# Maximising uptake of prehabilitation interventions: An agile scope of the secondary literature

Compiled by:

Hannah Shaw, Principal Evidence and Knowledge Analyst,

Claire Morgan, Senior Evidence and Knowledge Analyst,

Dr Kirsty Little, Consultant in Public Health, Public Health Wales

## Contents

## Introduction

Welsh Government stakeholders requested Public Health Wales Evidence Service undertake a search of the literature to establish what evidence exists around maximising uptake of prehabilitation interventions. A large number of systematic reviews and primary studies exist that examine post-operative clinical outcomes and effectiveness of prehabilitation interventions. However, stakeholders were keen to understand what factors influence people to take up prehabilitation interventions prior to surgery and how to maximise uptake. This scoping report provides an overview of the available evidence identified from robust secondary sources relating to maximising uptake of prehabilitation interventions. They include important factors to consider in any pilot or evaluation of these interventions.

The findings and conclusions included in this report are those of the source authors and not an interpretation by the Evidence Service. Factors relevant to answering the above question identified from the included systematic reviews have been extracted and briefly summarised. If a specific factor is of interest, it is advisable to read the sources from where they were taken in more detail. If utilising any reviews included in this scope to inform policy, it is important to consider the generalisability of their findings to your context.

The search undertaken for this scope is unlikely to have identified all evidence relating to this topic, as searches were not exhaustive and did not include primary studies, but instead focussed on identifying robust systematic reviews. The methodology used to produce this scoping report are outlined in Appendix A.

## Objective

To conduct a scoping review to identify factors that influence uptake in prehabilitation interventions. In particular, the following question was addressed:

- What evidence exists around maximising uptake of prehabilitation interventions?

## Key Messages

- No secondary evidence identified how to maximise uptake of prehabilitation
- The evidence highlights several components that influence patient uptake and engagement with prehabilitation interventions
- These appear to involve a complex interplay with individual components affecting multiple aspects of process factors (recruitment, participation, adherence and retention) and individual factors (motivation, acceptability and satisfaction) which act as both barriers and facilitators
- Common components acting as barriers to patient uptake and engagement with prehabilitation included:
    - **Time** (too busy/work commitments)
    - **Accessibility** (distance and time taken to travel)
    - **Setting of intervention** (hospital or home based)
    - **Health** (symptoms and side effects of current treatment)
- Components acting as facilitators to patient uptake and engagement with prehabilitation included:
    - Ability to **fit around everyday life** (flexibility)
    - **Locally accessible**
    - **Health** (perceived benefit to health and wellbeing)
    - **Support system** (colleagues/friends/ healthcare professionals, ability to track progress)
- Our search identified a lack of secondary evidence relating to how **ethnicity and age** may influence uptake and participation
- Our search identified a lack of secondary evidence relating to how **digital technology** may influence uptake and participation
- Our search identified a lack of secondary evidence relating to how **supervision** may influence uptake and participation
- Our search identified a lack of secondary evidence relating to uptake and participation among **orthopaedic surgical patients**
- The majority of evidence was identified from two reviews focussing on gynaecological cancer and colorectal cancer surgical patients
- We cannot tell if these barriers and facilitators would be generalisable to other types of prehabilitation interventions, surgical disciplines or patient groups not featured in the reviews.

## Definitions

“Prehabilitation” is a term describing interventions administered before surgery. They aim to improve health and fitness, thus reducing surgery-related morbidity,

complications and facilitate recovery. A number of different prehabilitation programmes exist, including: physical activity, nutritional support, smoking cessation, alcohol cessation, respiratory interventions, education and combined interventions (Perry et al., 2021).

The term "review" refers to any piece of evidence produced using systematic methodology (including critical appraisal) i.e., systematic reviews, scoping reviews, rapid reviews etc.

## Findings

Our searches failed to identify secondary evidence that directly investigated how to maximise uptake of prehabilitation. Therefore, we focussed on factors that may act as barriers and / or facilitators, influencing uptake and participation to prehabilitation. With this focus in mind, three systematic reviews (Cuijpers et al., 2022; Hijazi et al., 2017; Pouwells et al., 2015), one umbrella review of systematic reviews (McIsaac et al., 2022) and one scoping review (Saggu et al., 2022) were identified. Details of these are outlined in Appendix B which can be accessed here. The factors highlighted in this report may help policy makers to understand why people do or do not take up or participate in prehabilitation and take these into account when designing prehabilitation programmes.

The included reviews aimed to identify evidence relating to different aspects of prehabilitation interventions, including the composition of prehabilitation programmes, improving health, experience or cost and the effects of preoperative exercise therapy. A single scoping review collated research evidence on multimodal prehabilitation in gynaecological cancers and the related barriers and facilitators to engagement and delivery that should be considered when designing a prehabilitation intervention for this group of women (Saggu et al., 2022). Populations of interest among the included systematic reviews included patients' awaiting a range of surgical disciplines including colorectal cancer surgery, major abdominal cancer surgery, lung surgery and gynaecological cancer surgery. Two systematic reviews were specific to exercise prehabilitation interventions (Cuijpers et al., 2022; Pouwell et al., 2015), one scoping review focussed on multimodal interventions (Saggu et al., 2022), and the remaining two reviews including a mix of prehabilitation interventions (Hijazi et al., 2017; McIsaac et al., 2022). Most of the factors identified were derived from two reviews focussing on colorectal and gynaecological cancer patients (Cuijpers et al., 2022: Saggu et al., 2022). One of the systematic reviews aimed to identify feasibility studies in order assess the reporting quality and clinical generalisability of feasibility outcomes in feasibility studies addressing prehabilitation interventions (Cuijpers et al., 2022).

Included systematic reviews identified varied recruitment rates for prehabilitation programmes. One systematic review aimed to assess the reporting quality and clinical

generalisability of feasibility outcomes in feasibility studies addressing exercise prehabilitation before colorectal cancer surgery (Cuijpers, et al., 2022). Four of the twelve feasibility studies reported recruitment outcomes. When calculable, recruitment rates to the interventions ranged from 19.3% to 100%. A variety of reasons for not participating was outlined in the systematic review and is examined along with contributions from other systematic reviews. The majority of evidence identified came from the aforementioned systematic review (Cuijpers et al., 2022) and one scoping review (Saggu et al., 2022).

Table 1 outlines the elements identified from the included systematic reviews that appear to act as barriers and / or facilitators, as well as factors to consider that can influence patient's uptake and engagement with prehabilitation.

Many components identified often appeared to act as both barriers and facilitators. Factors that consistently appear as both barriers and facilitators include **time, access, setting and health**. It also appeared that some components, such as setting acted as both a facilitator or barrier depending on the surgical type or prehabilitation intervention.

**Time** related to both travel time to and from the intervention and the duration of the intervention. The ability to fit prehabilitation around everyday commitments acted as a facilitator in terms of acceptability and satisfaction. Included reviews highlighted aspects of a patient's life such as **work commitments or being too busy to attend** acted as a barrier to participation and adherence.

Locally **accessible** prehabilitation was seen as a facilitator. This was an important consideration in terms of the cost of transport, appointment burden and limited pre-operative time.

The **setting** of interventions was also an important factor influencing a patient's decision to attend prehabilitation. However, there were mixed opinions on what was the most convenient setting. One review identified better adherence and motivation in interventions which are **not hospital-based** among patients with gynaecological cancers. Conversely, those patients undergoing major abdominal cancer surgery reported that **supervised hospital-based** prehabilitation programmes had the highest compliance levels, compared to **supervised or unsupervised home-based** programmes.

Factors positively affecting motivation, acceptability and satisfaction identified in gynaecological cancer patients related more to the **perceived health and wellbeing benefits** of the intervention. In contrast, '**feeling unwell/too ill'**, **'side effects of current treatment'** and **'fatigue'** acted as a barrier or influenced people's recruitment, engagement, participation, access, adherence and retention to such interventions.

One element identified as a facilitator to motivation in multimodal prehabilitation among gynaecological cancer patients was the ability to **track progress** in the form of pedometers or diaries.

**Ethnicity and age** were factors highlighted with a paucity of evidence.

Table 1: Barriers, facilitators and factors influencing uptake and participation in prehabilitation

| Barriers | Facilitators | Factors for consideration |
|---|---|---|
| • "being too busy"<br>• having "personal issues (such as work commitments)"<br>• having "too much going on"<br>• "travel distance"<br>• "transportation issues"<br>• time taken to travel to and from hospital<br>• "being overwhelmed by the diagnosis"<br>• "not feeling well" / "feeling too ill"<br>• "side effects of current treatment"<br>• "fatigue" | • ability to fit around everyday life and to carry out other tasks which help 'prepare' for surgery<br>• locally accessible interventions<br>• perceived benefit to health and wellbeing, treatment-related outcomes and cancer-related outcomes<br>• support system (colleagues/friends/ healthcare professionals)<br>• progress tracking (pedometers/ diaries) | • geographical<br>• setting (hospital-based/home-based)<br>• socioeconomic<br>• literacy<br>• technology<br>• clinical symptoms<br>• ethnicity<br>• supervised or unsupervised interventions |

A scoping review conducted to collate the research evidence on multimodal prehabilitation in gynaecological cancers and the related barriers and facilitators to engagement and delivery that should be considered when designing a prehabilitation intervention for this group of women (Saggu et al., 2022). Authors synthesised the contexts and mechanisms they had identified as influencing engagement with prehabilitation. It illustrates the factors contributing to healthcare professional and patient engagement and provides a useful summary (figure 1).

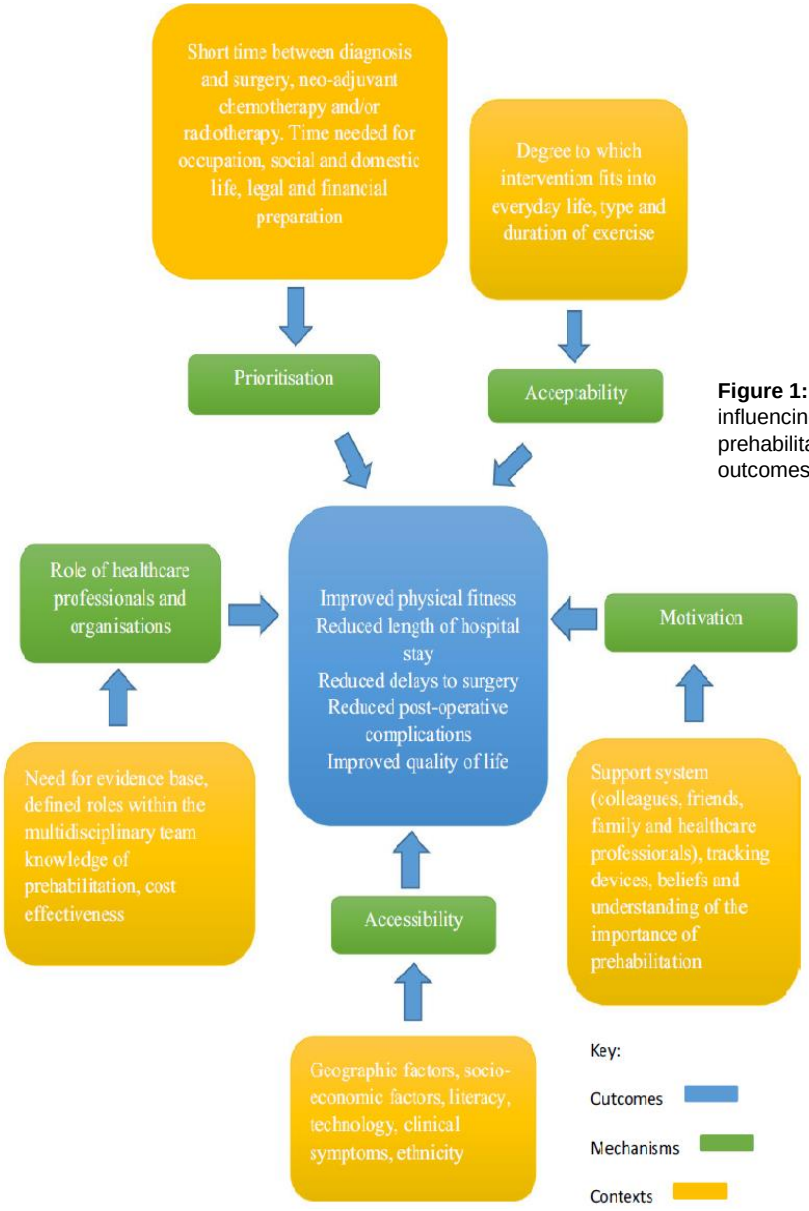


**Figure 1:** The contexts and mechanism influencing engagement with prehabilitation to achieve intended outcomes (Saggu et al., 2022)

# Barriers

Three components were identified as barriers to uptake and engagement. These related to 'time', 'travel and transport' and 'health'.

## Time

**Time** related to both travel time to and from the intervention and the duration of the intervention. Included reviews highlighted various aspects of a patient's life as a barrier to participation and adherence (Cuijpers et al., 2022). Similarly, travelling to and from hospital was described as 'time-consuming', and concerns were raised about spending more time in hospital, in addition to time already spent there attending appointments.

A scoping review collating evidence on multimodal prehabilitation in gynaecological cancers identified one study, among seven ovarian cancer patients, where participants appreciated home-based recommendations and found that travelling to and from hospital was reported as 'time-consuming' (Saggu et al., 2022). The same review identified concerns raised by patients about the large amount of time already spent within hospital for appointments and the possibility that prehabilitation programmes would require further attendances. To address this concern, one study asked patients and health care professionals their opinions on delaying surgery to allow for more pre-operative optimisation. However, patients concluded they were unlikely to delay due to anxiety. In addition, three studies included in this review utilised the three to six cycles of neo-adjuvant chemotherapy as a period for prehabilitation prior to surgery.

Authors highlighted limitations to their review included small sample sizes and insufficient clarity regarding the representativeness of the study sample for the target population. Systematic review authors also highlighted that it is often unclear in primary studies which part of the target population participated in the study or prehabilitation programme and often do not or cannot examine or explore the proportion of eligible patients who were not recruited (Cuijers et al., 2022).

## Accessibility and setting

**Accessibility and the setting** of interventions seemed to be an important factor influencing a patient's decision to attend prehabilitation. One systematic review addressing exercise prehabilitation before colorectal cancer surgery (Cuijpers et al., 2022) implied that the intensity and location of an exercise prehabilitation programmes among included studies may have acted as a barrier. Patient dropout from the studies was predominantly reportedly caused by "travel distance" and "transportation issues" among other factors.

However, there were mixed opinions on what was the most convenient setting. One review identified better adherence and motivation in interventions which are **not hospital-based** among patients with gynaecological cancers (Saggu et al., 2022). Conversely, those patients undergoing major abdominal cancer surgery reported that **supervised hospital-based** prehabilitation programmes had the highest compliance levels, compared to **supervised or unsupervised home-based** programmes (Cuijpers et al., 2022).

### Health

A systematic review assessing the reporting quality and clinical generalisability of feasibility outcomes addressing exercise prehabilitation before colorectal cancer surgery (Cuijpers et al., 2022) identified the reasons patients gave for being unable or unwilling to adhere to interventions. These included: “not feeling well”; “side effects of neoadjuvant chemoradiotherapy (NACRT)”; “being too busy”; having “personal issues (such as work commitments)”; “fatigue” and “transportation issues”. In addition, the same review identified “being overwhelmed by the diagnosis” as a barrier to participation, as well as “finding it too stressful”.

A scoping review collating evidence on multimodal prehabilitation in gynaecological cancers identified better adherence in interventions which are not hospital-based (Saggu et al., 2022). Authors identified two mixed method qualitative studies based in Denmark, among abdominal and ovarian cancer patients with an average age of 59. Feeling too unwell to participate was identified as a significant barrier for over 60% of patients in one study. In addition, clinical symptoms acted as a barrier to access. Lack of attendance to facility-based sessions was described as mainly due to ill-health, a finding highlighted in several other qualitative studies. In these Danish studies, physical and mental health was identified to act as a barrier to engage with society as well as activities expected of them as part of prehabilitation.

## Facilitators

Five components were identified as facilitators to uptake and engagement. These related to ‘time’; ‘accessibility’; ‘health’; ‘support’ and ‘tracking progress’.

### Time

Time related to both travel time to and from the intervention and the duration of the intervention. The ability to fit prehabilitation around everyday commitments acted as a facilitator in terms of perception of acceptability and satisfaction and allowed them to carry out other tasks which helped patient’s prepare for surgery (Saggu et al., 2022).

## Accessibility and Setting

In terms of access to prehabilitation, Saggu et al., (2022) focussed on patients with gynaecological cancers and identified geographical, socioeconomic, literacy, technology, clinical symptoms and ethnicity appeared to act as factors affecting access to prehabilitation through qualitative findings. For example, it was reported that prehabilitation needed to be locally accessible due to the cost of transport, appointment burden and limited pre-operative time. In another study included in this review, among seven ovarian cancer patients, participants appreciated home-based recommendations, as travelling to and from hospital was considered time-consuming. Interventions not based in hospitals were potentially more motivating with likely greater chances of success and adherence among this patient group.

Another systematic review reviewing the composition of prehabilitation programmes for patients undergoing major abdominal cancer surgery reported that supervised hospital-based prehabilitation programmes had the highest compliance levels, compared to supervised or unsupervised home-based programmes (Hijazi et al., 2017).

## Health

Factors relating to health acted as both facilitators and barriers to prehabilitation in terms of motivation, acceptability and satisfaction, recruitment, engagement, participation, access, adherence and retention.

Qualitative studies included in a scoping review which explored factors affecting the motivation of patients to engage in prehabilitation (Saggu et al., 2022) identified patients who believe prehabilitation is beneficial to their health and wellbeing, treatment-related outcomes and cancer-related outcomes were motivated to participate.

One scoping review (Saggu et al., 2022) reported gynaecological cancer patients' perceptions of acceptability of multimodal (physical, nutritional and psychological) prehabilitation interventions. All qualitative studies included reported the acceptability of prehabilitation from the patients' perspective, mostly suggesting that patients are positive about engaging with prehabilitation due to the perceived and actual health benefits. Patients' perceptions of acceptability included if it 'allowed them to carry out other tasks which helped them 'prepare' for surgery, such as meal preparation, laundry and gardening'. No studies in this scoping review specifically reported on the acceptability of psychological components.

## Support

Findings from qualitative studies, showed the importance of accessible support and supervision as a motivator, either through an opportunity to meet others face to face

or to monitor and encourage patients to keep on track with their prehabilitation goals (Saggu, et al., 2022). Patients with ovarian cancer reported support systems consisting of colleagues, friends and/or healthcare professionals were helpful to motivate them. However, another study found that some patients preferred not to 'burden' family members by relying on them, and therefore, identified healthcare professionals as the most appropriate motivators. In addition to having a human support system, gynaecological cancer participants taking part in remote multimodal prehabilitation interventions identified the ability to track progress using pedometers and diaries as highly motivating (Saggu et al., 2022).

### Other factors

No studies appeared to discuss whether ethnicity or age affected accessibility of prehabilitation interventions. However, one study included in the scoping review of multimodal prehabilitation in women with gynaecological cancers (Saggu et al., 2022) commented that some trials excluded patients on the basis of poor understanding or inability to speak/write the primary language.

Systematic review authors highlighted low retention rates hampered target population representativeness in study samples and that conclusion are solely based on patients who entered the study and took part in the intervention (Cuijpers et al., 2022). This highlights the potential for participant bias among systematic review findings, and thus may limit generalisability of findings. Few included primary studies identified in the reviews appeared to explore why some patients chose not to participate in prehabilitation programmes.

## Digital Interventions

Saggu et al (2022) examined barriers and facilitators to engagement and delivery of multimodal prehabilitation in gynaecological cancers and included three interventions that were reliant on wearable technology and smartphone applications. The review authors highlight in their discussion that the potential for digital interventions in the field of prehabilitation is huge, but highlight lack of access, confidence and competence in relation to technology can present obstacles. Review authors noted that given gynaecological cancers are more common among those aged 75–79 years old, the confidence, skills and access to technology in an older population must be considered.

Hijazi et al (2017) aimed to review the composition of prehabilitation programs for patients undergoing major abdominal cancer surgery and define the outcome measures used to evaluate this intervention. Authors highlighted that despite some programmes being home-based, there was still a need for intermittent supervision through planned home visits to assess patient's compliance and provide

reinforcement. Authors suggested that the use of wearable technologies may provide feedback to both the patient and healthcare provider about compliance and progress.

## Supervised and unsupervised interventions

All the included secondary evidence reported on the mode of delivery of the prehabilitation programmes. These generally included a variety of modalities ranging from directly supervised within hospital settings to interventions with entirely remote supervision, whilst others provided flexibility between facility-based supervision and remote supervision. Although, some reviews identified unsupervised prehabilitation interventions, the composition of programmes was rarely described in enough detail to ascertain which type of prehabilitation programme or surgical discipline was best suited to the differing modalities, and how this could influence uptake and participation.

Most included reviews did not explicitly explore the relationship between the supervisory component and its impact on uptake or participation. Despite this, some included reviews touched on this as an important consideration in their discussions, referencing other studies, not necessarily included in their review.

Some studies discussed the location of the supervision element of a prehabilitation programme (Hijazi et al., 2017; Cuijpers et al., 2022; Pouwels et al., 2015). Patients undergoing major abdominal cancer surgery had higher compliance rates for hospital-based prehabilitation programmes delivered under direct observation **(**Hijazi et al., 2017)**.** Cuijpers et al., (2022) focussed on the feasibility of exercise prehabilitation before colorectal cancer surgery. Review authors concluded that in exercise prehabilitation, feasibility might be improved by offering supervised community- or home-based interventions tailored to the physical and mental abilities of the patient.

Pouwels et al (2015) investigated the effects of Preoperative Exercise Therapy (PET) in patients scheduled for lung surgery on aerobic capacity, physical fitness, postoperative complications, length of hospital stay, quality of life and recovery. They noted that it is evident that the setting of the exercise intervention (PET or postoperative exercise) is an important influencing factor. In-patient studies frequently had supervision during the exercise sessions. It remains questionable if this is feasible in an outpatient setting, due to costs and because of the fact that travel (distance) is an important barrier for attending an exercise session. Realistically due to the financial aspects, home-based or outpatient studies may be more manageable in the longer term.

## Options for further work

Our searches failed to identify any evidence directly relevant to answer the question around what factors might maximise uptake of prehabilitation. Therefore, it may be appropriate to conduct a scoping review of primary literature to identify research which more directly addresses this question. Qualitative studies in particular are likely to have explored the barriers, facilitators and factors we have identified in more detail.

This scoping report has identified factors which may be important to consider when endeavouring to increase or maximise uptake of prehabilitation interventions. Most of these factors were derived from two reviews focussing on colorectal and gynaecological cancer patients. It may be beneficial to undertake a search of primary literature to examine other patient populations and surgery.

It would appear that there are conflicting preferences in different surgical population groups, for example in the preference of setting of delivery of interventions. It may be useful to undertake further research to gain more understanding of surgical populations and preferences for intervention types, durations and settings.

Given the lack of exploration around the supervisory element of prehabilitation and it's influence on uptake and participation within our included reviews, it would be interesting to explore this further, utilising primary literature.

## References

Cuijpers, Anne C.M et al. (2022) Quality and clinical generalizability of feasibility outcomes in exercise prehabilitation before colorectal cancer surgery- A systematic review. European journal of surgical oncology: the journal of the European Society of Surgical Oncology and the British Association of Surgical Oncology 2022: Vol 48 Issue 7. DOI: 10.1016/j.ejso.2022.04.012. https://www.clinicalkey.com/#!/content/playContent/1-s2.0-S0748798322004061?scrollTo=%23hl0001373

Hijazi, Y et al. (2017). A systematic review of prehabilitation programs in abdominal cancer surgery. International Journal of Surgery. 2017 Vol. 39. DOI: 10.1016/j.ijsu.2017.01.111. https://pubmed.ncbi.nlm.nih.gov/28161527/

McIsaac, D. I., et al. (2022). Prehabilitation in adult patients undergoing surgery: an umbrella review of systematic reviews. British Journal of Anaesthesia, 128 (2): 244e257 (2022). DOI: 10.1016/j.bja.2021.11.014 https://www.bjanaesthesia.org.uk/article/S0007-0912(21)00730-3/pdf

Perry, R. et al. (2021) Preadmission interventions (prehabilitation) to improve outcome after major elective surgery: a systematic review and meta-analysis. BMJ Open 2021;11:e050806. doi:10.1136/ bmjopen-2021-050806. https://bmjopen.bmj.com/content/bmjopen/11/9/e050806.full.pdf

Pouwels, S., et al. Preoperative exercise therapy in lung surgery patients: A systematic review. Respiratory Medicine 2015 Vol. 109 Issue 12. Accession Number: 26303337 DOI: https://dx.doi.org/10.1016/j.rmed.2015.08.009 https://pubmed.ncbi.nlm.nih.gov/26303337/

Saggu, R.K., et al. Considerations for multimodal prehabilitation in women with gynaecological cancers: A realist scoping review. BMC Women's Health (2022) 22:300. https://doi.org/10.1186/s12905-022-01882-z https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9294794/pdf/12905_2022_Article_1882.pdf

# Appendix A: Methods

As this is a broad topic, the research was limited to only include reviews produced using explicit and reproducible methods of systematic searching, critical appraisal of quality and synthesis of the primary literature on the topic. This is an acceptable way to rapidly assess the majority of the evidence base, and although it does not intend to identify every publication on a topic, it would allow for the production of an overview. Primary studies were excluded as including both primary and secondary sources of evidence on such a broad topic would have made this report unmanageable within the timeframe of this research.

**Data sources:** Twelve sources adhering to robust systematic review principles[1], two databases, Google scholar and Medline were searched for published secondary evidence (table 2) using search terms and strategies designed specifically for each data source. Searches were conducted using a combination of the following terms:

- Preoperative care
- Preoperative exercise
- Prehabilitation
- Barrier or facilitator
- Uptake, increase uptake, influence, maximise

**Study selection:** Reviews produced using systematic methodology (including critical appraisal) i.e., systematic reviews, scoping reviews, rapid reviews etc. were assessed for inclusion. Two reviewers independently screened the reviews for relevance at title, abstract and full-text level against the inclusion criteria outlined in table 3.

**Data extraction:** Where possible, data reporting relevant characteristics were extracted from the included reviews into a data extraction table (table X below). A second reviewer checked the extracted data. Disagreements at any stage were resolved through discussion with a third reviewer.

**Quality assessment:** As this report is primarily concerned with identifying characteristics that may influence uptake or engagement with prehabilitation interventions, none of the included reviews were critically appraised for their quality. If evidence were required for policy and practice initiatives, a more detailed evidence review would be appropriate.

[1] Follows core systematic review principles: comprehensive and stated search strategy, selection of sources based on objective criteria, assessment of risk of bias of primary sources and/or is a methodology developed by an expert body e.g. NICE. For a full list of sources searched, please refer to Sources searched section of the report.

**Data synthesis:** Data relevant to the question were extracted and can be found in Appendix B with accompanying narratives.

## Sources searched

| **Table 2: Resources searched** |
|---|
| **Core Sources (not optional)** |
| Cochrane database of systematic reviews - https://www.cochranelibrary.com/cdsr/reviews<br>*Systematic reviews on health care interventions, diagnostics and public health interventions.* |
| NICE – https://www.nice.org.uk/guidance<br>*Systematic evidence reviews that may underpin guidance.* |
| Joanna Briggs Institute -https://journals.lww.com/jbisrir/pages/advancedsearch.aspx<br>*Systematic and scoping reviews of both quantitative and qualitative evidence on healthcare and public health topics.* |
| **Public Health/ Wider Determinants Focus (select if relevant to your question)** |
| National Institute for Health Research (NIHR) Public Health Research – https://www.journalslibrary.nihr.ac.uk/phr/about-the-phr-journal.htm<br>*Some reports in this journal are systematic reviews of interventions to improve public health.* |
| The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) – http://eppi.ioe.ac.uk/cms/<br>*Publications list for systematic reviews in the fields of education, health promotion and public health, as well as social welfare and international development.* |
| Campbell Collaboration systematic reviews -https://www.campbellcollaboration.org/better-evidence.html<br>*Systematic reviews of the effects of social interventions in Crime & Justice, Education, International Development, and Social Welfare.* |
| What Works Centre for Wellbeing – https://whatworkswellbeing.org/about-us/<br>*Systematic reviews of the impacts of policies and projects on wellbeing.* |
| **Health Care Interventions and Technologies** |
| National Institute for Health Research Health (NIHR) Technology Assessment (HTA) Journal – https://www.journalslibrary.nihr.ac.uk/hta/about-the-hta-journal.htm<br>*Some reports in this journal are systematic reviews of interventions to prevent and treat disease and improve rehabilitation and long-term care.* |
| Agency for Healthcare Research and Quality (AHRQ)<br>*Effectiveness and comparative effectiveness reviews of health care interventions.* |
| Canadian Agency for Drugs and Technologies (CADTH) – https://www.cadth.ca/evidence-bundles-view<br>*Rapid response systematic reviews and meta-analyses of health technologies, including drugs and diagnostic tests, medical, dental and surgical devices and procedures.* |
| Evidence Synthesis Program Reports (va.gov) – https://www.hsrd.research.va.gov/publications/esp/reports.cfm<br>*Evidence syntheses of health care interventions of particular relevance to veterans.* |
| Scottish Intercollegiate Guidelines Network (SIGN) clinical guidelines – https://www.sign.ac.uk/our-guidelines/<br>*Clinical practice guidelines. Note: you should be looking for systematic evidence reviews that may underpin guidance on your topic, not the guidance itself. Not all guidance is based on evidence reviews* |

| Additional sources searched |
|---|
| Google Scholar – https://scholar.google.com/<br>*Search using your keywords AND "systematic review"* |
| Medline – https://www.scopus.com/search/form.uri?display=basic#basic<br>*Search using your keywords AND [Systematic Review]* |

| **Table 3: Inclusion Criteria** | |
|---|---|
| **Review question** | |
| What evidence exists around maximising uptake of prehabilitation interventions? | |
| **Participants** | Patients waiting for surgery |
| **Phenomenon of Interest** | Factors (personal and environmental) that influence uptake or participation of prehabilitation interventions |
| **Design** | Quantitative and qualitative data |
| **Evaluation (outcomes)** | Increase/decrease in uptake of prehabilitation interventions |
| **Research type** | Systematic reviews (qualitative and quantitative) |
| **Country** | All countries were included |
| **Other Study Considerations** | |
| Search dates limited to 2010 onwards<br>English language only | |

# Appendix B: Data extraction

| **Data extraction of the reviews identified in the scoping search (in alphabetical order)** | | | |
|---|---|---|---|
| | | | |
| **Reference**:<br>Cuijpers, ACM et al. (2022) Quality and clinical generalizability of feasibility outcomes in exercise prehabilitation before colorectal cancer surgery: A systematic review. European Jounral of Surgical Oncology. 48. 1483-1497<br>https://www.sciencedirect.com/science/article/pii/S0748798322004061 | **Aim/Question**:<br>This systematic review aimed to assess the reporting quality and clinical generalizability of feasibility outcomes in feasibility studies addressing exercise prehabilitation before CRC surgery. | **Results:**<br>PubMed/Medline, Embase, Cochrane, and CINAHL were searched to identify all feasibility studies focussing on exercise prehabilitation before colorectal cancer surgery. Twelve feasibility studies were included.<br><br>Adherence was reported in all studies, which ranged from 18.4% to 58.2%. Reasons for patients being unable or unwilling to adhere to the interventions was mainly “not feeling well”, “side effects of NACRT”, “being too busy”, having “personal issues (such as work commitments)”, “fatigue”, and “transportation issues”.<br><br>Six studies (50%) reported details assessing patient participation showing retention rates between 18.4% and 58.2%, which was caused by non-participation and drop-out. Patient dropout from the studies was predominantly caused by “side effects of NACRT”, “personal issues (e.g., work commitments, a lack of time), participating in the program was “too stressful”, “travel distance”, and “not feeling well”. Authors highlighted the number of patients completing each of the included feasibility studies (retained patients) reflected only a small part of the total number of (potentially) eligible patients. | **Comments /limitations:**<br>All 12 included studies were conducted in OECD countries between 2009-2019.<br><br>Authors note the focus is exercise prehabilitation, as opposed to nutritional or psychological prehabilitation.<br><br>Limitations include small sample sizes, poor reporting quality of included studies and insufficient clarity regarding the representativeness of the study sample for the target population. |

| | | | |
|---|---|---|---|
| | | Four studies reported recruitment outcomes. When calculable, recruitment rates ranged from 19.3% to 100%. The reasons of patients to not participate in the programs were “being too busy”, “being overwhelmed by the diagnosis”, having “too much going on”, and “travel distance”.<br><br>Two studies reported acceptability outcomes and a single study report on patient motivation and satisfaction, but no information was provided in the systematic review.<br><br>Systematic review authors feel physical exercise interventions are the cornerstone of most prehabilitation programs and are believed to be the most demanding for patients, because they often have to be performed in a short period of time, all while coming to terms with their cancer diagnosis, or during intensive neoadjuvant treatment. The review authors concluded that exercise prehabilitation interventions should not be predetermined, but adaptable to each individual patient so they are tailored to physical and mental abilities.<br><br>As this systematic review focussed on feasibility assessments, it contains studies with small sample sizes. | The population of the studies were colorectal cancer surgery patients. The review may not be generalisable to other prehabilitation users. |
| **Reference**:<br>Hijazi, Y, Gondal, U and Aziz, O (2017) A systematic review of prehabilitation programs in abdominal cancer Surgery. International Journal of Surgery. 39: 156-162 | **Aim/Question**:<br>This systematic review aimed to review the composition of prehabilitation programs for patients undergoing major abdominal cancer surgery and define the outcome measures that are used to evaluate this intervention. | **Results:**<br>Literature searches were performed in Medline, OVID, EMBASE, Google Scholar, and Cochrane databases. Outcomes of interest included prehabilitation program composition (exercise, nutritional, and psychological interventions), duration, mode of delivery, and outcome measures used to determine impact of prehabilitation versus standard care.<br><br>Nine studies (seven randomised controlled and two prospective non-randomised trials) comprising of 549 patients (281 prehabilitation versus 268 standard care) were included in this review. Five studies | **Comments /limitations:**<br>The included studies were conducted between 2009 and 2015 and are mainly based in European countries.<br><br>A limitation of this review is that many of the 9 studies did not assess outcomes of interest, |

| | | | |
|---|---|---|---|
| | | reported patients undergoing surgery for colorectal cancer, two for bladder tumours, one for liver resections, and one involving unspecified abdominal oncological operations.<br><br>The prehabilitation program interventions were trimodal in two studies (physical exercise, nutritional supplementation and psychological support), and unimodal in seven studies (pre-operative physical exercise alone).<br><br>Compliance to the prehabilitation programs was reported in seven studies and ranged from 16 to 100%. One study identified 59% of participants achieving 75% adherence to the programme. Hospital-based prehabilitation programmes delivered under direct observation had the highest compliance levels. | particularly for psychological assessments, post-operative complications and health-related quality of life.<br><br>The quality of each study was assessed using the Delphi list for quality assessment of randomised clinical trials (RCT) for conducting systematic reviews. 8 studies were judged 'Good' and 1 study 'Fair'. |
| **Reference**:<br>McIsaac, DI, et al. (2022) Prehabilitation in adult patients undergoing surgery: an umbrella review of systematic reviews. British Journal of Anaesthesia. 128 (2): 244-257 | **Aim/Question**:<br>The objective of this umbrella review was to synthesise and evaluate evidence for prehabilitation in improving health, experience, or cost outcomes. | **Results:**<br>This Umbrella review searched MEDLINE, Embase, Cochrane, Cumulative Index to Nursing and Allied Health Literature, PsycINFO, Joanna Briggs Institute's database, and Web of Science (inception to October 20, 2020). Authors included a total of 55 systematic reviews of elective, adult patients undergoing surgery and exposed to a prehabilitation intervention, where health, experience, or cost outcomes were reported.<br><br>Cancer surgeries (22; 40%) were the most common focus of included reviews, followed by mixed procedures (17; 31%), orthopaedics (6; 11%), cardiac and vascular (4; 7%), other surgery types (4; 7%), and abdominal non-oncologic (2; 4%). Most reviews focused on prehabilitation interventions that included exercise (31; 56%), followed by mixed (i.e. any form of prehabilitation was included in the review; 11; 20%), nutrition (11; 20%), other (a review of preoperative weight loss interventions; 1; 2%), or multimodal (i.e. | **Comments /limitations:**<br>Country of included studies was not described, but articles were published between 2004 and 2020.<br><br>Six included studies related to orthopaedic surgeries, but none of these contributed to barriers and facilitators in this scoping report<br><br>A limitation of this umbrella review is that by including only systematic |

| | | | |
|---|---|---|---|
| | | included studies had to use multicomponent prehabilitation interventions; 1; 2%).<br><br>Twenty reviews reported prehabilitation adherence rates (36%), with a mean adherence rate of 70% (standard deviation 24%). | reviews, it may not capture more recently published primary studies. |
| **Reference**:<br>Pouwells, S. et al. (2015) Preoperative exercise therapy in lung surgery patients: A systematic Review. Respiratory Medicine. 109: 1495-1504. | **Aim/Question**:<br>This systematic review summarises the effects of Preoperative Exercise Therapy (PET) in patients scheduled for lung surgery on aerobic capacity, physical fitness, postoperative complications, length of hospital stay, quality of life and recovery. | **Results:**<br>This systematic review included 11 studies (four RCTs). Most of the studies (6) used the intervention of a preoperative Pulmonary Rehabilitation (PR) programme of exercise.<br><br>Three included studies reported on adherence rates. These ranged between 0% and 100%. | **Comments /limitations:**<br>Country of included studies was not described, but articles were published between 2000 and 2013.<br><br>Limitations to this review include 1) heterogeneous patient populations being studied; 2) non-comparable PET programmes being evaluated and 3) lack of guidelines for the use of PET programs and reported outcome measures. |
| **Reference**:<br>Saggu, RK., et al. (2022) Considerations for multimodal prehabilitation in women with gynaecological | **Aim/Question**:<br>This scoping review was conducted to collate the research evidence on multimodal prehabilitation in gynaecological cancers and the related barriers and | **Results:**<br>This scoping review aimed to collate evidence on multimodal prehabilitation in gynaecological cancers and the related barriers and facilitators to engagement and delivery that should be considered when designing a prehabilitation intervention for this group of women. | **Comments /limitations:**<br>Most studies were conducted in the USA and may not be generalisable to a Wales or UK context.<br><br>This is a scoping review and does not have the |

| | | | |
|---|---|---|---|
| cancers: a scoping review using realist principles. BMC Women's Health. 22:300 https://doi.org/10.1186/s12905-022-01882-z | facilitators to engagement and delivery that should be considered when designing a prehabilitation intervention for this group of women. | The results of the review were that key mechanisms and contexts influencing engagement with prehabilitation can be summarised in five areas:<br>(1) **The role of healthcare professionals and organisations**. In order for healthcare professionals to engage with and deliver prehabilitation, they need a strong evidence base for prehabilitation within gynaecological cancer; defined roles for delivering prehabilitation within the multidisciplinary team and clear guidance around screening and triage<br>(2) **Patients' perceptions of acceptability**, including if it fitted in with their everyday lives and allowed them to carry out other tasks which helped them 'prepare' for surgery, such as meal preparation, laundry, gardening.<br>(3) **Factors influencing patient motivation**. Patients believed that prehabilitation is beneficial to their health and wellbeing, treatment-related outcomes and cancer-related outcomes.<br>(4) **Prehabilitation as a priority**: if surgery was imminent, patients felt the need to prioritise preparing for 'life and death' such a socialising, financial tasks and life administration.<br>(5) **Access to prehabilitation**: it needed to be locally accessible due to the cost of transport, appointment burden and limited pre-operative time. | same methodology as a systematic review. No quality appraisal has taken place.<br><br>Limitations to this scoping review include the inclusion criteria of only studies with multimodal programmes involving more than one non-medical intervention, due to their perceived ability of meeting the complex needs of cancer patients. Therefore, studies reporting on unimodal prehabilitation programmes or those concentrating on medical management and optimisation may have been missed. |

IBSN: 978-1-83766-154-1