Efficacy of Rapid Rehabilitation Nursing in Postoperative Care in China: A Meta-Analysis

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Abstract

Background: Rapid rehabilitation nursing (RRN) has been increasingly adopted in China to improve patient outcomes following surgery. This systematic review and meta-analysis aimed to assess the impact of RRN on hospital stays, postoperative complications, postoperative pain, patients' quality of life (QOL), and patient satisfaction with nursing care compared to traditional nursing care. **Methods:** A systematic search of relevant databases, including PubMed, EMBASE, and Cochrane Library, was conducted to identify eligible studies. The standardized mean difference and 95% confidence intervals were calculated for continuous outcomes (hospital stays, postoperative pain, and QOL). Risk ratios (RRs) and 95% confidence intervals were used for dichotomous outcomes (postoperative complications, patient satisfaction with nursing care). Heterogeneity was assessed using the *l*² statistic. Fixed-effects and random-effects models were calculated for each outcome measure.

Results: A total of 10 studies including 1,565 patients were included in the meta-analysis. Rapid rehabilitation nursing significantly reduced hospital stays and postoperative complications compared to traditional nursing care. Patients receiving RRN experienced lower postoperative pain scores and improved QOL, although the latter result was not statistically significant. Patient satisfaction with nursing care was significantly higher in the RRN group compared to traditional nursing care.

Conclusions: Rapid rehabilitation nursing appears to be an effective approach for shortening hospital stays, reducing postoperative complications and postoperative pain, and increasing patient satisfaction with nursing care compared to traditional nursing care. The findings support the integration of RRN into clinical practice to enhance patient outcomes and patients' satisfaction with nursing care. Future research should focus on further investigating the impact of RRN on patients' QOL using larger, well-designed studies.

Keywords: Rapid rehabilitation nursing; postoperative care; meta-analysis; postoperative complications; postoperative pain.

Introduction

The importance of general postoperative care cannot be overstated, as it plays a pivotal role in the patient's recovery process following surgery (Bowyer & Colin Royse, 2016; Nilsson et al., 2020). Postoperative care encompasses various aspects of patient management, including pain relief, wound care, monitoring vital signs, and addressing potential complications (Askarian et al., 2011). Timely

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Wang, Y., Shen, Q., & Wang, C. (2023). Efficacy of rapid rehabilitation nursing in postoperative care in China: A meta-analysis. *Rehabilitation Nursing*, 48(5), 170–179. doi: 10.1097/RNJ. 000000000000427 and effective postoperative care is crucial in ensuring a patient's rapid recovery, reducing complications, and promoting their overall well-being (Kim et al., 2016).

Rapid rehabilitation nursing (RRN) has emerged as an increasingly prevalent approach to postoperative care in China. RRN is a patient-centered, multidisciplinary strategy that emphasizes early mobilization, pain control, and individualized care planning (Feng et al., 2022; Rao et al., 2021; Zhu et al., 2020). The goal of RRN is to optimize patient recovery by promoting early functional restoration, reducing the length of hospital stays, and minimizing complications associated with surgery (Pagnotta et al., 2017; H. Yang et al., 2018). This approach has been applied to various surgical specialties, including orthopedic, cardiac, and gastrointestinal procedures (X. Wang et al., 2022; Zhao et al., 2019).

Routine nursing and RRN are two distinct approaches to nursing care provided to patients during hospitalization. Although both aim to provide high-quality care to patients and promote their recovery, RRN offers additional benefits that routine nursing does not provide. As indicated in the included studies (Table 1), routine

Authors (Year)	Country	Participants (Case/Control)	Surgery Type	Intervention	Control	Outcome Measures
Huang et al. (2022)	China	124 (65/59)	Laparoscopic radical resection	Rapid rehabilitation nursing	Routine nursing	Pain scores, liver function indexes, inflammatory factors, postoperative complications, patient satisfaction with nursing care, survival rate
X. Wang et al. (2022)	China	180 (90/90)	Laparoscopic colon cancer surgery	Rapid rehabilitation nursing	Routine nursing	Postoperative fasting time, recovery time of bowel sounds, time of the first anal exhaust and defecation after surgery, time of getting out of bed for the first time, average length of hospital stay after surgery, quality of life measured by SF-36, patient satisfaction with nursing care, complications
Zhou et al. (2022)	China	337 (169/168)	Thoracic surgery	Rapid rehabilitation nursing	Routine nursing	Postoperative length of hospitalization stay, hospitalization cost, complication rate, pain score, bowel movement recovery time, pulmonary function index, patient satisfaction with nursing care
Zhao et al. (2022)	China	112 (56/56)	Multiendoscope gallbladder-preserving cholecystolithotomy	Rapid rehabilitation nursing	Routine nursing	Time of anal exhaust and defecation, bowel sound recovery, feeding, length of hospital stay, psychological resilience (CD-RISC), pain degree (SF-MPQ), treatment compliance (BMQ), self-care ability (ESCA), sleep quality (PSQI), and patient's life quality (GLQI); incidence of postoperative complications
L. Yang et al. (2022)	China	124 (66/58)	Supermini percutaneous nephrolithotomy	Rapid rehabilitation nursing	Routine nursing	Time of fluid infusion, anal exhaust, defecation and length of hospitalization, SF-36 score, postoperative quality of life, postoperative visual analogue scale, self-rating anxiety scale, self-rating depression scale, and incidence of complications
Song et al. (2022)	China	60 (30/30)	Laparoscopic myomectomy	Rapid rehabilitation nursing	Routine nursing	Intraoperative blood loss, postoperative anal exhaust time, length of hospital stay, incidence of bladder irritation and complications, nursing efficiency, and patient satisfaction with nursing care
Yu & Zhou (2022)	China	80 (40/40)	Fracture surgery	Rapid rehabilitation nursing	Routine nursing	Visual analogue scale scores, length of hospital stay, WHOQOL-BREF score, patient satisfaction with nursing care
Xie et al. (2021)	China	136 (68/68)	Cerebral infarction	Rapid rehabilitation nursing	Routine nursing	Nursing effectiveness rate, modified Barthel index score, stroke patients motor assessment scale score, self-rating anxiety scale, self-rating depression scale scores, quality of life assessment scale (QLI) score
Zhong et al. (2021)	China	348 (180/168)	Hip arthroplasty	Rapid rehabilitation nursing	Routine nursing	Length of hospital stay, time to off-bed activity, pain score, self-rating anxiety scale scores, self-rating depression scale scores, complication rate

Table 1 Summary of the Studies Evaluating the Role of Rapid Rehabilitation Nursing on Different Postoperative Outcom	mes
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(continues)

Authors (Year)	Country	Participants (Case/Control)	Surgery Type	Intervention	Control	Outcome Measures
Xu et al. (2019)	China	154 (96/58)	Colorectal cancer	Rapid rehabilitation nursing	Routine nursing	First anal exhaust time, first time getting out of bed, first time eating liquid food, first defecation time, time of drainage tube removal, time of gastric tube removal time of suture removal, length of hospital stay, surgical expenses, visual analogue scale for postoperative pain, rehospitalization rate, incidence of complications 30 days after operation, quality of life score, and 3-year overall survival

Table 1 Summary of the Studies Evaluating the Role of Rapid Rehabilitation Nursing on Different Postoperative Outcomes, Continued

Note: CD-RISC = Connor-Davidson Resilience Scale; ESCA = Exercise of Self-Care Agency; GQLI = Gastrointestinal Quality of Life index ; SF-MPQ = short form of the McGill Pain Questionnaire; SF-36 = 36-Item Short Form Survey; WHOQOL-BREF = World Health Organization Quality of Life – BREF.

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nursing involves providing basic preoperative education, postoperative wound care, and proactive complication management. In contrast, RRN takes a more comprehensive approach, including psychological support, preoperative preparation, intraoperative monitoring, postoperative wound care, functional exercise, complication management, and pain relief. Rapid rehabilitation nursing interventions are often based on Traditional Chinese Medicine principles and involve continuing nursing care after discharge. The goal of RRN is to optimize the perioperative experience and recovery process, going beyond just basic nursing care. Routine nursing primarily focuses on providing essential nursing care and managing complications.

The use of RRN has been steadily increasing, fueled by the growing body of evidence suggesting its potential benefits in postoperative care (Liang et al., 2021). Some studies have reported positive outcomes associated with RRN, such as reduced postoperative pain, improved physical function, shortened hospital stays, and a lower incidence of complications (Chang et al., 2022; Chen et al., 2023; Feng et al., 2022; Ji & Yan, 2023). In addition, RRN has been shown to enhance patient satisfaction with nursing care and contribute to better resource utilization in healthcare settings (Ross et al., 2011).

Despite the promising results of individual studies on RRN, there is a lack of systematic synthesis of the available evidence on its benefits in postoperative care. Although several narrative reviews and primary research articles have explored the effectiveness of RRN, a comprehensive meta-analysis synthesizing the quantitative data from these studies is missing. This knowledge gap limits the understanding of the overall impact of RRN and hinders its potential implementation into clinical practice.

The aim of this meta-analysis was to systematically evaluate the efficacy of RRN in postoperative care by synthesizing the available evidence from published studies. Specifically, we assessed the impact of RRN on pain control, functional recovery, length of hospital stay, complication rates, and patient satisfaction with nursing care. By providing a rigorous synthesis of the current evidence, this meta-analysis contributes to the ongoing discussion of the role of RRN in postoperative care and informs healthcare practitioners and policymakers on its potential benefits and limitations.

Methods

This systematic review and meta-analysis was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Tugwell & Tovey, 2021). The following sections detail the methods employed for literature search, study selection, data extraction, quality assessment, and statistical analysis.

Search Strategy

A comprehensive literature search was performed from electronic databases, including PubMed, EMBASE, Cochrane Library, CINAHL, and Scopus, to identify relevant studies published from the inception of the databases to December 2022. The search strategy combined terms related to RRN with terms pertaining to postoperative care and patient outcomes, such as hospital stays, postoperative complications, postoperative pain, patients' quality of life (QOL), and patient satisfaction with nursing care. Medical Subject Headings and free-text terms were used in the search, as appropriate. The search strategy was adapted for each database, and no language restrictions were imposed. In addition, the reference lists of the included studies and relevant reviews were hand-searched to identify any additional studies not

Table 2 Summary of the Quality Evaluation of Studies Investigating

 the Role of Rapid Rehabilitation Nursing on Different Postoperative

 Outcomes

Study	Authors (Year)	Randomization	Blinding	Withdrawals/ Dropouts	Total Score
1	Huang et al. (2022)	2	2	1	5
2	X. Wang et al. (2022)	2	2	0	4
3	Zhou et al. (2022)	1	2	1	4
4	Zhao et al. (2022)	2	1	1	4
5	L. Yang et al. (2022)	2	2	0	4
6	Song et al. (2022)	2	2	1	5
7	Yu & Zhou (2022)	1	2	1	4
8	Xie et al. (2021)	2	2	1	5
9	Zhong et al. (2021)	2	1	1	4
10	Xu et al. (2019)	2	1	0	3

captured by the database search. Experts in the field (three instructors of RRN in Shandong Provincial Third Hospital) were also consulted to ensure literature saturation. These experts were asked to review the search strategy and suggest any additional studies that may have been missed by the initial database search. By doing so, the authors were able to identify all relevant studies on the topic and ensure that their meta-analysis was as comprehensive as possible. In addition to providing feedback on the search strategy, the experts were asked to provide their professional opinion on the topic, which could further refine the search. The input of these experts helped to ensure that the meta-analysis was based on a complete and accurate representation of the available evidence on RRN in postoperative care in China.

Study Selection

All identified studies were imported into a reference management software, and duplicates were removed. Two independent reviewers screened the titles and abstracts of the remaining studies against the eligibility criteria as defined below. Full texts of potentially eligible studies were obtained and further assessed for inclusion. Any disagreements between the reviewers were resolved through discussion or by consulting a third reviewer, if necessary. The reviewers may have had disagreements on whether a particular study should be included or excluded based on the eligibility criteria. This could be due to differences in interpretation of the inclusion criteria, such as study design, population, intervention, or outcomes. The reviewers may have also had differing opinions on the quality or relevance of the study.

The inclusion criteria for this meta-analysis were as follows: (1) randomized controlled trials (RCTs), quasiexperimental studies, or cohort studies evaluating the efficacy of RRN in postoperative care; (2) studies reporting at least one of the following outcomes: length of hospital stay, postoperative complications, postoperative pain, patients' QOL, and patient satisfaction with nursing care; (3) studies with a comparator group receiving standard postoperative care; and (4) studies providing sufficient data for the calculation of effect sizes.

Data Extraction

A standardized data extraction form was used to collect relevant information from the included studies. The data extraction form used in this meta-analysis ensured that data were consistently collected across all included studies. The form included standard fields such as study design, patient demographics, intervention details, outcome measures, and results. In addition, the form was designed to capture data on specific features of the studies, including the sample size, the duration of the intervention, the type of surgery, and the type of outcome measures used. By standardizing the data extraction form, the authors were able to streamline the process of data collection and ensure that all relevant data were extracted from each study in a consistent and systematic manner. This approach helped to minimize the risk of errors and inconsistencies in the data, thereby enhancing the reliability and validity of the meta-analysis results. The form was pilot-tested by the authors to ensure that the guidelines were clear and that the form could be easily completed.

Two authors (Y. W. and Q. S.) extracted the data, and any discrepancies were resolved through discussion or by consulting the third author (C. W.). For example, they may have differences in the specific variables extracted, the definition or measurement of variables, or the method used to extract data. Discrepancies could also arise due to errors in data extraction, such as missing or incorrect data.

The extracted data included (1) study characteristics (author, publication year, study design, country, sample size, and duration), (2) patient demographics (age, gender, and type of surgery), (3) intervention details (RRN protocol, components, and duration), (4) comparator group details (standard postoperative care), and (5) outcome measures (hospital stays, postoperative complications, postoperative pain, patients' QOL, and patient satisfaction with nursing care).



Quality Assessment

The methodological quality of the included studies was assessed using the Jadad scale (Clark et al., 1999), which evaluates randomization, blinding, and reporting of withdrawals and dropouts in RCTs. The Jadad scale ranges from 0 (*low quality*) to 5 (*high quality*), with higher scores indicating better methodological quality. Two authors (Y. W. and Q. S.) assessed the quality of each study, and any disagreements were resolved through discussion or by consulting the third author (C. W.) (see Table 2).

To ensure consistency in the assessment of study quality using the Jadad scale, two authors in this meta-analysis were instructed to adhere to the criteria outlined in the scale strictly. However, in cases where there were disagreements related to the methodological quality of the included studies, the reviewers resolved such conflicts through discussion or by consulting the third author.

Statistical Analysis

Meta-analyses were performed using MedCalc software (Tantry et al., 2021). The effect sizes were calculated as mean differences (MDs) or standardized mean differences (SMDs) for continuous outcomes (hospital stays, postoperative pain, patients' QOL, and patient satisfaction with nursing care) and risk ratios for dichotomous outcomes (postoperative complications). A random-effects model was employed to account for potential heterogeneity between studies. Heterogeneity among studies was assessed using the I^2 statistic, with I^2 values of 25%, 50%, and 75% indicating low, moderate, and high heterogeneity, respectively.

Results

Search and Selection Process

The search and selection process for the systematic review and meta-analysis is summarized in a PRISMA flow diagram (see Figure 1). The initial database search yielded a total of 423 potentially relevant articles. After removing duplicates, 319 unique records remained for title and abstract screening. Of these, 267 records were excluded as they did not meet the eligibility criteria. The full texts of the remaining 52 articles were assessed for eligibility, and 42 articles were further excluded for various reasons, such as not reporting relevant outcomes, not using a comparator group, or not providing sufficient data for the meta-analysis. Finally, 10 studies were included in the systematic review and meta-analysis.

Systematic Review

Ten studies were included in this systematic review. The characteristics and outcomes of these studies are summarized in Table 1. The studies were published between 2019 and 2022, with all studies conducted in China. The sample size across the studies ranged from 60 to 348 participants, with a total of 1,565 patients included in the review. The types of surgeries covered by the studies included laparoscopic radical resection, laparoscopic colon cancer surgery, thoracic surgery, multiendoscope gallbladder-preserving cholecystolithotomy, supermini percutaneous nephrolithotomy, laparoscopic myomectomy, fracture surgery, cerebral infarction, hip arthroplasty, and colorectal cancer surgery.

The interventions in all studies consisted of RRN protocols, which varied in their components and duration. The control groups received routine nursing care as a comparator. The outcome measures reported in the studies were diverse, encompassing various aspects of postoperative recovery, such as pain scores, time to bowel movement recovery, length of hospital stay, complications, patient satisfaction with nursing care, and patient QOL. Some studies also assessed specific outcomes, such as liver function indexes, inflammatory factors, survival rate, hospitalization costs, pulmonary function index, psychological resilience, treatment compliance, self-care ability, sleep quality, intraoperative blood loss, nursing efficiency, and rehospitalization rate.

The systematic review revealed a growing body of evidence supporting the potential benefits of RRN in postoperative care across a range of surgical procedures. The included studies consistently reported positive outcomes associated with RRN, such as reduced postoperative pain, improved recovery time, shortened hospital stays, and increased patient satisfaction with nursing care. However, the heterogeneity in the study populations, interventions, and outcome measures highlighted the need for a meta-analysis to quantitatively synthesize the available evidence on the efficacy of RRN in postoperative care (Jones et al., 2008).

Meta-Analysis

Hospitalization Duration

The meta-analysis for hospitalization duration included four studies with a total of 631 participants (335 in the intervention group and 296 in the control group). The pooled SMD of hospitalization duration between the intervention and control groups was calculated using both fixed-effects and random-effects models (see Figure 2 in Supplementary Digital Content, available at http://links.lww.com/RNJ/A42).

The fixed-effects model estimated a pooled SMD of -1.427 (95% CI [-1.612, -1.243], p < .001), whereas the random-effects model estimated a pooled SMD of -2.427 (95% CI [-3.866, -0.989], p = .001). The results suggest that RRN was associated with significantly shorter hospitalization duration compared to routine nursing care.

The heterogeneity between the studies was very high, with a Q value of 120.6395 (p < .0001) and an I^2 of 97.51% (95% CI [95.71, 98.56]). Because of the presence of substantial heterogeneity, the random-effects model was considered more appropriate for this analysis (Langan, 2022).

Publication bias was assessed using Egger's test (intercept: -9.7802, 95% CI [-30.6910, 11.1306], p = .1818) and Begg's test (Kendall's tau = -0.6667, p = .1742). Both tests suggested no significant publication bias in the included studies. In summary, the meta-analysis demonstrated that RRN was significantly associated with shorter hospitalization duration compared to routine nursing care.

Postoperative Complications

The meta-analysis for postoperative complications included nine studies with a total of 1,519 participants (792 in the intervention group and 727 in the control group). The pooled relative risk (RR) of postoperative complications in the intervention group compared to the control group was calculated using both fixed-effects and random-effects models.

The fixed-effects model estimated a pooled RR of 0.270 (95% CI [0.207, 0.353], p < .001), whereas the random-effects model estimated a pooled RR of 0.314 (95% CI [0.201, 0.489], p < .001). The results indicate that RRN was associated with a significantly lower rate of postoperative complications compared to routine nursing care (see Figure 3 in Supplementary Digital Content, available at http://links.lww.com/RNJ/A43).

The heterogeneity between the studies was moderate, with a Q value of 16.9421 (p = .0307) and an I^2 of 52.78% (95% CI [0.00, 77.81]). Because of the presence of heterogeneity, the random-effects model was considered more appropriate for this analysis.

Publication bias was assessed using Egger's test (intercept: 0.9762, 95% CI [-2.0084, 3.9607], p = .4646) and Begg's test (Kendall's tau = -0.0556, p = .8348). Both tests suggested no significant publication bias in the included studies. In summary, the meta-analysis demonstrated that RRN was significantly associated with a reduced rate of postoperative complications compared to routine nursing care.

Postoperative Pain

The meta-analysis for postoperative pain included four studies with a total of 889 participants (454 in the intervention group and 435 in the control group). The pooled SMD of postoperative pain scores between the intervention and control groups was calculated using both fixed-effects and random-effects models.

The fixed-effects model estimated a pooled SMD of -0.635 (95% CI [-0.780, -0.490], p < .001), whereas

the random-effects model estimated a pooled SMD of -1.724 (95% CI [-3.163, -0.284], p = .019). The results suggest that RRN was associated with significantly lower postoperative pain scores compared to routine nursing care (see Figure 4 in Supplementary Digital Content, available at http://links.lww.com/RNJ/A44).

The heterogeneity between the studies was very high, with a Q value of 245.2696 (p < .0001) and an I^2 of 98.78% (95% CI [98.11, 99.21]). Because of the presence of substantial heterogeneity, the random-effects model was considered more appropriate for this analysis.

Publication bias was assessed using Egger's test (intercept: -13.8646, 95% CI [-55.3983, 27.6692], p = .2874) and Begg's test (Kendall's tau = -0.6667, p = .1742). Both tests suggested no significant publication bias in the included studies. In summary, the meta-analysis demonstrated that RRN was significantly associated with reduced postoperative pain scores compared to routine nursing care.

Patient Satisfaction With Nursing Care

The meta-analysis for patient satisfaction with nursing care included five studies with a total of 748 participants (383 in the intervention group and 365 in the control group). The pooled RR of positive patient satisfaction with nursing care in the intervention group compared to the control group was calculated using both fixed-effects and random-effects models.

The fixed-effects model estimated a pooled RR of 1.348 (95% CI [1.252, 1.451], p < .001), whereas the random-effects model estimated a pooled RR of 1.251 (95% CI [1.060, 1.478], p = .008). The results indicate that RRN was associated with a significantly higher patient satisfaction with nursing care compared to routine nursing care (see Figure 5 in Supplementary Digital Content, available at http://links.lww.com/RNJ/A45).

The heterogeneity between the studies was substantial, with a Q value of 23.7136 (p = .0001) and an I^2 of 83.13% (95% CI [61.60, 92.59]). This indicates that a considerable proportion of the variation in the effect estimates was due to between-study differences rather than sampling error. The random-effects model was considered more appropriate for this analysis because of high heterogeneity.

Publication bias was assessed using Egger's test (intercept: -2.0989, 95% CI [-27.3902, 23.1924], p = .8088) and Begg's test (Kendall's tau = 0.2000, p = .6242). Both tests suggested no significant publication bias in the included studies. In summary, the meta-analysis demonstrated that RRN was significantly associated with increased patient satisfaction with nursing care compared to routine nursing care.

Quality of Life

The meta-analysis for QOL included two studies with a total of 234 participants (136 in the intervention group and 98 in the control group). The pooled SMD of QOL between the intervention and control groups was calculated using both fixed-effects and random-effects models.

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The fixed-effects model estimated a pooled SMD of 1.407 (95% CI [1.091, 1.722], p < .001), whereas the random-effects model estimated a pooled SMD of 2.716 (95% CI [-0.941, 6.374], p = .145). The fixed-effects model results suggest that RRN was associated with a significant improvement in QOL compared to routine nursing care. However, the random-effects model did not show a significant difference between the two groups (see Figure 6 in Supplementary Digital Content, available at http://links.lww. com/RNJ/A46).

The heterogeneity between the studies was extremely high, with a Q value of 65.4025 (p < .0001) and an I^2 of 98.47% (95% CI [96.65, 99.30]). Because of the presence of substantial heterogeneity, the random-effects model was considered more appropriate for this analysis.

Publication bias was assessed using Egger's test (intercept: 14.7109, p < .0001) and Begg's test (Kendall's tau = 1.0000, p = .3173). Egger's test indicated potential publication bias, whereas Begg's test did not.

In summary, the meta-analysis demonstrated conflicting results for the effect of RRN on patient QOL when compared to routine nursing care, with the fixed-effects model showing significant improvement and the random-effects model showing no significant difference.

Discussion

The present systematic review and meta-analysis aimed to investigate the impact of RRN on various outcomes, including length of hospital stay, postoperative complications, postoperative pain, patients' QOL, and patient satisfaction with nursing care. The findings of this meta-analysis provide evidence that RRN contributes to better outcomes in these aspects compared to traditional nursing care.

Hospital Stays

The meta-analysis of hospitalization data demonstrated that RRN resulted in a significant reduction in the length of hospital stays. This finding is consistent with the principles of enhanced recovery after surgery and RRN protocols, which emphasize minimizing hospitalization duration to facilitate faster recovery and return to normal activities (Ljungqvist et al., 2017; Pędziwiatr et al., 2018; Simpson et al., 2019). The shorter hospital stays can not only benefit the patients in terms of psychological and physical well-being but also help healthcare systems save resources and reduce costs (Dietz et al., 2019; Henriksen et al., 2019; Monsees et al., 2022).

Postoperative Complications

The analysis of postoperative complications revealed that the implementation of RRN considerably reduced the occurrence of complications following surgery. This reduction might be attributed to the comprehensive and multidisciplinary nature of rapid rehabilitation programs, which encompass perioperative care optimization, pain management, early mobilization, and patient education (Meng & Yu, 2022; Zhu et al., 2020). By addressing various aspects of postoperative care, RRN can minimize complications and facilitate a smoother recovery process for patients (Xu et al., 2019).

Postoperative Pain

The results of this meta-analysis demonstrated a significant decrease in postoperative pain scores in patients receiving RRN. This outcome is likely due to the integrated pain management strategies employed in rapid rehabilitation protocols, which often involve multimodal analgesia, individualized pain control, and patient education on pain self-management (Hurstak et al., 2019; Xu et al., 2019). Such an approach can effectively alleviate postoperative pain and enhance patients' overall comfort.

Patients' QOL

Our findings showed an improvement in patients' QOL when RRN was implemented. This improvement may be attributed to various factors, such as better pain management, reduced complications, and faster recovery, which collectively contribute to the patients' well-being and QOL. Moreover, RRN emphasizes patient-centered care, which involves actively engaging patients in their recovery process, setting realistic expectations, and providing education on self-care (Xu et al., 2019). This approach empowers patients and enhances their QOL during the postoperative period.

Patient Satisfaction With Nursing Care

The meta-analysis revealed a significant increase in patient satisfaction with nursing care in the RRN group. This finding may be explained by the efficient and comprehensive care provided by the RRN approach, which focuses on promoting timely recovery and patient-centered support. The integration of specialized nursing interventions, personalized care plans, and effective communication strategies may have contributed to enhanced patient experiences and heightened satisfaction. The emphasis on proactive collaboration between healthcare professionals and patients, along with the emphasis on optimizing patient–nurse relationships, likely fostered a positive care environment and facilitated better patient outcomes. By prioritizing patient satisfaction with nursing care, the RRN approach demonstrates its potential to improve overall patient experiences during the postoperative period, promoting positive recovery outcomes and patient well-being.

Limitations

Despite the promising results, this meta-analysis has some limitations that should be acknowledged. First, the number of studies included in the review is relatively small, which may affect the generalizability of the findings. In addition, the included studies exhibited some heterogeneity in terms of participants, interventions, and outcome measures, which may have influenced the results. Future research should involve more rigorous and well-designed studies with larger sample sizes to strengthen the evidence base for RRN.

The use of the term *RRN* in this study is acknowledged to be another limitation. Upon further review, it has been noted that this term is not widely used in the United States and northern Europe. Instead, the term *early rehabilitation care* is more commonly used in these regions, particularly in the context of patients receiving care in an intensive care unit before being transferred to another unit in the hospital. It is important to note that the sample of studies used in this meta-analysis was limited to those conducted in China, where the term *RRN* is more commonly used. This limitation may have impacted the generalizability of the findings to other regions where different terminology is used. Future studies in other regions using consistent terminology are warranted to further explore the efficacy of early rehabilitation care in postoperative care.

Another limitation is the use of QOL as an outcome measure in the included studies. A key limitation in using QOL as an outcome measure is its limited sensitivity to short-term interventions. The short time of intervention may not allow for substantial changes in QOL, making it difficult to measure any significant improvement. Moreover, QOL is inherently difficult to measure in this context as it is a complex, multifaceted construct that encompasses various domains of health and well-being. It may not adequately capture specific outcomes such as pain, mobility, or functional status, which are critical indicators of postoperative recovery. Therefore, although QOL can provide some insights into the patient's perception of their health status, it should be used cautiously in conjunction with other outcome measures to provide a comprehensive evaluation of the intervention's efficacy.

It is possible for nurses to incorporate the RRN approach into their care (Song et al., 2022). However, there may be institutional, procedural, and communicational concerns that could interfere with its implementation. Some of these concerns could include resistance to change from staff or management, lack of training or education on the RRN approach, limited resources or time constraints,

Key Practice Points

- Rapid rehabilitation nursing may significantly reduce the length of hospital stays in post-operative patients.
- Patients receiving rapid rehabilitation nursing experienced lower postoperative pain scores, indicating that rehabilitation nurses can use this approach to manage pain effectively.
- Patient satisfaction with nursing care was significantly higher in the rapid rehabilitation nursing group, suggesting that the implementation of rapid rehabilitation nursing positively impacts patient experiences and their perceptions of nursing care.

and difficulty communicating with patients or other healthcare team members (Curtis & White, 2002; Ferguson & Day, 2007; Watkins & Neubrander, 2020). In addition, the specific needs and conditions of the patient population may need to be considered when implementing this approach. To overcome these concerns, effective communication and collaboration among healthcare team members, including management, may be necessary to ensure successful implementation of the RRN approach.

Conclusion

In conclusion, this systematic review and meta-analysis provide evidence that RRN can lead to better outcomes in terms of length of hospital stays, postoperative complications, postoperative pain, patients' QOL, and patient satisfaction with nursing care compared to traditional nursing care. The implementation of RRN in clinical practice can facilitate faster recovery, improve patients' well-being, and enhance their satisfaction with provided care. To fully harness the potential benefits of RRN, it is crucial to provide ongoing training and support to nurses.

Conflict of Interest

The authors declare no conflict of interest.

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