Nurses' Knowledge, Attitudes, and Practices Regarding ICU Delirium, Kunming Tertiary Hospitals, Yunnan Province, the People's Republic of China*

ความรู้ ทัศนคติ และการปฏิบัติของพยาบาลเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียู โรงพยาบาลระดับตติยภูมิเมืองคุนหมิง มลฑลยูนนาน ประเทศสาธารณรัฐประชาชนจีน*

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Abstract

A descriptive correlational research design was used in this study to explore the level of knowledge, attitudes, and practices regarding ICU delirium among nurses who worked at Kunming Tertiary Hospitals, Yunnan Province, the People's Republic of China, as well as to determine the relationship between them. Purposive sampling was applied to recruit 256 participants. Measurement tools were composed of the Demographic Data Record Form, the Critical Care Nurses Knowledge of Delirium Scale (CCNKDS), the Attitude of ICU Nurses Towards Delirium (AINTD) and the Critical Care Nurse Practice Skills of Delirium Management Scale (CCNPSDMS). The Chinese version of each instrument was used, with Cronbach's alpha coefficients of .913, .802 and .922, respectively. Data were analyzed using descriptive statistics and Spearman's rank-order correlation test.

The results of this study were as follows:

1. Participants had knowledge regarding ICU delirium at a high level (M = 65.61, SD = 7.83);

2. Participants had a neutral attitude towards ICU delirium (M = 23.04, SD = 2.40);

3. Participants had practice regarding ICU delirium at a fairly low level (M = 114.84, SD = 27.44); and

4. Participants' knowledge and attitudes had a weak positive relationship with practices regarding ICU delirium ($r_s = .245$, $p < .01$ and $r_s = .176$, $p = .05$, respectively).

Further research should be done to explore factors influencing nurses' attitudes and practices regarding ICU delirium. Interventions should be done accordingly to improve attitudes and practices regarding ICU delirium among nurses, as well as to lower the incidence of ICU delirium.

Keywords: ICU delirium, Knowledge, Attitude, Practice, Critical Care Nurses

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Received 5 August 2021; Revised 6 September 2021; Accepted 8 September 2021

บทคัดย่อ

การศึกษาครั้งนี้เป็นการวิจัยเชิงพรรณาหาความสัมพันธ์เพื่อสำรวจระดับความรู้ ทัศนคติ และการปฏิบัติเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูของพยาบาลที่ทำงาน ณ. โรงพยาบาลระดับตติยภูมิ เมืองคุนหมิง มลฑลยูนนาน ประเทศสาธารณรัฐประชาชนจีน รวมทั้งหาความสัมพันธ์ระหว่างตัวแปรดังกล่าว คัดเลือกกลุ่มตัวอย่างอย่างเจาะจง จำนวน 256 คน เครื่องมือประเมินประกอบด้วยแบบบันทึกข้อมูลส่วนบุคคล แบบวัดความรู้ของพยาบาลวิกฤตเกี่ยวกับภาวะสับสนเฉียบพลัน แบบวัดทัศนคติของพยาบาลไอซียูเกี่ยวกับภาวะสับสนเฉียบพลัน และแบบวัดทักษะปฏิบัติของพยาบาลวิกฤตเกี่ยวกับภาวะสับสนเฉียบพลัน เครื่องมือฉบับภาษาจีนที่ใช้มีค่าสัมประสิทธิ์แอลฟ่าของครอนบาร์ค .913, .802 และ .922 ตามลำดับ วิเคราะห์ข้อมูลด้วยสถิติพรรณนา และสถิติสหสัมพันธเชิงอันดับของสเปียร์แมน

ผลการศึกษา มีดังนี้

1. กลุ่มตัวอย่างมีความรู้เกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูในระดับสูง (ค่าเฉลี่ย 65.61 และ ส่วนเบี่ยงเบนมาตรฐาน 7.83)

2. กลุ่มตัวอย่างมีทัศนคติเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูในระดับปานกลาง (ค่าเฉลี่ย 23.04 และส่วนเบี่ยงเบนมาตรฐาน 2.40)

3. กลุ่มตัวอย่างมีการปฏิบัติเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูในระดับค่อนข้างต่ำ (ค่าเฉลี่ย 114.84 และส่วนเบี่ยงเบนมาตรฐาน 27.44) และ

4. ความรู้และทัศนคติของกลุ่มตัวอย่างมีความสัมพันธ์ทางบวกอย่างมีนัยสำคัญทางสถิติในระดับต่ำกับการปฏิบัติเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูของพยาบาล ($rs = .245$, $p < .01$ และ $rs = .176$, $p = .05$ ตามลำดับ)

ควรมีการศึกษาถึงปัจจัยที่มีอิทธิพลต่อทัศนคติและการปฏิบัติเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูของพยาบาล และควรมีการจัดกระทำเพื่อยกระดับทัศนคติและการปฏิบัติเกี่ยวกับภาวะสับสนในผู้ป่วยไอซียูของพยาบาล เพื่อลดอุบัติการณ์การเกิดภาวะสับสนในผู้ป่วยไอซียู

คำสำคัญ: ภาวะสับสนในผู้ป่วยไอซียู ความรู้ ทัศนคติ การปฏิบัติ พยาบาลวิกฤต

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Background and significance

Critically ill patients usually suffer from not only life-threatening conditions, but also continuously complex treatments. Physical and/or psychological complications, especially delirium, are commonly found (Alasad, Tabar, & Ahmad, 2015). Intensive care unit (ICU) delirium is defined as a disturbance of consciousness characterized by acute onset and fluctuating course of inattention accompanied by either a change in cognition or a perceptual disturbance in a short period of time in ICU (American Psychiatric Association, 2013). Globally, the incidence of delirium in ICU was higher than in other units, at 33% to 80 %, respectively (Kallenbach & Amado, 2017).

Delirium was an independent predictor of poor outcomes in ICUs. Various negative consequences associated with ICU delirium were confirmed, including increased accidental extubation rate, days spent on ventilators, length of both ICU and hospital stay, long-term cognitive impairment and higher mortality (Tang, 2018). Moreover, taking care of patients with ICU delirium not only increases nurses' workload, but also increases their psychological burden and occupational injury. Lastly, ICU delirium is directly related to additional hospitalization costs (Xing, Sun, Jie, Yuan, & Liu, 2017).

Prevention of ICU delirium is a significant feature of critical care and an essential aspect to enhance the quality of care in ICUs worldwide (Kallenbach & Amado, 2017). The most effective measures for controlling ICU delirium among critically ill patients are composed of screening and preventing in high-risk groups, early detection and appropriate management (Ke et al., 2019). Nurses play the foremost role in screening, preventing, detecting and managing ICU delirium, as well as improving prognosis and outcomes for delirium patients through their performance (Tang, 2018).

Regardless of the existence of guidelines, nurses' inappropriate and inadequate practices regarding ICU delirium are still reported globally. To comprehensively explore human behaviors, the knowledge, attitudes, and practices (KAP) model has been widely used. Generally, studies applying the KAP model have confirmed the effect of knowledge and attitudes on practice (Schwartz, 1976). Insufficient knowledge of ICU delirium was found as a factor influencing nurses' preventive practices for high-risk patients (Lee, Park, & Kim, 2016). In addition, nurses' attitudes played an important role in prevention and management practices regarding ICU delirium (Monfared, Soodmand, & Ghasemzadeh, 2017).

Nurses' knowledge regarding ICU delirium refers to the familiarity, awareness, or understanding of ICU delirium-related information that they have gained from formal and informal education and/or experiences. This includes diagnostic criteria, influencing/risk factors, classification, manifestation, impacts, and management of ICU delirium. Such knowledge is vital for early prevention and optimal control of ICU delirium (Tang, 2018).

Nurses' attitudes regarding ICU delirium refers to nurses' opinions and feelings/emotions towards ICU delirium. A positive attitude is the basic premise of providing quality nursing

care. Therefore, it is particularly important to enhance the attitudes of nurses toward ICU delirium (Monfared et al., 2017).

Nurses' practices regarding ICU delirium refers to the preventive and managing activities that nurses provide to take effective control over ICU delirium. It mainly includes multi-component, non-pharmaceutical nursing interventions (Devlin et al., 2018). Combining evidence-based practice methods into bundles may significantly reduce the incidence of ICU delirium (Ke et al., 2019).

Inconsistent findings on knowledge, attitudes, and practices regarding ICU delirium among nurses have been reported worldwide, as well as in China. It can be concluded that nurses' knowledge varied from low to moderate levels, attitudes were inconclusive, and practices were at low to fairly low levels (Hamdan-Mansour, Othman, & Yacoub, 2010; Li et al., 2017; Monfared et al., 2017). Such results are context-based and have limited application elsewhere.

Kunming is the capital city of Yunnan province, the People's Republic of China (PRC). There are six tertiary hospitals in Kunming. Each hospital has its own rules, regulations, working systems, and resources related to providing care for critically ill patients. There has been limited study of the incidence and prevalence of ICU delirium in Kunming, or even in Yunnan province. In addition, no information about knowledge, attitudes, and practices regarding ICU delirium among nurses in Kunming city was found. To improve the quality of practice related to ICU delirium, identifying the baseline knowledge, attitudes, and practices in Kunming was necessary.

Objectives

To examine the level of nurses' knowledge, attitudes, and practices regarding ICU delirium, as well as the relationship between nurses' knowledge, attitudes, and practices regarding ICU delirium at Kunming Tertiary Hospitals, Yunnan Province, PRC.

Research questions

What is the level of nurses' knowledge, attitudes, and practices regarding ICU delirium, and is there any relationship between nurses' knowledge, attitudes, and practices regarding ICU delirium at Kunming Tertiary Hospitals, Yunnan Province, PRC?

Conceptual framework

The conceptual framework of this study is based on the Knowledge, Attitudes, and Practices (KAP) model (Schwartz, 1976). This model was used to explore the relationship between the knowledge, attitudes, and practices of nurses in this study in the context of ICU delirium.

Delirium is known to be a predictor of poor outcomes and increased mortality in ICUs. Prevention and management of this condition is vital. Nurses are responsible for all aspects of the patient's continuous care during their entire course of the ICU stay. Practices of ICU delirium are provided mainly by nurses. It is believed that if nurses are well equipped with enough knowledge, and positive attitudes, they will be

able to perform proper practices to prevent and manage ICU delirium.

Nurses' knowledge regarding ICU delirium refers to the familiarity, awareness, or understanding of ICU delirium-related information that they have gained from formal and informal education and/or experiences. It includes influencing/risk factors, classification, manifestation, impacts, and management of ICU delirium. Attitudes were described as a range of opinions and feelings/emotions among nurses towards ICU delirium whereas practices were conceptualized as activities carried out by nurses to prevent and manage ICU delirium. A baseline of knowledge, attitudes, and practices regarding ICU delirium among nurses in Kunming tertiary hospitals, Yunnan province, PRC, could be used to improve nurses' practices. Optimal control of ICU delirium could be made possible.

Methodology

Population and sampling

This was a descriptive correlation study conducted with nurses at Kunming tertiary hospitals in Yunnan Province, PRC. Samples were identified by the purposive sampling method in the First Affiliated Hospital of Kunming Medical Hospital (1stAH) according to these following criteria: 1) permanently worked in adult ICU for at least 6 months, and 2) agreed to participate in the study. Applying Yamane's formula (1973), a sample size of 213 was obtained. Concerning the possible loss of participants, 20% (43 participants) were added. Therefore, 256 participants were recruited for this study.

Research instruments

The questionnaire included four parts:

1. the Demographic Data Record Form including age, gender, ICU working experience, educational level, position, professional title, and ICU delirium training.

2. Critical Care Nurses Knowledge of Delirium Scale (CCNKDS) originally developed by Hamdan et al. (2010). It consisted of 26 items with a 3-point Likert scale and included six aspects as follows: definition, risk factors, impact, classification, manifestations, and medical management of ICU delirium. A higher score indicates higher level knowledge regarding ICU delirium. Criteria for level classification was determined by the developers (26.00 - 38.99 = low level, 39.00 - 51.99 = fair level, 52.00 - 64.99 = moderate level, and 65.00 - 78.00 = high level).

3. Attitude of ICU Nurses Towards Delirium (AINTD) originally developed by Monfared & colleagues (2017), containing 10 items with a 3-point Likert scale. The contents included nurses' opinions and feelings/emotions toward ICU delirium. Higher scores represent positive attitudes. Level classification was set by the developers (negative attitudes [10.00 - 16.99], neutral attitudes [17.00 - 23.99], and positive attitudes [24.00 - 30.00]).

4. the Critical Care Nurse Practice Skills of Delirium Management Scale (CCNPSDMS) originally developed by Hamdan et al. (2010) consisted of 20 items with a 100 mm visual analog scale. This scale includes both pharmacological and non-pharmacological interventions that nurses applied to prevent

and manage ICU delirium. A higher score showed a higher practice level regarding ICU delirium. Criteria for level determinants were set by developers (very low level [20.00 - 40.99], low level [41.00 - 80.99], fairly low level [81.00 - 120.99], moderate level [121.00 - 160.99], and high level [161.00 to 200.00]). All original measurement tools were translated into Chinese using the back translation method.

The reliability of the instruments was tested with 15 nurses who had similar characteristics to the participants. The Cronbach's alpha of the CCNKDS, AINTD, and CCNPSDMS were .913, .802, and .922, respectively.

Ethical considerations

The study was approved by the Research Ethics Committee of the Faculty of Nursing, Chiang Mai University, Thailand. Permission for data collection was obtained from 1st AH. All participants who agreed to participate in this study were required to sign a written consent form, independently, after details of the study were explained and clarification was made. They had the right to participate in or quit from this study at any time without any negative impact on their benefits or future career. In addition, only a code number was used for data analysis. Voluntariness, privacy, and confidentiality were ensured.

Data collection

A package of research documents was distributed to all participants including an information sheet, an informed consent form, and the QR code of the four parts of the questionnaires. The participants were asked to scan the QR code and complete e-questionnaires during a convenient time individually and independently without any assistance within one week. The response rate for the 256 participants was 100%.

Data analysis

The data was analyzed by way of the computer program SPSS 13.0, English version. Only nurses' practices data had normal distribution. Therefore, descriptive statistics and the Spearman's rank-order correlation test were used.

Results

According to Table 1, most participants (N = 256) were females (85.9%) with ages ranging from 22 to 51 years and an average age of 31.13 years old (SD = 5.17). More than half of them (52.70%) were aged between 21 to 30 years old. Their average working years were 6.98 years (SD = 5.19). The majority of them (82.40%) had worked for less than 10 years, held a bachelor's degree (86.70%), and worked as staff (81.30%).

Approximately two-thirds of them (57.80%) had not been involved in ICU delirium training. Work experience and learning by doing were claimed to be the main sources of knowledge and practice related to ICU delirium among participants (80.50%). Besides, most of them perceived that their workplaces had no standardized ICU delirium management guidelines, standard prevention and management systems, or ICU delirium standard assessment procedure, at 78.90%, 65.20%, and 61.30%, respectively. Moreover, about half of them (52.70%) felt their workload was too heavy to take care of ICU delirium (Table 1).

Participants' knowledge regarding ICU delirium in this study was at a high level ($\bar{X}$ = 65.61; SD = 7.83) whereas their attitudes were at neutral levels ($\bar{X}$ = 23.04; SD = 2.40) and their practice was at a fairly low level ($\bar{X}$ = 114.84; SD = 27.44) (Table 2). In addition, there was a statistically significant weak positive relationship between their knowledge and practices regarding ICU delirium (r = .245, p < .01) as well as between their attitudes and practices regarding ICU delirium (r = .176, p < .05) (Table 3).

Table 1 Number, frequency, percentage, mean, standard deviation, and range of ICU nurses' demographic characteristics (n = 256)

Demographic characteristics	Frequency (n)	Percentage (%)
Gender		
Female	220	85.90
Male	36	14.10
Age (Years (M = 31.13; SD = 5.17; Range = 22-51)		
21-30	135	52.70
31-40	108	42.20
41-51	13	5.10
Working years (M = 6.85; SD = 5.19; Range = 1-28)		
1-10	211	82.40
11-20	40	15.60
21-30	5	2.00
Education level		
Bachelor degree	222	86.70
Associate degree	25	9.80
Master degree	9	3.50
Position		
Staff	208	81.30
Nursing team leader	39	15.20
Head nurse	9	3.50
ICU delirium training		
No	148	57.80
Yes	108	42.20
The main source of ICU delirium - related knowledge and practice		
Work experience	206	80.50
Communicate from colleagues	151	59.00

Demographic characteristics	Frequency (n)	Percentage (%)
Standardized management guidelines		
No	202	78.90
Yes	54	21.10
Standardized ICU delirium assessment procedure		
No	157	61.30
Yes	99	38.70
The workload is too heavy to perform practices of ICU delirium		
Yes	135	52.70
No	121	47.30

Table 2 Participants' knowledge, attitudes, and practice regarding ICU delirium (n = 256)

Category	Mean (SD)	Level
Knowledge	65.61 (SD = 7.83)	High
Attitudes	23.04 (SD = 2.40)	Neutral
Practices	114.84 (SD = 27.44)	Fairly low

Table 3 The relationship between participants' knowledge, attitudes, and practices regarding ICU delirium (n = 256)

	Practices	Level	p-value
Knowledge	0.245*	weak	.000
Attitude	0.176**	weak	.005

* $p < .001$, ** $p = .005$

Discussion

Nurses' knowledge regarding ICU delirium

In this study, the participants' knowledge regarding ICU delirium was at a high level ($\bar{X}$= 65.61, SD = 7.83) (Table 2). This finding was higher than that of Jordanian studies that were done by Hamdan et al. (2010) ($\bar{X}$ = 64.40, SD = 6.51) and AbuRuz (2016) ($\bar{X}$ = 52.65, SD = 4.99). In addition, it was higher than other Chinese studies done by He and colleagues (2016) in Shanxi ($\bar{X}$ = 42.20, SD = 5.51) and (Cheng, Chen, & Feng, 2015) in Shanghai ($\bar{X}$ = 50.43, SD = 3.48). Possible explanations include educational background and training, application of ICU delirium standards (assessment, prevention, and management) in the unit, and working environment.

Regarding educational background and training, most participants in this study held a bachelor's degree (86.70%), which was higher than that of other studies, and almost half of them (42.20%) had been trained specifically on

ICU delirium. In addition, those who had been trained had higher knowledge than those who had not ($\bar{X}$ = 68.00; SD = 6.02 vs $\bar{X}$ = 63.86; SD = 8.52). In Yunnan province, there are two annual academic conferences on critical care that are attended by a lot of nurses. The topic of ICU delirium is usually included from time to time. Besides, there is annual hospital training for nurses provided by physicians and head nurses. These was strong support for the high level of knowledge among nurses in this study. As confirmed by Monika, Yumnam, Koushik, Rahul, and Jiten (2019), there was a statistically significant relationship between knowledge scores regarding ICU delirium and in-service education and/or training programs among nurses ($r = .51$, $p < 0.05$).

In this study, all participants in the unit were not aware of the application of ICU delirium standards (assessment, prevention, and management). For instance, only 21.10% perceived that their unit had ICU delirium prevention and management standards, and only 34.80% realized that their unit had standard ICU delirium assessment. It was evidence that those who were aware had higher knowledge (Table 1). As confirmed by Cheng, Chen and Feng (2015), the application of standard ICU delirium guidelines in the units were a strong influencing factor on knowledge among nurses. Strict application of guidelines leads to unified delirium management system development which improves knowledge among nurses (Xing et al., 2017).

Another explanation for the high level of knowledge in this study was the participants' working environment. The 1st AH is the largest tertiary hospital and multidisciplinary medical institution in Yunnan province. This institute has a crucial role as a leader in health care services, education, and clinical research in the province, as well as being responsible for the theoretical and clinical teaching of nursing undergraduates. Almost all nurses had a role, not only as health care providers, but also teachers, and supervisors (Kunming Medical University, 2019). Therefore, updating knowledge was expected to be part of the nurses' responsibility which meant that the more years of working experience, the higher the knowledge scores (scores of 65.56 ± 8.16, 65.67 ± 6.03, and 67.20 ± 7.19 for those who had worked 1-10 years, 11-20 years, and 21-30 years, respectively). In addition, 81.50% of them confirmed that the main source of their delirium knowledge gained was from working experience.

Nurses' attitudes regarding ICU delirium

Nurses in this study held a neutral attitude regarding ICU delirium ($\bar{X}$ = 23.04, SD = 2.40) (Table 2). This was inconsistent with the results of an Iranian study (Monfared et al., 2017) that found positive attitudes towards ICU delirium among nurses. On the contrary, Li, Hu, Liu, and Ning (2017) found that nurses in their study held negative attitudes regarding ICU delirium. The possible reasons why the results of this study were inconsistent with others are as follows: educational level, training experience, years of work, and knowledge regarding ICU delirium.

Participants in this study had lower education levels than that of Monfared et al. (2017) (86.70% vs 94.60%), but they had more

training experience, more people who had worked more than 10 years, and higher mean scores for knowledge than that of Li et al. (2017) (42.20% vs 31.50%, 17.60% vs 9.30%, and 63.70% vs 49.10%, respectively). As revealed in this study, a higher level of education meant a more positive attitude towards ICU delirium ($\bar{X}$ = 21.72, SD = 2.40; $\bar{X}$ = 23.17, SD = 2.37; $\bar{X}$ = 23.55, SD = 2.39; for those who had associate's degrees, bachelor's degrees, and master's degrees, respectively); and more years of working experience meant more positive attitudes towards ICU delirium ($\bar{X}$ = 22.77, SD = 2.39; $\bar{X}$ = 24.15, SD = 2.02; $\bar{X}$ = 25.20, SD = 2.28; for those who had worked 1-10 years, 11-20 years, and 21-30 years, respectively). Nurses with higher education are usually in higher positions, and have more responsibilities in terms of clinical outcomes of patients in their unit. Improving quality of services is probably their focus. Thus, taking control of possible negative consequences for their patients (ICU delirium) might be a priority, so they had positive attitudes towards ICU delirium. However, this group was small compared with the rest of the participants. Therefore, considering the average attitudes of the whole group, a neutral attitude regarding ICU delirium among participants of this study was dominant.

Nurses' practices regarding ICU delirium

The results showed that participants in this study had a fairly low level of practice regarding ICU delirium ($\bar{X}$ = 114.84, SD = 27.44) which was similar to results of the Jordanian study by Hamdan et al. (2010) and the Chinese study done by Li and colleagues (2017). On the contrary, it was lower than that of a Korean study done by Lee et al. (2016). The possible explanations include training experience and the level of education of nurses.

The practice level of ICU nurses in this study was fairly low which is congruent with Hamdan et al. (2010) and Li et al. (2017) both of which also found a fairly low level of practice among nurses. Similarities across studies (Hamdan et al., 2010; Li et al., 2017) were that the number of participants who had been trained specifically on ICU delirium was small (42.20% in this study vs 57.20% and 64.90%, respectively). In terms of educational levels, in this study, 86.70% of participants had a bachelor's degree whereas 3.50% had a master's degree. Comparing practice level, it was found that the group with master's degrees had a higher practice level ($\bar{X}$ = 129.67, SD = 38.99; vs $\bar{X}$ = 114.89, SD = 26.08). Xing et al. (2017) pointed out that education level and training experience were major influencing factors of practice regarding ICU delirium. The better understanding of the significance and knowing how to handle ICU delirium that participants had, the more likely they would perform appropriate practices. In addition, even though participants in this study had a high chance to be trained as mentioned above, most lectures were provided by physicians, and only a few were provided by head nurses. Therefore, most of the information provided was from the physicians' perspective. Besides, hands-on practice training regarding ICU delirium had never been provided. Therefore, implementing knowledge into practice depended on individuals' experiences. In every

circumstance, nurses with more appropriate training experiences were able to perform appropriate practices (Attapornkusol, Viseskul, & Kasatpibal, 2021). This confirmed that proper ICU delirium training increased appropriate practice which could decrease the incidence of ICU delirium by 54.29%.

The relationship between nurses' knowledge, attitudes, and practices regarding ICU delirium

The findings showed that there was a weak positive relationship between participants' knowledge and practices regarding ICU delirium ($rs = .245$, $p < .01$) which was congruent with the study of Hamdan et al. (2010) ($rs = .20$, $p < .001$).

It was assumed that those who had high knowledge were more likely to perform the proper practice. Increasing nurses' knowledge was suggested to be the first step to develop a successful practice regarding ICU delirium since practices were based on knowledge (Lee et al., 2016). However, in this study, 63.70% of participants had a high level of knowledge but only 6.60% of them had a high level of practice regarding ICU delirium. More than half of them (63.30%) had a fairly low, or lower, level of practice. There might be some obstacles that limit practice levels. Moreover, even though most nurses in this study had high knowledge, application of what was learned into practice was not easy since none of them had been trained in practicum regarding ICU delirium. Transferring knowledge into practice then depended on their individual experiences and available time. As confirmed by 52.70%, they had too heavy of a workload to perform ICU delirium practices. Due to their tight schedule, the level of ICU delirium practice was fairly low and did not correlate high with their knowledge.

There was a weak positive relationship between participants' attitudes and practices regarding ICU delirium ($rs = .176$, $p = .05$). This result implied that nurses' attitudes almost never correlated with their practices regarding ICU delirium. This was different from a previous study by Pan et al. (2018) which found a strong positive correlation between nurses' attitudes and practices regarding ICU delirium ($rs = .64$, $p = .00$). According to the knowledge, attitudes, and practices model developed by Schwartz (1976), people's attitudes directly influence their practice. A positive attitude is a basic premise for providing nursing services, which can improve the nurses' practice level during ICU delirium care. Moreover, in other studies, the nurses' attitudes towards ICU delirium may directly affect the nurses' preventive and management measures regarding ICU delirium (Monfared et al., 2017). In addition, the more positive attitudes nurses had, the higher their practice level would be. In this study, around half of the participants had neutral attitudes (53.50%), and 1.20% had negative attitudes towards ICU delirium. Even though knowledge of nurses in this study was high, the majority of them had attitudes regarding ICU delirium as neutral or low. A possible explanation might be they had too heavy a workload since 52.70% of them reported this, similar to another Chinese study which explained that low levels of ICU delirium practice were due to the high-intensity workload. Tiredness induced by various pres-

sures and disgust with work might drive nurses towards losing enthusiasm to care for patients and eventually decreasing ICU delirium practice (Li et al., 2017).

Conclusions and recommendations

This result provides the baseline situation on ICU delirium knowledge, attitudes, and practices among nurses in Kunming. This information will raise nurses' awareness of ICU delirium management. It can be used by administrative teams to design appropriate actions. Finally, the improvement of ICU care quality, as well as decreasing incidence of ICU delirium and its negative consequences can be made possible.

Conclusions and implications

To improve ICU delirium practices in ICUs, factors predicting ICU delirium practices among nurses should be explored. In addition, experimental research aims for ICU delirium attitudes and practices improvement among nurses should be designed and tested for their effectiveness.

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