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## Rationales for prehabilitation programs in patients preparing for oncologic surgery: a systematic review

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**Background:** Prehabilitation aims to improve patients' resilience to surgery and enhance postoperative recovery. Understanding rationales for prehabilitation content may identify opportunities for program optimization. This systematic review provides an overview of rationales, intervention, and outcomes used in prehabilitation studies in oncological populations.

**Methods:** We searched the databases MEDLINE, Embase, and Scopus on March 1st, 2024. Comparative prehabilitation studies including patients undergoing oncological surgery were included. Prehabilitation was defined as a preoperative exercise program, alone or combined with other components, with the explicit aim to improve postoperative outcomes. Extracted outcomes included reported rationales, program content, and primary endpoints.

**Results:** In total, 140 studies (N=24,925 patients) were included. Most (N=125, 89%) reported a rationale for improving physical fitness, particularly cardiorespiratory fitness (N=97, 69%). Psychological (N=46, 33%) and metabolic (N=28, 20%) rationales were reported less frequently. Rationales for specific attributes (e.g., intensity) were rarely described. Exercise was predominantly supervised (N=57, 41%), and of these supervised sessions, most were prescribed three times per week (N=25, 44%). Almost all studies (N=121, 86%) included an aerobic exercise component at moderate-intensity continuous (N=39, 32%) or high-intensity interval (N=34, 28%) mode. Intended duration varied from 1 to 12 weeks. Most reported primary endpoints were surgical outcomes (e.g., complications) (N=59, 42%), although definitions varied.

**Conclusions:** Preoperatively improving physical fitness is a widely used rationale for prehabilitation, however, studies are implicit in rationales for specific program components. Content and duration of prehabilitation showed considerable variation, often determined by feasibility and time to surgery. Prehabilitation studies could benefit from standardized outcomes. Adopting a more mechanistically grounded approach could improve program design and possibly effectiveness.

**Trial registration:** The review was preregistered in PROSPERO (CRD42024512892).

### Keywords

oncological surgery, physical exercise, prehabilitation, rationales, systematic review

### Conflict of Interest & Ethical Approval

yes

### Abstract submitters declaration

yes

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