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Efficacy of nursing intervention management in the operating room for patients undergoing cardiac surgery: A meta-analysis

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ADMINISTRATIVE INFORMATION

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INTRODUCTION

Review question / Objective A systematic search was conducted on PubMed, Web of Science, China National Knowledge Internet, and Wanfang databases to identify relevant studies published from January 1998 to March 2023. The inclusion criteria were studies that were randomized controlled trials (RCTs) or quasi-RCTs and compared the efficacy of nursing intervention management in the OR for patients undergoing cardiac surgery. The primary outcomes of interest were patient satisfaction and postoperative emotional disturbances, and the secondary outcomes included length of stay and nurse-related outcomes.The meta-analysis revealed that nursing intervention management in the OR was associated with a significant reduction in the length of hospital stay (odds ratio [OR] = 1.19, 95% CI: 0.81–1.75, P = 0.049), postoperative emotional disturbances (OR = 1.29, 95% CI: 1.01–1.66, P = 0.038), and improved patient satisfaction (OR = 1.13, 95% CI: 0.89–1.43, P = 0.039). The intervention group experienced a 19% reduction in hospitalization duration compared with the control group. The incidence of postoperative emotional disturbances in the intervention group was 29% lower than that in the control group. Moreover, patient satisfaction was 11.3% higher in the intervention group compared with that in the control group. However, no significant effects on the incidence of infection and postoperative pain were found.

Condition being studied Cardiac surgery is a complex, high-risk procedure that necessitates specialized nursing care in the operating room (OR). Nursing intervention management is vital in ensuring patient safety and optimizing outcomes. This meta-analysis aims to assess the effectiveness of nursing intervention management in the OR for patients undergoing cardiac surgery.

METHODS

Participant or population Patients undergoing cardiac surgery.

Intervention The intervention group received OR nursing intervention management.

Comparator The control group received standard nursing care.

Study designs to be included Study type: The study selection prioritized randomized controlled trials (RCTs) and quasi-RCTs that specifically examined the effects of OR nursing intervention management on patients undergoing cardiac surgery. RCTs and quasi-RCTs were chosen because they have strong internal validity and generalizability, and they randomly allocate participants to intervention and control groups, thereby reducing the influence of confounding factors. For this analysis, quasi-RCTs were defined as trials employing subject allocation methods other than randomization, such as systematic alternation, stratified random sampling, or purposive sampling. During the analysis, these methods were carefully examined to assess their effects on the study outcomes.

Eligibility criteria The inclusion criteria were as follows: (1) Study type: The study selection prioritized randomized controlled trials (RCTs) and quasi-RCTs that specifically examined the effects of OR nursing intervention management on patients undergoing cardiac surgery. RCTs and quasi-RCTs were chosen because they have strong internal validity and generalizability, and they randomly allocate participants to intervention and control groups, thereby reducing the influence of confounding factors. For this analysis, quasi-RCTs were defined as trials employing subject allocation methods other than randomization, such as systematic alternation, stratified random sampling, or purposive sampling. During the analysis, these methods were carefully examined to assess their effects on the study outcomes.
(2) Intervention methods: The intervention group received OR nursing intervention management, and the control group received standard nursing care. The exclusion criteria included the following: (1) studies lacking full-text availability; (2) conference proceedings, abstracts, reviews, case reports, or duplicate publications of the same study; and (3) articles with incomplete information, inaccurate data, or inappropriate statistical methodologies.

Information sources PubMed, Web of Science, China National Knowledge Internet, and Wanfang databases.

Main outcome(s) Our meta-analysis underscores the considerable effect of nursing intervention management in the OR on the outcomes and satisfaction of patients undergoing cardiac surgery. The evidence gathered from the included studies suggests that nursing interventions are effective in reducing postoperative emotional disturbances and length of hospital stay and improving patient satisfaction. The findings of this meta-analysis are particularly relevant in the context of evolving healthcare practices, where the emphasis on patient-centered care and quality improvement is increasing. Nurses play a pivotal role in the OR, and their interventions can remarkably influence patient outcomes. Therefore, the adoption of evidence-based nursing practices in the OR is crucial for enhancing the overall care of patients undergoing cardiac surgery. Notably, the quality of the evidence supporting these conclusions is limited by the small number of studies included in the analysis and the variability in the nature and implementation of nursing interventions across the studies. Future research should focus on large-scale, well-designed studies that can provide strong evidence on the effectiveness of nursing interventions in cardiac surgery. Moreover, research is needed to identify specific nursing strategies and interventions that can be consistently applied and scaled up in clinical practice to optimize patient outcomes and satisfaction.

Quality assessment / Risk of bias analysis The quality of the included studies was systematically evaluated using the Cochrane Risk of Bias Tool, which offers a comprehensive assessment of seven key criteria: randomization methods, allocation concealment, blinding, outcome reporting, selective reporting, and other sources of bias. The studies were meticulously examined to ensure that their randomization techniques were robust enough to mitigate selection bias. The studies' allocation concealment processes were assessed to confirm that the assignment of participants to intervention groups was effectively concealed from the allocators and the participants, thus preventing bias. In addition, whether the studies maintained double-blinding, which is critical in ensuring that the participants and those delivering interventions are unaware of the treatment allocation, was determined. Furthermore, we checked if the studies comprehensively reported all predefined outcomes and adhered to their protocols. The studies were carefully reviewed for signs of selective outcome reporting, where certain outcomes are reported while others are inexplicably omitted, which could indicate potential bias. Furthermore, other potential biases, such as baseline imbalances, clustering effects, and other systematic errors that could influence the validity

of the studies, were considered. Each of these criteria was classified into one of three categories, namely, low, unclear, or high risk of bias, to provide a clear assessment of the overall quality of the studies. In the evaluation of the potential biases in the included studies, the guidelines outlined in the Cochrane Handbook 5.0 were adopted. All the reviewed trials employed various stochastic methods, including simple random sampling, random number table sampling, online random grouping, and random number sampling, for their study design. Notably, two study provided a detailed account of using sealed envelopes for allocation concealment. All the trials utilized blinded methods, such as single-blind or double-blind approaches. All the included studies adopted parallel design, and assessments were conducted before and after the treatment for the participants.

Strategy of data synthesis The studies included were RCTs and quasi-experimental studies involving a total of 1,091 participants. Table 1 presents the characteristics of the included articles, including their design, cases, and population.

Subgroup analysis N/A.

Sensitivity analysis A sensitivity analysis was conducted to assess the robustness of the findings. The analysis was stable in selecting random-effect models. Another sensitivity analysis was performed by excluding studies with atypical interventions or small sample sizes. Again, these exclusions did not meaningfully change the direction nor magnitude of the effects observed, indicating that our findings are not driven by outliers or small-scale studies. The sensitivity analysis revealed that the meta-analysis has low sensitivity and robust stability, indicating that the findings are reliable and that the intervention effects are consistent across the studies. This conclusion is supported by the consistent outcomes of the sensitivity analysis, which did not alter the primary results considerably.

Country(ies) involved China.

Keywords Nursing intervention management; Operating room; Cardiac surgery; Outcome; Patient satisfaction.

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