SOUTH EAST ASIA NURSING RESEARCH
Available on : https://jurnal.unimus.ac.id/index.php/SEANR

Review article

Functional Independence and Self-Care Recovery After Surgery in Adults: An Evidence-Informed Narrative Review for Nursing Practice

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Article Info

Article History:
Submitted: May 10th 2026
Accepted: July 30th 2026
Published: August 30th 2026

Keywords:
activities of daily living; self-care; functional independence; postoperative recovery; early mobilization; discharge education; nursing.

Abstract

Postoperative recovery is often assessed through complications and length of stay, although recovery of daily functioning and home-care abilities may follow different trajectories. This narrative review synthesizes evidence published through 2025 on predictors, assessment, and nursing-sensitive interventions for functional independence and self-care among adults undergoing surgery. Targeted searching of PubMed-indexed records, publisher-hosted articles, and perioperative guidance informed a descriptive synthesis. Evidence was organized around functional decline, prehabilitation, early mobilization, rehabilitation, discharge education, and postoperative follow-up. Observational studies document functional decline in older surgical patients and associations with frailty, malnutrition, postoperative complications, and adverse postdischarge outcomes. Prehabilitation and enhanced recovery pathways improve selected outcomes; however, changes in walking performance, complications, or length of stay do not establish independence in basic activities of daily living. In randomized trials, structured rehabilitation improved ambulatory independence after hip fracture surgery, while nurse-led and teach-back-based education improved selected self-management outcomes among patients with stomas. Evidence remains heterogeneous across procedures, outcome measures, and observation periods. Perioperative nurses should assess baseline function, provide graded and safe mobilization, directly evaluate task-specific self-care competence, involve caregivers in discharge planning, and arrange individualized follow-up. Future studies should distinguish functional independence from mobility, discharge readiness, and self-efficacy and measure these outcomes longitudinally.

INTRODUCTION

Recovery after surgery is not synonymous with discharge from hospital. Patients may meet discharge criteria yet still require help with dressing, bathing, transferring, ambulation, nutrition, or treatment-related tasks. In a cohort of 5,077 older surgical patients, loss of independence at discharge was associated with increased hospital

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South East Asia Nursing Research, Vol 8 No 2, August 2026
ISSN:2685-032X
DOI: https://doi.org/10.26714/seanr.8.2.2026.70-79

readmission and mortality after discharge.[1] A multicentre analysis of 2,013 patients aged 80 years or older found a 20.2% prevalence of functional decline 30 days after an inpatient surgical procedure.[2] These findings support treating functional recovery as a patient-centred outcome, not merely an extension of surgical care.

Postoperative independence is multidimensional. Basic activities of daily living (ADL) reflect whether a person needs help with personal care and transfers, whereas instrumental activities of daily living (IADL) involve more complex tasks such as preparing meals, shopping, transport, and organizing medication. Self-care competence includes the ability to monitor symptoms, manage wounds or a stoma, take medicines safely, maintain appropriate activity, and recognize when clinical reassessment is required. Recovery of walking capacity does not necessarily imply independence in these domains. In a longitudinal study following major abdominal surgery, basic ADL and IADL recovered over different time frames, underscoring the importance of repeated assessment.[3]

Older age, frailty, preoperative dependence, malnutrition, postoperative delirium, and insufficient support may delay recovery. At the same time, Enhanced Recovery After Surgery (ERAS) recommendations and rehabilitation programs emphasize early activity, perioperative optimization, patient education, and coordinated transitions of care.[4,5] Nurses have a sustained role in observing functional performance, identifying barriers, and supporting safe self-care before and after discharge. The evidence synthesized here frequently reports complications or mobility rather than longitudinal assistance with ADL and demonstrated care-task competence; separating these outcomes is therefore central to this review.

This review critically synthesizes evidence available through 2025 regarding (1) predictors and measurement of postoperative independence, (2) effects and limitations of perioperative and postoperative interventions, and (3) practical nursing actions that support recovery in adult surgical populations. The review considers potentially transferable nursing principles while acknowledging that the underlying evidence is often procedure-specific.

METHODS

Review design and reporting approach

This evidence-informed narrative review integrates studies across surgical procedures, designs, and functional outcomes. The clinical question was: What factors influence postoperative functional independence and self-care, and which nursing-sensitive interventions may facilitate their recovery? This review was guided by principles of transparent narrative reporting, including a defined objective, a description of literature identification, a balanced presentation of the strength of evidence, and discussion of study limitations.[6] The review was not prospectively registered and did not use a systematic-review protocol.

Literature identification and eligibility

Targeted searches were undertaken in October 2026 using PubMed/MEDLINE-indexed records, peer-reviewed journal and publisher pages, and reference-list follow-up of relevant articles. Literature published no later than 31 December 2025 was eligible. Core concepts included "postoperative" or "surgery" combined with "functional independence", "functional decline", "activities of daily living", "self-care", "early mobilization", "rehabilitation", "prehabilitation", "discharge education", "teach-back", "nursing", or "enhanced recovery". Priority was given to relevant, identifiable clinical studies and evidence syntheses, with consideration of journal indexing; indexing information was checked

from publisher or academic sources where accessible. A direct authenticated Scopus database search was not conducted, and the search must not be interpreted as comprehensive Scopus retrieval.

Articles were considered when they involved adult surgical populations, postoperative independence or a related functional/self-management outcome, or interventions with clear nursing or multidisciplinary relevance. Evidence on nonoperative populations, pediatric populations, or purely technical surgical outcomes without a meaningful recovery perspective was not prioritized. Earlier landmark studies were retained when they established core concepts or recovery trajectories. Differences in procedures, interventions, and endpoints made quantitative pooling inappropriate for this targeted narrative synthesis.

Evidence charting and synthesis

For each selected report, publication year, clinical context, study design, sample or scope, relevant outcomes, and principal limitations were abstracted descriptively from accessible records or published text. Evidence was grouped into: baseline vulnerability and functional decline; measurement of independence; prehabilitation and ERAS; inpatient mobilization and rehabilitation; patient education and self-care; and transition-of-care support. Randomized trials were distinguished from observational associations and secondary syntheses. No duplicate independent screening, exhaustive search yield, formal study-level risk-of-bias scoring, or GRADE certainty assessment was completed; therefore no included-study count or PRISMA flow chart is claimed. The references comprise sources used for this thematic synthesis, not a systematically enumerated evidence set.

RESULTS

Defining and measuring independence after surgery

Functional independence concerns the ability to perform basic ADL with little or no assistance relative to the preoperative baseline. Walking distance and step count assess aspects of physical capacity but cannot substitute for observation of bathing, dressing, toileting, transferring, and other everyday tasks. Self-care independence additionally requires knowing how to carry out procedure-specific activities and demonstrating their performance when needed. Discharge readiness reflects a broader assessment of symptoms, confidence, and available support and may coexist with functional dependence. Table 1 operationalizes the distinctions most relevant for bedside nursing assessment.

Burden and predictors of postoperative dependence

A prospective investigation of older patients after major abdominal surgery showed different trajectories for basic and instrumental activities, with clinically meaningful deficits extending beyond the index admission.[3] In older patients undergoing several surgical procedures, loss of independence at discharge was associated with subsequent readmission and mortality.[1] Zhang et al. reported 406 cases of functional decline among 2,013 octogenarian surgical patients at 30 days (20.2%), with associations involving mobility-aid use, malnutrition, postoperative delirium, pressure injury, and reliance on a mobility aid at discharge.[2] A plastic-surgery registry study similarly documented loss of independence in a smaller, specialty-specific surgical cohort.[7]

Frailty should be conceptualized as a multidomain vulnerability rather than as advanced age alone. In a cohort of 3,497 older patients undergoing noncardiac

surgery, impairments in functional performance, functional dependence, social support, and urinary continence improved prediction of loss of independence; the total Edmonton Frail Scale model had an area under the receiver operating characteristic curve of 0.840.[8] Additional cohort work linked preoperative frailty and operative stress to early loss of independence.[9] These observational findings inform risk recognition but do not show that correcting a single predictor will necessarily prevent dependence.

Nursing assessment should document baseline ADL, frailty-related vulnerability, cognition, nutritional concerns, anticipated pain, assistance needs, and home support before surgery or as early as feasible. Without baseline information, postoperative assessment cannot reliably distinguish new decline from pre-existing dependence.

Prehabilitation and enhanced recovery pathways

Prehabilitation aims to strengthen physical and psychological reserves before surgery through exercise, nutritional optimization, or multimodal support. A large network meta-analysis of 186 randomized trials involving 15,684 participants found possible benefits for perioperative outcomes, but certainty varied widely across components and comparisons.[10] A meta-analysis of 27 randomized studies in major abdominal surgical oncology (2,532 patients) showed better preoperative six-minute walk distance and reduced odds of postoperative complications with prehabilitation; emergency readmission and length of stay were not clearly improved.[11] These outcomes support structured preparation but do not directly establish independence in bathing, dressing, or home self-care.

The PREHAB multicentre randomized clinical trial included 251 participants undergoing colorectal cancer surgery. Severe postoperative complications occurred in 17.1% of the prehabilitation group versus 29.7% in standard care, but the between-group difference in six-minute walking distance at four weeks after surgery was not statistically significant (15.6 m, 95% CI −1.4 to 32.6; P = .07).[12] This distinction illustrates why functional capacity, complication prevention, and independence must be reported as separate outcomes. A smaller evidence synthesis focused on multimodal colorectal prehabilitation offers supporting but more procedure-restricted findings.[13]

ERAS integrates perioperative measures and includes early mobilization and patient participation. The 2025 ERAS Society colorectal recommendations support mobilization beginning on the day of surgery, but the strength of evidence for individual functional endpoints differs.[4] Guidance for primary and secondary hospitals in low- and middle-income settings emphasizes adaptation to staffing, infrastructure, and care pathways.[5] In nursing practice, early activity requires assessment of clinical stability, adequate symptom management, individualized goals, and safe assistance—not a universal schedule independent of surgical contraindications.

Early mobilization and rehabilitation: benefits and limits

A randomized study among 120 patients after major abdominal surgery found that structured bed exercises were associated with earlier ambulation and improved early mobilization-related outcomes.[14] However, an RCT within an established colorectal ERAS protocol found that initiating mobilization in the post-anesthesia care unit did not significantly increase overall postoperative activity compared with standard ERAS mobilization.[15] A multicentre randomized trial examining fitness-tracker feedback after major abdominal surgery further illustrates that a device or additional reminder should not be

assumed effective without demonstrable clinical benefit.[16] These findings caution against equating intervention intensity with better independence.

A 2025 review of postoperative physiotherapy within enhanced recovery pathways identified potentially favorable effects on several mobility outcomes but also emphasized variation in the interventions and relative dominance of colorectal surgery.[17] By contrast, a multicentre randomized trial of 203 older adults after hip fracture surgery compared an integrated multidisciplinary rehabilitation model with conventional rehabilitation. At 12 months, independent ambulation was reported in 76.8% versus 56.0% of assessed participants, respectively, with better recovery toward prefracture ambulatory status in the integrated-care group.[18] Importantly, ambulation is a defined functional endpoint and does not establish full independence across all basic or instrumental ADL.

Nurses should reassess barriers to mobilization throughout recovery: pain, dizziness, fatigue, orthostatic intolerance, tubes and drains, fear of falling, delirium, and insufficient assistance can each affect mobility. Progression from bed activity to transfers and walking should be individualized, documented as observed performance, and coordinated with physiotherapy and medical teams.

Surgery-specific self-care and discharge education

Education is especially important when recovery requires patients to perform unfamiliar care tasks at home. A pilot randomized controlled trial of web-based discharge education after general surgery examined feasibility and postdischarge recovery outcomes, supporting the need to evaluate patient understanding and implementation rather than information delivery alone.[19] Telephone nursing education and counseling after coronary artery bypass graft surgery has been associated with improvements in discharge satisfaction and self-care strength in a clinical trial, although surgery-specific populations limit transferability.[20]

The teach-back approach asks a patient to explain or demonstrate information in their own words, allowing misunderstanding to be corrected before discharge. A randomized trial reported improved discharge readiness and satisfaction after teach-back-based discharge education.[21] In a three-arm trial of 111 patients following emergency colostomy, teach-back and pictorial education both improved stoma-related knowledge, adherence, and self-efficacy compared with routine care; teach-back produced higher self-efficacy than pictorial education at follow-up, while peristomal erythema findings were comparable.[22] These studies measure knowledge and self-management constructs, not necessarily independence in all ADL domains.

Further procedure-specific evidence comes from a randomized trial of 124 patients with temporary stomas. A progressive nurse-led education program improved readiness for discharge and stoma self-management compared with routine education, alongside other reported benefits.[23] These findings support combining information with guided practice, feedback, and verification of task-specific abilities; they do not establish independence across all ADL. A discharge leaflet alone cannot verify competence in wound care, medication use, or recognition of warning signs.

Evidence comparison and clinical interpretation

Table 2 presents illustrative empirical studies rather than a systematically screened evidence set. Sample sizes and findings are shown only where supported by the original reports. Across these studies, baseline vulnerability, multidimensional recovery, and outcome-

dependent intervention effects recur. Table 3 translates these themes into nursing actions across the perioperative continuum.

Table 1. Core domains and assessment targets for postoperative independence

Domain	Clinical meaning	Suggested observation or measure	Important distinction
Basic ADL independence	Need for assistance with washing, dressing, toileting, feeding and transfers	Direct ADL observation; Barthel-type ADL scale when suitable	Do not infer from ability to walk alone
Instrumental ADL	Ability to manage more complex home activities	Medication organization, cooking, transport and shopping capacity	Often recovers later than basic ADL
Physical mobility	Ability to sit, stand, transfer, ambulate and maintain endurance	Observed transfers, walking distance, assistive-device use	Mobility is only one part of independence
Surgery-specific self-care	Capacity to perform essential treatment tasks	Return demonstration of wound/stoma care, medication plan and red-flag recognition	Knowledge and confidence are not sufficient without competence
Discharge transition	Readiness to continue safely at home	Symptom control, support network, home barriers and follow-up access	Safe discharge may involve supported, not complete, independence

Table 2. Representative primary evidence on postoperative independence and self-care

Source	Design / setting	Reported finding relevant to recovery	Critical interpretation
Berian et al. (2016)1	Cohort; n = 5,077 older surgical patients	Loss of independence at discharge associated with readmission and mortality	Association; no causal intervention effect
Zhang et al. (2020)2	Registry cohort; n = 2,013 aged ≥80 years	20.2% experienced 30-day functional decline; delirium and malnutrition were associated factors	Age-restricted cohort; residual confounding
Goeddel et al. (2023)8	Retrospective cohort; n = 3,497 noncardiac surgical patients	Frailty domains improved prediction of loss of independence; model AUC 0.840	Prediction model, not evidence that risk modification prevents decline
Molenaar et al. (2023)12	Multicentre RCT; n = 251 colorectal cancer patients	Severe complications: 17.1% vs 29.7%; 4-week 6-minute walk difference nonsignificant	Benefit for complications differs from mobility and ADL independence
Simsek Yaban et al. (2024)14	RCT; n = 120 after major abdominal surgery	Bed exercise program facilitated early mobilization	Long-term ADL not directly established
Wilnerzon Thörn et al. (2024)15	RCT; elective colorectal surgery under ERAS	Immediate PACU mobilization did not increase overall activity	Incremental benefit depends on baseline pathway
Lim et al. (2025)18	Multicentre RCT; n = 203 post-hip fracture surgery	Independent ambulation at 12 months: 76.8% vs 56.0% among assessed participants	Procedure-specific; loss to follow-up and broader ADL need consideration
Rajabi et al. (2025)22	Three-arm RCT; n = 111 new colostomy patients	Teach-back and pictorial education improved self-care	Self-efficacy is not a direct measure of all ADL

Source	Design / setting	Reported finding relevant to recovery	Critical interpretation
		knowledge, adherence and self-efficacy	
Lin et al. (2025)23	Randomized trial; n = 124 temporary-stoma patients	Nurse-led staged education improved discharge readiness and stoma self-management	Requires replication in other surgical populations

Table 3. Proposed nursing pathway to improve postoperative independence

Care phase	Assessment priority	Nursing action	Outcome to document
Preoperative / admission	Baseline ADL, frailty, nutrition, cognition, caregiver availability	Risk identification and realistic goal-setting; collaborate on prehabilitation when appropriate	Baseline independence and individualized plan
Immediate postoperative	Hemodynamic stability, pain, dizziness, delirium, device barriers	Symptom control and clinically appropriate assisted mobilization	Observed sitting, standing and transfer performance
Ward recovery	Level of ADL assistance; fatigue; wound or stoma skills	Progressive mobility; self-care demonstration and feedback	Change in assistance level and task competence
Discharge preparation	Home barriers, medication understanding, red flags, support	Teach-back and return demonstration; caregiver participation; referral	Verified understanding, demonstrated skills, safe follow-up plan
Postdischarge	Actual function, complications, unmet needs	Targeted telephone / clinic follow-up and rehabilitation coordination	ADL trajectory, self-care performance and timely escalation

DISCUSSION

Independence is a longitudinal patient-centred endpoint

Postoperative success should be evaluated beyond survival, complications, and length of stay. Large observational studies show a substantial burden of new dependence among older patients and identify baseline vulnerabilities that can be detected in routine practice.[1,2,8] Yet functional independence is not a single measurement at one point in time. The recovery of basic ADL, IADL, walking capacity, and treatment-specific self-care follows different trajectories. Assessment from baseline through discharge and community follow-up is therefore preferable to assuming that discharge eligibility signifies complete recovery.[3]

Strength of evidence and reasons for heterogeneity

Evidence for multimodal optimization and rehabilitation varies by intervention and outcome. Large syntheses show improvements in selected perioperative outcomes, whereas the PREHAB trial separates reduced complication rates from a nonsignificant primary walking-distance comparison at four weeks.[10–12] Similarly, randomized evidence about immediate mobilization has yielded context-dependent or null incremental effects when standard care already includes an ERAS pathway.[15] Integrated hip-fracture rehabilitation provides more direct evidence concerning independent ambulation, but these results should not be generalized automatically to abdominal, cardiovascular, or plastic surgery.[18]

The studies differ in denominators, care settings, baseline risks, intervention intensity, follow-up, and outcome definitions. Observational studies are useful for risk stratification but remain vulnerable to confounding and selection effects. Small or single-specialty randomized trials may have insufficient precision for broader claims. Evidence syntheses of prehabilitation may also include overlapping primary studies; therefore their participant totals must not be aggregated across reviews as if they were independent samples. No formal certainty grading was attempted in this narrative review.

Implications for nursing practice and quality improvement

Nursing-sensitive recovery pathways should assess two related but distinct targets: restoration of functional performance and demonstration of self-care ability. Baseline functional assessment permits identification of new decline; assessment of frailty, cognition, nutritional risk, and home support helps target appropriate assistance.[2,8] During inpatient recovery, nursing staff should support safe graded mobility with attention to symptoms and procedural restrictions, while documenting actual task performance. At discharge, teach-back and return demonstration are preferable to presuming comprehension after a verbal explanation, particularly when the patient must manage a stoma or complex treatment at home.[21–23]

For local quality improvement, a nursing dashboard could track documented baseline ADL assessment, appropriate mobilization, observed self-care training, caregiver involvement when indicated, and follow-up for newly acquired dependence. Each indicator would require a prespecified denominator and observation time point. These are proposed process and outcome indicators, not validated thresholds or a tested intervention package. Local evaluation should first assess feasibility, completeness, and links to patient-reported or observed functional outcomes.

Research gaps

Future studies should prespecify independence measures, collect baseline ADL and self-care performance, separately assess assistance needs and functional capacity, and follow patients beyond discharge. Pragmatic trials could evaluate nurse-led ADL assessment plus structured skills training and postdischarge follow-up, using validated measures and prespecified patient-centred endpoints. Research in resource-constrained hospitals is especially needed because access to rehabilitation professionals, caregivers, and home-care services varies substantially. Stratified analyses may clarify which patients benefit most from each component of multidisciplinary care.

Limitations

This targeted narrative review did not search an authenticated Scopus database and may have omitted relevant studies. No predefined registered protocol, independent screening, formal risk-of-bias evaluation, or quantitative synthesis was conducted. The evidence base combines diverse surgical specialties, observational associations, randomized trials, and secondary reviews. Recommendations are therefore interpretive and should not be presented as proven standardized intervention effects. A PRISMA flow diagram would be inappropriate without a complete, traceable search and screening record. If this manuscript is later converted to a systematic or scoping review, the full search strategy, deduplication, eligibility judgments, exclusion reasons, and screening counts must first be generated and reported.

CONCLUSION

Postoperative independence extends beyond mobility and discharge readiness to

performance of daily activities and safe management of care after surgery. Frailty, malnutrition, functional vulnerability, and perioperative complications can signal patients at higher risk of dependency. Selected prehabilitation, rehabilitation, and nurse-led education interventions show benefits for specific outcomes, but these should not be equated with comprehensive ADL independence. Nursing care should therefore combine baseline risk assessment, observed functional monitoring, individualized mobilization, structured self-care teaching, discharge verification, and postdischarge support. Future trials should prespecify patient-centred independence outcomes rather than infer them from walking capacity or length of stay.

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