



Review

Preoperative exercise therapy in surgical care: a scoping review ☆, ☆ ☆, ★



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Abstract

Objectives: Several systematic reviews have focused on the role of preoperative exercise therapy (PET) in various fields of surgical care. Aims of the present scoping review are to summarize research findings and to identify gaps in existing literature.

Methods: Two authors independently conducted a comprehensive literature search on systematic reviews regarding PET. The risk of bias was assessed using “the methodology checklist for systematic reviews and meta-analyses of the Scottish Intercollegiate Guidelines Network (SIGN).” Findings of the included systematic reviews were summarized according to type of surgery and type of PET.

Results: Twenty-one reviews on PET with a low risk of bias were included. Seven reviews investigated PET in multiple surgical fields and 14 in just a single surgical field. PET was studied before cardiac surgery (n = 9), orthopedic surgery (n = 8), abdominal surgery (n = 8), thoracic surgery (n = 8), vascular surgery (n = 3), and urologic surgery (n = 1).

Conclusion: Overall, it seems that PET exerts beneficial effects on physical fitness and postoperative outcome measures. Gaps in current literature are the heterogeneity in selected patient populations and outcome measures as well as lack of guidelines on the specific PET regimes. Therefore, there is increasing need for multicenter randomized trials with specifically designed PET programs and a carefully selected patient population to strengthen current evidence.

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1. Introduction

The preoperative physical function of a patient is an independent predictor of postoperative morbidity and mortality [1-3]. The advent of surgical stress often leads to a substantial decrease in physical functioning through different pathways. In addition, prolonged periods of physical inactivity in the postoperative phase induce loss of muscle mass, cardiopulmonary deconditioning, pulmonary complications, and psychological distress. These phenomena may result in a decreased quality of life postoperatively, increased morbidity, and occasionally premature death [4-7].

Because preoperative physical capacity predicts postoperative recovery, especially in elderly patients, a substantial body of research is directed toward studying the effects of various regimens of preoperative exercise therapy (PET) [8-11]. A number of postoperative outcome measures such as complication rate, length of hospital stay, and time of convalescence were previously reviewed [12-14]. However, based on these reviews, a univocal conclusion cannot be obtained, in that PET is able to significantly reduce postoperative complications.

Interestingly, an overview of total PET research field has never been undertaken. The addition of all evidence, called a “scoping review,” is a necessary prerequisite toward future research projects involving PET [15]. If indeed a randomized clinical trial assessing the effect of PET is considered, the existing literature requires adequate “mapping” [15]. The concept of a scoping review is relatively new. A scoping review aims to systematically review an extensive body of literature that addresses a broad research question [16-19].

Aims of this scoping review are to provide an overview of currently available evidence of the effect of PET, based on available systematic reviews, and to identify fields of future research on the effects of different PET regimes on physical fitness and their implications on postoperative outcome measures.

2. Methods

2.1. Scoping review methodology

The concept of a scoping review is relatively new. A scoping review aims to systematically review an extensive body of literature that addresses a broad research question [16-19]. Although a systematic review focuses on obtaining an answer to a well-defined research question, a scoping review “maps” the relevant literature in a complete field of interest. A scoping review describes main findings rather than analyzing or drawing conclusions [16,17,19]. Therefore, the present work should be seen as a first step to provide an overview of the existing literature about PET programs in surgery and to identify the gaps of evidence requiring future research.

2.2. Identification of reviews and search strategy

We performed a systematic literature search of systematic reviews that were published in MEDLINE, Embase, CINAHL, PubMed, and The Cochrane Library up to March 2015. The search included combinations of the following search terms: (“Presurgical OR Preoperative OR Prehabilitation”) AND (“Physical Therapy Modalities”[Mesh] OR physical therapy OR physiotherapy OR “Exercise OR physical activity OR physical function”[Mesh] OR exercise). Details of the search strategy for each database can be obtained on request.

2.3. Selection of reviews and inclusion criteria

We included systematic reviews of randomized controlled trials, controlled trials, and observational studies that included patients who participated in a preoperative exercise program (PET) in surgery. There was no restriction on type of surgery. *PET* was defined as a structured regimen of physical activities, offered as a stand-alone regimen, as a home-based, or as a supervised approach.

Specific therapeutic goals were to gain or to increase musculoskeletal and/or cardiovascular and/or respiratory function.

Inclusion required a full-text article. In case of updated Cochrane reviews, the most recent published version was used. Two authors (S.P. and D.H.) who were blinded for authors and journal titles independently screened and selected studies on the basis of article title and abstract. After primary selection, both researchers independently reviewed the full study text and determined its suitability. Disagreements were resolved by discussion with each other and the senior author (J.T.) until consensus was reached.

2.4. Risk of bias assessment

The risk of bias associated with the current review selection methodology was assessed using “the methodology checklist for systematic reviews and meta-analyses of the Scottish Intercollegiate Guidelines Network (SIGN)” [20]. Items of this checklist were adapted to our topic and summarized to allow for a total estimation of the risk of bias. Two reviewers (S.P. and D.H.) independently assessed the quality of the included systematic reviews. The Cohen κ was calculated to determine the agreement between these authors. If required, disagreements were again resolved through discussion with the senior author (J.T.). On request, a detailed description of the quality assessment can be obtained.

2.5. Definitions and data extraction

We used a standardized data extraction form to systematically obtain data from the included studies with low or intermediate risk of bias (++ of +, according to the SIGN checklist [20]). To provide an overview of various types of surgery and

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