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ORIGINAL ARTICLE

Case Control Study

Effect of programmed comprehensive nursing on delirium incidence in intensive care unit children following severe cardiac surgery

Qiu-Yue Wang, Xiang Wang, Ming-Xiong Li

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Qiu-Yue Wang, Xiang Wang, Ming-Xiong Li, Department of Cardiothoracic Surgery, Children's Hospital of Nanjing Medical University, Nanjing 210000, Jiangsu Province, China

Co-first authors: Qiu-Yue Wang and Xiang Wang.

Corresponding author: Ming-Xiong Li, MNurs, Nurse, Department of Cardiothoracic Surgery, Children's Hospital of Nanjing Medical University, No. 8 Jiangdong South Road, Jianye District, Nanjing 210000, Jiangsu Province, China. 179350188@qq.com

Abstract

BACKGROUND

Programmed comprehensive nursing was adopted for intensive care unit (ICU) children following severe cardiac surgery to improve respiratory function and delirium incidence.

AIM

To explore how programmed comprehensive nursing impacts respiratory function and delirium incidence in ICU children post cardiac surgery.

METHODS

Between January 2022 and January 2024, 180 pediatric patients from the Children's Hospital of Nanjing were admitted to the ICU after cardiac surgery and randomly grouped. The control group comprised 90 patients and received routine nursing care. The observation group comprised 90 patients and received programmed comprehensive nursing. Both groups received continuous nursing care until discharge. Their respiratory function, incidence of delirium, and clinical outcomes were compared. The memory state and sleep quality of both groups were compared.

RESULTS

The incidence of delirium was 5.56% in the observation group when admitted to ICU, which was lower than that in the control group (20.00%; $P < 0.05$). The observation group demonstrated higher peak expiratory flow rate, respiratory frequency, deep breathing volume, and tidal volume in the ICU compared with the control group. Additionally, the observation group showed higher sleep depth, sleep latency, night awakening, return to sleep, and sleep quality compared with the control group ($P < 0.05$).

CONCLUSION
Programmed comprehensive nursing in ICU patients following severe cardiac surgery can reduce the impact on respiratory function, improve sleep quality, and alleviate postoperative delirium, showing significant promise for clinical application.

Key Words: Programmed comprehensive nursing; Intensive care unit; Cardiac surgery; Respiratory function; Delirium

Core Tip: The application of programmed comprehensive nursing in children with severe cardiac surgery in intensive care unit (ICU) can improve respiratory function and sleep quality, and can reduce the occurrence of delirium when staying in ICU. This study confirmed the effectiveness of programmed comprehensive nursing in improving children's respiratory function and reducing postoperative delirium by observing their respiratory function and delirium in ICU.

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INTRODUCTION

In recent years, the global incidence of cardiovascular disease has significantly increased, making it the leading cause of death and disability worldwide[1]. Cardiac surgery has become the primary treatment for cardiovascular disease; after surgery, children require admission to the intensive care unit (ICU) for vital sign monitoring and life support to maintain stable postoperative signs and improve their prognosis[2]. However, children undergoing cardiac surgery often experience varying degrees of lung function impairment post-surgery, mainly due to reduced bodily function, respiratory alkalosis, and diminished circulatory system function[3]. Additionally, children undergoing cardiac surgery are in a critical condition. Prolonged ICU stay increases the risk of postoperative delirium, potentially prolonging their recovery and affecting their prognosis and overall outcome[4]. Therefore, selecting a scientific-based and effective nursing intervention method is crucial to mitigate factors that hinder postoperative recovery and facilitate pediatric patient rehabilitation. Owing to the heavy workload of ICU nurses and the complexity of nursing measures, only routine nursing is currently employed, which is solely based on nurses' experience and lacks scientific evidence. Consequently, numerous issues arise within the nursing process[5]. Programmed comprehensive nursing can compensate for the shortcomings of routine nursing, standardize the nursing process for critically ill children in the ICU, streamline nursing procedures, and optimize care coordination, thus enhancing the effectiveness of nursing interventions. However, only a few clinical studies have explored the effects of programmed comprehensive nursing on ICU children who underwent severe cardiac surgery. Therefore, we analyzed the role of programmed comprehensive nursing in improving respiratory function in ICU children who underwent severe cardiac surgery and mitigating postoperative delirium, to offer guidance for nursing interventions in this specific patient population.

MATERIALS AND METHODS

Data and participants

Between January 2022 and January 2024, 180 children who underwent cardiac surgery were admitted to the ICU at Children's Hospital of Nanjing. Children were grouped according to random numbers. The control group comprised 90 patients [48 boys and 42 girls; age range: 2-13 (7.96 ± 2.84) years; types of surgery: Congenital heart disease in 59, tricuspid annuloplasty in 23, and others in 8 patients]. The operation time ranged from 160 to 324 (218.84 ± 36.49) minutes. Meanwhile, the observation group comprised 90 patients [45 boys and 45 girls; age range: 2-13 (8.01 ± 2.80) years; types of surgery: Congenital heart disease in 60, tricuspid annuloplasty in 20, and others in 10 patients]. The operation time ranged from 165 to 332 (221.84 ± 38.50) minutes. No significant difference was observed in baseline data between the two groups (P> 0.05), indicating comparability. The sample size was calculated by PASS software.

Inclusion and exclusion criteria

Children: (1) Who underwent cardiac surgery for the first time; (2) who were admitted to the ICU post-operation for monitoring; (3) with a length of ICU stay of ≥ 24 hours; (4) who exhibited stable postoperative signs, and clear cognition; (5) aged ≥ 2 years to facilitate scale evaluation and functional monitoring, and (6) whose parents or legal guardians consented to their participation by signing a consent form were included in the study.

Conversely, children: (1) Who had other significant organ diseases; (2) who were in prolonged coma; (3) with major infectious diseases, immunodeficiency, and coagulation disorders; (4) with a history of delirium; (5) with pulmonary diseases such as bronchial asthma and severe pneumonia; and (6) who exhibited mental symptoms existing before the operation were excluded.

Methods

The control group received routine nursing care, which involved close monitoring of changes in vital signs, fluid intake, level of consciousness after surgery, and bilateral lung respiratory sounds. Postoperative complications were managed by performing routine respiratory tract clearance to remove oral secretions promptly, facilitating expectoration, and maintaining airway patency. Furthermore, routine postoperative care was provided, which included routine nutritional support and addressing physical comfort needs.

Programmed comprehensive nursing was employed in the observation group based on the care plan used in the control group.

Assessment of nursing: The nursing staff conducted a comprehensive assessment of the children's condition before providing daily care. This assessment aimed to ascertain their mental state, monitor the development of their condition, and identify any changes in signs and symptoms. Additionally, the staff assessed for lung symptoms monitored the oxygen intake and evaluated the lung function. The intensive care delirium screening checklist (ICDSC) was used to evaluate the risk of delirium to provide a reference for further nursing interventions.

Respiratory function nursing: After the operation, the children's oxygen inhalation status should be closely monitored, the oxygen should be humidified, its concentration and flow should be adjusted appropriately, and the pipeline should be cleaned regularly. Oral secretions were promptly cleared, and atomized inhalation was performed after removing the machine to dilute the sputum. The children were encouraged to self-expectorate. To facilitate expectoration, back tapping and a vibration expectoration device were used. Autonomous breathing training: Each morning, after awakening, the nursing staff evaluated the timing of catheter removal and guided the children to breathe independently. If independent breathing is achieved, the nursing staff should train the infant in performing abdominal and pursed lip breathing to encourage autonomous and forceful coughing. This training was repeated ten times per minute for 3-5 minutes, once daily.

Wake-up nursing: The children discontinued using sedative drugs at 7: 00 every day to promote daily awakening. Once awake, the nurses communicated with the children using a structured five-step approach: (1) What is your name? What is my job role? Do you know what time is it now? (2) Do you know where you are? (3) Do you know what I am going to do now? and (4) Why are you here? This method aimed to understand the mental status of children through effective communication and inquiry.

Sleep nursing: This approach involves the administration of appropriate medications for postoperative sedation care in children. (1) Analgesia and a target-oriented shallow sedation mode are selected. The dosage of sedative drugs is reduced, and the degree of pain is evaluated once the child awakens. When pain is evident, the analgesic pump can be used to maintain analgesia according to the doctor's advice; and (2) The nursing staff should ensure noise control in the ICU by minimizing door opening and closing, speaking softly, and reducing the volume of various instruments. Additionally, the monitor alarm settings should be adjusted to appropriate levels to minimize nighttime alarms. During the daytime, the children's sleep was regulated, and bright lights were used to simulate the daytime atmosphere, enhancing their sleep cycle. Soft lights were used at night, and the lights in public areas were turned off. Various nursing and medical procedures were primarily scheduled during daytime, with a minimal number of interventions performed at night to avoid disturbing the children's sleep. Eye masks and earplugs were provided to help the children relax, and soft and soothing music was played before bedtime.

Early limb activity: Once the children's condition stabilizes, chest bands and pillows can be provided to prevent chest wound pain caused by repositioning and limb activities. Once awake, the child is encouraged to reposition independently while assisted by the nursing staff in performing passive limb activities at the bedside. The children were guided by a rehabilitation physician to complete the traumatic sitting exercise, with each session lasting for 20 minutes, three times daily. They gradually transitioned to a seated position at the bedside, maintaining an upright posture, and performed bed exercises for 20 minutes each session, three times a day. The children were encouraged to drink water and eat independently. Depending on the child's endurance and condition, they were guided to hold up the limb, extend the upper limb forward, clench a fist, pump the ankle, and extend the knee. According to the children's preferences and conditions, one of the two types was selected for 15-20 minutes daily. When the child can get out of bed and discharge from the ICU, they are encouraged to perform leg-divided deep squat exercises with both hands lifted sideways for 5-15 minutes daily.

Cognitive nursing: Before each procedure, the nursing staff explained the necessity and steps of various procedures to the children and asked them whether they required auxiliary tools such as a myopic lens. An electronic writing board was provided to the children, indicating the date of the day, data of the assigned nurse and doctor, and the primary treatment measures displayed in large fonts. A clock was hung on the wall of the ICU ward to help the child keep track of the time. Children's favorite books and family photos were placed at the bedside, and families were encouraged to contact them *via* telephone, video calls, and messaging.

The two groups received continuous intervention until discharge.

Outcome indicators

Postoperative delirium: Postoperative delirium is defined as a sudden disturbance in consciousness, inattention, altered level of consciousness, or mental confusion in children[6].

Time of clinical outcome: The nursing staff monitored and recorded the ICU admission time, mechanical ventilation time, and recovery time from the period when the child was able to get out of bed.

Respiratory function: The peak expiratory flow rate (PEF), respiratory rate, deep breathing volume, and tidal volume were recorded preoperatively and upon ICU admission.

The Richards-Campbell Sleep Questionnaire[7] was used to evaluate the sleep status of children before surgery and during ICU admission. This questionnaire assesses five dimensions: Sleep depth, sleep latency, night awakening, return to sleep, and sleep quality, with each dimension rated from 0 to 100 points. Scores of 25 points indicate poor sleep quality, 26-75 points indicate moderate sleep, and > 75 points indicate good sleep quality.

Statistical methods

Statistical analyses were performed using the SPSS statistical software version 26.0. The measurement data were expressed as mean ± SD. Shapiro-Wilk test is used to test the normality of continuous variables. When the data conformed to the normal distribution, independent and paired samples *t* were used for between- and within-group. Data that showed non-normal distribution were analyzed by non-parametric test. Paired samples t-test and Wilcoxon signed rank test were used for within- and between-group comparisons. Meanwhile, count data were expressed as rates (%) and compared using the c^2 test. A P value of < 0.05 was considered significant.

RESULTS

Postoperative delirium

The incidence rates of delirium in the observation group were 5.56% (5/90), which is significantly lower than that in the control group-20.00% (18/90; $\chi^2 = 8.424$, $P = 0.004$).

Time to clinical outcome

The time to specific clinical outcomes was shorter in the observation group compared with the control group ($P < 0.05$; Table 1).

Respiratory function

Preoperatively: No difference was observed in the specific respiratory function parameters between the two groups ($P > 0.05$). The respiratory function of the children decreased upon ICU discharge, but the extent of the reduction in the observation group was lower than that in the control group ($P < 0.05$; Table 2).

Sleep status

Preoperatively: No difference was observed in the sleep status between the two groups ($P > 0.05$). However, although the sleep quality of the two groups decreased upon discharge from the ICU, it was higher in the observation group than in the control group ($P < 0.05$; Table 3).

DISCUSSION

In recent years, advancements in medical technology have contributed to a notable increase in the number of cardiac surgery cases. This trend has significantly improved the survival rates and prognosis of children with heart diseases, extending their overall survival time. Currently, children's expectations for cardiac surgery are increasing. Moreover, it is necessary to improve the survival time of children and their postoperative quality of life and reduce the occurrence of postoperative adverse events. After cardiac surgery, children typically require ICU admission for vital sign monitoring during the critical postoperative period. However, children in the ICU are susceptible to delirium, which occurs in 13.5%-41.7% of cases[8]. Pain after heart surgery, surgical trauma, hemodynamic fluctuations, anxiety and depression, and visual and hearing impairments contribute to the onset of delirium. This prolongs postoperative mechanical ventilation time and ICU time of children increases treatment costs, and affects prognosis and outcome[9]. Therefore, the early adoption of scientific-based and effective intervention measures after surgery is crucial for reducing the occurrence of postoperative delirium in children. Currently, the core of ICU nursing management is standardization and programming to improve the quality of nursing management. Therefore, the study adopted programmed comprehensive nursing, utilizing a "nursing quality assurance system" as the standard. This approach uses a combination of programmed and systematic nursing strategies and the characteristics and specific symptoms of children after cardiac surgery to reduce nursing errors and improve overall nursing proficiency[10].

This study reported a delirium incidence of 5.56% in the observation group after admission to the ICU, which was lower than that in the control group (20.00%). The specific time to clinical outcomes was shorter in the experimental group than in the control group ($P < 0.05$). These results indicate that programmed comprehensive nursing can reduce the occurrence of postoperative delirium in children and shorten the duration of mechanical ventilation and ICU admission. After Zhang *et al*[11] adopted a comprehensive nursing intervention for ICU patients, the incidence and duration of delirium in the ICU significantly decreased, and the 28-day mortality rate reduced by 18%. In programmed comprehensive nursing, the risk of delirium in children is evaluated using the ICDSC, which serves as a reference point for further care. This improves the relevance and effectiveness of the care provided. Simultaneously, the early awakening of

Table 1 Comparison of time to clinical outcome (mean ± SD, day)

Group	ICU admission time	Mechanical ventilation time	Recovery time since the patient's ability to get out of bed was regained
Observation group (n = 90)	4.68 ± 1.05	1.58 ± 0.64	2.08 ± 0.96
Control group (n = 90)	5.82 ± 1.07	2.48 ± 0.81	3.27 ± 1.01
t value	7.214	8.271	8.102
P value	< 0.001	< 0.001	< 0.001

ICU: Intensive care unit.

Table 2 Comparison of specific respiratory function parameters (mean ± SD)

Group	PEF (L/min)		Respiratory frequency (times /min)		Deep breath volume (L)		Tidal volume (L)	
	Preoperative	Out of ICU	Preoperative	Out of ICU	Preoperative	Out of ICU	Preoperative	Out of ICU
Observation group (n = 90)	289.83 ± 24.84	251.20 ± 23.80[a]	18.71 ± 1.58	15.84 ± 1.02[a]	3.12 ± 0.48	2.80 ± 0.36[a]	0.58 ± 0.08	0.50 ± 0.06[a]
Control group (n = 90)	291.06 ± 26.02	225.84 ± 21.06[a]	18.60 ± 1.55	13.48 ± 1.08[a]	3.10 ± 0.50	2.31 ± 0.35[a]	0.57 ± 0.07	0.42 ± 0.05[a]
t value	0.324	7.570	0.471	15.071	0.275	9.258	0.892	9.717
P value	0.746	< 0.001	0.638	< 0.001	0.785	< 0.001	0.373	< 0.001

[a]P < 0.05 compared with preoperative parameters in the same group.
ICU: Intensive care unit.

Table 3 Comparison of sleep states (mean ± SD, points)

Group	Sleep depth		Sleep latency		Night awakening		Return to sleep		Sleep quality	
	Preoperative	ICU discharge	Preoperative	Preoperative	ICU discharge	Preoperative	ICU discharge	ICU discharge	Preoperative	ICU discharge
Observation group (n = 90)	83.18 ± 6.28	71.64 ± 5.72[a]	85.50 ± 5.89	80.68 ± 6.52	68.84 ± 4.90[a]	81.78 ± 6.82	73.52 ± 5.78[a]	73.18 ± 4.94[a]	82.78 ± 6.86	74.52 ± 5.80[a]
Control group (n = 90)	82.71 ± 6.35	64.84 ± 5.86[a]	84.93 ± 6.13	81.72 ± 6.80	61.37 ± 5.18[a]	82.16 ± 6.90	65.10 ± 5.81[a]	63.84 ± 4.87[a]	83.16 ± 7.15	66.89 ± 5.93[a]
t value	0.499	7.878	0.636	1.047	9.939	0.372	9.747	12.773	0.364	8.726
P value	0.618	< 0.001	0.526	0.296	< 0.001	0.711	< 0.001	< 0.001	0.716	< 0.001

[a]P < 0.05 compared with preoperative parameters in the same group.
ICU: Intensive care unit.

children and daily inquiries about time, place, and personnel can enhance their perception and memory, thus facilitating cognitive training and reducing the occurrence of delirium. In addition, attention should be paid to examining the postoperative sleep quality in children. The provision of appropriate pain management, light sedation, and the establishment of a regular sleep pattern can help improve the child's physiological function and well-being and reduce the likelihood of delirium. Previous studies, such as that conducted by Kiliç and Kav[12], have shown that the use of blinders and earplugs in ICU patients significantly reduced the incidence of delirium. Therefore, by implementing programmed comprehensive nursing, following standardized postoperative care procedures for children, identifying the risks of postoperative delirium in children, and adopting the corresponding nursing intervention, the occurrence of postoperative delirium was reduced, and the recovery in children was improved.

Pulmonary interstitial edema and mechanical ventilation in children after cardiac surgery will reduce lung compliance and increase airway resistance, leading to impaired lung function in children[13]. However, this study showed higher PEF, respiratory frequency, deep breath volume, and tidal volume in the observation group upon ICU discharge compared with the control group ($P < 0.05$). This finding indicated that programmed comprehensive nursing can reduce the degree of postoperative lung function damage. Programmed comprehensive nursing was implemented, emphasizing that early postoperative pulmonary function exercises, close monitoring of the respiratory status of children, and guiding them to voluntarily expectorate phlegm can enhance pulmonary activity and vital capacity. Spontaneous breathing training was conducted once daily by removing the tube, and early abdominal breathing and purse lip breathing were performed. These measures could increase the pulmonary diaphragm activity range, improve respiratory muscle contraction in children, promote the discharge of respiratory tract secretions, and improve respiratory function.

Factors such as therapeutic procedures, mechanical ventilation, sedation, and analgesia in children undergoing cardiac surgery can cause memory impairment and hallucinations to a certain extent. Sleep disorders are common in ICU children, causing disruptions in their circadian rhythm and decreased cognitive ability[14]. This study showed that sleep depth, sleep latency, night awakenings, return to sleep, and sleep quality were higher in the observation group than in the control group ($P < 0.05$). Tonna *et al*[15] demonstrated that sleep quality could be improved by emphasizing the importance of nursing interventions in ICU patients, continuously improving nursing quality, and adopting standardized and programmed nursing interventions. Programmed comprehensive nursing interventions, including sleep improvement, early awakening, and cognitive interventions, can enhance the children's memory, attention, cognitive function, and sleep quality. Additionally, nursing efforts should focus on ensuring noise control and performing various medical procedures during the daytime to foster a comfortable and quiet ICU environment. In addition, placing children's books and toys at the head of the bed encourages family interaction, thereby reducing memory problems and enhancing sleep quality among ICU children. However, this study is a single-center study and the subjects are all from the Children's Hospital of Nanjing, which may lead to biased results. In the future, we can conduct multi-center studies and study different populations to validate these results.

In summary, programmed comprehensive nursing for ICU children who underwent severe cardiac surgery can reduce the impact on respiratory function and sleep quality and reduce the occurrence of delirium when admitted to the ICU. These findings underscore the potential clinical utility of such nursing interventions.

CONCLUSION

Children admitted to the ICU following severe cardiac surgery may experience delirium, impaired respiratory function, and reduced sleep quality due to mechanical ventilation, pain, poor sleep quality, environmental factors, surgical trauma, and other factors. Programmed comprehensive nursing was adopted to standardize nursing procedures for children in the ICU. Nursing risk assessment, early respiratory function exercise, early mobilization, cognitive training, and sleep quality improvement reduced the incidence of delirium, improved postoperative respiratory function, enhanced the sleep quality of children, and mitigated memory issues among ICU children. The clinical significance of these findings is substantial and merits further investigation.

FOOTNOTES

Author contributions: Wang QY and Wang X designed the study; Wang QY, Wang X, and Li MX contributed to the analysis of the manuscript; Wang QY and Wang X involved in the data and writing of this article; and all authors have read and approved the final manuscript. Two co-first authors (Wang QY and Wang X) made equal contributions for several reasons: Wang QY and Wang X undertook work of equal importance and workload in the research project. They both contributed to the success of the research by applying their professional knowledge and expertise. In terms of research design and planning, both Wang QY and Wang X participated in formulating the research plan, including the clarification of research objectives, selection of methods, and design of the experimental process. They discussed and determined the most appropriate research plan. Both of them equally contributed to the data collection to ensure the accuracy and integrity of the data. During data analysis, they interpreted the data to ensure the reliability of the results. During the interpretation and discussion stage, Wang QY and Wang X participated in the interpretation and discussion of the results and thoroughly explored the significance and impact of the research findings. During the writing and revision process, they collaborated closely and carefully wrote each section.

Institutional review board statement: This study was reviewed and approved by the Institutional Review Board of Children's Hospital of Nanjing Medical University.

Informed consent statement: All study participants and their legal guardians provided written informed consent before recruitment.

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Country of origin: China

ORCID number: Qiu-yue Wang 0009-0004-4535-1194; Xiang Wang 0009-0005-9123-8720; Ming-xiong Li 0009-0002-8294-295X.

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REFERENCES

1 **Kim SJ**, Mesquita FCP, Hochman-Mendez C. New Biomarkers for Cardiovascular Disease. *Tex Heart Inst J* 2023; **50** [PMID: 37846107 DOI: 10.14503/THIJ-23-8178]
2 **Cleveland M**, Baute R, Clindaniel C, Hertz L, Pond R, Centers GI. Inter-Rater Reliability of Delirium Screening of Infants in the Cardiac ICU: A Prospective, Observational Study. *Pediatr Crit Care Med* 2023; **24**: e147-e155 [PMID: 36727939 DOI: 10.1097/PCC.0000000000003182]
3 **Higbee DH**, Granell R, Sanderson E, Davey Smith G, Dodd JW. Lung function and cardiovascular disease: a two-sample Mendelian randomisation study. *Eur Respir J* 2021; **58** [PMID: 33574079 DOI: 10.1183/13993003.03196-2020]
4 **Miranda F**, Gonzalez F, Plana MN, Zamora J, Quinn TJ, Seron P. Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) for the diagnosis of delirium in adults in critical care settings. *Cochrane Database Syst Rev* 2023; **11**: CD013126 [PMID: 37987526 DOI: 10.1002/14651858.CD013126.pub2]
5 **Chang YL**, Hsieh MJ, Chang YC, Yeh SL, Chen SW, Tsai YF. Self-efficacy of caring for patients in the intensive care unit with delirium: Development and validation of a scale for intensive care unit nurses. *Aust Crit Care* 2023; **36**: 449-454 [PMID: 36137875 DOI: 10.1016/j.aucc.2022.08.006]
6 **Gravante F**, Giannarelli D, Pucci A, Pisani L, Latina R. Calibration of the PREdiction of DELIRium in ICu Patients (PRE-DELIRIC) Score in a Cohort of Critically Ill Patients: A Retrospective Cohort Study. *Dimens Crit Care Nurs* 2023; **42**: 187-195 [PMID: 37219472 DOI: 10.1097/DCC.0000000000000586]
7 **Rollo E**, Della Marca G, Scala I, Buccarella C, Rozera T, Vollono C, Frisullo G, Broccolini A, Brunetti V. Validation Study of the Richards-Campbell Sleep Questionnaire in Patients with Acute Stroke. *J Pers Med* 2022; **12** [PMID: 36143258 DOI: 10.3390/jpm12091473]
8 **Martinez FE**, Tee R, Poulter AL, Jordan L, Bell L, Balogh ZJ. Delirium Screening and Pharmacotherapy in the ICU: The Patients Are Not the Only Ones Confused. *J Clin Med* 2023; **12** [PMID: 37685738 DOI: 10.3390/jcm12175671]
9 **Seyffert S**, Moiz S, Coghlan M, Balozian P, Nasser J, Rached EA, Jamil Y, Naqvi K, Rawlings L, Perkins AJ, Gao S, Hunter JD 3rd, Khan S, Heiderscheit A, Chlan LL, Khan B. Decreasing delirium through music listening (DDM) in critically ill, mechanically ventilated older adults in the intensive care unit: a two-arm, parallel-group, randomized clinical trial. *Trials* 2022; **23**: 576 [PMID: 35854358 DOI: 10.1186/s13063-022-06448-w]
10 **Alwekhyan SA**, Alshraideh JA, Yousef KM, Hayajneh F. Nurse-guided incentive spirometry use and postoperative pulmonary complications among cardiac surgery patients: A randomized controlled trial. *Int J Nurs Pract* 2022; **28**: e13023 [PMID: 34676618 DOI: 10.1111/ijn.13023]
11 **Zhang S**, Han Y, Xiao Q, Li H, Wu Y. Effectiveness of Bundle Interventions on ICU Delirium: A Meta-Analysis. *Crit Care Med* 2021; **49**: 335-346 [PMID: 33332818 DOI: 10.1097/CCM.0000000000004773]
12 **Kiliç G**, Kav S. Effect of using eye masks and earplugs in preventing delirium in intensive care patients: A single-blinded, randomized, controlled trial. *Nurs Crit Care* 2023; **28**: 698-708 [PMID: 37138379 DOI: 10.1111/nicc.12901]
13 **Hegazy FA**, Mohamed Kamel SM, Abdelhamid AS, Aboelnasr EA, Elshazly M, Hassan AM. Effect of postoperative high load long duration inspiratory muscle training on pulmonary function and functional capacity after mitral valve replacement surgery: A randomized controlled trial with follow-up. *PLoS One* 2021; **16**: e0256609 [PMID: 34449776 DOI: 10.1371/journal.pone.0256609]
14 **Andersen-Ranberg NC**, Poulsen LM, Perner A, Hästbacka J, Morgan M, Citerio G, Collet MO, Weber SO, Andreasen AS, Bestle M, Uslu B, Pedersen HS, Nielsen LG, Damgaard K, Jensen TB, Sommer T, Dey N, Mathiesen O, Granholm A. Haloperidol vs. placebo for the treatment of delirium in ICU patients: a pre-planned, secondary Bayesian analysis of the AID-ICU trial. *Intensive Care Med* 2023; **49**: 411-420 [PMID: 36971791 DOI: 10.1007/s00134-023-07024-9]
15 **Tonna JE**, Dalton A, Presson AP, Zhang C, Colantuoni E, Lander K, Howard S, Beynon J, Kamdar BB. The Effect of a Quality Improvement Intervention on Sleep and Delirium in Critically Ill Patients in a Surgical ICU. *Chest* 2021; **160**: 899-908 [PMID: 33773988 DOI: 10.1016/j.chest.2021.03.030]

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