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OBM Neurobiology

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Review

Effectiveness of Preoperative Orientation on the Incidence of Delirium in Patients Undergoing Coronary Artery Bypass Graft Surgery: Scoping Review

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Academic Editor: Anton R. Kiselev

OBM Neurobiology
2026, volume 10, issue 3
doi:10.21926/obm.neurobiol.2603353

Received: January 22, 2026
Accepted: September 04, 2026
Published: September 14, 2026

Abstract

Postoperative delirium (POD) constitutes a frequent but severe complication that develops after patients undergo coronary artery bypass graft (CABG) operations. The condition results in extended stays in intensive care units, together with functional deterioration, higher medical expenses, and increased death rates. This review analyzes preoperative orientation programs based on implementation evidence demonstrating their effectiveness in reducing postoperative delirium rates among adult CABG patients. The research team conducted a scoping review using JBI methodology and PRISMA-ScR guidelines. The research team conducted database searches that covered the time period from 2000 through December 31, 2025. The research team included studies that involved adult CABG patients who received orientation programs and used validated assessment tools to measure delirium. The review identified four studies, including three RCTs and one observational study. The studies showed that multiple intervention types reduced delirium symptoms among patients. The interventions included multimedia content together with nurse-led ICU orientation programs and digital cognitive training orientation sessions. The results demonstrate that preoperative orientation serves as an effective low-risk method that hospitals can use to prevent postoperative delirium. The research team requires larger trials to test their hypothesis.

Keywords
Postoperative delirium; coronary artery bypass graft; preoperative orientation; patient education; non-pharmacological interventions; scoping review

1. Introduction

Postoperative delirium (POD) is a neuropsychiatric complication that is frequently encountered and is regarded as very serious, especially in major cardiac surgeries like coronary artery bypass graft (CABG) operations [1]. It is characterized by sudden and variable disturbances in the patient's ability to pay attention, to be aware of, and to think clearly. It may be accompanied by hallucinations, disorientation, and emotional swings [2]. The incidence of delirium for CABG patients has been reported to be between 20% and 50%, with the exact percentage dependent on factors such as patient characteristics, the complexity of the surgery, and the methods used for assessment [3]. The condition leads to significant consequences; patients who suffer from delirium following CABG are more likely to face extended stays in the ICU, higher hospital costs, functional decline, and even death [4].

Several risk factors are responsible for the development of postoperative delirium, and they are: old age, mental decline, hypoxia, electrolyte disturbances, and stress in the operating room [4]. Among these factors, psychological distress and the patient's unpreparedness for the operation have been considered more and more as factors that can be changed [5]. Fear and doubt during cardiac surgery can boost the activation of the body's stress system, worsen sleep problems, and impair the patient's capacity to cope with anesthesia and surgical stress [6].

Preoperative orientation and education programs are the main non-pharmacological preventive methods that are gradually being accepted [7]. Standard orientation interventions include well-organized explanations of the surgical procedure, anesthesia, ICU environment, postoperative expectations, pain control, recovery, and so forth. Some programs also use educational videos, preoperative ICU orientation tours, or cognitive-orientation subtype elements to reduce anxiety, familiarize patients with the postoperative environment, and strengthen coping skills [8-10].

Recent evidence from randomized and quasi-experimental studies in cardiac surgery indicates that preoperative orientation may help to lower anaesthesia and surgery-related anxiety, and improve patient satisfaction and readiness for surgery, which might lead to fewer cases of POD [11, 12]. Excellent results have been observed with such interventions as multimedia preoperative orientation, ICU orientation sessions, and digital cognitive training orientation regarding psychological outcomes and delirium rates in diverse cardiac populations. Nevertheless, the results vary, and differences in the format, duration, timing, and content of the intervention make direct comparison difficult [13-16].

So far, there has not been a thorough synthesis that encompasses the exposure, features, and the effectiveness reported for preoperative orientation-based interventions directed towards mitigating postoperative delirium in patients undergoing CABG surgery. The current knowledge is dispersed among various studies dealing with areas such as preoperative orientation, anxiety reduction, digital cognitive training orientation, and environmental orientation, but the overall impact on delirium outcome is still not well understood. The purpose of this review is to create a

systematic map of the evidence already available concerning interventions for preoperative orientation, to characterize the range and the nature of these strategies, to analyze the impact on delirium incidence as reported, and to point out the knowledge gaps that exist with the aim of facilitating future research as well as informing perioperative practice.

2. Methods

This scoping review followed the Joanna Briggs Institute (JBI) methodological guidance for evidence synthesis and reported it according to the PRISMA-ScR (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews) framework. It aimed to review the existing literature on the effectiveness of the preoperative orientation measures in lowering the incidence of postoperative delirium in adult patients undergoing coronary artery bypass graft (CABG) surgery.

The inclusion and exclusion criteria for the review were established by the Population-Concept-Context (PCC) model. The target population consisted of CABG adult patients aged 18 years and above. The concept concentrated on any type of preoperative orientation or preoperative orientation intervention administered before surgery, such as video-based orientation programs, preoperative ICU orientation tours, nurse-led preoperative orientation sessions, multimedia or digital orientation, cognitive preparation, or psychological preparedness activities which, though aimed at lessening anxiety, improving understanding, or getting the patient familiar with the surgery, would also possess the protagonist role in the intervention. Only those studies which utilized validated tools like the Confusion Assessment Method (CAM), Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), Intensive Care Delirium Screening Checklist (ICDSC), or equivalent clinical assessments to measure postoperative delirium as the main or secondary outcome were included in the review. The studies were from any healthcare context and setting. The evidence sources included randomized controlled trials, quasi-experimental studies, cohort studies, and other primary research with quantitative data. Exclusion criteria encompassed studies involving non-CABG surgical patients, interventions delivered only after surgery, purely pharmacological interventions, pediatric populations, and non-primary literature such as editorials or narrative reviews. For the purposes of this review, preoperative orientation was defined as any structured intervention delivered before surgery that aimed to familiarize patients with the perioperative environment, procedures, and expectations, with the explicit goal of reducing psychological distress and improving postoperative outcomes.

We implemented a detailed search strategy across electronic databases, including PubMed/MEDLINE, Embase, CINAHL, Scopus, and the Cochrane Central Register of Controlled Trials. In addition, the Google Scholar engine was employed for additional searching. The search was a combination of keywords and Medical Subject Headings (MeSH) about “coronary artery bypass,” “preoperative orientation,” “video-based orientation,” “preoperative ICU orientation,” “patient orientation,” and “delirium,” with the restrictions of being in English, involving human adults, and being published from 2000 through December 31, 2025. In addition, we manually scrutinized the reference lists of all included studies and relevant reviews to identify additional articles with eligible features.

We selected studies in two phases. Two reviewers independently screened titles and abstracts, and then assessed full texts of potentially eligible studies. Disagreements were resolved by

discussion or a third reviewer if no consensus could be reached. A PRISMA-ScR flow diagram described the selection process. We did not calculate a formal Cohen's kappa statistic during the initial screening process, so we cannot retrospectively estimate kappa without the original reviewer-level screening data. This shortcoming is openly acknowledged.

The data from the studies that were included were plotted using a standardized extraction form that was specifically created for this review. The form captured study characteristics such as author, year, country, design, sample size, patient demographics, type and components of the preoperative orientation intervention, comparator details, delirium assessment methods, and key outcomes. Two reviewers extracted the data independently, and resolved differences by consensus.

Two reviewers independently assessed methodological quality and risk of bias using the Joanna Briggs Institute critical appraisal checklist appropriate to each study design. The three randomized controlled trials were appraised using the JBI checklist for randomized controlled trials, while the retrospective observational study was appraised using the JBI checklist for cohort studies. Each checklist item was judged as Yes, No, Unclear, or Not applicable. Reviewers compared their assessments and resolved disagreements by discussion, with third-reviewer arbitration when required. The appraisal was used to interpret the strengths and limitations of the evidence and was not used to exclude studies solely based on methodological quality.

Due to the diversity of interventions and study designs, the extracted data were narratively synthesized. The results were grouped according to the type of preoperative orientation intervention, which included video-based orientation, nurse-led orientation programs, cognitive-orientation subtype, and preoperative ICU orientation tours. The synthesis was concentrated on illustrating the breadth of the existing literature, pinpointing the reported impacts on the occurrence of postoperative delirium, and exposing the areas that need more research. Quantitative pooling was considered inappropriate because the four studies differed substantially in intervention subtype, content, duration, delivery mode, clinical setting, study design, delirium assessment schedule, and reported outcome measures. The review included three randomized controlled trials and one retrospective observational study, with sample sizes and follow-up procedures that were not sufficiently comparable to support a clinically meaningful pooled estimate. In addition, the purpose of this scoping review was to map the breadth and characteristics of the available evidence rather than estimate a single summary treatment effect. Therefore, a structured narrative synthesis was used to preserve the clinical and methodological differences across studies.

The study selection process is summarized in the PRISMA-ScR flow diagram (Figure 1).

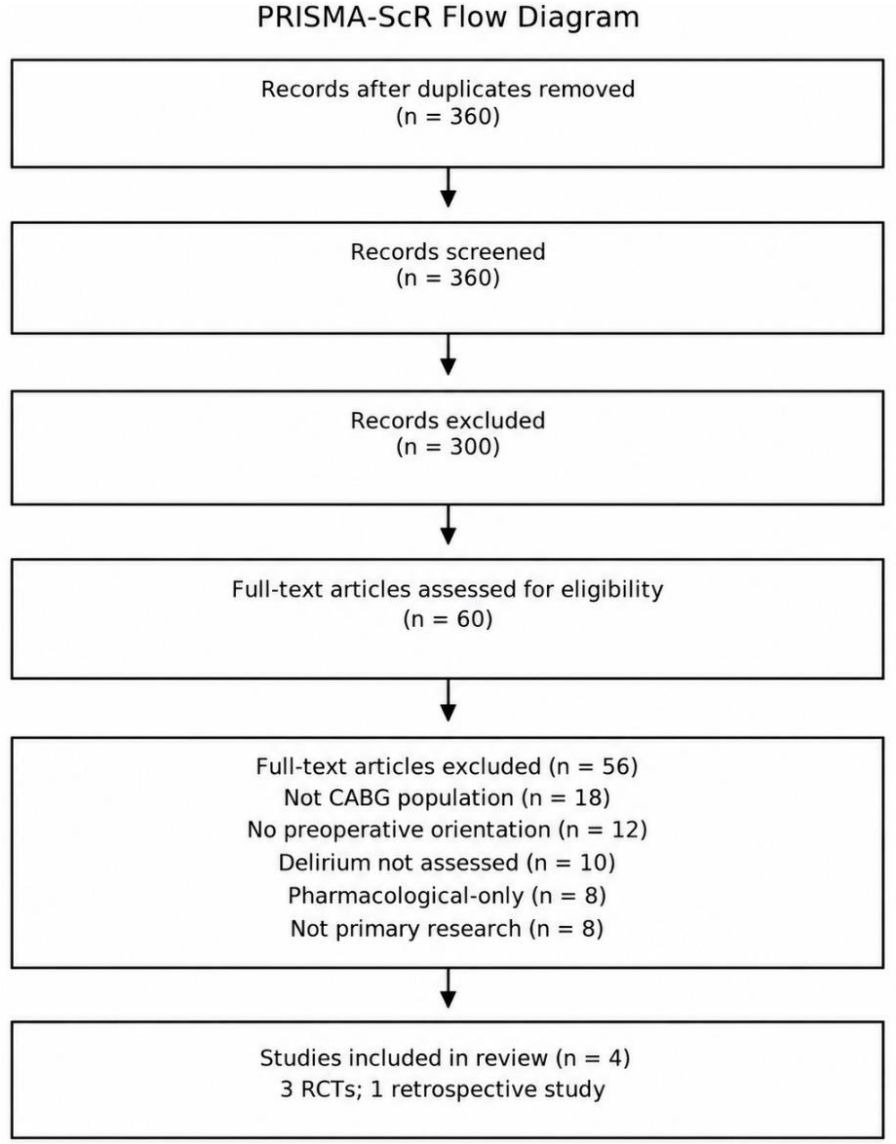

Figure 1 PRISMA-ScR flow diagram of the study selection process.

3. Results

3.1 Overview of Included Studies

The characteristics and key outcomes of the four included studies are summarized in Table 1.

Table 1 Summarizes the design, intervention, delirium assessment tool, and key outcome of the four included studies.

Study/Design	Sample	Intervention	Delirium tool	Key outcome
Fahimi et al. [13] RCT	110 CABG patients	Multimedia preoperative orientation; 3 videos, 20-30 min, 1 day preoperative	Confusion Assessment Method for the Intensive Care Unit (CAM-ICU)	Lower delirium in intervention group; POD2 morning: 3.6% intervention vs 29.1% control
Xue et al. [14] RCT	133 cardiac surgery patients	Individualized one-to-one preoperative orientation	CAM-ICU	Delirium: 10.4% intervention vs 24.2% control (P = 0.038)
Nakamura et al. [15] Retrospective observational	253 cardiovascular surgery patients	10-20-min nurse-led ICU orientation	CAM-ICU	Delirium: 14.1% orientation vs 27.2% non-orientation
Jiang et al. [16] Multicenter single-blind RCT	218 randomized; 208 analyzed	Preoperative mobile digital cognitive training orientation	CAM/CAM-ICU	Delirium: 27.5% intervention vs 43.4% control; adjusted RRR 57%

Note: P values < 0.05 were considered statistically significant.

A clinically oriented comparison of the four preoperative orientation subtypes is presented in Table 2.

Table 2 Provides a clinically oriented comparison of the four preoperative orientation subtypes, including applicable scenarios, implementation resources and reported cost information, and clinical benefits.

Preoperative orientation subtype	Applicable clinical scenario	Implementation resources/cost information	Clinical benefits reported
Multimedia preoperative orientation	CABG patients preparing for surgery; structured video-based preparation.	Digital device/computer or CD player plus nurse educator. No formal monetary cost was reported.	Lower postoperative delirium, particularly on POD2-4; POD2 morning 3.6% in the intervention group vs 29.1% in the control group.
Individualized nurse-led preoperative orientation	Elective cardiac surgery patients; tailored to age, literacy, anxiety, and understanding.	One-to-one nurse/educator time and individualized materials. No formal monetary cost was reported.	Delirium 10.4% vs 24.2% in control (P = 0.038); shorter mechanical ventilation and ICU stay were also reported.
Brief nurse-led ICU orientation	Cardiovascular surgery patients receiving a short preoperative introduction to the ICU environment.	10-20-minute in-person session using verbal communication and simple visual demonstration; no multimedia tools. Described as low-cost.	Postoperative delirium 14.1% vs 27.2% in the non-orientation group; remained independently protective after adjustment.
Digital cognitive training orientation	Cardiac/CABG patients with a longer preoperative period suitable for mobile cognitive training.	Android smartphone/app plus nurse oversight; approximately 10 hours prescribed, median completion about 6 hours. No formal monetary cost was reported.	Delirium 27.5% vs 43.4% in control; adjusted relative risk reduction 57%; fewer delirium days and shorter delirium duration.

Fahimi et al. [13] carried out a randomized clinical trial in Iran with the objective of assessing the efficacy of a multimedia preoperative orientation program in the prevention of postoperative delirium in patients undergoing coronary artery bypass graft (CABG) surgery. From a pool of 110 first-time CABG patients, those taking part in the trial were randomly separated into two groups: the intervention and the control group. The intervention group was treated to the full multimedia preoperative orientation package of a structured nature with three short videos, each of which was

about 4-6 minutes long. The first video was about the disease process and the CABG surgery, the second one was about the postoperative ICU care, which included respiratory exercises, early mobilization, devices, and possible complications, while the last one offered a very candid presentation of experiences from patients who had undergone CABG. The aim of this content was quite clear: to prepare the patients mentally and emotionally for the surgery and post-surgery. The control group, by contrast, received only the hospital's standard preoperative orientation, which was mostly verbal and accompanied by written materials.

The multimedia program was enacted one day before the surgery using a digital device (private computer or CD player), and the viewing of the content was done separately for each of the patients. The total education time was about 20-30 minutes, and a nurse educator was present to answer questions and ensure participants understood the material. The method incorporated a mix of narrated videos, animations, and real patient stories to promote interest and lessen preoperative anxiety by getting the patients used to what will happen before and after the surgery.

Postoperative delirium has been evaluated over the full duration of the ICU stay by using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) twice daily. The level of consciousness was constantly evaluated in order to make sure the delirium assessment was precise. The study found that delirium occurred considerably less in the multimedia preoperative orientation group than in the control group, particularly on postoperative days (POD) 2, 3, and 4 during morning assessments. To illustrate, during the morning of POD 2, 3.6% of the intervention group were delirious, while 29.1% of the control patients were delirious. The difference in the level of delirium was minimal on POD 1, but a strong protective effect appeared afterward. The authors indicated that a short, organized multimedia preoperative orientation program can be recognized as a non-pharmacological measure that is effective for the prevention of postoperative delirium in CABG patients. They encouraged the inclusion of such multimedia preoperative orientation in the standard preoperative protocols as a means of improving patient readiness and cognitive stability in the postoperative period.

Xue et al. [14] planned and executed a randomized controlled trial with the aim of seeing if a preoperative individualized education program could possibly reduce the incidence of postoperative delirium in patients who had elective cardiac surgery. The experiment consisted of 133 adult patients who were randomized either to the intervention group (n = 67) or the control group (n = 66), with the former receiving the preoperative orientation tailored to their needs and the latter getting the routine perioperative information. The individualized education was designed particularly for each patient, considering his/her age, educational background, anxiety level, and understanding of the surgical process. The content of the education was patients' specific structured explanations of the cardiac surgery, anesthesia, the ICU environment after surgery, mechanical ventilation, healthcare devices and tubes, pain management techniques, early mobilization, and coping with fear and discomfort. The teaching materials for patients changed according to their needs, with patients having lower literacy getting simpler visual explanations and those with higher education levels getting more detailed medical explanations.

The one-on-one education was given in person by trained nurses or educators just before the operation. The multimedia programs used in the control group were standardized for session duration. Still, the intervention was not standardized, and the length of each session depended on the patient's learning pace and needs. This personalized approach made it possible for the educators to change illustrations, communication style, and the level of information given in order

to increase the patient's understanding and also decrease his/her preoperative anxiety. The patients in the control group received only the usual preoperative orientation that is conducted by the surgical and anesthetic team.

We monitored postoperative delirium using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU). The very first assessment took place after about 12-18 hours post-surgery when hemodynamic stabilization was achieved, and it continued with two assessments per day for the next five days after surgery. The diagnostic approach was very conservative; both a positive CAM-ICU score and physician confirmation were required for the diagnosis of delirium in order to minimize false positives. The findings indicated that the incidence of delirium in the individualized education group was greatly reduced, with only 10.4% developing delirium compared to 24.2% in the control group ($P = 0.038$). Furthermore, the patients in the intervention group showed a shorter period of mechanical ventilation and ICU stay, which indicated the larger recovery benefits that could be associated with the preoperative orientation intervention.

The authors deduced that preoperative orientation tailored to the individual patient was a significant contributor to patient understanding, psychological distress reduction, and a marked decrease in the risk of postoperative delirium resulting from cardiac surgery. By adjusting the educational material according to the patients' cognitive and emotional needs, the intervention not only raises the patients' awareness of the surgical and ICU environment but also reduces their fear and confusion while improving their overall postoperative outcomes. These results have recognized individualized education as a non-pharmacological method that can be effectively employed in cardiac surgical environments to prevent delirium.

Nakamura et al. [15] performed a retrospective single-center observational study to assess whether a routine preoperative nurse-led orientation program could minimize postoperative delirium after heart surgery. After introducing the program into standard practice in 2021, the researchers analyzed previous electronic medical records (2020-2021) and matched patients who received the orientation with those who did not. The content of the orientation consisted of clarification of the ICU setting (monitors, alarms, ventilators, drainage, and lines), anticipated postoperative care, and communication, as well as mobility restrictions, pain and sleep expectations, the possibility of using physical restraints, and basic information about delirium and its possible manifestations. ICU nurses delivered the sessions in person; each session lasted about 10-20 minutes and used verbal communication and simple visual demonstrations (no multimedia tools). All patients were subjected to daily assessments for delirium in the ICU postoperatively using the CAM-ICU tool. The sample included 253 patients, of whom 128 were given the orientation, and 125 did not. Postoperative delirium rates were significantly lower in the orientation group (14.1%) as compared to the non-orientation group (27.2%). Even after accounting for potential confounders, the preoperative nurse-led session remained an independent protective factor for delirium. The authors opined that a brief, low-cost educational encounter might successfully reduce postoperative delirium in this patient population.

The multicenter, single-blind randomized clinical trial by Jiang et al. [16] aimed to confirm the hypothesis that digital cognitive training orientation would lead to a decrease in the occurrence of postoperative delirium among patients undergoing coronary artery bypass surgery. The research process took place in three hospitals connected to universities in southeastern China from April 2022 to May 2023. A total of 218 subjects were randomized, and 208 subsequently participated in the analysis. The eligibility criteria required participants to be enrolled at least ten days before

surgery, and their median age was 66 years, with a considerable proportion (around 40%) having mild cognitive impairment at the beginning of the study.

The cognitive training orientation was structured to resemble a preoperative cognitive training program of a mobile application, which was used on an Android smartphone that was already loaded with the “Light of Future” cognitive training app. The app consisted of tasks that helped to improve skills in six areas: memory, imagination, reasoning, reaction time, attention, and processing speed. A patient’s age and education level were used as guidelines for modifying the training difficulty level. Patients were told to finish a total of ten hours of training before their surgery, which usually took one hour a day in a number of short sessions. The actual participation was a bit less than what was required, with the median being around six hours of completion time. A nurse was assigned to oversee the process of completion, and it was common for most participants to meet the minimum compliance requirement of attending three hours. The control group, on the other hand, received normal preoperative care which did not include any cognitive training intervention.

We evaluated postoperative delirium using validated tools twice daily from postoperative day one through day seven. The Confusion Assessment Method (CAM) was utilized for non-ventilated patients, while the CAM-ICU was utilized for those in intensive care or under mechanical ventilation. Any positive outcome at either the morning or the evening assessment was classified as an episode of delirium. Outcomes also included the severity and duration of delirium, postoperative cognitive dysfunction, length of stay, intubation duration, and 30-day postoperative events. The results showed a significant reduction in delirium incidence among subjects who participated in digital cognitive training orientation. Delirium occurred in 27.5% of the group that received the intervention compared to 43.4% of the control group, which means a 57% relative risk reduction after adjusting for baseline factors. The patients in the intervention group also had fewer days with delirium and a shorter duration of delirium. The severity of delirium was also lower. However, the groups did not differ significantly in postoperative cognitive dysfunction, ICU or hospital length of stay, duration of intubation, 30-day mortality, or readmission.

The authors arrived at the decision that digital cognitive training orientation is a promising non-pharmacological technique for lowering the incidence of delirium after surgery in patients undergoing CABG. They proposed that the intervention's positive impact might be due to increased cognitive reserve and improved ability to withstand perioperative neurological stress. The authors, however, pointed out that the trial had a small number of delirium cases and depended on a hospitalized preoperative period that might not apply to settings with short preoperative admissions. They were, nevertheless, encouragingly optimistic and called for further large-scale investigations to prove the effectiveness and scalability of this cognitive training strategy.

4. Discussion

All studies produced one common result: performance of the preoperative orientation interventions was able to protect patients from developing delirium. Despite being different in many aspects such as format, duration, method of delivery, and the use of technology, the studies consisted of preparing the patients mentally and emotionally for surgery as the main factor that positively influenced the neurocognitive outcome in the postoperative period.

Another key finding of this review is the wide variety of preoperative orientation methods. These ranged from structured multimedia preoperative orientation [13] to individualized, one-on-one,

nurse-led teaching [14], routine nurse-led ICU orientation [15], and systematic digital cognitive training via a mobile app [16]. This variation mirrors the care trends that are taking place in preoperative treatment, where the interventions are targeting patients who are not only technologically and logistically informed but also psychologically ready, with less anxiety, stronger cognitive reserve, etc. All these different ways of doing it are still considered to be reaching the same goal. That is, the patients are being made aware of the coming perioperative experience, and the psychological and cognitive stress, which is a contributor to delirium, is being countered. For clarity, we conceptualized all interventions as subtypes of preoperative orientation, including multimedia preoperative orientation, individualized nurse-led preoperative orientation, brief preoperative ICU orientation, and digital cognitive training orientation.

From an implementation perspective, the included studies suggest a continuum from low-resource to technology-supported orientation approaches. The brief nurse-led program reported by Nakamura et al. [15] required a 10-20-minute in-person session without multimedia tools. In contrast, the digital cognitive training intervention required a smartphone/application, nurse oversight, and a longer preoperative period. Because no included study conducted a formal economic evaluation, the current evidence cannot support a cost-effectiveness conclusion. Nevertheless, low-resource nurse-led orientation may be easier to implement and scale where technology or financial resources are limited. At the same time, digital approaches may be feasible where devices and longer preoperative preparation are available. Future studies should report implementation costs, staff time, training requirements, technology costs, adherence, reach, and patient outcomes.

The findings of this review suggest that preoperative orientation may reduce postoperative delirium, although the evidence remains limited. The study of Fahimi et al. [13] showed that multimedia preoperative orientation lowered delirium significantly on days 2-4 after surgery, especially in morning assessments. This phenomenon corresponds with biological theories associating psychological readiness with sleep-wake cycles' stabilization and the cognitive-orientation subtype. The study by Xue et al. [14] presenting personalized preoperative orientation led to an incidence of delirium less than half of the control (10.4% vs. 24.2%), indicating that adjusting preoperative information to the patient's literacy, emotional, and cognitive levels can produce significant neuropsychiatric gains.

A similar result was reported in the retrospective study by Nakamura et al. [15], where a 10-20-minute ICU nurses' orientation resulted in a considerably lower incidence of delirium (14.1% vs. 27.2%). Notably, this intervention requires no technology, specialized personnel, or extra clinical resources, thus confirming its practicality and potential for widespread use in hectic cardiac units. This evidence supports the idea that simple, routine, nurse-delivered orientation may be as effective as more sophisticated preoperative orientation programs.

The most cutting-edge intervention, digital cognitive training orientation, assessed by Jiang et al. [16] prior to surgery, yielded the highest proportionate decrease in delirium (27.5% vs. 43.4%). One may argue that digital cognitive training orientation enhances existing neural circuits, expands the brain's ability to manage cognitive tasks, and thus improves the patient's and doctor's tolerance of cerebral stress during surgery and in the postoperative stage. This opens up the idea that preoperative orientations can not only be used for educating patients but also for applying systematic cognitive conditioning, especially among the elderly or those with slight memory problems.

Considering the evidence from the included studies, several mechanisms may plausibly explain an association between preoperative orientation and postoperative delirium, but these mechanisms should be regarded as hypotheses rather than established causal pathways. Anxiety reduction was an intended component of the multimedia intervention described by Fahimi et al. [13], while Xue et al. [14] tailored preoperative orientation to patients' anxiety, literacy, and understanding. Environmental familiarization and communication were central to the nurse-led ICU orientation reported by Nakamura et al. [15]. In contrast, Jiang et al. [16] proposed that cognitive training may increase cognitive reserve and resilience to perioperative neurological stress. However, these mediators were not consistently measured or tested as causal pathways in the included studies; therefore, these mechanisms require further investigation.

All four included studies were conducted in China, Iran, or Japan, and the total evidence base was small. This geographic concentration and limited sample size reduce population representativeness and restrict the generalizability of the findings to other healthcare systems and patient populations.

On the other hand, the conclusion from this review shows clearly that future research needs to be in a specific direction. Firstly, future studies should be large, multi-center trials that are able to compare different types of orientation techniques in a direct manner and determine the optimal approach by considering timing, duration, and delivery. Also, the combination of the educative and cognitive interventions might lead to the exploration of the individual components of the two as the one offering the greatest benefit, which would be wise. Furthermore, it is important to look into the various patient subgroups, like those with very low cognition, very anxious, very low health literacy, or frailty, to see who among them benefits the most from the research. Lastly, the preoperative orientation within the cardiac ICUs should be subjected to the use of standard delirium prevention frameworks like the ABCDEF bundle in future studies.

To conclude, the combined results of the scoping review underscore the fact that preoperative orientation, whether through audiovisual programs, personalized instruction, mental exercise, or short nurse-led ICU visits- consistently leads to a decrease in the incidence of postoperative delirium in patients undergoing CABG and major cardiac surgery. The convergence of findings across the included studies provides a promising signal regarding the potential role of cognitive and psychological preparation before surgery as a non-pharmacological approach to delirium prevention. However, this interpretation should remain cautious given the small and heterogeneous evidence base. Preoperative orientation through the improvement of patient state and reduction of stress in the preoperative period turns out to be a practical, non-risky, and possibly high-impact way of enhancing postoperative neurocognitive outcomes in cardiac surgery.

4.1 Implications for Practice

The findings obtained from this scoping review imply that preoperative orientation interventions, whether given through multimedia preoperative orientation, nurse-led individual teaching, digital cognitive training orientation, or brief ICU orientation, have a remarkable capacity to minimize postoperative delirium in patients undergoing CABG and other heart surgeries. Moreover, even simple, low-cost, short-term measures like the nurse-led orientation studied by Nakamura et al. [15] have been effective in reducing delirium incidence, suggesting that hospitals can adopt these methods without investing heavily in technology or funding. Nursing staff, especially those in the ICU, are best positioned to spearhead such efforts because of their close connection to the postoperative environment and their capability to prepare patients. It seems that tailoring the educational content to the patients' literacy, anxiety, cognitive status, and learning preferences is indispensable; one-on-one education interventions were especially effective in reducing delirium. Besides, along with shedding light on the importance of delirium prevention and making it more patient-centered, the combination of preoperative orientation with the ABCDEF bundle will definitely greatly reduce the chances of postoperative delirium. Above all, we can say that preoperative orientation should be regarded as a practical and feasible aspect of routine cardiac surgical care, which brings not only psychological and cognitive benefits but also prevention of delirium.

4.2 Implications for Future Research

Despite the promising results, considerable research gaps remain and require further investigation. Future studies should consider large, multicenter randomized controlled trials as the primary method of strengthening the evidence base and making results more universally applicable. It is also necessary for the intervention content, duration, and delivery methods to be standardized since the current studies differ in their structure and scope to an extreme degree. Understanding the mechanisms through which preoperative orientation alleviates delirium is another important topic for further research; among others, measuring the impact of anxiety reduction, cognitive reserve enhancement, sleep quality, and neuroinflammatory markers may provide insight into the cognitive benefits experienced. Moreover, scientists should also look to pinpoint the patient groups that get the most out of specific interventions, especially those who are at high risk for delirium, like the elderly, patients with prior cognitive impairment, or those under severe preoperative anxiety. On the other hand, studies comparing the effectiveness of different teaching methods are necessary to determine whether multimedia preoperative orientation, personalized instruction, digital cognitive training orientation, or nurse-led orientation will be the most beneficial in terms of cost and feasibility. Long-term outcomes such as cognitive function status after surgery, quality of life, hospital readmission rates, and functional recovery will need to be assessed, as existing studies primarily focus on short-term postoperative delirium. Lastly, implementation science methodologies and economic analyses will be the major determinants of the large-scale adoption of these practices. At the same time, the use of digital and hybrid delivery modes should be investigated for their possible effects on accessibility, scalability, and patient involvement, among others.

5. Conclusion

The present scoping review maps the available evidence concerning preoperative orientation interventions aimed at reducing postoperative delirium in patients undergoing CABG and other major cardiac surgeries. Across four studies (three randomized controlled trials and one retrospective observational study), the reported direction of effect was generally favorable, but the evidence base remains small and heterogeneous. The four intervention subtypes (multimedia preoperative orientation, individualized nurse-led teaching, structured mobile-based cognitive training, and brief ICU orientation) varied substantially in format, intensity, timing, and delivery, limiting direct comparison.

The findings suggest that addressing modifiable psychosocial and cognitive factors before surgery may be beneficial. Still, the apparent effects should be interpreted cautiously given the small number of studies and the retrospective design of one study. The evidence is not sufficient to establish that one orientation subtype is superior to another or that the proposed mechanisms are causal. Once a larger and methodologically comparable evidence base becomes available, a meta-analysis could be considered to estimate pooled effects and explore heterogeneity by intervention subtype, timing, and patient characteristics.

To sum up, preoperative orientation is a promising non-pharmacological, patient-centered strategy for the prevention of delirium in CABG candidates. However, to come up with a more precise definition of the intervention components, to find out which patients are most responsive, and to consider long-term cognitive and functional outcomes, large-scale, standardized research is still needed.

Author Contributions

Kawther Al-Hadidi: Conceptualization, methodology, literature search, data extraction, data analysis, investigation, and writing—original draft. Jafar Alshraideh: Supervision, methodology, critical review, and writing—review and editing. Mohammad Saleh: Literature search, data extraction, methodological assessment, and writing—review and editing. All authors: Reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Competing Interests

The authors have declared that no competing interests exist.

AI-Assisted Technologies Statement

During the preparation of this manuscript, the authors used OpenAI ChatGPT for language editing and grammar refinement. The authors reviewed and edited all AI-assisted output and take full responsibility for the accuracy, integrity, and final content of the manuscript.

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