Protocol for Mapping Review of factors which facilitate or impede engagement (commencement and continuation) with Pulmonary and Cardiac Rehabilitation

Registration

The following protocol is eligible for inclusion in the PROSPERO registry and will be deposited in that registry as soon as it has been finalised with the Department of Health and Social Care and the NIHR HS&DR Programme Administration.

Protocol authors:

Andrew Booth, ScHARR. School of Health and Related Research (ScHARR), Regent Court, Regent Street, The University of Sheffield, S1 4DA. a.booth@sheffield.ac.uk

Lindsay Blank l.blank@sheffield.ac.uk

Anna Cantrell, ScHARR. a.j.cantrell@sheffield.ac.uk

Katie Sworn, ScHARR. k.sworn@sheffield.ac.uk

Duncan Chambers, ScHARR. d.chambers@sheffield.ac.uk

Elizabeth Goyder, ScHARR. e.goyder@sheffield.ac.uk

Contributions: Andrew Booth is methodological adviser to the project and wrote the first draft of the protocol. All other authors provided significant intellectual input and approved the submitted version. As Co-Director of the NIHR HS&DR Evidence Synthesis Centre, Andrew Booth functions as the guarantor of the review.

Amendments: This draft protocol will remain a working document throughout the course of the research and will be amended in agreement with the funders as required.

Support: Funded by the NIHR HS&DR Programme.

Role of sponsor or funder

This review is funded by the NIHR HS&DR under their Evidence Synthesis Centre Sheffield contract. This protocol was developed and the work undertaken in conjunction with the Department of Health and Social Care, specifically relating to the NHS England and NHS Improvement (NHSEI) NHS @home initiative.

INTRODUCTION

Rationale

Cardiac and pulmonary rehabilitation programmes vary but usually consist of the key components of exercise, education, relaxation, and emotional support. There is a considerable body of systematic review evidence considering the effectiveness of rehabilitation programmes on clinical outcomes (e.g. Joshi et al. 2021, Li et al. 2019), comparing one mode of delivery with another e.g. community versus centre based rehabilitation (Anderson et al. 2017), or considering the relative effectiveness of rehabilitation using new technologies (Chong et al. 2021).

However, much less is known about what is effective in terms of engaging patients in rehabilitation and sustaining that engagement over time (Jahandideh et al. 2018).Therefore, despite increasing awareness of the factors which influence engaging with and sustaining rehabilitation - including those related to environment, knowledge, attitudes and behaviours (Cox et al. 2017), a lack of understanding of these factors (particularly in relation to differential effects for different populations) continues to impact on implementation of rehabilitation programmes (Jones 2017). There is a need to map the evidence across both pulmonary and cardiac rehabilitation to understand full range of potential intervention strategies; as existing reviews tend to be specific to a patient group, and do not focus on understanding what might work for populations with lower uptake (Early et al. 2018).

Our review seeks to understand not only the factors that impede or facilitate engagement (commencement or continuation) in rehabilitation, but also what interventions exist to address these specific factors and whether they have been shown to be effective in increasing access to, and continued engagement in rehabilitation; particularly for those patients at greater risk of not accessing services.

Objectives

The review will address three related sub-questions;

- What are the factors that impede or facilitate engagement (commencement or continuation) in rehabilitation by patients with heart disease or chronic lung disease?
- Which intervention components, evaluated or innovative, have been proposed to increase engagement in rehabilitation and which factors do they propose to address?
- What evidence is there for the effectiveness of such interventions as documented at a review level?

An important sub-text of these questions relates to health inequalities and differential uptake. Evidence suggests that inequalities that are already present are further exacerbated due to intrinsic features of rehabilitation programmes.

The PerSPECTiF (Booth et al. 2019) formulation for these questions is as follows:

Perspective	Setting	Phenomenon of Interest	Environment	Comparison	Timing	Findings
Patients Clinicians Institution	Home or Hospital	Cardiac[1] or Pulmonary Rehabilitation[2]	UK NHS	Ethnic Minorities	Commencement/ Initiation or Continuation / Maintenance	Acceptability
		Intervention components in Rehabilitation[1, 2]		Other components		Appropriateness
		Interventions		Different population groups	Upon completion of intervention	Effectiveness

1. British Thoracic Society 2001. 2. BACPR 2017.

METHODS

Eligibility criteria

For inclusion, reviews should report factors identified from a UK context, whether separately or within a wider systematic review. To be included in the mapping review the review should report a systematic review with a recognisable degree of systematicity. All included reviews will have been published within the last five years (2017-2022) and they will include a minimum of one UK-based study. Where possible UK-specific data will be identifiable upon extraction and subsequent presentation. Where UK specific data cannot be disaggregated, reviews will be considered for inclusion on a case by case basis and in considering the number of UK focused reviews identified.

For inclusion a review will report:

- Cardiac or pulmonary rehabilitation
- Rehabilitation in any context. Rehabilitation is defined as "*a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment*" (WHO 2021).
- Factors affecting commencement, continuation or completion of rehabilitation, including self-referral into rehabilitation, or an intervention that aims to increase the commencement, continuation of completion of rehabilitation
- Reviews published within the last five years

Reviews which focus on the effectiveness of rehabilitation, or compare modes of rehabilitation (e.g. physical activity versus other), or location of rehabilitation (e.g. community versus hospital) will be considered to be outside the scope of this review.

Information sources

The rapid timeframe pursued by the team requires a focus on electronic databases. However the focus on UK developments will also allow the inclusion of recent initiatives

that are not reported in the peer reviewed literature. Sources of recent initiatives may include the databases of the King's Fund, Health Services Management Centre, alongside brief internet based searches.

Search strategy

We propose to conduct a single search process to retrieve both reviews of effectiveness (i.e. quantitative) and of factors impacting upon engagement (i.e. qualitative). Sources will include specific resources that focus on systematic reviews and other systematically conducted reviews (e.g. scoping and mapping reviews) and general resources where systematic reviewsfilters may be run against search results. As this project is conceived as a rapid review we will restrict the databases searched according to best evidence on database coverage. Using Embase as a supplement to PubMed covers 78% of publications and 88% of Cochrane-eligible effectiveness studies (Frandsen et al. 2021). Similarly, a combination of PubMed and CINAHL (two commonly recommended databases for qualitative reviews) retrieves 82% of the publications (Frandsen et al. 2019).

Review-Specific Sources	**General databases**
Cochrane Library	EMBASE
Epistemonikos	MEDLINE
	CINAHL

We will privilege the main subject headings for the two focal topics of interest:

Cardiac Rehabilitation [MESH]

and

Lung Diseases / rehabilitation* OR Pulmonary Disease, Chronic Obstructive / rehabilitation

The rationale for this is (i) reviews are more likely to be indexed with main subject headings and (ii) the focus on qualitative aspects and overall effectiveness is less likely to match to granular subject headings. There are no validated search filters for Cardiac or Pulmonary Rehabilitation. Filters or Publication types will be used to retrieve references to review publications. We will not explore complex and extensive subject trees relating to specific aspects of rehabilitation delivery.

A draft search strategy constructed for Ovid MEDLINE is included as an Appendix. Records will be managed in Endnote and a database of included studies with selection decisions will be available on completion of the project.

Study selection will be undertaken independently by two reviewers. Following piloting of a test set they will each screen half of the records for eligible reviews. In cases of uncertainty each will cross refer to their associate reviewer. In accordance with the Cochrane Rapid Review guidelines a sample of 20% of records will be screened for validation of inclusion decisions.

A "light touch" data extraction process will be undertaken. This will include review characteristics, number of included studies and proportion of UK studies. Top level themes will be extracted for the qualitative syntheses and a summary of results/outcomes will be extracted from the abstracts of included quantitative reviews.

Interventions will be characterised using a version of TiDIER-Lite (Chambers et al. 2020) as pioneered by the team, using descriptive data from study characteristics. Extraction will be undertaken using purpose-designed forms. A sample of forms will be checked by a second reviewer.

Data items

Qualitative Syntheses	**Reviews**	**Reviews of Reviews**
• Factors facilitating commencement • Factors impeding commencement • Factors facilitating completion • Factors impeding completion *Differences by PROGRESS-plus variables*	TiDIER-LITE: • What • By Whom? • Where? • To what intensity? • How often? *Differences by PROGRESS-plus variables*	Summary of effectiveness (not synthesised, just aggregated: • Outcome Measures • Direction of Effect • Strength of Effect *Differences by PROGRESS-plus variables*

Outcomes and prioritization

Data will include both programme outcomes (e.g. completion of the programme, rates of withdrawal or dropout etc, satisfaction) and clinical outcomes. The results of primary outcomes of interest will be presented. However, other relevant outcomes will be mapped as part of the analysis of reviews. Data on the characteristics of participants upon initiation (demographic and clinical characteristics) will be a particular focus of data presentation.

The NHSEI team have prioritised intervention components of specific relevance to their own programmes. This list comprises, but is not restricted to:

- Case finding
- Waiting list prioritisation
- Streamlining the care pathway (especially through use of technologies[1])
- Self-monitoring
- Supported self-management
- Self management
- Self management education
- Health Coaches/Motivational coaching
- Peer support
- Acquisition of Knowledge, Skills and Confidence

[1] Technologies for the managing the pathway NOT for delivering the rehabilitation.

- Patient activation
- Use of digital tools
- Remote monitoring
- Shared decision making
- Health literacy

Risk of bias in individual studies

Given that the purpose of the mapping exercise is to describe factors identified as important in connection with engagement, no quality assessment will be required for the qualitative reviews. The quality of the quantitative reviews will be briefly summarised, based on the aggregative quality of the included studies. Quality assessment of the included reviews will not be undertaken except as a way of reconciling conflicting evidence to facilitate interpretation.

Data synthesis

Data synthesised from quantitative studies will be determined by the reporting characteristics of the included reviews. Interventions will be tabulated alongside the summary results of included reviews.

Qualitative data will take the form of themes. We will follow innovative methods of mega-aggregation, used with reviews of qualitative syntheses (reviews of reviews), recently profiled in the synthesis methods literature (Hendricks et al. 2021) and subsequently used by team members for WHO-sponsored work. These will be reduced to a parsimonious model based on a process of reciprocal translation. Identified themes will be compared with existing conceptual models in order to establish completeness.

Formal subgroup analyses will not be undertaken, However, the review team will code studies against ethnic minority composition and any other salient features from the PROGRESS-Plus classification (O'Neill et al. 2014). Studies or study populations meeting these features will be separately analysed and reported in comparison to the characteristics and results for a non-specific population.

The rapid characteristics of this review prohibit formal analysis of meta-biases as they relate to aspects of reporting and publication bias. However, the review will include published and formally evaluated projects and programmes together with recent initiatives awaiting evaluation. In particular, the team will seek to prevent innovation bias – the unconscious favouring of new initiatives that have not undergone formal evaluation.

In order to identify recent initiatives awaiting analysis, a three day desk based research task will be assigned towards completion of the review. The intention will be to ensure that the review is contemporary and captures service innovation. Sources may include the databases of the King's Fund, Health Services Management Centre alongside brief internet searches.

There is no formal requirement to complete GRADE or GRADE-CERQual assessments of the strength of evidence as recommendations will not be made. The focus will be on presenting a descriptive map of factors, intervention components and intervention effects.

Outputs and Timescale

The output will be a map of factors identified as important to commencement or continuation of rehabilitation, specifically cardiac or pulmonary rehabilitation but with some take home wider lessons, where identified. This will be accompanied by some brief intervention profiles -as defined by TiDiER-Lite (Chambers et al. 2020) and a summary of the most authoritative current review evidence underpinning each intervention.

Importantly, the review will be completed in 3 months (by Friday 29th April). This timescale will inform and direct any suggested methodological shortcuts, together with the ramifications of those shortcuts for confidence in review findings and completeness.

Proposed review timetable (12 weeks):

Week beginning	7 Feb	14 Feb	21 Feb	28 Feb	7 Mar	14 Mar	21 Mar	28 Mar	4 Apr	11 Apr	18 Apr	25 Apr	2 May plus
Draft protocol agreement													
Database searches													
Database sifting and study selection													
Data extraction													
Synthesis and mapping of factors													
Identification of recent initiatives													
Write up, internal review and PPI													
Delivery of outputs to funder													
Dissemination													
Progress meetings													

References

Anderson L, Sharp GA, Norton RJ, Dalal H, Dean SG, Jolly K, Cowie A, Zawada A, Taylor RS. Home-based versus centre-based cardiac rehabilitation. Cochrane Database Syst Rev. 2017 Jun 30;6(6):CD007130. doi: 10.1002/14651858.CD007130.pub4. PMID: 28665511; PMCID: PMC6481471.

British British Thoracic Society (2001). Pulmonary rehabilitation. Thorax 2001;56:827–834

Booth, A., Noyes, J., Flemming, K., Moore, G., Tunçalp, Ö., & Shakibazadeh, E. (2019). Formulating questions to explore complex interventions within qualitative evidence synthesis. BMJ global health, 4(Suppl 1), e001107.

Chambers D, Cantrell A, Booth A. Implementation of interventions to reduce preventable hospital admissions for cardiovascular or respiratory conditions: an evidence map and realist synthesis. Southampton (UK): NIHR Journals Library; 2020 Jan. PMID: 31927819.

Chong MS, Sit JWH, Karthikesu K, Chair SY. Effectiveness of technology-assisted cardiac rehabilitation: A systematic review and meta-analysis. Int J Nurs Stud. 2021 Dec;124:104087. doi: 10.1016/j.ijnurstu.2021.104087. Epub 2021 Sep 5. PMID: 34562846.

Cox, N. S., Oliveira, C. C., Lahham, A., & Holland, A. E. (2017). Pulmonary rehabilitation referral and participation are commonly influenced by environment, knowledge, and beliefs about consequences: a systematic review using the Theoretical Domains Framework. Journal of Physiotherapy, 63(2), 84-93. https://doi.org/10.1016/j.jphys.2017.02.002

Early F, Wellwood I, Kuhn I, Deaton C, Fuld J. Interventions to increase referral and uptake to pulmonary rehabilitation in people with COPD: a systematic review. International journal of chronic obstructive pulmonary disease. 2018;13:3571

Frandsen TF, Eriksen MB, Hammer DMG, Christensen JB, Wallin JA. Using Embase as a supplement to PubMed in Cochrane reviews differed across fields. J Clin Epidemiol. 2021 May;133:24-31. doi: 10.1016/j.jclinepi.2020.12.022.

Frandsen TF, Gildberg FA, Tingleff EB. Searching for qualitative health research required several databases and alternative search strategies: a study of coverage in bibliographic databases. Journal of Clinical Epidemiology; 2019 Oct;114:118–24. Available from: http://dx.doi.org/10.1016/j.jclinepi.2019.06.013

Hendricks L, Eshun-Wilson I, Rohwer A. A mega-aggregation framework synthesis of the barriers and facilitators to linkage, adherence to ART and retention in care among people living with HIV. Syst Rev. 2021 Feb 11;10(1):54. doi: 10.1186/s13643-021-01582-z.

Jahandideh, S., Kendall, E., Low-Choy, S., Donald, K., & Jayasinghe, R. (2018). The process of patient engagement in cardiac rehabilitation: A model-centric systematic review. Behaviour Change, 35(4), 185-202.

Jones AW, Taylor A, Gowler H, O'Kelly N, Ghosh S, Bridle C. Systematic review of interventions to improve patient uptake and completion of pulmonary rehabilitation in COPD. ERJ open research. 2017 Jan 1;3(1).

Joshi VL, Christensen J, Lejsgaard E, Taylor RS, Zwisler AD, Tang LH. Effectiveness of rehabilitation interventions on the secondary consequences of surviving a cardiac arrest: a systematic review and meta-analysis. BMJ Open. 2021 Sep 2;11(9):e047251. doi: 10.1136/bmjopen-2020-047251. PMID: 34475160; PMCID: PMC8413927.

Li W, Pu Y, Meng A, Zhi X, Xu G. Effectiveness of pulmonary rehabilitation in elderly patients with COPD: a systematic review and meta-analysis of randomized controlled trials. International journal of nursing practice. 2019 Oct;25(5):e12745.

O'Neill J, Tabish H, Welch V, Petticrew M, Pottie K, Clarke M, Evans T, Pardo Pardo J, Waters E, White H, Tugwell P. Applying an equity lens to interventions: using PROGRESS ensures consideration of socially stratifying factors to illuminate inequities in health. Journal of Clinical Epidemiology. 2014, 67 (1), pg. 56-64. doi:10.1016/j.jclinepi.2013.08.005

Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015 Jan 2;349(jan02 1):g7647.

WHO 2021. Rehabilitation. Rehabilitation (wh https://www.who.int/news-room/fact-sheets/detail/rehabilitation o.int) Accessed 03.02.2022

Appendix: Medline Search Strategy

Database: Ovid MEDLINE(R) and Epub Ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <1946 to January 25, 2022>

Search Strategy:

---

1 Cardiac Rehabilitation/ (3199)

2 exp Pulmonary Disease, Chronic Obstructive/rh [Rehabilitation] (2586)

3 exp Lung Diseases/rh [Rehabilitation] (6270)

4 "cardiac rehab*".ab,ti. (7275)

5 "pulmonary rehab*".ab,ti. (4104)

6 or/1-5 (16470)

7 (engag* or participat* or involv* or attend* or contin* or commit* or maint* or adhere*).ab,ti. (5334012)

8 (uptake* or initiat* or referral* or self-referral* or recruit* or commenc* or inten*).ab,ti. (2619801)

9 (complet* or finish* or retention or "drop out*" or withdraw* or discontin*).ab,ti. (2110028)

10 (barrier* or facilitat* or imped*).ab,ti. (1011927)

11 or/7-10 (9073367)

12 6 and 11 (9016)

13 (MEDLINE or systematic review).tw. or meta analysis.pt. (352967)

14 ("Qualitative systematic review" or "qualitative systematic reviews" or "qualitative evidence synthesis" or "qualitative evidence syntheses" or "qualitative research synthesis" or "qualitative research syntheses" or "Qualitative synthesis" or "qualitative syntheses").ab,ti. (3606)

15 13 or 14 (353509)

16 12 and 15 (478)

17 limit 16 to english language (464)

18 limit 17 to yr="2017 - 2022" (269)

****

Search strings 1-3 are MeSH terms for cardiac and pulmonary rehabilitation

Search strings 4 and 5 are terms for cardiac and pulmonary rehabilitation searched for in the title and abstract

Search string 6 combines the terms for cardiac and pulmonary rehabilitation using OR

Search strings 7-10 are terms, searched for in the title and abstract, for factors affecting commencement, continuation or completion of rehabilitation

Search string 11 combines the above terms using OR

Search string 12 combines search strings 6 and 11 using AND to retrieve research on factors affecting commencement, continuation or completion of cardiac or pulmonary rehabilitation

Search string 13 is the reviews filter from McMaster University Health Information Research Unit that maximises sensitivity (https://hiru.mcmaster.ca/hiru/HIRU_Hedges_MEDLINE_Strategies.aspx)

Search string 14 are terms for qualitative systematic reviews using in other review and evidence syntheses by Information Specialists at ScHARR

Search string 15 combines the reviews and qualitative systematic reviews filters using OR

Search string 16 combines search string 12 and 15 using AND to retrieve reviews (including qualitative reviews) on factors affecting commencement, continuation or completion of rehabilitation

Search string 17 limits the search to English Language

Search string 18 limits the search to reviews from 2017-2022