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Original Article

Evidence-based nursing combined with cognitive function training can reduce the incidence of delirium in ICU patients and improve their cognitive function

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Abstract: Objective: To explore whether evidence-based nursing combined with cognitive function training can reduce the incidences of delirium in intensive care unit (ICU) patients and improve their cognitive function. Methods: ICU patients in our hospital were randomly divided into an evidence-based nursing group (the E group) and an evidence-based nursing combined with cognitive function training group (the EC group). The incidences of delirium, the Pittsburgh Sleep Quality Index (PSQI) scores, the Mini-Mental State Exam (MMSE) scores, the National Institutes of Health Stroke Scale (NIHSS) scores, the Barthel Index levels, and the nursing satisfaction rates were compared between the two groups. Results: Before the nursing, there were no significant differences in the MMSE scores, the NIHSS scores, the Barthel Index levels or the PSQI scores between the E group and the EC group ($P>0.05$). After one week of treatment, the incidences of delirium in the EC group were significantly lower than they were in the E group ($P<0.05$). The PSQI scores and the NIHSS scores in the EC group were significantly lower than they were in the E group ($P<0.001$). The MMSE scores and the Barthel Index levels in the EC group were significantly higher than they were in the E group ($P<0.01$). There was no significant difference in the nursing satisfaction rates between the two groups ($P>0.05$). Conclusion: Compared with using evidence-based nursing only, the combined application of evidence-based nursing and cognitive function training has a significantly better effect on the improvement of neurological function, sleep quality and normal living conditions in ICU patients.

Keywords: Evidence-based nursing, cognitive function training, ICU patients, delirium

Introduction

Delirium is an acute transient neurological abnormality, specifically characterized by a disturbance of consciousness [1]. Delirium is common among intensive care unit (ICU) patients. Previous studies have shown that the incidence of delirium in neurosurgery ICU patients is 42.0%, in stroke patients it is 10.0%-13.0%, in postoperative cerebrovascular surgery patients it is 31.1%, and in postoperative patients with hypertensive cerebral hemorrhages it is 21.7%-22.6% [2]. There are many clinical manifestations of delirium in ICU patients, including disorders of the sleep cycle, a sudden change in mental state, depression of consciousness, etc. The specific manifestations include a decreased clarity of consciousness, nychthemeral rhythm inversion, irritability, anxiety, and a decreased arousal level [3]. After the occurrence of delirium in ICU patients, the probability of complications such as pneumonia and pulmonary infarction increases significantly [4]. Therefore, to improve patient prognosis, it is important for ICU nurses to grasp the relevant risk factors for delirium in critically ill patients and to adopt targeted strategies to respond to it promptly.

Delirium is common in ICU patients with early postoperative complications and multiple diseases. The characteristics of delirium onset are temporality, fluctuation, and detection difficulty. The main characteristics of delirium include: (1) cognitive impairment (such as visual delusions and hallucinations), cognitive change (such as memory loss, disorientation, and language disorders) and confusion of conscious-

Table 1. Comparison of the general information between the two groups (n, $\bar{x} \pm sd$)

	E group (n=38)	EC group (n=38)	χ^2/t	P
Gender			0.152	0.696
Male	18	21		
Female	20	17		
Etiology			0.715	0.397
Severe pulmonary infection	7	4		
After severe craniocerebral trauma operation	9	8		
Compound injury	5	6		
Severe acute pancreatitis	6	7		
Others	11	13		
Basic diseases			0.618	0.431
Diabetes	4	2		
Hypertension	9	10		
None	11	15		
Others	14	11		
Age (years)	41.2±13.5	42.4±14.5	0.373	0.709

ness (decreased awareness of the environment and the loss of attention); (2) the course of the disease fluctuates greatly every day and has rapid attacks (lasting for several hours to several days); (3) there are many inducing factors, and the pathogenesis is complex, and it is mainly caused by cognitive dysfunction.

Evidence-based nursing is an effective nursing method commonly used in clinical practice, and it can continuously standardize clinical nursing by analyzing problems and formulating solutions, so as to improve the nursing quality and effect [5]. Cognitive function training is a common clinical function training method, and it mainly applies to the rehabilitation of patients with various diseases such as cardio-cerebral diseases. It mainly exercises the patients' writing, memory, coordination, and calculation abilities [6].

In clinical practice, the effect of routine nursing for ICU patients is not good. At present, there is little research on nursing delirium patients with cognitive function training. Therefore, this study explored the nursing effect of the evidence-based nursing method and the evidence-based nursing combined with cognitive function training method in ICU patients.

Materials and methods

General information

Seventy-six ICU patients admitted from January 2019 to December 2019 in Shenzhen Hospital, Fuwai Hospital, Chinese Academy of Medical Sciences (Shenzhen Sun Yat-sen Cardiovascular Hospital) were recruited as the study cohort and randomly divided into two groups. This study was approved by the Ethics Committee of Shenzhen Hospital, Fuwai Hospital, Chinese Academy of Medical Sciences (Shenzhen Sun Yat-sen Cardiovascular Hospital). The first group, the evidence-based nursing group (the E group): the ICU patients in this group were only given evidence-based nursing care. The second group, the evidence-based nursing combined with cognitive function training group (the EC group): the ICU patients in this group were administered the combined nursing mode including evidence-based nursing and cognitive function training.

There were no significant differences in the general clinical data between the E group and the EC group. See **Table 1**.

Inclusion and exclusion criteria

The inclusion criteria were: (1) all the patients were ICU patients without delirium; (2) the patients were expected to be treated in ICU for more than one week and were able to cooperate with this trial; (3) the patients were older than 18 years old; (4) the patients or their family members understood, agreed to this experiment, and signed the informed consent.

Exclusion criteria were: (1) patients who were in deteriorated condition and who could not participate in this trial; (2) patients who could not

clearly express their ideas; (3) patients with missing relevant data; (4) patients with other malignant tumors; (5) patients who experienced delirium during their hospitalization before the experiment.

Nursing methods

Evidence-based nursing research was used in the E group. The specific nursing process is described below. (1) Psychological nursing. The nursing staff communicated with the patients and evaluated their psychological conditions. Based on the results, the nursing staff provided targeted psychological counseling to the patients, listened to their demands and accepted reasonable suggestions. Real-time and directional communication with the patients was adopted in order to understand their needs and physical status. (2) Avoidance of perceptual deprivation. After the patients were admitted to ICU, they were assisted in familiarizing themselves with the ICU environment as soon as possible, so that the patients could truly feel comfortable in the environment around them, so their feelings of fear and helplessness in the unfamiliar environment were reduced. (3) Sleep nursing. Pain management standards were implemented to reduce the impact of the pain on sleep. Noise stimulation was reduced as much as possible to ensure sleep time and sleep quality for the patients. Night lights could only be used when necessary for the treatment, and drugs could be used to promote sleep when necessary to reduce the delirium risk factors in the ICU patients. (4) Limited activity nursing. Nursing staff guided the patients in carrying out appropriate activities every day and following the principle of gradual progress. For the patients with limited activity unable to move in the bed by themselves, they were helped to turn over once every two hours. For the patients with postoperative incision pain and multiple indwelling tubes, restraint belts were used to limit their activities. (5) Diet and defecation nursing. For patients who needed tracheal intubation, the amount of water and food intake was limited after the extubation. The patients should be guided to consume a small amount of water and food each time for multiple times to reduce their cardiac loads. (6) Preventive nursing of complications. The patients' conditions were closely monitored. Regular chest physical therapy, such as deep breathing and effective coughing, were used to prevent pulmonary infections and other complications. (7) Family members support care. The nursing staff arranged visits from family members and reasonably adjusted the visiting time according to the patients' condition and symptoms. The duty nurse was the visiting manager and was responsible for explaining the patients' conditions to the visitors and guiding the family members to provide encouragement and support to the patients, so as to enhance the patients' confidence in their rehabilitation.

The patients in the EC group received cognitive function training in addition to the treatment provided to the E group. Cognitive function training includes four aspects: music, vocabulary learning, clock memory painting, and mental health. Each aspect of the training was implemented by professional nursing staff, and the qualities and times of each intervention were similar. The specific measures are described below. (1) Music performance training. The patients were provided with a short piece of a simple music score, and they only needed to complete it on the tablet computer simulation keyboard with one hand. Each training lasted for 0.5 h, and it was given twice a week. (2) Vocabulary learning. In order to eliminate any interference from the patients' previous education levels, several simple words in Spanish were selected. The patients were asked to learn three words within 20 minutes and to review the learned words the next time. Each time lasted for 0.5 h, twice a week. (3) Clock memory painting training. The patients were asked to observe a clock picture for 10 minutes and then draw the clock pattern by memory on the blank paper. The learning process lasted for 30 minutes and was done twice a week. (4) Mental health state intervention. Psychiatrists assessed the patients' mental states, communicated with them and helped them solve their psychological problems to keep them optimistic. Each psychological intervention appointment lasted for 30 minutes, twice a week. The total exercise time was one week.

In terms of the drug selection for the treatment of delirium, the European Society of Anesthesiology (ESA) guidelines suggest that the routine use of benzodiazepines should be avoided, and low-dose haloperidol and atypical antipsychotics can be used when necessary. However, in some special cases, benzodiazepines can be given. In addition, studies have shown that the perioperative use of α2 recep-

Table 2. Comparison of the delirium occurrences between the two groups (n)

Group	n	Numbers of occurrence (n)	Incidence (%)
E group	38	16	42.11
EC group	38	9	23.68
χ^2			2.921
P			0.047

Table 3. Comparison of the MMSE scores in the two groups ($\bar{x} \pm sd$)

Group	n	Before care	One week after treatment	t	P
E group	38	18.43±3.14	21.94±4.35	4.033	<0.001
EC group	38	19.01±3.25	25.94±5.75	6.468	<0.001
t		0.791	3.420		
P		0.431	0.001		

Note: MMSE: Mini-Mental State Exam.

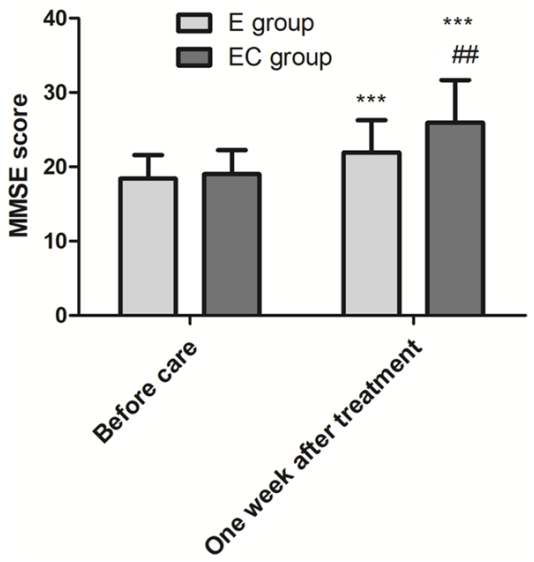

Figure 1. The MMSE scores of the E group and the EC group. Compared with before the care in the same group, ***P<0.001; compared with the E group, ##P<0.01. MMSE: Mini-Mental State Exam.

tor agonists (dexmedetomidine or clonidine) can reduce the incidence of postoperative delirium in patients undergoing cardiovascular surgery [7]. In this study, patients with delirium were treated with haloperidol (Jinan Woerde Chemical Co., Ltd., China) as a routine treatment. The initial dose was 25 mg/d, and the dosage was adjusted according to the disease condition. The treatment dose was 25-10 mg/d. The drugs were injected intramuscularly at intervals of more than 30 min. Scopolamine (Chengdu First Pharmaceutical Co., Ltd., China) or benzhexol (Changzhou Kangpu Pharmaceutical Co., Ltd., China) were used to treat patients with extrapyramidal symptoms, but it should not be used as a preventive medication.

Outcome measures

The primary outcome measures included the occurrence of delirium, cognitive function, neurological function and daily living abilities. The secondary outcome measures included sleep quality and nursing satisfaction.

Delirium occurrence

The occurrence of delirium in the two groups was determined using the confusion assessment method for the intensive care unit (CAM-ICU), and the incidences of delirium were recorded. The assessment was conducted once every 8 hours at 6, 14 and 22 o'clock over a period of one week. The incidence of delirium (%) = patients with delirium/total patients × 100%.

Cognitive function

After one week of the nursing intervention, the Minimum Mean Square Error (MMSE) scale was used to test the cognitive function. The total possible score of the MMSE is 30 points. The lower the score, the more serious the cognitive impairment.

Neurological function

After one week of nursing intervention, the National Institute of Health Stroke Scale (NIHSS) was used to determine the neurological function. The total possible score is 40 points. Higher scores indicate poor neurological function.

Daily living abilities

After one week of the nursing intervention, the Barthel Index was used to evaluate the daily living abilities. The index's total possible score is 100 points. High scores indicated good self-care abilities.

Sleep quality

After one week of the nursing intervention, the Pittsburgh Sleep Quality Index (PSQI) scale was

Table 4. Comparison of the NIHSS scores between the two groups ($\bar{x}$ ± sd)

Group	n	Before care	One week after treatment	t	P
E group	38	34.82±5.34	26.14±4.09	7.955	<0.001
EC group	38	35.37±5.41	22.33±5.37	10.550	<0.001
t		0.446	3.479		
P		0.656	<0.001		

Note: NIHSS: National Institutes of Health Stroke Scale.

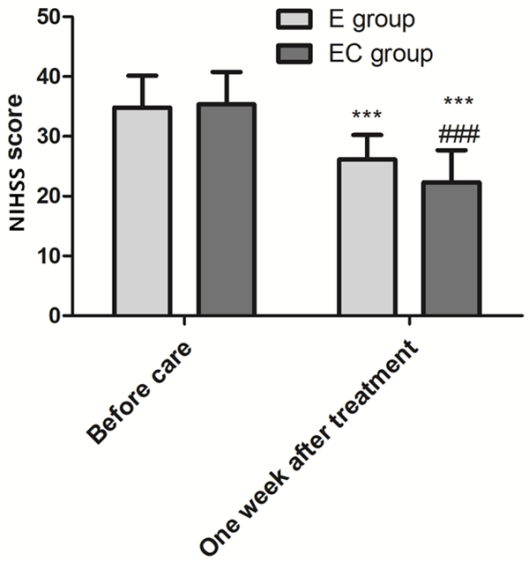

Figure 2. The NIHSS scores of the E group and the EC group. Compared with before the care in the same group, ***P<0.001; compared with the E group, ###P<0.001. NIHSS: National Institutes of Health Stroke Scale.

used to determine the patients' sleep quality. The applicable population included insomnia patients and patients with mental problems. It also applied to the sleep assessment for normal people. The PSQI scale contains seven items (sleep duration/quality/efficiency/disturbances, etc.). Higher scores indicated poor sleep quality.

Nursing satisfaction rate

After one week of the nursing intervention, the inpatient satisfaction evaluation scale (self-made) was used to evaluate the patients' nursing satisfaction levels. The scale included 6 indexes, for a total possible score of 6 points. Four points and above indicated satisfied, three points indicated basically satisfied, and zero to two points indicated dissatisfied. The satisfaction rate (%) = (satisfied number + basically satisfied number)/total number × 100%.

Statistical analysis

All the data were analyzed using SPSS 23.0 software. First, the normal distribution was tested, and all the data that fit into a normal distribution and were expressed as the mean ± standard deviation ($\bar{x}$ ± sd); independent-samples t-test were used for the group comparisons, and paired-samples t-tests were used for the pairwise comparisons. The enumeration data were analyzed using χ^2 tests. P<0.05 was considered statistically significant.

Results

Comparison of the occurrences of delirium in the two groups

After one week of the nursing intervention, the occurrences of delirium in the EC group were significantly lower than they were in the E group (P<0.05). See **Table 2**.

Comparison of cognitive function between the two groups

Before the nursing, there were no significant differences in the MMSE scores between the two groups (P>0.05). One week after the nursing, the two groups' scores increased (P<0.001), and the scores in the EC group were significantly higher than the scores in the E group (P<0.01). See **Table 3** and **Figure 1**.

Comparison of the neurological function in the two groups

Before the nursing, there was no significant difference in the NIHSS scores between the two groups (P>0.05). One week after the nursing, both groups' scores decreased (P<0.001), and the scores in the EC group were significantly lower than the scores in the E group (P<0.001). See **Table 4** and **Figure 2**.

Comparison of the daily living abilities in the two groups

Before the nursing, there was no significant difference in the Barthel Index levels between the two groups (P>0.05). One week after the nurs-

Table 5. Comparison of the Barthel Index levels between the two groups ($\bar{x} \pm sd$)

Group	n	Before care	One week after treatment	t	P
E group	38	45.24±6.77	64.12±7.15	11.820	<0.001
EC group	38	45.64±6.23	73.43±8.43	16.340	<0.001
t		0.268	5.192		
P		0.789	<0.001		

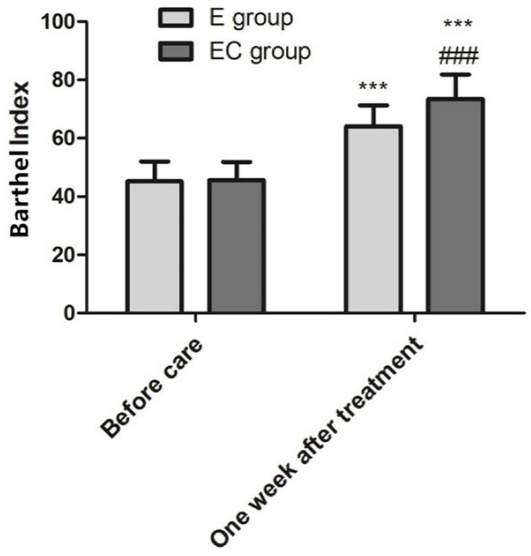

Figure 3. Comparison of Barthel Index levels between the two groups. Compared with before the care in the same group, ***P<0.001; compared with the E group, ###P<0.001.

ing, both groups' scores increased (P<0.001), and the scores in the EC group were significantly higher than the scores in the E group (P<0.001). See **Table 5** and **Figure 3**.

Comparison of the sleep quality in the two groups

After one week of nursing intervention, the total PSQI scores in the E group and the EC group were 9.54±0.67 and 6.89±0.14, respectively. The indexes such as sleep duration, sleep efficiency, and sleep disturbances in the E group were significantly higher than they were in the EC group (all P<0.001). Compared with the EC group, the total PSQI scores in the E group were significantly higher (P<0.001). See **Table 6**.

Comparison of the nursing satisfaction between the two groups

One patient died in the E group, and two patients died in the EC group. There were 2 cases (5.55%) who were dissatisfied with nursing care in the EC group and 8 cases (21.63%) in the E group. There were no significant differences in the numbers of satisfied patients or the satisfaction rates between the EC group and the E group (P>0.05). See **Table 7**.

Discussion

Delirium is a clinically common, cognitive dysfunction disease, and it is mainly characterized by disturbances of consciousness and often occurs in patients with severe diseases. In the ICU, the incidence of delirium in male patients is significantly higher than it is in female patients. The elderly are a high-risk population for delirium, and it has an important relevance to their declined physiological function, reduced metabolic capacity, low drug tolerance, and poor psychological stress ability [8]. There are many reasons why delirium occurs in ICU patients, such as a neurotransmitter imbalance, cognitive impairment, and emotions [9].

Daily living abilities is a globally-recognized health concept, and it indicates that care for patients focuses not only on health but also on their mental state. The results of our study showed that evidence-based nursing could improve the life quality and various functions of patients in the ICU and promote their prognosis. Moreover, cognitive function training combined with evidence-based nursing can have a significantly better effect on patient improvement, and it can improve patients' cognitive and neurological functions, reduce their incidences of delirium, improve their daily living abilities, and play a supporting role in the prognosis and rehabilitation of ICU patients.

According to published studies, evidence-based nursing intervention after routine treatment for ICU patients can effectively improve the patients' limb function, promote the improvement of their rehabilitation quality, alleviate their clinical symptoms and improve their mental state [10]. A large number of clinical trials have proved that evidence-based nursing can not only improve the motor function, language function, cognitive function, and other damaged functions of postoperative patients but it can also strengthen the patients' mental, psychological, and social readaptation abilities, restore autonomous function, social activities, and interpersonal relationships and maximize

Table 6. Comparison of the PSQI scores between the two groups ($\bar{x} \pm sd$)

Indexes	E group (n=38)	EC group (n=38)	t	P
Sleep quality	1.36±0.67	0.84±0.05	4.771	<0.001
Falling asleep time (h)	1.26±0.54	0.61±0.03	7.409	<0.001
Sleep duration	1.65±0.14	0.74±0.16	26.390	<0.001
Sleep efficiency	1.68±0.75	0.78±0.23	7.072	<0.001
Sleep disturbances	1.16±0.54	0.57±0.13	6.548	<0.001
Use of sleep medication	1.02±0.44	0.43±0.01	8.264	<0.001
Daytime dysfunction	1.19±0.47	0.65±0.23	6.362	<0.001
Total scores	9.54±0.67	6.89±0.14	23.870	<0.001

Note: PSQI: Pittsburgh Sleep Quality Index.

Table 7. Comparison of the nursing satisfaction between the two groups (n (%))

Group	n (deaths excluded)	Satisfied	Basically satisfied	Dissatisfied	Satisfaction rate
E group	37	18 (48.64)	11 (29.73)	8 (21.63)	29 (78.38)
EC group	36	24 (66.67)	10 (27.78)	2 (5.56)	34 (94.44)
χ^2			1.647		2.320
P			0.199		0.127

the ability to engage in daily life activities [11-13]. Research shows that a reduction of the generation of fear, anxiety, worry, and other emotions after surgery greatly improves patients' life quality [14]. Therefore, it is crucial to carry out evidence-based nursing for ICU patients. One relevant study shows that compared with general nursing, evidence-based nursing can achieve a remarkable effect on promoting prognosis among ICU patients, which not only effectively reduces the incidence of poor prognoses but also improves the patients' satisfaction with clinical nursing [15].

The cognitive function training mode is a new nursing mode, and it is based on scientific theory to ensure that all aspects of nursing are more refined, so as to ensure treatment efficiency [16]. An experiment shows that the application of cognitive function training in ICU patients can significantly improve the treatment efficiency, reduce the likelihood of emergencies, and improve the psychological emotions and satisfaction of ICU patients [17]. Another study found that cognitive function training can help ICU patients better achieve the purpose of rehabilitation by training their limbs, memory, daily living abilities, comprehensive ability and other aspects [18]. Cognitive function training can guide ICU patients' psychological states, daily lives, and ameliorate their problems to soothe their anxiety, fear, and other adverse emotions, which can help them better cooperate with the doctors for their treatment [19]. An experimental comparative study shows that compared with single evidence-based nursing, evidence-based nursing combined with cognitive function training has a better nursing effect on ICU patients and can significantly improve the psychological state, satisfaction, and other indicators of ICU patients [20, 21].

There are some deficiencies in the research process of our experiment. Due to the physical conditions of some of the patients, we did not conduct a comprehensive physical examination for all the test personnel, so we were not able to exclude the influences of other diseases on the patients' neurological functions and sleep quality. In addition, we did not show the influence of the nursing methods on other indicators. More nursing methods should be added in future research to provide a more favorable experimental basis for the nursing of ICU patients.

In conclusion, the nursing effect of evidence-based nursing combined with cognitive function training on ICU delirium patients is significantly better than evidence-based nursing alone. The former has a significantly better effect on improving patients' cognitive function and life abilities and can improve their sleep quality and neurological function.

Disclosure of conflict of interest

None.

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References

[1] Sun F, Yang N, Li C and Ma M. Effect of bundle nursing of sedation and Analgesia on delirium of trachea intubation patients in ICU. J Nurs 2018; 25: 58-61.

[2] Skrobik Y, Duprey MS, Hill NS and Devlin JW. Low-dose nocturnal dexmedetomidine prevents ICU delirium. A randomized, placebo-controlled trial. Am J Respir Crit Care Med 2018; 197: 1147-1156.

[3] Jiang Y, Song Q, Zang R, Wei Z, Jiang L and Huang X. Construction of nursing quality evaluation index system for ICU patients. Chin J Nurs 2020; 55: 177-181.

[4] Green C, Bonavia W, Toh C and Tiruvoipati R. Prediction of ICU delirium: validation of current delirium predictive models in routine clinical practice. Crit Care Med 2019; 47: 428-435.

[5] Liu N, Zou Q, Wang N and Chen W. Effect of evidence-based nursing for patients with vocal cord polypectomy. J Clin Med Pract 2018; 22: 79-81.

[6] Qiao Y, Wang J, Yu Y, Wang Y, Sun J, Ruan Z, Wu L and Chang H. Construction and practice of nurse-led cognitive function training clinic. Chin Nurs Manag 2018; 18: 962-965.

[7] Luo A and Zhang J. Interpretation of the 2017 European society of anaesthesiology evidence-based and consensus-based guideline on postoperative delirium. J Clin Surg 2018; 26: 29-33.

[8] Karamchandani K, Schoaps RS, Printz J, Kowaleski JM and Carr ZJ. Gender differences in the use of atypical antipsychotic medications for ICU delirium. Crit Care 2018; 22: 220.

[9] Tang E, Laverty M, Weir A, Wilson ES, Walsh TS, Allerhand M, Parks S, MacLullich AMJ and Tieges Z. Development and feasibility of a smartphone-based test for the objective detection and monitoring of attention impairments in delirium in the ICU. J Crit Care 2018; 48: 104-111.

[10] Tian J, Dan H, Shi N, Zhang J and Zhang Z. Efect of evidence-based nursing on leukemia patients with infections during chemotherapy and its influence on quality of life of patients. Chin J Nosocomiol 2018; 28: 295-297.

[11] Shi Y. The Application of evidence-based nursing in patients with delirium after hip replacement. Chin Cont Med Edu 2018; 10: 180-182.

[12] Chen L, Pan L, Ye X and Zhang X. The effect of holistic nursing based on evidence-based concept on delirium in ICU. Chin Mod Doctor 2019; 57: 160-164.

[13] Donaghy J. ITU patients with delirium did not benefit from electronic and pharmacist support encouraging the deprescribing of benzodiazepines and anticholinergics. Evid Based Nurs 2020; 23: 52.

[14] Hacker Rn Bsn Ccrn P. Supporting family in their search for meaning and purpose during unexpected ICU admission improves coping, resilience and psychological outcomes. Evid Based Nurs 2020; 23: 15.

[15] Guo H, Shen Y, Jiang H and Yang H. Best evidence based thre-level nursing management of ICU delirium for criticaly Il patients. J Nurs Sci 2018; 33: 25-28.

[16] Brück E, Schandl A, Bottai M and Sackey P. The impact of sepsis, delirium, and psychological distress on self-rated cognitive function in ICU survivors-a prospective cohort study. J Intensive Care 2018; 6: 2.

[17] Tsui A, Kuh D, Richards M and Davis D. Delirium symptoms are associated with decline in cognitive function between ages 53 and 69 years: findings from a British birth cohort study. Alzheimers Dement 2018; 14: 617-622.

[18] Gao L, Xu S, Fu J and Zhu X. Clinical effect of cognitive function training on intelligent development of children with brain injury syndrome. Clin Focus 2018; 33: 129-131.

[19] Kilian J, Wiśniowska-Szurlej A, Kopańska M and Ćwirlej-Sozańska A. The use of neurofeedback method in cognitive function training in the elderly - a systematic literature review. Med Og Nauk Zdr 2020; 26: 1-7.

[20] McAdams-DeMarco MA, Konel J, Warsame F, Ying H, González Fernández M, Carlson MC, Fine DM, Appel LJ and Segev DL. Intradialytic cognitive and exercise training may preserve cognitive function. Kidney Int Rep 2018; 3: 81-88.

[21] Song J, Liu D, Zhang M, Wang H and Tan S. Intermittent Theta Burst Stimulation (Itbs) combined with working memory training to improve cognitive function in schizophrenia: study protocol for a randomized controlled trial. Trials 2020; 21: 683.