**Data files for**

**The changes in health-related quality of life after attending cardiac rehabilitation: A qualitative systematic review of the perspective of patients living with heart disease.**

**File 1: PRIMSA Checklist**

**PRISMA 2020 Checklist**

| **Section and Topic**  | **Item #** | **Checklist item**  | **Location where item is reported**  |
| --- | --- | --- | --- |
| **TITLE**  |  |
| Title  | 1 | Identify the report as a systematic review. | Page 1  |
| **ABSTRACT**  |  |
| Abstract  | 2 | See the PRISMA 2020 for Abstracts checklist. | Page 2 |
| **INTRODUCTION**  |  |
| Rationale  | 3 | Describe the rationale for the review in the context of existing knowledge. | Page 3 & 4 |
| Objectives  | 4 | Provide an explicit statement of the objective(s) or question(s) the review addresses. | Page 4 |
| **METHODS**  |  |
| Eligibility criteria  | 5 | Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses. | Page 5 |
| Information sources  | 6 | Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted. | Page 4 |
| Search strategy | 7 | Present the full search strategies for all databases, registers and websites, including any filters and limits used. | Page 4  |
| Selection process | 8 | Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process. | Page 5 |
| Data collection process  | 9 | Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process. | Page 5 |
| Data items  | 10a | List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect. | Page 4-6 |
| 10b | List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information. | Page 4-6 |
| Study risk of bias assessment | 11 | Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process. | Page 4-6, 9 |
| Effect measures  | 12 | Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results. | Page 5  |
| Synthesis methods | 13a | Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)). | Page 5 |
| 13b | Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions. | Page 5 |
| 13c | Describe any methods used to tabulate or visually display results of individual studies and syntheses. | Page 5 |
| 13d | Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used. | Page 5 |
| 13e | Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression). | Page 5 |
| 13f | Describe any sensitivity analyses conducted to assess robustness of the synthesized results. | Page 5 |
| Reporting bias assessment | 14 | Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases). | Page 9  |
| Certainty assessment | 15 | Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome. | Page 9 |
| **RESULTS**  |  |
| Study selection  | 16a | Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram. | Page 8 |
| 16b | Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded. | Page 8 |
| Study characteristics  | 17 | Cite each included study and present its characteristics. | Page 9 &10 |
| Risk of bias in studies  | 18 | Present assessments of risk of bias for each included study. | Page 9 |
| Results of individual studies  | 19 | For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots. | Not applicable  |
| Results of syntheses | 20a | For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies. | Page 7-10 |
| 20b | Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect. | Page 10-12 |
| 20c | Present results of all investigations of possible causes of heterogeneity among study results. | Page 10-12 |
| 20d | Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results. | Page 10-12 |
| Reporting biases | 21 | Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed. | Not applicable  |
| Certainty of evidence  | 22 | Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed. | Page 10-12 |
| **DISCUSSION**  |  |
| Discussion  | 23a | Provide a general interpretation of the results in the context of other evidence. | Page 13-15 |
| 23b | Discuss any limitations of the evidence included in the review. | Page 13-15 |
| 23c | Discuss any limitations of the review processes used. | Page 13-15 |
| 23d | Discuss implications of the results for practice, policy, and future research. | Page 13-15 |
| **OTHER INFORMATION** |  |
| Registration and protocol | 24a | Provide registration information for the review, including register name and registration number, or state that the review was not registered. | Page 4 |
| 24b | Indicate where the review protocol can be accessed, or state that a protocol was not prepared. | Page 4 |
| 24c | Describe and explain any amendments to information provided at registration or in the protocol. | Page 4  |
| Support | 25 | Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review. | Page 15 |
| Competing interests | 26 | Declare any competing interests of review authors. | Page 15 |
| Availability of data, code and other materials | 27 | Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review. | Supplementary files |

*From:*  Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: <http://www.prisma-statement.org/>

**Supplementary File 2: search strategy**

**CINAHL**

(("heart disease\*") OR ("heart failure\*") OR ("coronary disease\*") OR ("coronary artery disease\*") OR ("cardiovascular disease\*") OR ("myocardial Ischemia\*") OR angina\* OR ((MH "Cardiovascular Diseases")) OR ((MH "Heart Diseases")) OR ((MH "Myocardial Ischemia+")) OR ((MH "Coronary Disease+")) OR ((MH "Myocardial Diseases+")) OR ((MH "Heart Failure+")) OR ((MH "Cardiac Patients")) OR ((MH "Heart Surgery+"))) AND ((health n6 improve\*) OR ("overall health") OR (wellbeing OR "well being") OR ("life quality") OR ("health related quality of life" OR HRQL) OR ("quality of life" OR QoL) OR ((MH "Quality of Life")) OR ((MH "Outcomes (Health Care)")) OR ((MH "Patient-Reported Outcomes")) OR ((MH "Self Report")) OR ("self report")) AND (("cardiac rehabilitation") OR ("cardiac\* exercise") OR ("cardiac intervention\*") OR ("secondary prevention") OR ((MH "Preventive Health Care")) OR ((MH "Rehabilitation, Cardiac+")) OR ((MH "American Association of Cardiovascular and Pulmonary Rehabilitation")) OR ((MH "Therapeutic Exercise")))

**Medline**

(("heart disease\*") OR ("heart failure\*") OR ("coronary disease\*") OR ("coronary artery disease\*") OR ("cardiovascular disease\*") OR ("myocardial ischemia\*") OR angina OR ((MH "Cardiovascular Diseases")) OR ((MH "Heart Diseases")) OR ((MH "Myocardial Ischemia+")) OR ((MH "Coronary Disease+")) OR ((MH "Cardiomyopathies+")) OR ((MH "Heart Failure+")) OR ((MH "Thoracic Surgery"))) AND (("quality of life" OR QoL) OR (health n6 improve\*) OR ("overall health") OR (wellbeing OR "well being") OR ("life quality") OR ("health related quality of life" OR HRQL) OR ("self report") OR ((MH "Quality of Life")) OR ((MH "Outcome Assessment, Health Care")) OR ((MH "Patient Reported Outcome Measures")) OR ((MH "Self Report"))) AND (("cardiac rehabilitation") OR ("cardiac\* exercise") OR ("cardiac intervention\*") OR ("secondary prevention") OR ((MH "Secondary Prevention")) OR ((MH "Cardiac Rehabilitation")) OR ((MH "Exercise Therapy")))

**PsycINFO**

(("heart disease\*") OR ("heart failure\*") OR ("coronary disease\*") OR ("cardiovascular disease\*") OR ("coronary artery disease\*") OR ("myocardial ischemia\*") OR angina\* OR (DE "Cardiovascular Disorders") OR (DE "Heart Disorders" OR DE "Angina Pectoris" OR DE "Arrhythmias (Heart)" OR DE "Coronary Thromboses" OR DE "Myocardial Infarctions") OR (DE "Heart Surgery")) AND (("quality of life" OR QoL) OR (health n6 improve\*) OR ("overall health") OR (wellbeing OR "well being") OR ("life quality") OR ("health related quality of life" OR HRQL) OR ("self report\*") OR (DE "Quality of Life" OR DE "Health Related Quality of Life") OR (DE "Treatment Process and Outcome Measures") OR (DE "Patient Reported Outcome Measures") OR (DE "Well Being") OR (DE "Self-Report")) AND (("cardiac rehabilitation") OR ("cardiac\* exercise\*") OR ("cardiac intervention\*") OR ("secondary prevention") OR (DE "Rehabilitation") OR (DE "Exercise"))

**Embase**

Query ('heart disease'/de OR 'heart disease' OR 'heart failure'/exp OR 'heart failure' OR 'coronary disease' OR 'coronary artery disease'/exp OR 'coronary artery disease' OR 'cardiovascular disease'/de OR 'cardiovascular disease' OR 'heart muscle ischemia'/exp OR 'heart muscle ischemia' OR 'myocardial ischemia' OR 'angina pectoris'/de OR 'angina pectoris' OR 'angina' OR 'myocardial disease'/exp OR 'myocardial disease' OR 'cardiac patients'/de OR 'cardiac patients' OR 'cardiovascular surgery'/exp OR 'cardiovascular surgery') AND ('quality of life'/exp OR 'quality of life' OR (health NEAR/6 improve\*) OR 'overall health' OR 'wellbeing'/de OR 'wellbeing' OR 'well being' OR 'life quality' OR 'health related quality of life' OR hrql OR 'self report'/de OR 'self report' OR 'patient-reported outcome'/de OR 'patient-reported outcome' OR 'outcome assessment'/exp OR 'outcome assessment') AND ('cardiac rehabilitation' OR 'cardiac exercise' OR 'cardiac intervention' OR 'secondary prevention' OR 'heart rehabilitation'/de OR 'heart rehabilitation')

**JBI**

1 (heart disease\* or cardiovascular or coronary or myocardial or cardiac).mp. [mp=text, heading word, subject area node word, title]

2 Life quality.mp. [mp=text, heading word, subject area node word, title]

3 health related quality of life.mp. [mp=text, heading word, subject area node word, title]

4 (wellbeing or well being).mp. [mp=text, heading word, subject area node word, title]

5 exercise.mp. [mp=text, heading word, subject area node word, title]

6 intervention.mp. [mp=text, heading word, subject area node word, title]

7 cardiac rehabilitation.mp. [mp=text, heading word, subject area node word, title]

8 secondary prevention.mp. [mp=text, heading word, subject area node word, title]

9 2 or 3 or 4

10 5 or 6 or 7 or 8

11 1 and 9 and 10

**Cochrane Library**

("heart disease\*" OR "heart failure\*" OR "cardiovascular disease\*" OR "myocardial ischemia" OR "cardiovascular patient\*" OR "cardiovascular surgery\*")

AND ("health related quality of life" OR "quality of life" OR wellbeing OR "well being" OR "life quality" OR "overall health" OR "health outcome\*" OR "patient report\*")

AND ("cardiac rehabilitation" OR "cardiac exercise" OR "secondary prevention" OR "cardiac intervention\*" OR "prevent\* health" OR "therap\* exercise")

**SCOPUS**

(TITLE-ABS-KEY("heart disease\*" OR "heart failure\*" OR "cardiovascular disease\*" OR "myocardial ischemia" OR "cardiovascular patient\*" OR "cardiovascular surgery\*")

AND TITLE-ABS-KEY("health related quality of life" OR "quality of life" OR wellbeing OR "well being" OR "life quality" OR "overall health" OR "health outcome\*" OR "patient report\*")

AND TITLE-ABS-KEY("cardiac rehabilitation" OR "cardiac exercise" OR "secondary prevention" OR "cardiac intervention\*" OR "prevent\* health" OR "therap\* exercise"))

**Web of Science**

("heart disease\*" OR "heart failure\*" OR "cardiovascular disease\*" OR "myocardial ischemia" OR "cardiovascular patient\*" OR "cardiovascular surgery\*")

AND ("health related quality of life" OR "quality of life" OR wellbeing OR "well being" OR "life quality" OR "overall health" OR "health outcome\*" OR "patient report\*")

AND ("cardiac rehabilitation" OR "cardiac exercise" OR "secondary prevention" OR "cardiac intervention\*" OR "prevent\* health" OR "therap\* exercise")

**Supplementary File 3: Prisma Flow- outlining inclusion/ exclusion**

**Identification of studies**

**Included**

Full text articles assessed for eligibility

(n = 35)

Records screened (abstract)

(n = 441)

Records screened (title)

(n = 4681)

**Identification**

Records identified from:

Databases (n = 10813)

Records removed *before screening*:

(n = 6132)

Records excluded based on the title (n = 4240). Of which not related HRQL (n= 3650)

Not-related CR (n=590)

Records excluded based on abstract
(n = 406)

Of which, not related HRQL (n= 250)/ not-related CR (n=100)

Not-adult sample (n=56)

(n = )

**Screening**

Full-text articles excluded:

(n =22)

Reasons:

1 Not related HRQL (n= 8)

2 Patient data could not be extracted from health care providers (n= 2)

3 Participants did not recruit from CR (n= 3)

4 Focus on experience of cardiac event rather than CR (n= 4)

5 Non-adult sample (n= 3)

6 Not in English (n=2)

Studies included in the synthesis

(n = 13)

**Supplementary File 4: Full text Article Screening**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Author** |  | **Full text screening** |
| **Title** | **Include?** | **Exclude?** | **Reason for exclusion** |  |
| L.W | Alvai | Barriers to education in cardiac rehabilitation within an Iranian society: A qualitative descriptive study |  | Yes | Does not include any data relating to HRQl . Focus is on delievry CR |
|  | Adams | Importance of resistance training for patients after a cardiac event |  | Yes | Wrong outcome |
| **L.W** | **Clark** | **A realist study of the mechanisms of cardiac rehabilitation** | **Yes** |  |  |  |
|  | Boothby | Sexual Activity After Acute Coronary Syndrome: A Qualitative Approach to Patient and Partner Experiences |  | Yes | Wrong outcome |
|  | Balestroni | Lifestyle and adherence to the recommended treatments after cardiac transplantation |  |  | Wrong outcome |
|  | Devi | Exploring the experience of using a web-based cardiac rehabilitation programme in a primary care angina population: a qualitative study |  | Yes | Qualitative, psychological wellbeing not QoL. For discussion. |
|  | Grace | Patient preferences for home-based versus hospital-based cardiac rehabilitation |  | Yes | Quant study and focus more on delivering CR |
| **L.W** | **Dechaine.** | **Healing the heart: A qualitative study of challenges and motivations to cardiac rehabilitation attendance and completion among women and men** | **Yes** |  |  |  |
|  | Gulanick | Recovery patterns and lifestyle changes after coronary angioplasty: the patient's perspective |  |  | Not focus on HRLQ |
|  | Hummel | Quality of life after heart and heart-lung transplantation |  | Yes | wrong outcome |
| L.W | Helem | “When what is taken for granted disappears”: women’s experiences and perceptions after a cardiac event |  | Yes | wrong outcome |
| L.W | Jbilo | Understanding men's psychological reactions and experience following a cardiac event: A qualitative study from the MindTheHeart project |  | Yes | Not focus on HRLQ |
| L.W | Jokar | Behavioral change challenges in the context of center-based cardiac rehabilitation: A qualitative study |  | Yes |  |  |
| **L.W** | **Jokar** | **Begin again and continue with life: A qualitative study on the experiences of cardiac rehabilitation patients** | **Yes** |  |  |  |
| L.N | King | Men and women managing coronary artery disease risk: Urban-rural contrasts |  | Yes | wrong outcome |
| L.N | Leung | Gender differences in motivations and perceived effects of Mind-Body Therapy (MBT) practice and views on integrative cardiac rehabilitation. |  | Yes | wrong outcome |
| **L.N** | **Mcphilips** | **Cardiac rehabilitation patients experiences and understanding of group metacognitive therapy: a qualitative study** | **Yes** |  |  |  |
| **L.N** | **Mead** | **Barriers to effective self-management in cardiac patients: The patient's experience** | **Yes** |  |  |  |
|  | Morton | Multidisciplinary team approach to heart failure management |  | Yes | Wrong outcome |
| **L.N** | **Meredith** | **Getting to the heart of the matter: an ethnography of emotions and emotion regulation in cardiac rehabilitation** | **Yes** |  |  |  |
| **L.N** | **Mitchel** | **Cardiac rehabilitation: participating in an exercise program in a quest to survive** | **Yes** |  |  |  |
| **I.J** | **Nadarajah** | **The lived experience of individuals in cardiac rehabilitation who have a positive outlook on their cardiac recovery** | **Yes** |  |  |  |
| **L.N** | **Nicolai** | **To change or not to change - That is the question: A qualitative study of lifestyle changes following acute myocardial infarction** | **Yes** |  |  |  |
| I.J | Ohagan | Work Reintegration and Cardiovascular Disease: Medical and Rehabilitation Influences |  | Yes | Wrong outcome |
|  | **Parkosewich** | **Cardiac rehabilitation barriers and opportunities among women with cardiovascular disease** |  | Yes | Wrong outcome |
| I.J | Paquet | Re-engineering cardiac rehabilitation programmes: Considering the patient's point of view |  | Yes | Wrong outcome |
| **I.J** | **Pietrabissa.** | **Enhancing behavioral change with motivational interviewing: A case study in a Cardiac rehabilitation unit** | **Yes** |  |  |  |
|  | Rushford | Recall of information received in hospital by female cardiac patients |  | Yes | Wrong outcome |
| I.J | pulignano | Barriers to Cardiac Rehabilitation access of older heart failure patients and strategies for better implementation |  | Yes | Wrong outcome |
|  | Smirnov | Effect of occupational therapy on the psychosocial status of patients with myocardial infarction at the second stage of rehabilitation |  | Yes | Wrong outcome |
|  | Tolmie | Coronary artery bypass graft operation: patients' experience of health and well-being over time |  | Yes | Health and well being not QoL specifically |
| I.J | Smith | ‘Betwixt and between health and illness’ – women's narratives following acute coronary syndrome |  | Yes |  |  |
|  | **White** | **Patients' perspectives on cardiac rehabilitation, lifestyle change and taking medicines: Implications for service development** | **Yes** |  |  |  |
|  | **White** | **Qualitative study of cardiac rehabilitation patients' perspectives on making dietary changes.** | **Yes** |  |  |  |
|  | **Wong** | **Attitude toward the out-patient cardiac rehabilitation program and facilitators for maintenance of exercise behavior** | **Yes** |  |  |  |
|  | Yu | Long-term changes in exercise capacity, quality of life, body anthropometry, and lipid profiles after a cardiac rehabilitation program in obese patients with coronary heart disease |  | Yes | Quan study and focus more on delivering CR |
|  |  |  |  |  |  |  |

**Supplementary File 5: Characteristics of included studies for methodological review**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Study**  | **Methods for data collection and analysis** | **Country**  | **Phenomena of interest** | **Setting / context**  | **Participant characteristics and sample size**  | **Description of main results**  |
| Clark *et al.* (2005) |  Focus groups were conducted to discuss their perceptions and experiences. The data were generated and analysed using therealist approach of Pawson and Tilley.  | Scotland | To explore patients’ experiences of cardiac rehabilitationand perceptions of the mechanisms and contexts influencing its long-term effectiveness. | Cardiac rehabilitation | Forty-seven participants (30 males and 17 females) with a formal diagnosis of coronary heart disease | Results. Participants’ accounts indicated that the didactic content of cardiac reha-bilitation was not strongly linked to longer-term health behaviour change. The main positive effects of cardiac rehabilitation were related to the effect of participation on mediating social and body-focused mechanisms that were triggered when the reha- bilitation setting was perceived to be safe. Social mechanisms identified included social comparisons, camaraderie, and social capital. Body-focused mechanisms included greater knowledge of personal physical boundaries and a greater trust in the heart- diseased body. Collectively, these mechanisms had a positive effect on confidence thatwas perceived as being imperative to maintain health behaviour change. |
| Dechaine *et al.* (2018) | Participants were equally divided based on the number of CR session completed (less than or equal to 18 vs. more than 18). Data were gathered from individual interviews and analysed using an inductive content analysis.  | United States | To articulate similarities and differences in the CR treatment experiences by gender.  | Urban and rural Cardiac rehabilitation |  20 women and 20 men | Both women and men view CR as a means to move forward from their cardiac incident andachieve good health. Women were more likely than were men to be motivated by a perceived obligation to CR staff and improved quality of life. Men, in comparison, identified their commitment to CR as a need to complete a task.  |
| Joker *et al.* (2017) | descriptive qualitative approach, whichis widely acknowledged as the best approach for eliciting in-depthdescriptions of behavioural changes in the context ofcardiac rehabilitation centres.  | Iran  | To explore the mechanism that underline behavioural changes within CR centres.  | Cardiac rehabilitation |  15men and 8 women with coronary heart disease | Trying to stay alive and begin again arose as thetwo main themes related to behavioural change. Thesethemes include the changes in cognition and values thatlead to improvements in the process of behavioural change asa major outcome of cardiac rehabilitation. |
| Mead et al. (2010) | Using a qualitative study design consisting of focus group interview | United States | To explore how for disadvantaged patients access barriers interfere with typicalmanagement challenges to undermine patients’ efforts to care for their illnesses. | Cardiac rehabilitation | 33 focus group discussions with heart patients  | We identiﬁed nine major themes reﬂecting issues related to patients’ ability to care for andmanage their heart conditions. We grouped the themes into three domains of interest: (1) barriers thatinterfere with getting necessary services, (2) barriers that impede the monitoring and management of aheart condition on a daily basis, and (3) supports that enable self-management and improve care.Conclusion: For disadvantaged populations, typical problems associated with self-management of aheart condition are aggravated by substantial obstacles to accessing care. |
| McPhillips et al. (2021) | Using qualitative study with intervention component and using interview.  | England  | To explore qualitatively, CRpatients’ experiences and understanding of group MCT withthe aim of examining aspects of treatment that patientsexperienced as helpful | Cardiac rehabilitation | 43 women andMen with differing levels of distress and were approachedby telephone from both the control and intervention.  | Results Two main themes were identified: (1) generaltherapy factors that were seen largely as beneficial, wherepatients highlighted interaction with other CR patientsand CR staff delivery of treatment and their knowledge ofcardiology; (2) group MCT- specific factors that were seenas beneficial encompassed patients’ understanding of theintervention and use of particular group MCT techniques.Most patients viewed MCT in a manner consistent with themetacognitive model. All the patients who completed groupMCT were positive about it and described self- perceivedchanges in their thinking and well- being. A minority ofpatients gave specific reasons for not finding the treatmenthelpful. |
| Meredith *et al.* (2019) | Three main methods were used tocollect data over a 12-month period, including participant observation (225 h),informal and formal interviews, and a reﬂexive diary. Thematic analysis wasused to generate patterns (themes) in the data and purposeful sampling was purposeful | England | To providea penetrative insight into the social and psychological environment in a UK CR setting, witha speciﬁc focus on aﬀective and behavioural phenomena.  | Cardiac rehabilitation | 10 formal interviews were conducted to further elucidate the lived experiences ofseveral key actors within the CR context., interviewing patients(n = 4), staﬀ (n = 3) and volunteers (n = 3).  | Compositenarratives illustrated the emotional intensity of recovering from a cardiacevent and highlighted the value of CR to aid patients with reskilling andemotional support. In discussing our data, we emphasise the potential valueof emotional intelligent care provision, and the creation of an environmentthat encourages emotional disclosure. |
| Mitchel *et al.* (1999) | Adhering to the belief that human experience can be explainedfrom the viewpoint of the person who has experienced the event, this study attempted to explore and describestrategies used by individuals who had experienced a cardiacevent to overcome barriers associated with an exercise program. Each interview last 1 hour.  | United States | To explore and describe strategies that individ­uals who experienced a cardiac event used to overcome barri­ers associated with an exercise program.  | Cardiac rehabilitation | Six subjects (four females and two males) who were enrolledin a cardiac exercise programfor1 year or longer, and who con tinued to actively participate in at least two cardiac exerciseclasses per year | Individuals who consistently participated in a cardiac exercise program did not usestrategies to overcome barriers; rather, in their quest to survive,they used strategies to ensure their participation in the program.  |
| Nadarajah *et al.* (2017) | Husserlian phenomenology guided this study. A purposive sample of 10 individuals who had experienced anacute cardiac event and had a predominantly positive outlook were interviewed. Data were analyzed using Colaizzi’smethod. A purposive sampling strategy was used to recruit participants for thisstudy. | United States | To explore the experiences of cardiac recovery in cardiac rehabilitation participants with a predominantly positive outlook, within the context of an acute cardiac event, including exploring barriers and facilitatorsof cardiac recovery. And to explore how a positive outlook impacted completion of phase two of thecardiac rehabilitation program | Cardiac rehabilitation | Ten individuals were interviewed. Only one individual wasAsian, and the other nine were Caucasian. | Three themes emerged from the data. The first was “choosing life over death,” where participants discussedhow they made a decision to improve their health. The second theme was “learning to live a new self,” where participantsdescribed the changes they had to make in order to improve their health. The third theme was “a life-transformingcardiac event” where participants shared how the cardiac event had changed their life. |
| Nicolai et al., 2018 | Semi-structured interviews were conducted with 21 individuals who had recentlyexperienced an AMI. The interviews were audio-recorded and transcribed verbatim. The datawere analysed using qualitative content analysis. | Germany  | To investigate key factors related to lifestyle changesfollowing acute myocardial infarction (AMI) by eliciting survivors’ subjective needs for, attitudestowards and experiences with behaviour changes in their everyday life to improve futureinterventions promoting lifestyle changes. | Cardiac rehabilitation | 21 participants (13 men and 8 women), ranging from 38-79 years of age.  | The data revealed that lifestyle changes following AMI are influenced by acombination of individual (physical and psychological) and social factors that can be grouped intofacilitators and barriers. The interviews indicated the need for more personalised informationregarding the causes and risk factors of illness, the benefits of lifestyle changes and the importanceof including significant others in lifestyle advice and education and of individualising support. |
| Pietrabissa et al,(2015) | Qualitative case study and using interview.  | Italy  | To integrate theory with practice by describinga three-session case scenario.  | Cardiac rehabilitation | A case was a 39 years-old man, resident in thesouth of Italy., at admission to the hospital,weighing 143 kgs. With an initial BMI of 51.9, calculated bydividing the weight (in kg) by the square of the height (in meters),he falls into the highest of the level of obesity (super morbidhis problematic life-style have not been taken into account. Theobesity), presenting increased risk for several health-related conditions.Giorgio was diagnosed with dilated cardiomyopathy, aserious condition in which the heart muscle becomes weakened,therefore unable to satisfy peripheral requirements. He also has aprosthetic heart valve. | By the use of MI principles and techniques, the patient reported anincrease in his motivation and ability to change, developing a post discharge plan thatincorporates self-care behaviours. |
| White et al (2010) | In-depth qualitative interviews were conducted and audiotaped with 15 patients approximately threemonths after hospital discharge, after they had completed a hospital-based cardiac rehabilitation programme.Repeat interviews with ten patients explored whether their perspectives had changed when interviewed againapproximately nine months later. | England | To understand patients’ perspective on CR lifestyle change and taking medicines.  | Cardiac rehabilitation | All 15 patients attended the CR programme ranging from 72-55. They were white British, and 13 weremarried and living with their partner.  | Patients tended to talk about the exercise component of cardiac rehabilitation and only talk about theinformation provision component when prompted, which suggested they viewed the programme as beingprimarily about exercise. They seemed to have little subsequent contact with health services, except routinesix-monthly check-ups for their coronary heart disease. Unmet information needs were common, especiallyabout medicines. Nevertheless, all patients reported continuing to take cardiac medicines, but tended to onlymaintain changes to aspects of lifestyle perceived as causes of coronary heart disease, rather than viewinglifestyle recommendations as standards to achieve. |
| White et al (2011) | Following ethical approval, in-depth, audiotaped, qualitative interviewswere conducted with 15 post-myocardial infarction CR patients (11 menand four women) who had completed a hospital-based CR programme. Participantscomprised White British individuals aged 42–65 years, from a variety ofsocioeconomic backgrounds. Interview topics included perspectives on CHDand lifestyle changes, including diet. Follow-up interviews with 10 patients,conducted approximately 9 months later, explored whether their perspectiveshad changed | England | To explore CR patients’ perspectives on making andmaintaining dietary changes. | Cardiac rehabilitation | Eleven of the participants were men and four werewomen. All were White British individuals aged 42–65 years, although most patients were aged between 50and 65 years, and from a variety of socioeconomic backgrounds.Thirteen patients were married and living withtheir partner, two were not living with a partner andnone of the patients were related to each other.  | Results: Patients tended to only make and maintain dietary changes if they perceivedtheir diet to be a cause of their CHD. The only dietary changes patientsreported involved ‘cutting things out’ of their diet; patients did not make dietarychanges if they considered that they did not need to ‘cut things out’. |
| Wong *et al.(2016)* | A qualitative descriptive study design was used, and 22 CHDpatients were recruited in Hong Kong in 2014. In-depth interviews andcontent analyses were conducted. The tripartite model of attitudeswas adopted as research framework | Hong Kong  | To examine the attitudes of Chinese patientswith coronary heart disease (CHD) toward the outpatient cardiacrehabilitation program (OCRP), as well as their exercise behaviour,intention, maintenance and related factors.  | Cardiac rehabilitation | 22 participants, 15 (68.2%) were men, and 18 (81.8%) were married patients with a mean age of 54 years ranging from 43 years to 74 years. | Two themes were identified: (1) informant attitude (perception,affection, and practice) toward the OCRP and (2) Exercise Behavior– intention, maintenance and its related factors. Most informantsshowed positive perception and affection regarding the outpatientrehabilitation program, leading to regular practice of exercise inthe program and at home. Peer, group dynamic, social support andChinese culture influences on exercise behavior may serve as majorfacilitators to maintain exercise behavior. |

**Supplementary File 6: Dependability Assessment of included studies**

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| --- |
| Dependability score |
| Citation | Is there congruity between the research methodology and the research question or objectives | Is there congruity between the research methodologyand 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? | Dependability score |
| Clark *et al.* (2005) | Yes | Yes | Yes | No | Yes | 4/5 High |
| Dechaine *et al.* (2018) | Yes | Yes | Yes | Yes | Yes | 5/5 High |
| Joker *et al.* (2017) | Yes | Yes | Yes | No | No | 3/5 Mod |
| Mead et al. (2010) | Yes | Yes | Yes |  Yes | Yes | 5/5 High |
| McPhillips et al. (2021) | Yes | Yes | Yes | Unclear | Unclear | 3/5 Mod |
| Meredith *et al.* (2019) | Yes  | Yes | Yes | Yes | Yes | 5/5 High |
| Mitchel *et al.* (1999) | Yes | Yes | Yes | Unclear | Unclear | 3/5 Mod |
| Nadarajah *et al.* (2017) | Yes | Yes | Yes | Yes | Yes | 5/5 High |
| Nicolai et al., 2018 | Yes | Yes | Yes | Unclear | Unclear | 3/5 Mod |
| Pietrabissa et al,(2015) |  |  |  |  |  |  |
| White et al (2010) | Yes | Yes | Yes |  Unclear | Yes | 4/5 Mod |
| White et al (2011) | Yes | Yes | Yes |  Unclear  | Yes | 4/5 Mod |
| Wong *et al.(2016)* | Yes | Yes | Yes |  Yes | Yes | 5/5 High |

**Supplementary File 7: Data Extraction**

**Data extraction included studies**

All Data was extracted by the first author.

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| --- | --- | --- |
| **Study**  | **Key findings**  | **Themes/ categories**  |
| Clark *et al.* (2005) | Results. Participants’ accounts indicated that the didactic content of cardiac reha-bilitation was not strongly linked to longer-term health behaviour change. The main positive effects of cardiac rehabilitation were related to the effect of participation on mediating social and body-focused mechanisms that were triggered when the reha- bilitation setting was perceived to be safe. Social mechanisms identified included social comparisons, camaraderie, and social capital. Body-focused mechanisms included greater knowledge of personal physical boundaries and a greater trust in the heart- diseased body. Collectively, these mechanisms had a positive effect on confidence thatwas perceived as being imperative to maintain health behaviour change. | **The process of attending CR: the self and the group, the outsider and the insider***“*I was wary because I have never been active at all as you can probably see. I have never been particularly ﬁt and I was concerned about doing exercises in front of other people (Pt 4, 5 and 6 agree). In case I made a fool of myself…it has always been a problem with me: We always stayed at the back (referring to self and Pt 5). We stayed in the very, very last row so nobody would watch us”**The mechanisms of cardiac rehabilitation: how change was promoted and inhibited**“At the end of the day, you have to get on with your life. You have got to leave the nest. Some people were saying ‘Can I come back?(to CR)’ I can see the social element, but that is not what it is about. You have to be back being independent”.*“*My whole pattern of life has changed. I had never been to a gym before and I reached 69 years of age and suddenly I have found I am enjoying it and of course, it is geared for my age group and my particular problem. Before you didn’t know your limitations, but after, deﬁnitely after doing rehabilitation you could tell exactly what you could do. And I haven’t looked back since. I don’t do heavy work but, reasonably, I now know there is lots I can do” |
| Dechaine *et al.* (2018) | Both women and men view CR as a means to move forward from their cardiac incident andachieve good health. Women were more likely than were men to be motivated by a perceived obligation to CR staff and improved quality of life. Men, in comparison, identified their commitment to CR as a need to complete a task.  | **Motivations to CR Attendance and Completion**“I’m looking at it as longevity and the quality of my life. Quality of life to me is key; I don’t want to sit in a wheelchair somewhere where I’m incontinent and I’m contributing nothing. That isn’t living; that’s existing.^ (F12) recovery would mean that I myself would feel very comfortable continuing stuff that I’m doing at the rehab center, like with the exercise, making sure that I’mdoing something every day, and that I don’thavea problem with it… Just to know that I’mgoing to be okay and confident enough to do my exercising every day by myself, you know, onmy own.^ I knew I was on a monitor … and I’dpushit harder, because I figured if I was going to have a heart attack, I might as well have it here when they had me monitored instead of at the gym… I really used cardiac rehab just to reinforce the fact that I could go to the gym and do what I wanted to do, and not have to worry about having a heart attack.Some of the things I went to when I got home from the nursing home-- I went [to a nursing home] because it would please the kids. The asked me to go, and I really didn’twanttogo, but after I went, I felt better... By them encouragingme to get out and do stuff other than just going to a doctor’s appointment, it had me looking forward to something, and it got me out of that little funk I was in… If you have somebody that’s encouraging you to do something, you do it just to please them**Cardiac journey** “Recovery would mean that I myself would feel very comfortable continuing stuff that I’mdoing at the rehab center, like with the exercise, making sure that I’mdoing something every day, and that I don’thavea problem with it… Just to know that I’mgoing to be okay and confident enough to do myexercising every day by myself, you know, on my own”. |
| Joker *et al.* (2017) | Trying to stay alive and begin again arose as thetwo main themes related to behavioural change. Thesethemes include the changes in cognition and values thatlead to improvements in the process of behavioural change asa major outcome of cardiac rehabilitation. | **Wanting to change: “**I used to overindulge when eating. At lunchtime, I always ate the fattiest food served at the restaurant. I never took my high cholesterol seriously**”.****Finding myself :** I guess no one could ever say that he does not love himself. This is something natural. I can say that I love myself. What I’m saying is that if I can manage to do whatever I’ve been told by my doctors, I mean shed some kilos and lose weight, I can prove that my health matters to me. **Keeping my heart : “**A month after my operation, I threw a party where I cooked. I did not want any help, so I did all the cooking. By doing so, I also wanted to test myself. I passed. I wanted to feel the difference before and after going under the knife”.**Living symptoms free : “**I promised to myself that I would not go to work unless I was physically fit and ready to work. I made this pact with myself after starting cardiac rehabilitation”**Continuation of cardiac rehabilitation** :” have a number I want to reach, let say 100. I am aiming to reach that number before my final session. Next, I would like to try my best to maintain this positive outcome even after I leave here. I would also like to continue doing vigorous exercises, which I have learnt from you and your colleagues, in order to maintain my health” |
| Mead et al. (2010) | We identiﬁed nine major themes reﬂecting issues related to patients’ ability to care for andmanage their heart conditions. We grouped the themes into three domains of interest: (1) barriers thatinterfere with getting necessary services, (2) barriers that impede the monitoring and management of aheart condition on a daily basis, and (3) supports that enable self-management and improve care.Conclusion: For disadvantaged populations, typical problems associated with self-management of aheart condition are aggravated by substantial obstacles to accessing care. | **Barriers to accessing necessary services: “**The doctor is hesitant to order the test you need. They don’t even attempt to do it because they assume you can’t pay for it.... Sometimes the lack of insurance does affect your care. ‘The doctor gives you six prescriptions and Medicaid only pays for three, so what happens with the other three? In that case I just don’t buy ‘em”. **Supports to improving self-management**‘**Social support** ‘I have people I can go to and talk to—my brother, my son. I talk to them about everything. All of themworking to support me.’’‘‘My wife does all this stuff, like a nurse. That’s her ﬁrst priority. I say, ‘I gotta take 11 pills this morning?’and she says, ‘I wanna see you alive.’’’‘‘Sometimes you just need someone to listen to you. If you feel like crying, just cry. You think you in thatboat by yourself, but all of us are riding in that same boat.’’ **Secondary prevention, disease management programs**‘‘Since they referred me back here I had a complete turnaround.... Before I couldn’t even walk to the bathroom.Now I’m doing well. I can walk over a mile.’’‘‘It’s a regimented routine, rather than trying to do it at home. You’d slip otherwise. I would.’’‘‘The rehab has been making me feel better. I’m tired in the morning, but when I leave I’m full of energy.’’‘‘It’s also the social life. It’s really the center of my life.’’‘‘I don’t know what I would have done without [the cardiac rehab staff]. Because when you go home you’reon your own.**Psychological issues** It is overwhelming because it’s like a physical and mental thing.... Sometimes I look around and I actuallycry because I can’t handle it... I’m losing control.’’‘‘I believe the stress you have in your life can often be more damaging than the cholesterol.’’‘‘What you used to do, you can’t do. I used to love to go ﬁshing, hunting swimming. But I can’t do that now.You get to where you don’t care if you wake up the next morning.’’‘‘The meds I take are just too much medicine. I can’t take it anymore.’’‘‘I would get so stressed I wouldn’t take my medicine |
| McPhillips et al. (2021) | Results Two main themes were identified: (1) generaltherapy factors that were seen largely as beneficial, wherepatients highlighted interaction with other CR patientsand CR staff delivery of treatment and their knowledge ofcardiology; (2) group MCT- specific factors that were seenas beneficial encompassed patients’ understanding of theintervention and use of particular group MCT techniques.Most patients viewed MCT in a manner consistent with themetacognitive model. All the patients who completed groupMCT were positive about it and described self- perceivedchanges in their thinking and well- being. A minority ofpatients gave specific reasons for not finding the treatmenthelpful. | **Interaction with other CR patients : “**Group MCT provided a positive environment where patients felt comfortable to talk about their thoughts, which they may otherwise have kept to themselves: ‘It was good to get it out…you opened up a bit once you started talking… I found that really helpful… they brought things out you’d keep deep down in you”**CR Staff delivery of group MCT**: I was hung up about standing up like at AA… it wasn’t like that… it was alright because the cardiac rehab nurses I knew anyway, it wasn’t like talking to a stranger… so it wasn’t a big issue talking in the group… they care about you out of therapy anyway… you could speak to them about anything**Patient experiences of using group MCT techniques**: Postponement, that’s a good thing… you think, ‘oh I can’t deal with that, I’m gonna deal with that next Thursday’… for me that works… you sort of hung that problem on a hook and you move on… and it doesn’t come back into your head I found’The thought comes into your head and then you let that worry you… they’re teaching you to control that… which I thought was a good thing, but I said to them… when I’ve sorted the house, when we’ve moved… once I’ve sorted my problems out I can see how that [Group- MCT] is gonna be miles more beneficiaL**Self-perceived changes as a result of group MCT: “**I just feel dead privileged that I can just like draw on it whenever I want… So it’s there and as long as I need it and I want to use it, which I will do… so it is not just six weeks, it’s kind of like life- changing for me” |
| Meredith *et al.* (2019) | Compositenarratives illustrated the emotional intensity of recovering from a cardiacevent and highlighted the value of CR to aid patients with reskilling andemotional support. In discussing our data, we emphasise the potential valueof emotional intelligent care provision, and the creation of an environmentthat encourages emotional disclosure. | **Surviving anxiety: ‘I mean physically I am ﬁne, but mentally I am struggling:** I was fearful, but now I feel like I am managing better. You know, you have a heart attack and they get you inand put a stent in you and it happens so quick, and then you’re at home again. Then they ask you to exercise,and you think, “are you CRAZY? I’ve just had a heart attack!” But it’s a supportive environment here, this hasbeen so useful”. “I just had no idea that anxiety could be so crippling. I mean physically I am ﬁne, but mentally I am struggling. I can’t believe how much the anxiety changes you, even to the extent that I can actually feel tingling down my arms!”I’ve learnt how to control it. I understand that fear is there for a reason, it’s the reason I got blue lighted into hospital, and for a good reason, it allowed me to seek treatment. I just didn’t know how to control it, andmanage it so that it wasn’t detrimental to my health. It got to the point where my anxiety wasn’t saving meanymore; it was actually putting me in a dark place – not killing me, but deﬁnitely stopping me live**Putting on a brave face: ‘I think feeling ill is an indication of weakness. It’s like the runt in a litter of dogs, and the weak one doesn’t survive:** He was just so closed! He seemed almost rude and aggressive, he had such a bad attitude. But I think it’s really because of his insecurities and his fear; you know people don’t know what to expect. He’s probably got a lot on his mind. I could see him trying to hold back tears at one point. I see it quite a lot; it’s like the grieving process after a heart attack. At the beginning they’re often in denial –“this hasn’t happened to me”–and then they start going through the whole, “I can accept it” stage, and thenthey’re sad about it, and then they come to the, “I have to deal with it” stage.**An inspiration: ‘It’s having that sense of humour and positive mind set’**: Yeah I felt the same when I was going through this. It’s like treading on egg shells after you’ve had a heartattack. I just wasn’t sure how much I could do, you know, you don’t want to break the shells. But coming hereI found that I could do a lot more than I thought.June shared positively. Yeah exactly, and I am deﬁnitely doing a lot more than I was. I’m not going to let it beat me; I don’t want to be a cardiac cripple! Emotionally it’s very tiring, because the other pains I have are constant. But it’s all about having a sense of humour! |
| Mitchel *et al.* (1999) | Individuals who consistently participated in a cardiac exercise program did not usestrategies to overcome barriers; rather, in their quest to survive,they used strategies to ensure their participation in the program.  | Barriers to participation were refined into three groups. The first group comprised physical limitations. Subjects identified medication side effects, fear of heart transplant rejection, arthritis, and residual effects from a cardiovascular accident as factors that limited the intensity of their exercise. The second group of barriers had to do with sense of self. The subjects' comments included the following: “I'm shy and entering a new group was difficult,” “I'm basically just lazy,” and “I didn't have anything to wear.” The third group of perceived barriers focused on financial concerns. Financial constraints can have a great influence on attendance and adherence with cardiac rehabilitation programs. Two of the subjects were employed full time, one subject was employed part time, and three of the subjects were retired.The subjects were asked, “What barriers did you overcome in order to participate in the exercise program?” All six subjects responded that they did not have to overcome any barriers. One individual stated, “I'll do whatever I have to do so I never go through another heart attack again.”**They reported that activity was essential to their good physical and mental health, increased energy level, and improved flexibility**.**Strategies:** In response to the question, “What have you changed in your life in order to participate in the program?” all subjects indicated that they had to make a lifestyle change after their cardiac event, and joining the exercise class was the easiest change to make. One subject indicated that the cardiologist made the referral to the rehabilitation program (the subject also stated that the doctor did not give him a choice). Other strategies the six identified were using compensation time and changing schedules at work, budgeting money for the class fee each month, and “getting up earlier.”**Importance of exercise:** The importance of exercise was rated high by all subjects, that people consistently reported a sense of well-being as a direct benefit of engaging in exercise. Each of the six subjects stressed that being active was of key importance to them. They reported that activity was essential to their good physical and mental health, increased energy level, and improved flexibility. One subject reported, “I feel better now than I ever did before.” Another subject reported that she had had 90% coronary artery closure at the time of her MI and “now my heart is normal after 4 years of exercise.”All six subjects stated they would not exercise on their own if they were given that option. The cardiac exercise class provided the opportunity, not only for physical training, but also for sociability. As one person said, “I've made a lot of friends here and that's what keeps me coming back.” Each subject expressed that the sense of camaraderie they felt in the exercise program was a major motivating factor in their participation.Subjects were asked what they thought would happen if they stopped exercising. One answered, “I'd rather not contemplate it.” Another individual stated, “I have a sincere appreciation for the individuals who saved my life. I owe them.” The subjects' overall consensus was they would become sedentary, gain weight, and risk having another cardiac event if they did not remain active. |
| Nadarajah *et al.* (2017) | Three themes emerged from the data. The first was “choosing life over death,” where participants discussedhow they made a decision to improve their health. The second theme was “learning to live a new self,” where participantsdescribed the changes they had to make in order to improve their health. The third theme was “a life-transformingcardiac event” where participants shared how the cardiac event had changed their life. | **Choosing life over death.** The theme “Choosing life over death” describes an increased awareness of mortality thatled individuals to make improving their health a priority. After participants were stabilized medically from theiracute cardiac event, they began processing and reflecting on their experience, ultimately deciding that they wantedto live. The majority of participants decided to make important changes while they were still in the hospitalafter the cardiac event. One participant explained this process by stating “Life. Choosing life over death.Really, it becomes that simple… Life and death is a really good**Learning to live a new self:** You see a lot of people who are a lot older than I am who have been doing this for some number of years and that leads you [to] think that, ‘well, of course, everybody dies eventually, but it’s not imminent.’I can just kind of almost take myself on a little meditation [during a walk in the park] and I went so far as to put anaddition on my house that is all windows so that I can look out into the green because I find greens and blues very calming. After completion of phase two CR, some participants had difficulty overcoming previous lifestyle problemsbecause of lifestyle barriers, such as inconsistent dieting and exercise. One of the employed men reported, “I’mpretty good now on other [exercise] metrics but the meeting and the snacks, and the food just kills me. Idon’t have the willpower to push it away.” Most participants participated in exercise programs, for example, but many had difficulty with making healthy diet changes. Some participants were anxious and depressed becauseof concern over their inability to exercise, and therefore decided to participate in phase three CR. Almost all persons were worried about having Another cardiac event: “[The] hardest part to Live with… [is] knowi it’s going to happen again.” Most individuals were worried about family security, as One participant explained, “I Have a 22-year-old son, and I have a wife and all that kind of stuff, so you worry about your mortality.” In addition, some worried about finances, specifically about making less money after their cardiac event and spending more money for medications, out-of-pocket phase three CR, and losing life insurance. Despite the negative emotions after their cardiac event, participants adopted a more positive outlook on their lives, regardless of challenging life circumstances. One of the men explained it like this, I think attitude is key. I think it really is important to have a good attitude, and I think that sets the stage for a lot of positives in terms of trying to deal with the challenges that a heart attack or a critical illness might bring.**A life transforming cardiac event.** But, a lot of this is also, you know, post-heart attack. I use it. People say, “What are you doing?” I said, ‘I am doing what I However, not think is important.’ You know, and it is like, okay, they [my work administrator] are afraid to push me. So, I use it … You can always blame your heart. Then they back off, Oh yeah, yeah. ‘Your health comes first.’ Because I went on this diet, I have an excuse to say to some of my friends [at a previous job], ‘I don’t want to go to lunch every week.’ I go to exercise Monday, Wednesday, Friday, and I am in here [CR] from 11 am to 1 pm. Some of the things I was doing with them were not stimulating. They were just time consuming. Whereas it was like – this sort of gave me an excuse to back out of some of those relationships or to keepthem down real low. |
| Nicolai et al., 2018 | The data revealed that lifestyle changes following AMI are influenced by acombination of individual (physical and psychological) and social factors that can be grouped intofacilitators and barriers. The interviews indicated the need for more personalised informationregarding the causes and risk factors of illness, the benefits of lifestyle changes and the importanceof including significant others in lifestyle advice and education and of individualising support. | acilitator: Positive physical feedback and Barrier:Physical impairments and comorbidities. Most ofthe interviewees stated that they monitoredphysiological processes and that positivephysical feedback led to increased selfconﬁdenceand increased motivation tomaintain changes. However, physicalimpairments and comorbidities were oftenmentioned as limiting factors and barriers tolifestyle changes, particularly with respect tophysical activity. Those interviewees whoreported considerable physical impairmentsand comorbidities often mentioned lifestylechanges in the manner of ‘I would liketo ...but I can’t’**Psychological factors**:All the participants indicatedthat they were surprised by the diagnosisof a heart attack. Most of theinterviewees described being in shock afterhearing the diagnosis and felt they ﬁrstneeded to address the complex emotions(i.e., happiness regarding survival, sadness,anxiety) that the diagnosis evoked. Afterthat, many of the participants expressed thatthey engaged in a self-reﬂection processaimed at ﬁnding meaning in the AMI.Viewing their heart attack as a chroniccondition enhanced the interviewees’ readinessto implement lifestyle changes. Some ofthe participants experienced having a heartattack as a ‘warning shot’ and as receiving asecond chance. Accordingly, the participantswho reported lifestyle changes notedthat they reappraised their life domains,reviewed their lives and re-evaluated andchanged their priorities.**Self-motivation and self-discipline:** have a heart rate monitor, and I always look for it when I get out of breath, so that I regulate breathing again using the breathing technique and take a break when I notice that it doesn’t work, when I notice that I can’t breathe anymore, simply taking a break**Facilitator: Social support.** Support from family, friends and neighbours was frequently cited as beneﬁcial to our interviewees’ eﬀorts to adopt healthy lifestyles. Most of the interviewees stressed the importance of instrumental support from family and friends. Emotional support from family and friends was also mentioned as a source ofcomfort. It ranged from the mere presence of family and friends via emotional counselling to mutual activities. This support was important because it conveyed feelings of safety and facilitated a return to normalcy. Because recently fears came up once again (...) And knowing that I am not alone is giving me a sense of security.Most of the participants indicated that stress was a major factor in having a heart attack. However, the CR attendees stated that stress-reduction programmes were frequently misdirected and therefore not transferrableto their daily life. Simply to get of that image... the image that smokers are themselves to blame if they There are so many situations (...) where I get excited, ﬂy into a rage, where everything gets out of control. But I can’t come along, position myself and do yoga or stuﬀ like that. |
| Pietrabissa et al,(2015) | By the use of MI principles and techniques, the patient reported anincrease in his motivation and ability to change, developing a post discharge plan thatincorporates self-care behaviours. | Lack of physical activity and poor diet had led him to progressive weight gain and experiencing signiﬁcant daily life diﬃculties. Giorgio was perfectly aware that his behavior was counter-productive for his health status, but he stated he simply could not do otherwise. Reﬂectively listening, the therapist started focusing on engaging the patient, building interest in change, and eliciting willingness to implement self-care behaviors. have gradually gained weight not realizing it and now... 4 months ago, I have started to think about everything. And I have to change.” (Change talk Need). Rather than focusing on the negative experiences of his failure When a person is ambivalent about changing behavior, it is in following the care plan, the practitioner continued exploring Giorgio’s goals and values. Apart from his own health status, his main motivation for changing were his wife and three children. o get back to a healthier status and spend more time with my children. During the previous week, something had changed within the patient’s mind. In fact, for the first time, he felt the need to completely open up to the therapist, revealing the real and intimate reason that has led him to stop taking care of himself. Giorgio had never verbally expressed it before, with an obvious liberating effect. The basic emotion sustaining the problem is the fear, to which an important guilt is linked (“I’m afraid of getting back to being fit, then eventually relapsing back into the problem”).The encounter proceeded exploring any additional worries of the patient. Despite presenting realistic concerns in mind regarding his health status, he expressed sincere need for well-being and clear goals. Regarding his health objectives, he formulated specific plans of action and showed realistic understanding of the time necessary to achieve lasting results (“I’m hopeful... I give myself a year and a half … I do not believe it would be enough time to get to the point I would like to reach. However, I do hope to get to the point of being 80% independent”).I was wondering, when a person continues to implement behaviors he knows being harmful for himself, for his health... There must be a reason.... Otherwise it’s torturous, a self-destruction, isn’t it? Must be some motives that lead you to act in this way. What do you think?” […] “Look, I hope to continue following the diet at home … and regarding my previous conduct, looking back … it was just a sort of self-destruction! That’s it!” |
| White et al (2010) | Patients tended to talk about the exercise component of cardiac rehabilitation and only talk about theinformation provision component when prompted, which suggested they viewed the programme as beingprimarily about exercise. They seemed to have little subsequent contact with health services, except routinesix-monthly check-ups for their coronary heart disease. Unmet information needs were common, especiallyabout medicines. Nevertheless, all patients reported continuing to take cardiac medicines, but tended to onlymaintain changes to aspects of lifestyle perceived as causes of coronary heart disease, rather than viewinglifestyle recommendations as standards to achieve. | **Perspectives on the CR programme**: .before I started to go on the rehab, exercise thing [CR programme]I suppose it was a fear in the back of your mind that you were frightened of doing something that’ll bring it on again. People I’ve had dealings with in the rehab group have always made it clear that they would be happy to see me again and talk things over with me if I ever needed to and the door has always been left open, which is nice. It’s reassuringwhen people are like that but I haven’t taken them up on it. The people I’ve had dealings with in the rehab group have always made it clear that they would be happy to see me again and talk things over with me if I ever needed to and the door has always been left open, which is nice. It’s reassuring when people are like that but I haven’t taken them up on it.**Perspectives on information received**: She said keep fat as low as possible. Well, you know, that was all the help we had. I mean we’ve been to the library and got low fat cookery books and things like that, but you don’t know whether you’re doing right or wrong. **Perspectives on lifestyle modiﬁcation**: 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. 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.**Perspectives on information received**: She said keep fat as low as possible. Well, you know, that was all the help we had. I mean we’ve been to the library and got low fat cookery books and things like that, but you don’t know whether you’re doing right or wrong.  |
| White et al (2011) | Results: Patients tended to only make and maintain dietary changes if they perceivedtheir diet to be a cause of their CHD. The only dietary changes patientsreported involved ‘cutting things out’ of their diet; patients did not make dietarychanges if they considered that they did not need to ‘cut things out’. | **Cutting things out’**: making dietary changes, most patients explicitly talked about dietary changes they had made but only in terms of ‘cutting things out’ of their diet, and appeared to perceive that their diet had been a cause of their heart attack. For example, one patient reported ‘trying to cut out fatty foods’, one patient said that he had ‘certainly cut down on a lot of things’, whereas another said: ‘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.’ (R15: male) One patient talked about reducing his ‘fat intake a lot’ to reduce his cholesterol, which he perceived to be a cause of his heart attack. Two patients talked about speciﬁc foods they had ‘cut out’ of their diet but in terms of being ‘bad’ foods or foods they ‘can’t have’. One of these patients talked about enjoying ‘soft cheese and things that are bad for me’ and added, ‘now I only eat it occasionally, not much’. She said ‘it was a contributory factor thatI smoked and I’m overweight’, whereas the other patient said: ‘… I didn’t realise what damage some of the stuff were doing to you … I love cheese and I love fryups. I don’t have them any more. I don’t have sugar … Chocolate I can’t have and … Oh yes, and ﬁsh and chips**Maintaining dietary changes** In the follow-up interviews, some patients appeared to have maintained the dietary changes that they said they had made by the time of the initial interview. For example, one patient said ‘I really do watch what I eat whereas another said that, as a result of the changes he had made, ‘we don’t really have a bad diet, we don’t eat fat stuff’. In addition, another patient (who only implied that he had changed his diet in the initial interview) said that he had lost ‘over a stone’ as a result of an ‘enforced salad diet’ and had ‘cut a lot of stuff out’. ‘I got another episode in my leg [of cellulitis] and I thought you can’t sort of sit and not eat anything!’**Not making dietary changes**: not needing to ‘cut things out’ By contrast, in the initial interviews, two patients explained why they had not made dietary changes but did so in terms of not needing to ‘cut things out’ of their diet, and did not perceive that their diet had been a cause of their heart attack. One of these patients said, ‘diet has never been a problem because I always enjoy what happens to be good for me’, whereas the other patient said: I don’t think my diet is all that bad; I’ve not been to McDonalds or had takeaways … I have very little cooked in fat or lard or grease or anything like that … I’m not exactly overweight … I don’t stuff myself with fried egg and bacon and things like that. I have them occasionally but I don’t eat them on a daily basis. I don’t eat things like beef burgers or stuff like that. |
| Wong *et al.(2016)* | Two themes were identified: (1) informant attitude (perception,affection, and practice) toward the OCRP and (2) Exercise Behavior– intention, maintenance and its related factors. Most informantsshowed positive perception and affection regarding the outpatientrehabilitation program, leading to regular practice of exercise inthe program and at home. Peer, group dynamic, social support andChinese culture influences on exercise behavior may serve as majorfacilitators to maintain exercise behavior. | Perception toward OCRP differed among CHD patients. All informants generally regarded OCRP as an essential part of the therapeutic schedule. They expected that exercise schedule embedded in OCRP was useful for their recovery, and regular exercise would be a positive health behavior that they should keep doing even upon OCRP completion. On the one hand, participants claimed that they should keep the exercise habit as prescribed in the OCRP. On the other hand, 41% claimed that they may not have time to exercise as scheduled because of work commitment. Two informants related their experience as follows: The OCRP was very useful, and I lost some weight and felt stronger in my leg muscles. Exercise is good for my health, especially for my heart … I think it can help me to resume my health and I can go to work again after completion of the program …. (Informant 2 who completed the OCRP) As I expected, the OCRP was useful and trained my arm and leg muscle stronger. However, I start to regain my work gradually from next week and therefore I may miss one or two sessions per week in the remaining class. Anyway, I tried my best to attend all if possible …. (Informant 5 who had completed half of the OCRP class) Affection associated with OCRP CHD patients shared positive and affirmative affections toward OCRP. In general, all the CHD patients strongly agreed that the role of OCRP was aligned with their personal xpectations that the rehabilitation class can assist them to resume an improved life as normal as possible or because they expressed feelings of wanting to take good care of theirhealth. An informant shared her experience as follows: I liked OCRP exercise. It built up my exercise habit. In the CR center, I feel very safe for taking exercise. The nurses and physiotherapist can guide me and provide support if I feel discomfort during exercise. The content of CR program is useful for daily life such as stress managementand diet advises … I hope that I can resume my usual activities as before …. (Informant 10) OCRP class is important to me and I want to complete it in order to strengthen my body again. I want to resume my normal work again …. (Informant 14 whose age was 50 years old and completed PCI two months ago) Some of the CHD patients were motivated to perform more OCRP exercises, with one saying: I am not very diligent with exercising. In the OCRP, doctors motivated me a lot to exercise even though I felt a bit tired after that … I think I will complete the class …. (Informant 6) OCRP practice CHD patients exhibited various experiences of practicing OCRP. Followed the guidelines, whereas 41% (n = 9) created their own CR plans and only attended selected sessions. The good practices of CHD patients included adherence to the OCRP organized by rehabilitation centers, participation in a variety of lectures related to CR and development of individual CR plans according to comprehensive assessments conducted by nurses, therapists and social workers. One informant summarized the affection toward OCRP and ways for further maintenance of exercise behavior as follows: I tried to search for ways to support my exercise habit. Luckily, the CR center nurse suggests a plan for me, in which I could set my goals, achieve my goal and record my achievements. The CR center provides an easy-to-follow schedule of exercise, so I keep on following the assigned tasks. Eventually, I could form a habit of walking exercise daily …. (Informant 5) Theme 2: Exercise behavior intention, maintenance, and its related factors We analyzed the patients’ responses regarding their beliefs related to factors affecting their intention and maintenance for exercise habit to determine how they maintain their behavioral habits. Informants shared their experience about the factors affecting exercise behavior intention and maintenance. Peer, group dynamic and social supportIn this study, support from family, friends and colleagues was found to be important for CHD patients in maintaining exercise behavior. Five patients (23%) mentioned that exercise together with group dynamic was particularly important for long-term exercise engage- ment. In addition, four participants (18%) claimed that their spouses supported them well through verbal reminder and even accompanied them to join the daily exercises. Three selected informants related their experience as follows: Exercise peers in OCRP are important for me to keep joining until completion of the OCRP class. I like to meet them every week … Sometimes, if I feel lazy, my friends will remind me to keep it up. Now we always meet and join some other low level hiking activities together … Walking together is fun and we can talk about everything when we walk …. (Informant 20)My boss is very kind to me. He helped me change the job nature and offered me sufficient time to exercise after work. At the beginning, I am a bit worry of my rehabilitation program will disturb my work, but my colleagues showed understanding and empathy … I am happy that I don’t create much problem in my work due to my health problem … I want to keep working to support my family. (Informant 8)My family is very supportive … My wife encourages me a lot. She reminds me to adhere to healthy diet and exercise maintenance. She walks with me every day …. (Informant 9 who completed the OCRP class 1 month ago) |

**Supplementary File 8:** **Themes and Categories**

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|  Synthesised Finding  |
| Studies  | Physical health  | Social functioning  | Mental and emotional health  |
| Clark *et al.* (2005) | 🗸 | 🗸 | 🗸 |
| Dechaine *et al.* (2018) |  |  |  |
| Joker *et al.* (2017) | 🗸 |  | 🗸 |
| Mead et al. (2010) |  |  | 🗸 |
| McPhillips et al. (2021) |  |  | 🗸 |
| Meredith *et al.* (2019) |  | 🗸 | 🗸 |
| Mitchel *et al.* (1999) | 🗸 | 🗸 |  |
| Nadarajah *et al.* (2017) | 🗸 |  |  |
| Nicolai et al., 2018 | 🗸 |  |  |
| Pietrabissa et al,(2015 |  |  | 🗸 |
| White et al (2011) | 🗸 |  |  |
| White et al (2010) | 🗸 |  |  |
| Wong *et al.(2016)* | 🗸  | 🗸 |  |