inform future research on the effectiveness of different theoretical approaches in the design of simple interventions aimed at increasing CR uptake.
Tolmie et al. (2009)	A purposive sample of adults aged 65 years or over, who were able to give informed and competent consent after suffering a myocardial infarction in the previous six months. Face-to-face audio-taped in-depth interviews were conducted, transcribed verbatim and Framework Analysis was used to analyse data.	United Kingdom	Needs of older people in relation to cardiac rehabilitation.	Cardiac rehabilitation-hospital	Sixteen males and 15 females, with an age range of 66–90 years (mean 74.5, SD 6.2). Non-attenders ( $n = 11$ ), Partial attendees ( $n = 7$ ), Full attendees ( $n = 9$ ).	The three main themes were identified: 'The sensible thing to do', 'Assessing the impact' and 'Nothing to gain'. Irrespective of the level of attendance, cardiac rehabilitation programmes are not equipped to meet the needs of many older people either in terms of risk factor reduction or programme uptake. More appropriate programmes are needed.
Traywick & Schoenberg (2008)	Face-to-face semi-structured interviews with 45 females who had survived a heart attack were undertaken, those able to speak English. Potential participants who were extremely hard of hearing, unable or unwilling to speak for an extended period, or too ill to complete the interview due to other health conditions were excluded. The participants were thanked for their time and provided with an honorarium of \$25. Interviews were audio-taped and transcribed verbatim. Thematic data analysis was undertaken.	United States	Exercise barriers and facilitators amongst female heart attack survivors	Older-geriatric population, cardiac rehabilitation (exercise)	$n = 45$ . Age range: 48–88 years, mean = 73 years. Females only.	There were multiple and connected determinants of exercise, including cognitive factors (competing demands, perceived health maintenance), life course issues (exercise as inappropriate given traditional gender expectations, positive lifelong experiences with exercise), and social and ecological environment determinants (social support, weather-related barriers). Enhancing exercise requires addressing these multifaceted and complex barriers faced by older females.

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**Table A6** (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Webster et al. (2002)	Interviews to explore the experiences and needs of Gujarati Hindu MI patients and their partners in the first month after an MI.	United Kingdom	The experiences and needs of Gujarati Hindu patients and their partners in the first month after a myocardial infarction	South Asian, coronary care	$n = 35$ (25 males and 10 females). The average age was 65 (69 for males, 64 for females) years.	A number of categories emerged from the data relating to a lack of information and advice, poor performance of activity, little lifestyle adjustment, poor expectations, lack of future plans, strong family support, dissatisfaction with the family doctor, and a significant belief in fate. Experiences and health care needs of Gujarati Hindu patients with myocardial infarction appear different to those of non-Asians. Patients tended to talk about the exercise component of cardiac rehabilitation and only talk about the information provision component when prompted, which suggested they viewed the programme as being primarily about exercise. They seemed to have little subsequent contact with health services, except routine six-monthly check-ups for their coronary heart disease. Unmet information needs were common, especially about medicines. Nevertheless, all patients reported continuing to take cardiac medicines but tended to only maintain changes to aspects of lifestyle perceived as causes of coronary heart disease, rather than viewing lifestyle recommendations as standards to achieve. Ensuring that individual patients' information needs about medicines and lifestyle are adequately met remains a key focus for cardiac rehabilitation development. Key aspects include individualising information and actively seeking and responding to patients' needs during and after cardiac rehabilitation.
White et al. (2010)	In-depth qualitative interviews were conducted with patients and audiotaped approximately three months after hospital discharge after they had completed a hospital-based cardiac rehabilitation programme. Repeat interviews patients were conducted approximately nine months later. Interviews were audiotaped and transcribed verbatim. Interviews were conducted until data saturation was achieved. Thematic analysis was undertaken; analysis was thoroughly grounded in data.	United Kingdom	Medicine taking and lifestyle changes in patients approximately three months after a hospital-based CR programme.	Hospital-based cardiac rehabilitation	$n = 15$ (11 males, 4 females). Mean age = 59.07 years. All of the patients attended the CR programme because they had a heart attack.	Patients tended only to make and maintain dietary changes if they perceived their diet to be a cause of their CHD. The only dietary changes patients reported involved 'cutting things out' of their diet; patients did not make dietary changes if they considered that they did not need to 'cut things out'. These findings suggest that, despite receiving information about eating a balanced diet, CR patients may perceive dietary change in terms of whether or not they need to 'cut things out' of their diet. Greater emphasis may be needed in dietary information on increasing the proportion of healthy foods consumed and choosing healthier alternatives.
White et al. (2011)	In-depth, audiotaped, qualitative interviews were conducted with post-myocardial infarction CR patients who had completed a hospital-based CR programme. Themes were analysed.	UK	Cardiac patients' perspectives on making and maintaining dietary changes	Hospital-based CR programme	$n = 15$ (11 males and 4 females), aged 42–65 years.	Patients tended only to make and maintain dietary changes if they perceived their diet to be a cause of their CHD. The only dietary changes patients reported involved 'cutting things out' of their diet; patients did not make dietary changes if they considered that they did not need to 'cut things out'. These findings suggest that, despite receiving information about eating a balanced diet, CR patients may perceive dietary change in terms of whether or not they need to 'cut things out' of their diet. Greater emphasis may be needed in dietary information on increasing the proportion of healthy foods consumed and choosing healthier alternatives.

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Table A6 (Continued).

Study	Methods for data collection and analysis	Country	Phenomena of interest	Setting/context/culture	Participant characteristics and sample size	Description of main results
Wyer et al. (2001)	Semi-structured interviews were carried out with patients who had been admitted to a general hospital with myocardial infarction and were eligible for cardiac rehabilitation. Interviews were taped and transcribed. The transcripts were subjected to interpretative phenomenological analysis.	United Kingdom	Beliefs on recovery and cardiac rehabilitation by attenders and non-attenders	Cardiac rehabilitation NHS UK	$n = 21$ . Nine attenders: 8 males one female, age range: 39–70 years, mean age: 59.6 years. Six accepters/non-attenders: 4 males and two females, age range: 51–72 years, mean age: 59.7 years. Six non-accepters/non-attenders: 5 males and one female, age range: 55–71 years, mean age: 65.83 years.	By interviewing attenders and non-attenders of CR, and carrying out an IPA of the data, it was possible to identify differences between the two groups. Several key differentiating themes were identified: the use of medical versus psychological model; illness perception; control; causal attribution; coping strategies; and attitude to CR. Attenders were more likely to use a psychological model to make sense of their experience and recovery, whereas non-attenders appeared to use a medical model. Attenders were more likely to see themselves in control of their recovery and to view the programme as a way of taking responsibility for improving their health and reducing their chances of recurrence. Attenders were also more likely to use information seeking ways of coping while non-attenders used avoidance/minimising coping strategies. The other main difference between the groups was their attitude to CR; with attenders viewing it as being of fundamental benefit while non-attenders viewed it as irrelevant and superfluous. The technique of IPA proved useful in allowing an abstraction of the factors affecting the decision-making process.

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