Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies (SOS-Prehab)

GILLIS, Chelsia, MCISAAC, Daniel I <http://orcid.org/0000-0002-8543-1859>, SANTA MINA, Daniel <http://orcid.org/0000-0003-4361-1656>, CHEVALIER, Stéphanie, BALDINI, Gabriele, CARLI, Francesco, SCHEEDE-BERGDAHL, Celena, EDGAR, Linda, SMRK, Vanessa, AVERY, Leah <http://orcid.org/0000-0003-3578-1209>, BESSISSOW, Amal, COCA MARTINEZ, Miquel <http://orcid.org/0000-0001-9180-2006>, COPELAND, Robert <http://orcid.org/0000-0002-4147-5876>, DALTON, Susanne Oksbjerg, DANJOUX, Gerad, DENEHY, Linda, ENGEL, Dominique, GRIMMETT, Chloe <http://orcid.org/0000-0002-7540-7206>, GROCOTT, Michael P <http://orcid.org/0000-0002-9484-7581>, GILL, Heather L, JACK, Sandy, JENSEN, Bente Thoft, LEVETT, Denny, MARTINEZ-PALLI, Graciela, MERCHANT, Zoe, MOORE, John, PECORELLI, Nicolò <http://orcid.org/0000-0002-0883-8196>, RANDALL, Ian, RIEDEL, Bernhard, SCHIERBECK, Geoff, SLOOTER, Gerrit, WEST, Malcolm <http://orcid.org/0000-0002-0345-5356> and FIORE, Julio F <http://orcid.org/0000-0002-0019-8673>

OXFORD

Guidelines Collaborative Research

BJS, 2026, znaf302
https://doi.org/10.1093/bjs/znaf302
Guideline

Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies (SOS-Prehab)

Chelsia Gillis[1,2,3,*], Daniel I. McIsaac[4,5,6], Daniel Santa Mina[7], Stéphanie Chevalier[1,8,9], Gabriele Baldini[3,10,11], Francesco Carli[3], Celena Scheede-Bergdahl[3,12], Linda Edgar[3], Vanessa Smrk[1], Leah Avery[13], Amal Bessissow[14], Miquel Coca Martinez[15], Robert Copeland[16], Susanne Oksbjerg Dalton[17,18,19], Gerad Danjoux[20,21], Linda Denehy[22], Dominique Engel[23], Chloe Grimmett[24], Michael P. Grocott[25], Heather L. Gill[26], Sandy Jack[25,27], Bente Thoft Jensen[28], Denny Levett[25], Graciela Martinez-Palli[29], Zoe Merchant[30], John Moore[31,32], Nicolò Pecorelli[33], Ian Randall[34], Bernhard Riedel[35,36,37], Geoff Schierbeck[38], Gerrit Slooter[39], Malcolm West[40,41,42], Julio F. Fiore Jr.[2] and Collaborators

[1]School of Human Nutrition, McGill University, Montreal, Quebec, Canada
[2]Department of Surgery, McGill University, Montreal, Quebec, Canada
[3]Department of Anaesthesia, McGill University, Montreal, Quebec, Canada
[4]Department of Anesthesiology & Pain Medicine, The Ottawa Hospital, University of Ottawa, Ottawa, Ontario, Canada
[5]Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Ontario, Canada
[6]School of Epidemiology & Public Health, University of Ottawa, Ottawa, Ontario, Canada
[7]Faculty of Kinesiology and Physical Education, University of Toronto, Toronto, Ontario, Canada
[8]Department of Medicine, McGill University, Montreal, Quebec, Canada
[9]Department of Medicine, Research Institute of the McGill University Health Centre, Montreal, Quebec, Canada
[10]Department of Health Science, University of Florence, Florence, Italy
[11]Department of Anaesthesia and Intensive Care, Careggi University Hospital, Florence, Italy
[12]Department of Kinesiology and Physical Education, McGill University, Montreal, Quebec, Canada
[13]Centre for Population Health and Healthcare, School of Health and Life Sciences, Teesside University, Tees Valley, UK
[14]Division of General Internal Medicine, McGill University Health Centre, Montreal, Quebec, Canada
[15]Department of Anaesthesiology, Hôpital Maisonneuve-Rosemont, Université de Montréal, Montreal, Quebec, Canada
[16]Advanced Wellbeing Research Centre, Sheffield Hallam University, Sheffield, UK
[17]Cancer Survivorship, Danish Cancer Institute, Copenhagen, Denmark
[18]Danish Research Centre for Equality in Cancer, Department of Clinical Oncology and Palliative Care, Zealand University Hospital, Næstved, Denmark
[19]Institute of Clinical Medicine, Faculty of Health Sciences, University of Copenhagen, Copenhagen, Denmark
[20]Department of Perioperative Medicine, South Tees Hospitals NHS Foundation Trust, Middlesbrough, UK
[21]North Yorkshire Academic Alliance of Perioperative Medicine, James Cook University Hospital, Middlesbrough, UK
[22]Department of Physiotherapy and Sir Peter MacCallum Department of Oncology, The University of Melbourne, Centre for Health Services Research, Peter MacCallum Cancer Centre, Melbourne, Victoria, Australia
[23]Department of Anaesthesiology and Pain Medicine, Inselspital, Bern University Hospital, University of Bern, Bern, Switzerland
[24]School of Health Sciences, University of Southampton, Southampton, UK
[25]Perioperative and Critical Care, NIHR Southampton Biomedical Research Centre, University Hospital Southampton-University of Southampton, Southampton, UK
[26]Division of Vascular Surgery, Dalhousie University, Halifax, Nova Scotia, Canada
[27]Clinical Experimental Science, Faculty of Medicine, University of Southampton, Southampton, UK
[28]Department of Urology, Aarhus University Hospital, Denmark and Danish Research Centre for Surgical Cancer (ACROBATIC), Aarhus University, Aahrus, Denmark
[29]Department of Anaesthesia, Hospital Clínic-IDIBAPS, University of Barcelona, CIBERES, Barcelona, Spain
[30]North West Lung Centre, Manchester University NHS Foundation Trust, Manchester, UK
[31]Faculty of Biology, Medicine, and Health, University of Manchester, Manchester, UK
[32]Department of Anaesthesia, Manchester University Hospitals, Manchester, UK
[33]Division of Pancreatic and Transplant Surgery, Pancreas Translational and Clinical Research Centre, IRCCS San Raffaele Scientific Institute, Milan, Italy
[34]Department of Anaesthesiology and Pain Medicine, University of Toronto, Toronto, Ontario, Canada
[35]Department of Anaesthesia, Perioperative Medicine, and Pain Medicine, Peter MacCallum Cancer Centre, Melbourne, Victoria, Australia
[36]Sir Peter MacCallum Department of Oncology, The University of Melbourne, Melbourne, Victoria, Australia
[37]Department of Critical Care, The University of Melbourne, Melbourne, Victoria, Australia
[38]Portfolio Liaison Surgery Doctors of BC, Vancouver, British Columbia, Canada
[39]Department of Surgery, Máxima MC, Veldhoven, The Netherlands
[40]Academic Surgery, Cancer Sciences, Faculty of Medicine, University of Southampton, Southampton, UK
[41]Southampton Complex Cancer and Exenteration Team (SCCET), University Hospital Southampton, Southampton, UK
[42]NIHR Biomedical Research Centre, Perioperative Medicine and Prehabilitation, University Hospital Southampton, Southampton, UK

Correspondence to: Chelsia Gillis, School of Human Nutrition, McGill University, Macdonald Campus, 21111 Lakeshore, Sainte-Anne-de-Bellevue, Montreal, Quebec, H9X 3V9, Canada (e-mail: chelsia.gillis@mcgill.ca)

The Collaborators are co-authors of this study and are listed under the heading Collaborators

Received: November 18, 2025. **Revised:** December 22, 2025. **Accepted:** December 23, 2025

Abstract

Background: Prehabilitation, a process of building physiological reserve before surgery to improve postoperative outcomes, is a complex, multimodal intervention that requires rigorous evaluation in clinical trials. Incomplete reporting by such trials obscures essential intervention components and delivery contexts, hindering comparability and interpretability. This, in turn, limits clinical implementation and the replication or refinement of interventions by researchers. The aim of this study was to develop a reporting checklist for RCTs of prehabilitation.

Methods: A modified two-round Delphi process using the EQUATOR framework with 53 international experts across exercise, nutrition, psychological, and perioperative care disciplines was conducted. An initial checklist of candidate items was adapted from existing reporting standards, contextualized for prehabilitation, and iteratively refined through expert voting. Items rated eight to nine on a nine-point scale by ≥70% of participants in round two were classified as 'essential' and those rated seven were considered 'important'.

Results: The final checklist comprised 40 items. Sixteen items were classified as 'essential' and 24 items were classified as 'important' for guiding comprehensive reporting of prehabilitation interventions. These items span key domains including intervention components, delivery methods, adherence, participant characteristics, and outcome measures. High agreement among experts underscores the checklist's relevance and usability.

Conclusion: Adoption of Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies (SOS-Prehab), alongside methodological and outcome-reporting items of CONSORT could improve transparency, completeness, and interpretability of prehabilitation trials. This could enable better reproducibility, robust evidence synthesis, and accelerate translation into clinical practice and policy.

Introduction

Surgery represents a controlled form of physiological trauma performed for a therapeutic purpose; yet, it is rarely preceded by systematic preoperative preparation of the patient, despite evidence that modifiable patient factors (for example nutrition status, functional capacity, anxiety) strongly influence outcomes[1]. Prehabilitation was developed to address this gap by reframing the surgery waiting interval as an opportunity to enhance functional capacity and physiological reserve, so that patients are better prepared to tolerate surgical stress and achieve more effective recovery[2]. While prehabilitation programmes vary, they generally involve exercise, nutrition, psychological support, or a combination thereof, to address the impending metabolic, functional, and emotional demands of surgery[3,4]. The concept is compelling and grounded in physiological rationale; however, its implementation and the supporting evidence remain variable[2,5–9].

Existing reviews of prehabilitation suggest potential benefits: a network meta-analysis of over 100 randomized trials found that unimodal or multimodal exercise and nutrition interventions may reduce postoperative complications by 30–40% and shorten hospital length of stay by approximately 1 day (low to very low-certainty evidence)[5]. Moreover, an umbrella review of 55 systematic reviews reported moderate-certainty evidence for improved functional recovery after cancer surgery[10]. Despite these encouraging findings, poor research reporting undermines the strength of the evidence, limits clinical adoption, and restricts opportunities to refine interventions for further research. In this regard, prehabilitation trials on average report about half of the checklist items from the existing general trial- and intervention-reporting frameworks[11]. Moreover, in a scoping review of 110 oncology prehabilitation studies, one-quarter of the nutrition components were indiscernible and two-thirds did not report on adherence monitoring[12]. Such inconsistent and incomplete reporting limits the ability to identify the active components of prehabilitation, evaluate their effectiveness across different patient populations, and conduct rigorous knowledge synthesis to inform implementation guidelines.

As a complex intervention[13], prehabilitation therefore requires detailed reporting of its components, delivery, and context to ensure reproducibility and facilitate knowledge translation. Currently, there is no internationally accepted reporting guideline for prehabilitation trials. The aim of this study was to develop a tailored, consensus-based checklist to address this gap and improve the quality, completeness, and consistency of prehabilitation trial reporting.

Methods

The Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies (SOS-Prehab) were developed and registered in accordance with the Enhancing the Quality and Transparency of Health Research (EQUATOR) framework[14]. Consistent with its scope, SOS-Prehab focuses on intervention reporting, while methodological and outcome reporting align with CONSORT-2025[15]. The Delphi methodology is reported in accordance with the DELPHISTAR checklist[16]. Ethics approval was obtained from the McGill University Institutional Review Board (A02-E19-24A) before study initiation.

Development phase

The multidisciplinary and multiprofessional SOS-Prehab Steering Committee comprised prehabilitation experts specializing in nutrition (C.Gi., S.C.), exercise and physiotherapy (D.S.M., C.S.-B., J.F.F.), psychology (L.E.), and perioperative medicine (D.I.M., G.B., F.C.). The process began with a scoping review of prehabilitation trials to assess reporting quality against several established guidelines (CERT[17], TIDieR[18], PRESENT[19], CONSORT-SPI[20]) and to identify candidate checklist items. This review confirmed that reporting quality was suboptimal[11]. A preliminary 54-item checklist was created by adapting elements from existing guidelines, which were then reviewed for completeness by the International SOS-Prehab Advisory Committee (23 additional experts and co-authors).

Recruitment

Experts were defined as individuals who had previously published randomized trials of prehabilitation. For the purposes of SOS-Prehab, prehabilitation was defined as 'a process from diagnosis to surgery, consisting of one or more preoperative interventions of exercise, nutrition, psychological strategies and respiratory training, that aims to enhance functional capacity and physiological reserve to allow patients to withstand surgical

stressors, improve postoperative outcomes, and facilitate recovery'[3]. Experts were identified by contacting the first and last authors of the trials included in the scoping review[11], aiming for a target sample of 50 participants, including approximately 10 from each stakeholder group (perioperative medicine, nutrition, exercise, and psychology). Where gaps in disciplinary representation were identified, additional eligible experts were invited. This target aligns with a meta-analysis of 31 Delphi studies, which reported a median panel size of 50 and noted that larger panels often have lower response rates[21]. Only participants who completed round one were invited to participate in round two.

Modified Delphi process

A two-round, international, web-based Delphi survey was conducted using Research Electronic Data Capture (REDCap) between July and August 2024 to determine the essential reporting items for prehabilitation trials. This approach was chosen because Delphi methods enable structured, iterative input from geographically dispersed experts to achieve consensus on complex issues[22]. The Delphi process was considered 'modified' because: candidate items were pre-specified based on a scoping review and existing reporting frameworks, rather than generated inductively; structured, anonymized feedback was provided between rounds; and the process incorporated formal clinical sensibility testing in round two.

In round one, participants rated each pre-specified candidate item on a nine-point scale (1–3 = non-essential, 4–6 = somewhat essential, 7–9 = essential, and 0 = unable to respond) and could suggest refinements to item wording through free-text comments. Items rated non-essential by >50% of participants were removed from subsequent rounds.

In round two, participants were presented with the round one results (agreement rate, median, and range), their own previous scores, and scores stratified by group expertise (perioperative medicine, exercise, nutrition, psychology). Participants were then invited to re-score each item and provide justification for any changes. Free-text comments were used to refine item wording but did not supersede consensus criteria. All responses were anonymized and participants were blinded to the identities of other respondents throughout the Delphi process. Disagreements were handled quantitatively using pre-specified consensus thresholds (see the Data analysis section). Additionally, participants completed an adapted version of the clinical sensibility testing tool[23], tailored to the Delphi context and checklist objectives, to appraise the clarity, relevance, and comprehensiveness of the proposed items.

Data analysis

Continuous data are reported as mean(s.d.) and categorical (dichotomous) data are reported as *n* (%). Because no standard cut-offs exist for Delphi consensus[22] (reported thresholds vary by as much as 55–100% agreement[24]), consensus was defined a priori as ≥70% of respondents rating an item as 'essential' (scores 7–9) and <15% rating it as 'non-essential' (scores 1–3). To enhance feasibility and uptake, the item list was further refined into a concise set of 'minimum' reporting requirements; the Steering Committee established post hoc that items rated eight to nine by ≥70% of experts would be classified as 'essential', with the remaining consensus items (rated 7 by ≥70%) classified as 'important'.

Results

The response rate was 46% (63 of 137) in round one and 84% (53 of 63) in round two (*Fig. 1*). *Table 1* presents the characteristics of the 53 participants. Participants represented perioperative medicine (25 (47%)), exercise science (10 (19%)), nutrition (9 (17%)), psychology (6 (11%)), and other fields (3 (6%)). Most were based in Europe (27 (51%)) and in North America (20 (38%)), with an equal distribution of sex and self-identified gender.

Using the pre-specified threshold (≥70% rating 7–9 = 'essential'), 40 items met the consensus criteria. After threshold refinement (≥70% rating 8–9 = 'essential'; ≥70% rating 7 = 'important'), the process resulted in a final SOS-Prehab checklist comprising 16 'essential' items and 24 'important' items. The modified Delphi process was limited to two rounds because the preparatory scoping review effectively replaced the initial open-ended item-generation round of a traditional Delphi process. Moreover, high levels of agreement and rating stability were achieved early in the process, with only a small number of items removed after rounds one and two. Given the study objective of identifying a concise set of minimum reporting requirements, additional rounds were judged unlikely to meaningfully alter item prioritization while increasing respondent burden and risk of attrition.

To facilitate integration with existing trial reporting standards, SOS-Prehab items are presented alongside CONSORT-2025 sections and items in *Table 2*. Below, detailed explanations for each SOS-Prehab essential item, categorized by publication section, are provided. Further justification for the inclusion of each item, proportion of agreement, application guidance, and examples of reporting are provided in *Supplementary Material 1*. Excluded items are listed in *Supplementary Material 2*. A fillable Microsoft Word version of the checklist is available on the EQUATOR Network website.

The following essential items are recommended for each section of manuscripts that report on prehabilitation studies:

Title/Abstract

Specify the target population (that is type of surgery, diagnosis, clinical risk)

Intervention feasibility, design, and effectiveness can vary according to patient characteristics, such as the type of surgery (for example esophagectomy *versus* arthroplasty), diagnosis (for example cancer), and baseline clinical risk (for example nutritional or frailty status). Reporting this information helps readers judge the applicability of the findings to their own patients or settings, minimizes misinterpretation, improves indexing, and helps ensure that conclusions are not inappropriately generalized beyond the studied population.

Add 'prehabilitation' as a keyword for indexing purposes

Including 'prehabilitation' as a keyword improves accessibility and prevents incomplete retrieval of relevant trials, which could otherwise lead to biased or misleading conclusions. Because prehabilitation research spans multiple disciplines (that is surgery, anaesthesia, rehabilitation, nutrition, and psychology) studies may be indexed under broader, less specific terms. Consistent use of 'prehabilitation' (rather than variants such as 'preoperative rehabilitation' or 'pre-rehabilitation') facilitates systematic reviews by ensuring that all relevant studies are captured.

Specify prehabilitation components (for example exercise, nutrition, psychological support)

Prehabilitation interventions are often multimodal with variability between studies and within components (that is modalities). Clear identification of each component enables readers to interpret results within the correct programme

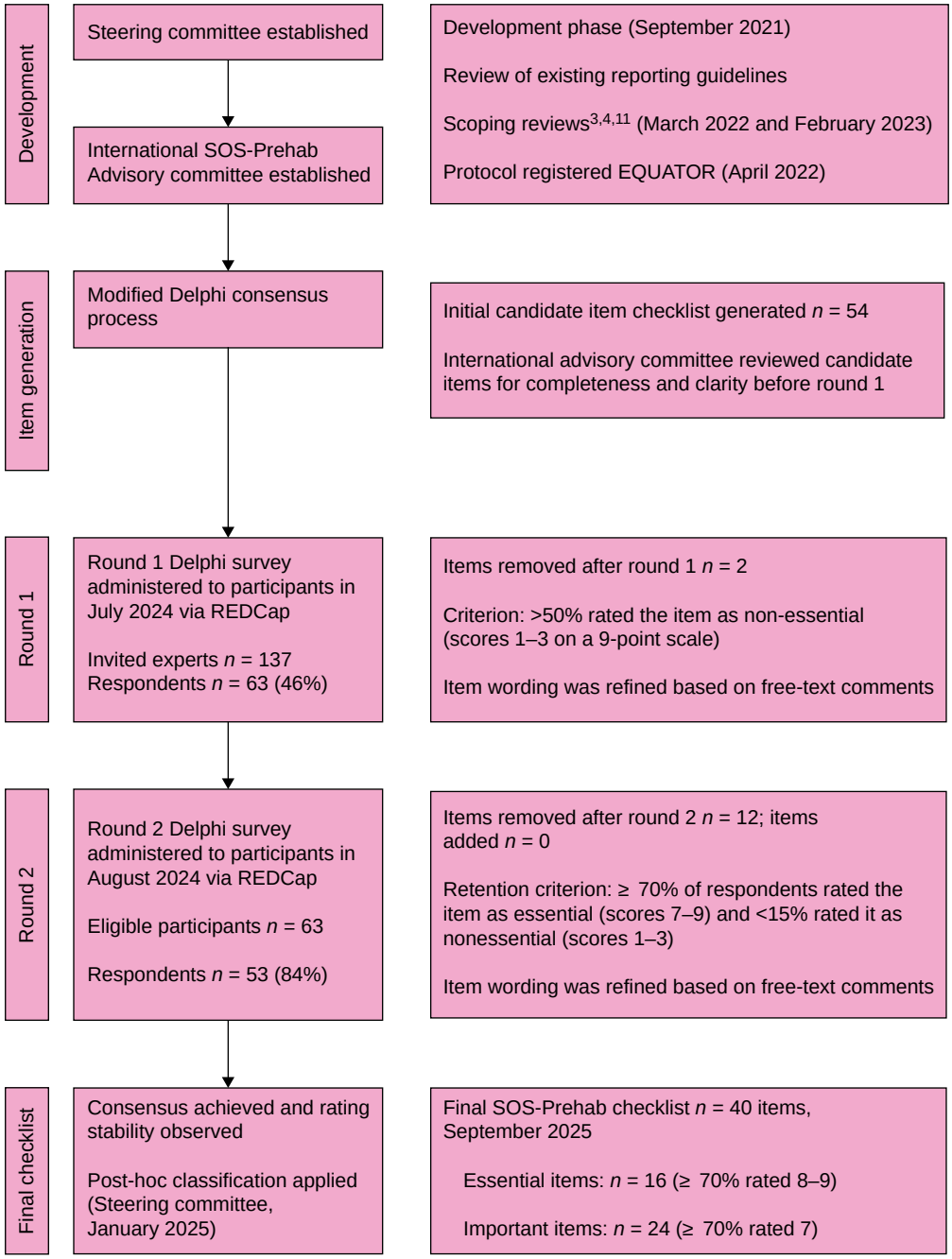

Fig. 1 Flow diagram illustrating expert recruitment and participation across Delphi rounds and the evolution of checklist items from initial generation to the final SOS-Prehab reporting guideline

SOS-Prehab, Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies; REDCap, Research Electronic Data Capture; EQUAOTR, Enhancing the QUAlity and Transparency Of health Research.

context, avoiding overgeneralized conclusions about 'prehabilitation.' It also allows rapid assessment of applicability, supports accurate indexing, and facilitates evidence synthesis.

Introduction

Specify the prehabilitation components and anticipated benefit(s)

Explicitly detailing each component (for example exercise, nutrition, psychological support) and its intended benefit clarifies the component's purpose and mechanism of action. Because programme theory (that is how an intervention is expected to produce its effects and under what conditions) may vary, linking each component to the targeted effect prevents assumptions and supports hypothesis-driven interpretation. For example, psychological support could be used to reduce perioperative anxiety or enhance adherence to the other components. This transparency enables readers to assess the plausibility of observed effects, facilitate replication, and, in context-specific results, identify which components may be essential for achieving the desired outcomes.

Methods: Intervention and comparator

Describe the specific behavioural changes targeted by prehabilitation

Health behaviours (for example increasing physical activity to 150 min/week or consuming 5–10 servings of fruits and

Table 1 Characteristics of 53 prehabilitation experts who completed both rounds of the Delphi process

Profession/expertise	
Perioperative medicine	25 (47)
Exercise	10 (19)
Nutrition	9 (17)
Psychology	6 (11)
Other (nurse, research coordinator)	3 (6)
Sex	
Male	27 (51)
Female	26 (49)
Self-identified gender	
Man	27 (51)
Woman	26 (49)
Age (years), mean(s.d.)	51(8.9)
Years since graduation of primary degree, mean(s.d.)	26(10.9)
Continent	
Europe	27 (51)
North America	20 (38)
Australia	5 (9)
Asia	1 (2)

Values are *n* (%) unless otherwise indicated.

vegetables/day) are the patient-oriented mechanisms through which prehabilitation exerts its effects and may be reinforced by behaviour change techniques. Clearly defining behavioural targets provides measurable criteria for evaluating intervention fidelity and patient adherence, helps determine whether desired changes were achieved, and enables identification of specific behaviours that drive improvements in clinical outcomes. Moreover, explicitly defining target behaviours prevents misclassification of interventions with distinct goals and mechanisms of action.

Describe the mode(s) of delivery (for example face-to-face, hybrid, internet, telephone), level of supervision, planned follow-up schedule (number and frequency of visits), and whether the intervention was delivered individually or in groups

Mode of delivery, supervision level, and follow-up schedule can influence accessibility, engagement, adherence, resource needs, scalability, and outcomes. As a complex intervention, prehabilitation's success or failure may depend on these core elements. For example, group-based exercise can foster peer support and reduce costs, whereas individual sessions could allow greater personalization for high-risk patients. The number of planned follow-ups affects programme intensity and opportunities for adjustment. Reporting these factors enables accurate interpretation, supports replication and cross-study comparisons, and informs implementation planning across diverse healthcare settings. It also facilitates secondary analyses, such as evaluating dose–response relationships and conducting subgroup analyses based on mode of delivery.

If exercise is part of the intervention:

Specify whether and how baseline assessment informed the therapeutic plan (for example personalized *versus* generic one-size-fits-all intervention) and provide a rationale for the chosen approach

Personalized interventions, such as tailoring exercise intensity (for example based on cardiopulmonary exercise test-derived parameters, heart rate, or the Borg scale), can optimize programme design but may require greater resources. Generic programmes may enhance scalability but risk under-addressing individual needs. Stating the baseline assessment approach and its rationale enables meaningful comparison between studies, clarifies the resource demands relative to expected benefits (informing cost-effectiveness analyses), and supports implementation planning. It also allows interpretation of outcomes within the context of the intervention's adaptability and alignment with the programme theory.

Describe the cardiovascular exercise, resistance/strength training, and/or respiratory muscle training included in the programme, specifying each exercise type separately

Each exercise modality targets distinct physiological systems. Clear differentiation is essential because combining modalities can obscure mechanisms of effect and lead to misinterpretation (for example attributing benefits to aerobic training when resistance or respiratory training also contributed). Specific patient groups might respond differently to different types of exercise. Reporting modalities separately enables mechanism-based interpretation and supports mediation analyses to explore causal pathways, as well as effect modification analyses to assess whether specific subgroups respond differently, while facilitating replication and comparison across studies.

Provide complete exercise prescription details, including type of exercise, number of sessions, timing, frequency, intensity, and/or dose (sets, repetitions, duration)

Training parameters (for example 3 sets of 10 repetitions at 60% of one-repetition maximum, performed twice weekly) determine the magnitude of physiological adaptations, influence safety, and affect feasibility in different patient populations. Generic descriptions, such as 'strength training twice per week', are insufficient for reproducibility, hinder mechanism-based interpretation, and obscure potential dose–response relationships. Using the frequency, intensity, timing, and type (FITT) principle to describe interventions ensures comprehensive reporting, facilitates replication and knowledge mobilization, enables accurate comparison across studies, and supports inclusion in meta-analyses.

If nutrition is part of the intervention:

Describe how nutritional status was evaluated

Baseline nutritional status influences surgical risk, recovery, and functional outcomes. At a minimum, malnutrition should be evaluated using a validated screening or diagnostic tool. Different tools can yield different classifications of malnutrition; as such, transparent reporting is essential for accurate comparison across studies. Clear reporting of assessment methods (for example the tool used, timing, cut-offs, and assessor) enables appropriate interpretation of study findings, supports reproducibility, and could facilitate meta-analyses stratified by nutritional status.

Methods: Outcomes

For each target behaviour, describe how engagement, adherence, and/or behaviour change were measured (for example logbooks, activity monitors, dietary tracking apps, questionnaires) and state the predefined engagement, adherence, and/or behavioural outcome targets

For each intervention component, describe how engagement, adherence and/or behaviour change were measured (for example logbooks, activity monitors, dietary tracking apps, questionnaires) and state the predefined engagement, adherence, and/or behavioural outcome targets. Report both the quantitative level of engagement and adherence (for example mean, median) and the proportion of participants meeting the pre-specified behavioural outcome targets, as these provide complementary insights into intervention fidelity. The choice of measurement method directly affects data accuracy, comparability, and interpretation of effectiveness, as some

Table 2 Integration of essential and important SOS-Prehab items with corresponding CONSORT-2025 checklist items

Section	CONSORT-2025 checklist item	SOS-Prehab item
Title and abstract		
Title and structured abstract	1a Identification as a randomized trial	1a (i). Label the intervention as 'prehabilitation' **1a (ii). Specify the target population (for example type of surgery, diagnosis, clinical risk)** **1a (iii). Add 'prehabilitation' as a keyword for indexing purposes**
	1b Structured summary of the trial design, methods, results, and conclusions	**1b (i). List all prehabilitation components (for example exercise, nutrition, psychological support)** 1b (ii). Specify the duration (range) of prehabilitation 1b (iii). State the setting where the prehabilitation intervention took place (for example hospital, community, home) and whether the intervention was supervised, unsupervised, or hybrid
Open science		
Trial registration	2. Name of trial registry, identifying number (with URL), and date of registration	
Protocol and statistical analysis plan	3. Where the trial protocol and statistical analysis plan can be accessed	
Data sharing	4. Where and how the individual deidentified participant data (including data dictionary), statistical code, and any other materials can be accessed	
Funding and conflicts of interest	5a. Sources of funding and other support (for example supply of drugs) and role of funders in the design, conduct, analysis, and reporting of the trial	
	5b. Financial and other conflicts of interest of the manuscript authors	
Introduction		
Background and rationale	6. Scientific background and rationale	6 (i). Define 'prehabilitation' as applied in the trial **6 (ii). Specify the prehabilitation components (for example exercise, nutrition, psychological support) and anticipated benefit(s)**
Objectives	7. Specific objectives related to benefits and harms	
Methods		
Patient and public involvement	8. Details of patient or public involvement in the design, conduct, and reporting of the trial	
Trial design	9. Description of trial design including type of trial (for example parallel group, crossover), allocation ratio, and framework (for example superiority, equivalence, non-inferiority, exploratory)	
Changes to trial protocol	10. Important changes to the trial after it commenced including any outcomes or analyses that were not pre-specified, with reason	
Trial setting	11. Settings (for example community, hospital) and locations (for example countries, sites) where the trial was conducted	11 (i). For trials that select participants based on screening, describe screening processes, tools, and personnel 11 (ii). Describe the existing standard of care at the surgical site, including: • Preoperative medical optimization (for example anaemia treatment, smoking cessation, alcohol cessation, polypharmacy management, diabetes management) • Use of Enhanced Recovery Pathways • Use of neoadjuvant oncological treatments, where applicable 11 (iii). State the intervention setting (that is hospital, outpatient clinic, community, home, hybrid)
Eligibility criteria	12a. Eligibility criteria for participants 12b. If applicable, eligibility criteria for sites and for individuals delivering the interventions (for example surgeons, physiotherapists)	12b. Identify providers for each intervention component (for example kinesiologist, physiotherapist), describing their qualifications and any study-specific training
Intervention and comparator	13. Intervention and comparator with sufficient details to allow replication; if relevant, where additional materials describing the intervention and comparator (for example intervention manual) can be accessed	Overall information about the prehabilitation programme 13a (i). Describe any physical or information resources used in the intervention (that is information booklets, fitness monitors) or to facilitate intervention delivery (for example smartphone apps) and the instructions/training provided to participants, and where these materials can be accessed (for example online appendix, URL) **13a (ii). Describe the specific behaviour changes targeted by the prehabilitation programme (for example increasing physical activity to ≥150 min/week, consuming 5–10 servings of fruits and vegetables/day)** **13a (iii). Describe the mode(s) of delivery (for example face-to-face, hybrid, internet, telephone), level of supervision, planned follow-up schedule (number and frequency of visits), and whether the intervention was delivered individually or in groups** If exercise is part of the intervention: **13b (i). Specify whether and how baseline assessment informed the therapeutic plan (for example personalized *versus* generic one-size-fits-all intervention) and provide a rationale for the chosen approach**

(continued)

Table 2 (continued)

Section	CONSORT-2025 checklist item	SOS-Prehab item
		13b (ii). Describe the cardiovascular exercise, resistance/strength training, and/or respiratory muscle training included in the programme, specifying each exercise type separately **13b (iii). Provide complete exercise prescription details, including type of exercise, number of sessions, timing, frequency, intensity, and/or dose (sets, repetitions, duration)** 13b (iv). If the intervention was personalized, titrated, or adapted, describe how progressions and regressions were managed—specifying what changes were made, why, when, how, and the thresholds used; include how initial exercises were selected and progressed If nutrition is part of the intervention: 13c (i). Describe how nutritional status was evaluated, which may include: • **Malnutrition assessment (for example Subjective Global Assessment)** • Anthropometrics (for example weight, height) and/or body composition analysis (for example Bioelectrical Impedance Analysis, Dual-energy X-ray Absorptiometry, Computed Tomography) • Dietary intake assessment (for example food record or recall, number of days, portion size estimation, food composition tables), including supplemental intake (for example oral nutrition supplements, vitamins/minerals) 13c (ii). For nutrition interventions, describe the intervention targets, such as nutritional requirements (for example energy, protein), dietary recommendations, or guidelines used to guide the prescription 13c (iii). For nutrition interventions that include supplements, specify the type (for example plant-based protein, whey protein), prescribed dose, timing (for example before or after exercise), and duration of use If psychological support is part of the intervention: 13d (i). Describe how psychological status was assessed (for example Distress Thermometer, GAD-7), including thresholds used, and explain how assessment results informed the prehabilitation programme 13d (ii). Explain the purpose of the psychological support component (for example improving mental health, normalizing preoperative mood disturbances, enhancing intervention adherence) and how it is expected to contribute to overall prehabilitation outcomes 13d (iii). Specify the type of psychological support provided (for example mindfulness, cognitive behavioural therapy, counselling) and detail the number, frequency, and duration of sessions
Outcomes	14. Pre-specified primary and secondary outcomes, including the specific measurement variable (for example systolic blood pressure), analysis metric (for example change from baseline, final value, time to event), method of aggregation (for example median, proportion), and time point for each outcome	**14 (i). For each target behaviour, describe how engagement, adherence, and/or behaviour change were measured (for example logbooks, activity monitors, dietary tracking apps, questionnaires) and state the predefined engagement, adherence, and/or behavioural outcome targets** 14 (ii). If explanatory preoperative outcomes were assessed (for example changes in physical, nutritional, or psychological status from baseline to immediately before surgery), define and justify each outcome; specify any thresholds or criteria used to determine post-intervention 'success' (for example increase of x metres in 6-min walking distance) **14 (iii). Define and justify postoperative outcomes (for example 30-day complication rate), explaining clinical relevance and describing key measurement properties such as validity, reliability, and the minimally important clinical difference** **14 (iv). Define and justify the timing of assessments**
Harms	15. How harms were defined and assessed (for example systematically, non-systematically)	
Sample size	16a. How sample size was determined, including all assumptions supporting the sample size calculation 16b. Explanation of any interim analyses and stopping guidelines	
Randomization: sequence generation	17a. Who generated the random allocation sequence and the method used 17b. Type of randomization and details of any restriction (for example stratification, blocking, and block size)	
Allocation concealment mechanism	18. Mechanism used to implement the random allocation sequence (for example central computer/telephone; sequentially numbered, opaque, sealed containers), describing any steps to conceal the sequence until interventions were assigned	
Implementation	19. Whether the personnel who enrolled and those who assigned participants to the interventions had access to the random allocation sequence	

(continued)

Table 2 (continued)

Section	CONSORT-2025 checklist item	SOS-Prehab item
Blinding	20a. Who was blinded after assignment to interventions (for example participants, care providers, outcome assessors, data analysts) 20b. If blinded, how blinding was achieved and description of the similarity of interventions	
Statistical methods	21a. Statistical methods used to compare groups for primary and secondary outcomes, including harms 21b. Definition of who is included in each analysis (for example all randomized participants) and in which group 21c. How missing data were handled in the analysis 21d. Methods for any additional analyses (for example subgroup and sensitivity analyses), distinguishing pre-specified from post hoc	21d. If an adherence or per-protocol analysis is planned, clearly define the criteria (for example completion of ≥4 of 6 prescribed sessions, achievement of ≥80% of the prescribed rating of perceived exertion)
Results		
Participant flow, including flow diagram	22a. For each group, the numbers of participants who were randomly assigned, received intended intervention, and were analysed for the primary outcome 22b. For each group, losses and exclusions after randomization, together with reasons	22a. When feasible, report the characteristics of patients who declined trial participation and their reasons for refusal
Recruitment	23a. Dates defining the intervals of recruitment and follow-up for outcomes of benefits and harms 23b. If relevant, why the trial ended or was stopped	
Intervention and comparator delivery	24a. Intervention and comparator as they were actually administered (for example, where appropriate, who delivered the intervention/comparator, how participants adhered, whether they were delivered as intended (fidelity))	**24a (i). Specify the actual duration of prehabilitation and report appropriate measures of dispersion** 24a (ii). Specify and describe the number of intervention sessions actually delivered, compared with the number planned, and indicate whether they were delivered as intended 24a (iii). For each intervention, report the proportion of participants who met attendance, adherence, and/or behavioural targets, and, where applicable, describe reasons for poor adherence 24a (iv). Explicitly report any predefined components of the intervention that were not delivered, including deviations from the planned protocol
	24b. Concomitant care received during the trial for each group	**24b. *If applicable,* describe any additional testing performed outside both the prehabilitation programme and standard care (for example CPET, echocardiography) and explain how results influenced the prehabilitation plan**
Baseline data	25. A table showing baseline demographic and clinical characteristics for each group	25. Characterize the study sample by reporting baseline and surgery details, including: • **Diagnostic information (for example indication for surgery, cancer *versus* non-cancer, tumour type, neoadjuvant treatment)** • Surgical risk (for example ASA grade) • Functional capacity/status (for example CPET, 6-min walk test) • Nutritional status (for example Subjective Global Assessment) • Psychological status (for example GAD-7) • Surgical approach
Numbers analysed, outcomes, and estimation	26. For each primary and secondary outcome, by group: • the number of participants included in the analysis • the number of participants with available data at the outcome time point • result for each group and the estimated effect size and its precision (such as 95% confidence interval) • for binary outcomes, presentation of both absolute and relative effect size	
Harms	27. All harms or unintended events in each group	27 (i). Explicitly state whether adverse events occurred; if they did, differentiate between adverse events and serious adverse events 27 (ii). Describe how adverse events, if any, were monitored and managed, and indicate whether affected participants remained in the study
Ancillary analyses	28. Any other analyses performed, including subgroup and sensitivity analyses, distinguishing pre-specified from post hoc	
Discussion		
Interpretation	29. Interpretation consistent with results, balancing benefits and harms, and considering other relevant evidence	
Limitation	30. Trial limitations, addressing sources of potential bias, imprecision, generalizability, and, if relevant, multiplicity of analyses	30. Discuss the limitations arising from not addressing specific SOS-Prehab reporting checklist items in the trial design and/or analysis

Bold SOS-Prehab items are considered essential and non-bold SOS-Prehab items are important/recommended. SOS-Prehab, Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies; GAD-7, Generalized Anxiety Disorder 7-item scale; CPET, Cardiopulmonary Exercise Testing.

Table 3 Acceptability of the 40 SOS-Prehab items as rated by 53 prehabilitation experts

Items	Values
To what extent are the items directed at important issues pertaining to surgical prehabilitation research	Large extent: 34 (64) Moderate extent:10 (19) Fair extent: 4 (8) Limited extent: 5 (9)
To what extent are the items provided easily understood?	Large extent: 23 (43) Moderate extent: 22 (42) Fair extent: 5 (9) Limited extent: 3 (6)
To what extent are these items likely to elicit the information needed for peer review of surgical prehabilitation interventions?	Large extent: 36 (68) Moderate extent: 10 (19) Fair extent: 3 (6) Limited extent: 4 (7)
Are there important items pertaining to the reporting of surgical prehabilitation interventions that should be included in the checklist that have been omitted?	Insignificant gaps: 39 (73) Minimal gaps: 11 (21) Minor gaps: 2 (4) Important gaps: 1 (2)
How many items are inappropriate or redundant?	Hardly any: 36 (68) A few: 10 (19) Some: 3 (6) Many: 4 (7)
How likely is the reporting of these items to influence the quality of reporting for surgical prehabilitation	Very likely: 31 (58) Quite likely: 13 (25) Likely: 3 (6) Unlikely: 4 (7) Very unlikely: 2 (4)

Values are *n* (%). SOS-Prehab, Standards for reporting research methods, interventions, and Outcomes in Surgical Prehabilitation studies.

assessment tools may influence behaviour (for example self-monitoring may increase engagement or adherence). Predefined engagement, adherence, and behavioural outcome targets enable assessment of whether the intervention was delivered/received as intended, which is essential for interpreting whether observed effects are attributable to the intervention itself or reflect suboptimal implementation. For example, a programme targeting a total dietary protein intake of 1.2 g/kg/day may appear ineffective if participants achieve only 0.8 g/kg/day. Transparent reporting of such targets enables dose–response evaluation, facilitates comparison across studies, and informs strategies to improve intervention uptake, engagement, and adherence.

Define and justify postoperative outcomes (for example 30-day complication rate), explaining clinical relevance and describing key measurement properties such as validity, reliability, and the minimally important clinical difference

Outcome selection directly affects trial interpretability and comparability, and without a clear justification may be poorly aligned with the intervention's intended effects (for example using the 6-min walk test when the intervention does not include walking or any cardiopulmonary/aerobic training that could plausibly improve walking capacity). Reporting key measurement properties (for example validity, reliability, and clinically important differences) is essential to ensure that selected outcomes accurately capture the intended construct. When outcomes are measured both at baseline and follow-up, report values at both time points and specify the analytical approach used to assess change. Analyses should emphasize between-group differences in change (the true intervention effect) rather than within-group improvements alone, which can overestimate benefit and hinder interpretation as well as meta-analytic synthesis. For tools that involve some subjectivity, such as clinician-oriented classifications like the Clavien–Dindo system for complications, detailed supplementary tables that describe how outcomes were identified and classified increase transparency, enable independent verification, strengthen confidence, and facilitate comparison across studies.

Define and justify the timing of assessments

Recovery trajectories vary over time, by type of surgery, and across patient subgroups. Clearly defining and justifying the timing of postoperative assessments (for example complications recorded during the index hospitalization *versus* within 30 days) ensures that outcomes are measured at clinically relevant points, align with intervention goals, and are comparable across studies. Explicitly reporting timing also facilitates meta-analyses and supports interpretation of whether observed effects might reflect short-term recovery, longer-term adaptation, or development of complications.

Results: Intervention and comparator delivery

Specify the actual duration of prehabilitation and report appropriate measures of dispersion

Planned and actual prehabilitation durations often differ due to factors such as surgical scheduling, patient readiness, and logistical constraints. Variation in duration (for example 2 *versus* 6 weeks) can substantially influence physiological adaptations, intervention effectiveness, and the interpretation of findings. Reporting both the mean or median duration and measures of variability (for example standard deviation, interquartile range) enables dose–response analyses, supports evidence synthesis, and informs realistic implementation planning in clinical settings.

***If applicable*, describe any additional testing performed outside both the prehabilitation programme and standard care and explain how results influenced prehabilitation delivery**

Prehabilitation assessments may prompt further investigations or treatments that fall outside both the prehabilitation programme and usual care, such as cardiopulmonary exercise testing, echocardiography, or specialist referrals. These can independently influence outcomes and, if unreported, their effects may be misattributed to the prehabilitation programme alone (that is attribution bias).

Results: Baseline data

Characterize the study sample by reporting baseline and surgery details

Surgical indication, surgical approach, and diagnostic information, such as cancer staging and prior treatments (if relevant), should be reported at a minimum, as these factors influence baseline surgical risk, programme feasibility, and/or outcomes. For example, patients with cancer who have completed chemoradiation may require different prehabilitation components than non-cancer surgical patients. Without such diagnostic details, applicability and comparability are compromised. Comprehensive baseline reporting enables assessment of heterogeneity in response to the intervention, supports interpretation of subgroup effects, and informs the generalizability of findings.

Item acceptability

Table 3 summarizes the 40-item acceptability among the 53 prehabilitation experts. Most rated the checklist items as addressing important issues in prehabilitation research to a large extent (64%) or a moderate extent (19%), as being easily understood to a large extent (43%) or a moderate extent (42%), and as being likely to elicit the information needed for peer review to a large extent (68%) or a moderate extent (19%). Perceived omissions were minimal—73% identified insignificant gaps, 21% identified minimal gaps, and only 2% reported important gaps. Most experts considered the number of inappropriate or redundant items to be minimal (68% 'hardly any', 19% 'a few'). A majority believed the checklist was very likely (58%) or quite likely (25%) to improve the quality of surgical prehabilitation reporting.

Discussion

Reporting guidelines play a meaningful role in improving the quality, transparency, and impact of research. For instance, journal endorsement of the CONSORT guideline is associated with more complete and transparent reporting of randomized trials, including more precise descriptions of methodology and outcomes[25,26]. Underscoring the importance of reporting standards, meta-epidemiological studies indicate trials with inadequate or unclear allocation concealment and blinding tend to overestimate treatment effects[27–30]. Moreover, publications developed with checklists significantly aid peer reviewers in identifying gaps and inconsistencies, thereby influencing manuscript quality[31]. In short, guidelines can elevate rigour, facilitate replicability and reliability, support evidence synthesis, and accelerate the generation of high-quality evidence available to clinicians and policymakers.

In a rapidly evolving, multidisciplinary, and still maturing field such as prehabilitation, the need for high-quality, standardized reporting is particularly relevant. Prehabilitation is a complex intervention[13], often integrating exercise, nutrition, and psychological support, and frequently tailored to individual patient needs[3,8]. Without clear and comprehensive reporting, the nuance required to interpret findings is lost, making it impossible to determine which components mediate observed effects, how they interact, and in which contexts they are most effective. Early adoption of prehabilitation-specific reporting standards could accelerate the field's maturation by ensuring that future trials are conducted and reported in ways that yield clear, comparable, reproducible, and clinically relevant evidence —ultimately enabling the right patient to receive the right care at the right time.

Although frameworks such as TIDieR[18] and CERT[17] provide valuable general guidance for intervention reporting, they were not designed to capture core features distinctive to prehabilitation. SOS-Prehab complements these tools by operationalizing prehabilitation-specific elements such as: structured reporting of baseline status (items 25, 13c, 13d); integration with study context, including setting (hospital/community/home/hybrid) and local care standards (for example use of enhanced recovery pathways) (items 11); intervention adaptability and personalization (item 13a); and how exercise and other components were progressed, regressed, or titrated with explicit thresholds (item 13b). To maintain alignment with established trial reporting standards, SOS-Prehab focuses on the reporting of prehabilitation interventions, while methodological and outcome-reporting elements should remain guided by CONSORT-2025[15].

This study has limitations. First, despite the intention to recruit balanced representation across disciplines, psychological expertise was under-represented in the Delphi survey (6 experts), which may have limited the extent to which behaviour change components were addressed. While exercise and nutrition professionals also receive formal training in behaviour change strategies (including motivational interviewing, adherence support, and lifestyle counselling), greater input from psychology experts may have further strengthened the identification of 'essential' or 'important' items related to behavioural support, including behaviour change theory or behaviour change techniques, or items related to psychological support and type of support (for example motivational support *versus* distress counselling). The absence of such items from the final checklist does not imply that they are irrelevant. Although the response rate in round one was 46%, consistent with Delphi studies recruiting large, international expert panels[21], retention between rounds was high (84%), indicating sustained expert engagement across rounds. Second, participants self-identified their primary discipline (perioperative medicine, nutrition, exercise/physiotherapy, psychology) but detailed information about their specialty (for example anaesthesia, surgery, other) was not systematically collected. Third, while the Delphi process captures expert consensus, agreement among panellists does not guarantee correctness. Prehabilitation is multidisciplinary and there is a risk that experts may undervalue items outside their own area of expertise, potentially omitting critical components. Fourth, Because SOS-Prehab is a research reporting guideline rather than a clinical or patient-facing intervention, patient and public involvement was not incorporated into the Delphi process; however, such engagement will be essential for future implementation-focused or patient-directed guidance. Fifth, the operational definition of prehabilitation did not include other potential intervention domains, such as cognitive training. Finally, the high level of agreement across items prompted a protocol modification to classify them as 'essential' or 'important' to ensure a concise final checklist. Only the 'essential' items are presented in the main manuscript; however, the 'important' items, provided in *Table 2* and *Supplementary Material 1*, were also endorsed by experts. Their reporting is highly encouraged to enhance completeness and transparency in prehabilitation trials. Future work will focus on evaluating the usability and clarity of SOS-Prehab through user testing with investigators and applying the checklist to existing and prospective prehabilitation trials to assess reporting completeness and inform iterative refinement.

SOS-Prehab is the first consensus-based reporting checklist designed to address the complexity of surgical prehabilitation trials. By detailing key aspects of intervention components, context, and outcomes, this checklist aims to enhance the clarity, completeness, and reproducibility of research in this field. Given the multidisciplinary nature of prehabilitation, consistent use of SOS-Prehab could enable more accurate interpretation of findings, facilitate evidence synthesis, and accelerate translation into practice and policy. With widespread adoption and periodic refinement as the field evolves, SOS-Prehab has the potential to standardize the conduct and reporting of prehabilitation research globally, thereby accelerating progress toward more effective, evidence-informed prehabilitation care.

Collaborators

C. J. L. Molenaar (Maxima Medical Center, Eindhoven, Netherlands), T. A. Duhamel (University of Manitoba, Winnipeg, Canada), R. Sebio-Garcia (Hospital Clínic Barcelona, Barcelona, Spain), C. Steinmetz (Universitätsmedizin Göttingen, Göttingen, Germany), C. Nguyen (Université de Paris, Paris, France), B. P. O'Gara (Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, USA), A. Onerup (University of Gothenburg, Gothenburg, Sweden), M. Licker (University Hospital of Martinique, Fort-de-France, France), Y. Huang (Chinese Academy of Medical Sciences & Peking Union Medical College Hospital, Beijing, China), M. Lundberg (University of Gothenburg, Gothenburg, Sweden), A.-A. Marchand (Université du Québec à Trois-Rivières, Trois-Rivières, Canada), P. Gränicher (Maastricht University, Maastricht, Netherlands), M. L. Humeidan (The Ohio State University Wexner Medical Center, Columbus, USA), A. Fulop (Pázmány Péter Catholic University, Budapest, Hungary), B. Bánky (Semmelweis University, Budapest, Hungary), D. Dunne (Aintree University Hospital, Liverpool, UK), F. Ausania (Cirugía, CHUVI, España), J. Klaase (University Medical Center Groningen, Groningen, the Netherlands), C. M. Prado (University of Alberta, Edmonton, Canada), D. Steffens (Royal Prince Alfred Hospital, Sydney, Australia), S. A. Wootton (University of Southampton, Southampton, UK), D. Provan (West of Scotland Cancer Network, UK), R. Barlow (Cardiff University, Wales, UK), C. Shaw (The Royal Marsden NHS Foundation Trust, London, Sutton, UK), C. Basualdo-Hammond (Alberta Health Services, Edmonton, Canada), N. Kiss (Deakin University, Geelong, Australia), I. Bentov (University of Washington, Seattle, WA, USA), K. Mayson (Vancouver General Hospital, Vancouver, Canada), C. Keen (Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK), G. Phillips (Sheffield Hallam University, Sheffield, UK), A. Fisher (University College London, London, UK), H. Webb-Peploe (Gloucestershire Hospitals NHS Foundation Trust, Gloucestershire, UK), L. Humphreys (Sheffield Hallam University, Sheffield, UK), K. K. Parmar (University Hospitals Birmingham NHS Foundation Trust).

Funding

The authors have no funding to declare.

Acknowledgements

C.Gi. is a Tier 2 Canada Research Chair in Perioperative Nutrition (CRC-2023-00240). D.I.M. receives salary support from the Ottawa Hospital Anaesthesia Alternate Funds Association, is a Clinical Research Chair at the University of Ottawa Faculty of Medicine, and received a Mid-Career Knowledge Translation Award from Physician Services Inc. J.M. is a University of Manchester MAHSC Honorary Clinical Chair. M.P.G. receives funding from the NIHR Southampton Biomedical Research Centre (UK) and the NIHR Senior Investigator Scheme (UK).

Author contributions

Chelsia Gillis (Conceptualization, Data curation, Formal analysis, Methodology, Supervision, Writing—original draft), Daniel I. McIsaac (Conceptualization, Writing—review & editing), Daniel Santa Mina (Conceptualization, Writing—review & editing), Stéphanie Chevalier (Conceptualization, Writing—review & editing), Gabriele Baldini (Conceptualization, Writing—review & editing), Francesco Carli (Conceptualization, Writing—review & editing), Celena Scheede-Bergdahl (Conceptualization, Writing—review & editing), Linda Edgar (Conceptualization, Writing—review & editing), Vanessa Smrk (Data curation, Formal analysis, Project administration, Writing—review & editing), Leah Avery (Conceptualization, Writing—review & editing), Amal Bessissow (Conceptualization, Writing—review & editing), Miquel Coca Martinez (Conceptualization, Writing—review & editing), Robert Copeland (Conceptualization, Writing—review & editing), Susanne Oksbjerg Dalton (Conceptualization, Writing—review & editing), Gerad Danjoux (Conceptualization, Writing—review & editing), Linda Denehy (Conceptualization, Writing—review & editing), Dominique Engel (Conceptualization, Writing—review & editing), Chloe Grimmett (Conceptualization, Writing—review & editing), Michael P. Grocott (Conceptualization, Writing—review & editing), Heather L. Gill (Conceptualization, Writing—review & editing), Sandy Jack (Conceptualization, Writing—review & editing), Bente Thoft Jensen (Conceptualization, Writing—review & editing), Denny Levett (Conceptualization, Writing—review & editing), Graciela Martínez-Palli (Conceptualization, Writing—review & editing), Zoe Merchant (Conceptualization, Writing—review & editing), John Moore (Conceptualization, Writing—review & editing), Nicolò Pecorelli (Conceptualization, Writing—review & editing), Ian Randall (Conceptualization, Writing—review & editing), Bernhard Riedel (Conceptualization, Writing—review & editing), Geoff Schierbeck (Conceptualization, Writing—review & editing), Gerrit Slooter (Conceptualization, Writing—review & editing), Malcolm West (Conceptualization, Writing—review & editing), Julio F. Fiore Junior (Conceptualization, Methodology, Supervision, Writing—review & editing), and Collaborators (Writing—review & editing)

Disclosure

C.Gi. has received speaker honoraria from Abbott Nutrition, Nestle, and Fresenius Kabi unrelated to this manuscript. S.C. has received a speaker honorarium from Nestlé, not related to the present work. M.W. has received speaker honoraria from Medtronic. M.W., D.L., S.J., and M.P.G. are co-founders of Prehab4Life. M.P.G. has received consultancy fees and unrestricted grant support from Becton Dickinson Ltd and Sphere Medical Ltd. B.T.J. has received consultant and speaker honoraria from MEDAC and Wellspect, not related to the present work. G.B. has received speaker honoraria from Abbott Nutrition, Fresenius Kabi, Baxter, and Aristea Education. L.D. has received speaker honoraria from Roche and Bristol Myers Squibb. The authors declare no other conflict of interest.

Supplementary material

Supplementary material is available at BJS online.

Data availability

Data are available upon reasonable request.

References

1. Bamdad MC, Brown CS, Kamdar N, Weng W, Englesbe MJ, Lussiez A. Patient, surgeon, or hospital: explaining variation in outcomes after colectomy. *J Am Coll Surg* 2022;**234**:300–309
2. Gillis C, Ljungqvist O, Carli F. Prehabilitation, enhanced recovery after surgery, or both? A narrative review. *Br J Anaesth* 2022;**128**:434–448
3. Fleurent-Grégoire C, Burgess N, McIsaac DI, Chevalier S, Fiore JF Jr, Carli F *et al.* Towards a common definition of surgical prehabilitation: a scoping review of randomised trials. *Br J Anaesth* 2024;**133**:305–315
4. Fleurent-Grégoire C, Burgess N, Denehy L, Edbrooke L, Engel D, Testa GD *et al.* Outcomes reported in randomised trials of surgical prehabilitation: a scoping review. *Br J Anaesth* 2024;**133**:42–57
5. McIsaac DI, Kidd G, Gillis C, Branje K, Al-Bayati M, Baxi A *et al.* Relative efficacy of prehabilitation interventions and their components: systematic review with network and component network meta-analyses of randomised controlled trials. *BMJ* 2025;**388**:e081164
6. Boney O, Bell M, Bell N, Conquest A, Cumbers M, Drake S *et al.* Identifying research priorities in anaesthesia and perioperative care: final report of the joint National Institute of Academic Anaesthesia/James Lind Alliance Research Priority Setting Partnership. *BMJ Open* 2015;**5**:e010006
7. McKeen DM, Banfield JC, McIsaac DI, McVicar J, McGavin C, Earle MA *et al.* Top ten priorities for anesthesia and perioperative research: a report from the Canadian Anesthesia Research Priority Setting Partnership. *Can J Anaesth* 2020;**67**:641–654
8. Wallace SKA, Bucknall TK, Forbes A, Myles PS. A mixed-methods study to identify the top 10 research priorities for perioperative medicine in Australia. *Br J Anaesth* 2025;**134**:1503–1512
9. Cook S, Liu X, Hancock M, Solomon M, Koh C, Kim B *et al.* How robust is the evidence for prehabilitation in cancer surgery? A systematic review and fragility index analysis. *Ann Surg Oncol* 2026;**33**:1042–1067
10. McIsaac DI, Gill M, Boland L, Hutton B, Branje K, Shaw J *et al.* Prehabilitation in adult patients undergoing surgery: an umbrella review of systematic reviews. *Br J Anaesth* 2022;**128**:244–257
11. Engel D, Testa GD, McIsaac DI, Carli F, Santa Mina D, Baldini G *et al.* Reporting quality of randomized controlled trials in prehabilitation: a scoping review. *Perioper Med (Lond)* 2023;**12**:48
12. Gillis C, Davies SJ, Carli F, Wischmeyer PE, Wootton SA, Jackson AA *et al.* Current landscape of nutrition within prehabilitation oncology research: a scoping review. *Front Nutr* 2021;**8**:644723
13. Skivington K, Matthews L, Simpson SA, Craig P, Baird J, Blazeby JM *et al.* A new framework for developing and evaluating complex interventions: update of Medical Research Council guidance. *BMJ* 2021;**374**:n2061
14. Moher D, Schulz KF, Simera I, Altman DG. Guidance for developers of health research reporting guidelines. *PLoS Med* 2010;**7**:e1000217
15. Hopewell S, Chan A-W, Collins GS, Hróbjartsson A, Moher D, Schulz KF *et al.* CONSORT 2025 statement: updated guideline for reporting randomized trials. *Nat Med* 2025;**31**:1776–1783
16. Niederberger M, Schifano J, Deckert S, Hirt J, Homberg A, Köberich S *et al.* Delphi studies in social and health sciences—recommendations for an interdisciplinary standardized reporting (DELPHISTAR). Results of a Delphi study. *PLoS One* 2024;**19**:e0304651
17. Slade SC, Dionne CE, Underwood M, Buchbinder R, Beck B, Bennell K *et al.* Consensus on Exercise Reporting Template (CERT): modified Delphi study. *Phys Ther* 2016;**96**:1514–1524
18. Hoffmann TC, Glasziou PP, Boutron I, Milne R, Perera R, Moher D *et al.* Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ* 2014;**348**:g1687
19. Betts JA, Gonzalez JT, Burke LM, Close GL, Garthe I, James LJ *et al.* PRESENT 2020: text expanding on the checklist for proper reporting of evidence in sport and exercise nutrition trials. *Int J Sport Nutr Exerc Metab* 2020;**30**:2–13
20. Grant S, Mayo-Wilson E, Montgomery P, Macdonald G, Michie S, Hopewell S *et al.* CONSORT-SPI 2018 Explanation and Elaboration: guidance for reporting social and psychological intervention trials. *Trials* 2018;**19**:406
21. Gargon E, Crew R, Burnside G, Williamson PR. Higher number of items associated with significantly lower response rates in COS Delphi surveys. *J Clin Epidemiol* 2019;**108**:110–120
22. Williamson PR, Altman DG, Bagley H, Barnes KL, Blazeby JM, Brookes ST *et al.* The COMET Handbook: version 1.0. *Trials* 2017; **18**(Suppl 3): 280
23. Burns KE, Duffett M, Kho ME, Meade MO, Adhikari NK, Sinuff T *et al.* A guide for the design and conduct of self-administered surveys of clinicians. *CMAJ* 2008;**179**:245–252
24. Powell C. The Delphi technique: myths and realities. *J Adv Nurs* 2003;**41**:376–382
25. Turner L, Shamseer L, Altman DG, Schulz KF, Moher D. Does use of the CONSORT Statement impact the completeness of reporting of randomised controlled trials published in medical journals? A Cochrane review. *Syst Rev* 2012;**1**:60
26. Dechartres A, Trinquart L, Atal I, Moher D, Dickersin K, Boutron I *et al.* Evolution of poor reporting and inadequate methods over time in 20 920 randomised controlled trials included in Cochrane reviews: research on research study. *BMJ* 2017;**357**:j2490
27. Hróbjartsson A, Emanuelsson F, Skou Thomsen AS, Hilden J, Brorson S. Bias due to lack of patient blinding in clinical trials. A systematic review of trials randomizing patients to blind and nonblind sub-studies. *Int J Epidemiol* 2014;**43**:1272–1283
28. Wang Y, Parpia S, Couban R, Wang Q, Armijo-Olivo S, Bassler D *et al.* Compelling evidence from meta-epidemiological studies demonstrates overestimation of effects in randomized trials that fail to optimize randomization and blind patients and outcome assessors. *J Clin Epidemiol* 2024;**165**:111211
29. Mills EJ, Ayers D, Chou R, Thorlund K. Are current standards of reporting quality for clinical trials sufficient in addressing important sources of bias? *Contemp Clin Trials* 2015;**45**:2–7
30. Pildal J, Hróbjartsson A, Jørgensen K, Hilden J, Altman D, Gøtzsche P. Impact of allocation concealment on conclusions drawn from meta-analyses of randomized trials. *Int J Epidemiol* 2007;**36**:847–857
31. Cobo E, Cortés J, Ribera JM, Cardellach F, Selva-O'Callaghan A, Kostov B *et al.* Effect of using reporting guidelines during peer review on quality of final manuscripts submitted to a biomedical journal: masked randomised trial. *BMJ* 2011;**343**:d6783