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Assessment of Nurses' Knowledge and Practices Regarding Care of Patients with Delirium at AL-Thawra Hospital, Yemen

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Abstract

Delirium in the intensive care unit (ICU) setting is often under-recognized and undertreated lead to increases morbidity, duration of mechanical ventilation, and length of stay. Nurses' knowledge and practice had a significant role in the improvement of the quality of healthcare and preventive measures for patients with delirium. **The study aimed:** To assess nurses' knowledge and practices regarding care of patients with delirium at AL-Thawra Hospital – Yemen. **Subjects & method:** A descriptive research design was utilized in this study. The study incorporated a convenience sample of (60) nurses working in the ICUs. Data collection tools included: demographic and work-related characteristics data, nurses' knowledge questionnaire of delirium**,** and observational checklist for assessment of nurses' practices caring for delirium patients. **Results:** Age of studied nurses' was ranged from 25 to 30 years old, and 61.7% of them were females, 55% had a diploma in nursing , and 61.7% of nurses had 1-5 years working in ICU. The majority of the studied nurses had poor knowledge and practices, with a significant decrease in the total mean score (29.72±7.00 & 48.38±20.20), respectively. **Conclusion:** Nurses had poor knowledge and practices regarding the care of delirium patients. **Recommendations:** Education program regarding the care of delirium patients in ICU is essential for nurses to improve their knowledge and practices.

Keywords: Delirium, Knowledge ICU Nurses & Practices.

Introduction

The Diagnostic and Statistical Manual of Mental disorders, 5th edition (DSM-5) defined delirium as an acute onset of fluctuating cognitive impairment and a disturbance of consciousness which is characterized by disturbances of orientation, memory, language skills, thinking, perception, motor behavior, sleep-wake cycle and with impaired attention as the core cognitive disturbance that is not better explained by a pre-existing, established or other evolving neurocognitive disorders **(American Psychiatric Association, 2013).**

Delirium is a common morbidity for intensive care unit (ICU) patients as it affects 60% to 80% of mechanically ventilated patients. In the non-mechanically ventilated, the incidence is significantly lower and is found to be between 20% and 50% **(Ibrahim et al., 2018).** In comparison, the overall incidence in a hospital affects about 30% of patients. More specifically, it showed that among patients who developed delirium during the ICU hospitalization, 1.6% suffered from hyperactive delirium, which made this category the rarer type of delirium. Hypoactive delirium accounted for 43. 5%, this is worrisome considering that its subtle clinical presentation contributes to under diagnosed by nurses. Moreover, it revealed that hypoactive delirium was underdiagnosed 66% to 84% of the time. Finally, mixed delirium was the most common type, with an incidence of 54.9% **(Harroche et al., 2014).**

Nursing knowledge surveys had highlighted a lack of knowledge related to delirium risk factors, its presentation and prevalence (especially the hypoactive subtype), non-pharmacological interventions, associated increase in mortality, and its fluctuating presentation **(Bellelli et al., 2015, Hosie et al., 2019).**

In this respect, **Hayhurst et al., (2016)** reported that, nurses frequently fail to recognize delirium with non-detection rates as high as two thirds. Contributing reasons for non-detection include insufficient knowledge of delirium, a lack of widespread screening, and the use of imprecise terms such as confusion" and heterogeneous presentation of delirium. Compounding this problem is the fact that delirium is preventable, with the evidence base for prevention being stronger than treatment. Arguably, a greater understanding and implementation of preventative strategies could reduce the incidence of delirium and its associated complications **(Lee et al., 2020).**

The survey was carried out during an annual scientific meeting for critical care professionals representing different geographical regions in the USA.

This survey concluded that 60% of them had lack of knowledge about delirium **(Wells, 2012).** Likewise, a study from the USA specifically measured nurse recognition of delirium in the hospitalized older person and found nurses failed to identify delirium 75% of the time and recommended significant of nursing education to foster knowledge and confidence in delirium assessment, emphasizing the use of The Confusion Assessment Method for the ICU (CAM-ICU) rather than orientation and neurological assessment **(Coyle., 2015).**

Significance of study

Delirium is the most common neuropsychiatric condition in hospital, 15% to 25% on general medical wards, up to 60% on surgical wards – critical care 80% in the sickest ventilated patient **(Halter, 2018).** Delirium is a concern for ICU nurses because the early recognition of patients with developing delirium requires the assessment of patients at risk for this syndrome. Baseline neurological assessment of ICU patients is often limited **(Ribeiro et al., 2016).**

The medical and nursing records at the intensive care units at Al-Thawra Hospital had no statistical data related to this health problem over the past few years. Nursing performance regarding assessment and management for patients with delirium may be difficult or varied from one nurse to another and depend on their previous clinical experience. Delirium in ICU threatens patient health, leads to longer hospitalization, and consequently reflected upon hospital resources **(Hayhurst et al., 2016)**.

In Yemen, there has been no clear evidence identified in ICU nurses' knowledge and practices. Therefore, the current study could be helpful in service planning and providing evidence base to improve nursing care of delirious patients in ICUs.

Aims of study: The current study aims to assess nurses' knowledge and practices regarding care of patients with delirium at AL-Thawra Hospital – Yemen.

Research Questions

To fulfill the aim of this study, the following research questions were formulated;

Q1: What is the level of knowledge that nurses had about delirium?

Q2: What is the level of practices that nurses perform regarding delirium assessment for intensive care unit patients?

Subjects and method

Research design: A descriptive research design was utilized in this study.

Study setting

This study was conducted in the Intensive Care Units at Al-Thawra Hospital, Al-Hodeidah City, in Yemen. There are two Intensive Care Units, general ICU and Coronary Care Unit (CCU). The general ICU consists of 3 rooms; every room contains 5 beds with 5 cardiac monitors and 3 mechanical ventilators; approximately 90 cases admit monthly. While the CCU consists of 2 rooms, every room contains 4 beds with 4 cardiac monitors and 3 mechanical ventilators, approximately 60 cases admit monthly. The nurse-patient ratio was nearly 1:2

Study subjects: A convenient sample of 60 nurses working at ICU who are providing direct care during three shifts (morning, evening, and night) for critically ill patients in the previous settings were included in the study. Nurses were distributed as follows: 40 nurses from general ICU and 20 from CCU who meet inclusion criteria.

The inclusion criteria are

- Nurses on duty.
- At least one year of experience in ICU.
- Qualification for nursing practice either by diploma (after secondary school) and Bachelor.

Tools of data collection

The following tools were used to collect data of the current study:

Tool I: Demographic and work-related characteristics data tool: This included: nurse age, sex, residence, level of education, marital status, unit type, duration of work in ICU, working time, working hours/day, and attendance of previous training program about delirium.

Tool II: Nurses' knowledge questionnaire of delirium:

This tool was constructed and developed by the researcher after reviewing the relevant literature **(Hare et al., 2008; Jang & Yeom., 2018).** It is a self-administered questionnaire that takes about 30 minutes, was used to assess the level of intensive care nurses' knowledge about delirium.

This tool consists of (60) questions covering the knowledge about of delirium in ICU; it is divided into seven main parts: included: definition, incidence, subtypes, assessment, risk factors, clinical manifestations, and management & nursing care of delirium.

Scoring system: Each correct answer will have (1) mark, incorrect or missed answer have (0). Total score (60 marks) was be classified into three levels as follows: poor knowledge if the score was less than 60% (<36), fair knowledge if the score was 60% to less than 75% (36-<45), and good knowledge if the score was 75% and above (45-60)**.**

Tool III: Observational checklist for assessment of nurses' practices caring for delirium patients:

This tool was constructed and developed by the researcher after reviewing the relevant literature **(Oh.,**

2018 & National Institute for Health and Care Excellence., 2019). It was used to assess the practices of intensive care nurses toward patients suffering from delirium.

The observation was carried out by the researcher for 60 minutes for each nurse. This tool consists of (98) items; it is divided into twelve main parts, included: assessment of delirium, establish/maintain normal fluid balance, establish/maintain aeration and oxygenation, provide nutritional support, maintain circulation, effective communication, pain management, skin care, sensation, safety, prevention of infection, and sleep/wake pattern.

Scoring system: The score of each item was allotted as "done" which takes (1) grade and not properly done or not done takes (0) grade. Total scoring (98 graded) was be classified into three levels as follows: poor practice if the score was less than 60%, (<58.8), fair practice if the score was 60% to less than 75% (58.8-<73.5), and good practice if the score was 75% and above (73.5-98)**.**

Procedure: The procedure was carried out through two phases.

1- Preparatory phase

Official permission to collect data and implement the educational program was obtained from the Dean of the Faculty of Nursing, Assuit University, and director of Al-Thawra Hospital, Al-Hodeidah, Yemen.

The tools of the study were developed by the researcher. They were revised and corrected by supervisors.

Validity

Validity was done for all tools by five experts from faculty members in the nursing and medical field from Assuit University. Three of them were from psychiatric nursing and two from psychiatric medicine were from different academic categories, i.e., professor and assistant professor, to confirm the accuracy and relevance of the information and tools.

Pilot study

The pilot study was carried out on 10 nurses who were later excluded from the main study subjects to test and evaluate the clarity, feasibility, and applicability of the research tools and to estimate the time needed to collect data. The required modifications were conducted.

Reliability

The reliability of the tools was assessed through (10) subjects using the developed questionnaire and reassessment after (7) days on the same subjects; the results were the same each time. Subjects who participated in the reliability test were excluded from the main study subjects.

The reliability was carried out using the Cronbach alpha coefficient test to nurses' knowledge questionnaire of delirium, and observational checklist for assessment of nurses' practices caring for delirium patients. It was found to be (r= 0.84, & 0.92) respectively.

2- Implementation phase:

Data of the current study were collected during the period from beginning Jun 2019 till the end of October 2019. It was collected data in three days every week for each setting mentioned before; in the morning, evening, and night shift. The researcher interviews each nurse to explain the steps of the research and its aims, choice of the individual interview is easier to avoid disturbance in the system of work that occurs because of the group interview.

Ethical consideration

1. Research proposal was approved by the Ethical Committee in the Faculty of Nursing.
2. The study followed common ethical principles in research.
3. There was no risk for study subjects during the application of the research.
4. Oral consent was obtained from nurses that are willing to participate in the study, after explaining the purpose of the study.
5. Nurses have the right to refuse to participate and/or withdraw from the study at any time
6. Confidentiality of obtained data was maintained and ensured for every studied sample before starting data collection.

Statistical design

Data were entered and analyzed with the **IBM SPSS version 20.0** software. The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by **number and percent** (N, %), where continuous variables described by mean and standard deviation **(Mean, SD)**. **Chi-square test** and fisher exact test used to compare between categorical variables where compare between continuous variables by **t-test**. Pearson correlation coefficient used to assess the association between continuous variables. **A two-tailed p < 0.05** was considered statistically significant.

Results

Table (1): Demographic and some important work-related variables of the studied nurses (N=60)

Variables	studied nurses (N=60)	
	No	%
Age groups: Mean ± SD (range)	**29.18±4.25 (22-40)**	
< 25 year	13	21.7
25-30 years	28	**46.7**
>30 years	19	31.7
Sex		
Male	23	38.3
Female	37	**61.7**
Residence		
Rural	14	23.3
Urban	46	**76.7**
Level of education		
Bachelor of nursing	27	45.0
Diploma	33	**55.0**
Marital Status		
Single	29	**48.3**
Married	27	45.0
Divorced	4	6.7
Types of Unit		
General ICU	40	**66.7**
Coronary Care Unit	20	33.3
Duration of work in ICU: Mean ± SD (range)	**5.47±3.15 (1-15)**	
< 5 years	37	**61.7**
5 – 10 years	20	33.3
> 10 years	3	5.0
Working time		
Morning	15	25.0
Evening	18	30.0
Night	27	**45.0**
Working hours/day: Mean ± SD (range)	**9.82±2.76 (6-16)**	
6 – 8 hours	27	45.0
> 8 hours	33	55.0
Previous training program about delirium		
Yes	00	00
No	60	**100.0**

Table (2): Distribution the mean score and levels of ICU nurses knowledge regarding delirium (N=60)

Items	Mini - Max Score	Mean±SD	Level
Definition of delirium	0 - 1	0.58±0.50	Poor
Incidence of delirium	0 - 1	0.53±0.50	Poor
Subtypes of Delirium	0 - 4	1.20±1.13	Poor
Assessment of delirium	0 - 7	2.38±1.37	Poor
Risk factors of delirium	0 - 18	9.95±2.84	Poor
Clinical manifestations of delirium	0 - 11	6.52±2.43	Poor
Management and nursing care of delirium	0 - 18	8.55±2.84	Poor
Total Knowledge Score	**0 - 60**	**29.72±7.00**	**Poor**

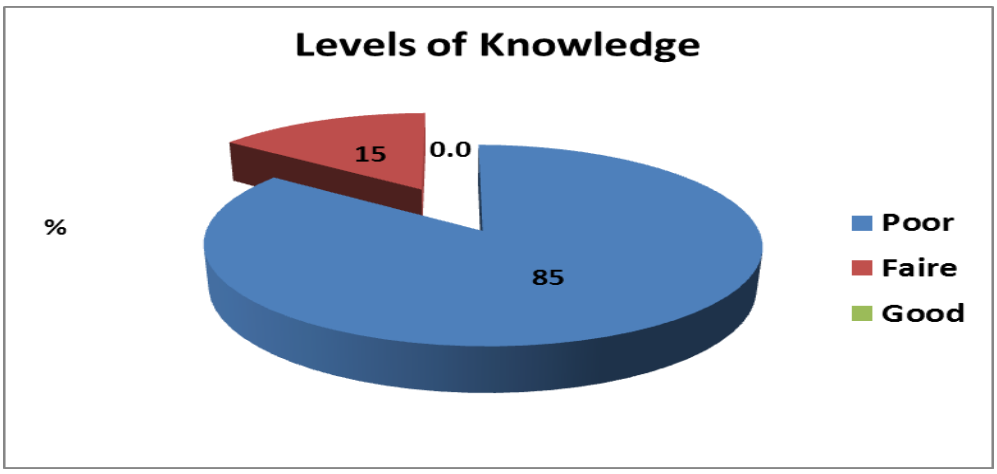

Figure (1): Distribution of levels of knowledge among ICU nurses about delirium (N=60)

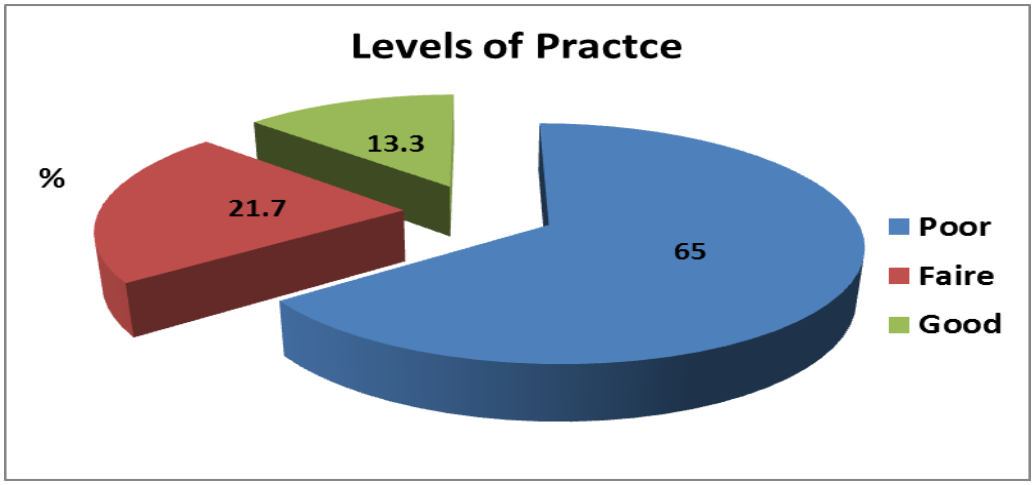

Figure (2): Distribution of levels of practice among ICU nurses about delirium (N=60)

Table (3): Distribution the mean score and levels of ICU nurses practice regarding delirium (N=60)

Items	Mini - Max Score	Mean±SD	Level
Assessment of delirium.	0 - 8	1.10±0.84	Poor
Establish/maintain normal fluid balance	0 - 9	7.32±2.13	Good
Establish/maintain aeration and oxygenation	0 - 9	5.40±1.58	Faire
Provide nutritional support	0 - 12	6.13±2.64	Poor
Maintain circulation	0 - 7	4.97±2.18	Faire
Effective communication	0 - 10	4.05±2.20	Poor
Pain management	0 - 9	3.45±2.93	Poor
Skin care	0 - 4	1.63±1.52	Poor
Sensation	0 - 10	4.77±3.24	Poor
Safety	0 - 5	2.93±1.46	Poor
Prevention of infection	0 - 9	4.27±2.69	Poor
Sleep/wake pattern.	0 - 6	2.37±1.96	Poor
Total Practice Score	**0 - 98**	**48.38±20.20**	**Poor**

Table (4): Relationship between demographic, some important work-related variables and mean scores of knowledge & practices among nurses (N=60)

Variables	N	knowledge score	practice score
		Mean±SD	Mean±SD
Age groups			
< 25 year	13	29.23±11.01	43.92±24.92
25-30 years	28	28.46±5.05	49.96±19.05
>30 years	19	**31.89±5.84**	48.11±19.06
P. value		0.251	0.674
Sex			
Male	23	28.22±8.46	52.17±19.02
Female	37	30.65±5.86	46.03±21.18
P. value		0.194	0.261
Residence			
Rural	14	28.29±8.29	48.43±21.92
Urban	46	30.15±6.61	48.37±20.22
P. value		0.387	0.993
Level of education			
Bachelor of nursing	27	30.52±5.85	48.56±21.22
Diploma	33	29.06±7.85	48.24±20.22
P. value		0.427	0.954
Marital Status			
Single	29	29.45±7.18	50.31±19.75
Married	27	30.19±7.15	46.44±20.66
Divorced	4	28.50±5.97	47.50±28.35
P. value		0.871	0.781
Types of Unit			
General ICU	40	30.08±7.60	45.53±23.97
Coronary Care Unit	20	29.00±5.74	**54.10±8.12**
P. value		0.580	0.127
Duration of work in ICU			
< 5 years	37	28.43±7.64	47.00±21.99
5 – 10 years	20	**32.40±4.70**	49.30±18.41
> 10 years	3	26.00±7.00	**59.33±13.01**
P. value		0.058	0.593
Working time			
Morning	15	**32.67±4.12**	36.53±12.80
Evening	18	28.94±7.29	**53.83±19.77**
Night	27	28.59±7.79	51.33±22.21
P. value		0.168	**0.029***
Working hours/day			
6 – 8	27	31.26±4.70	49.48±16.70
> 8	33	28.45±8.30	47.49±23.27
P. value		0.124	0.710

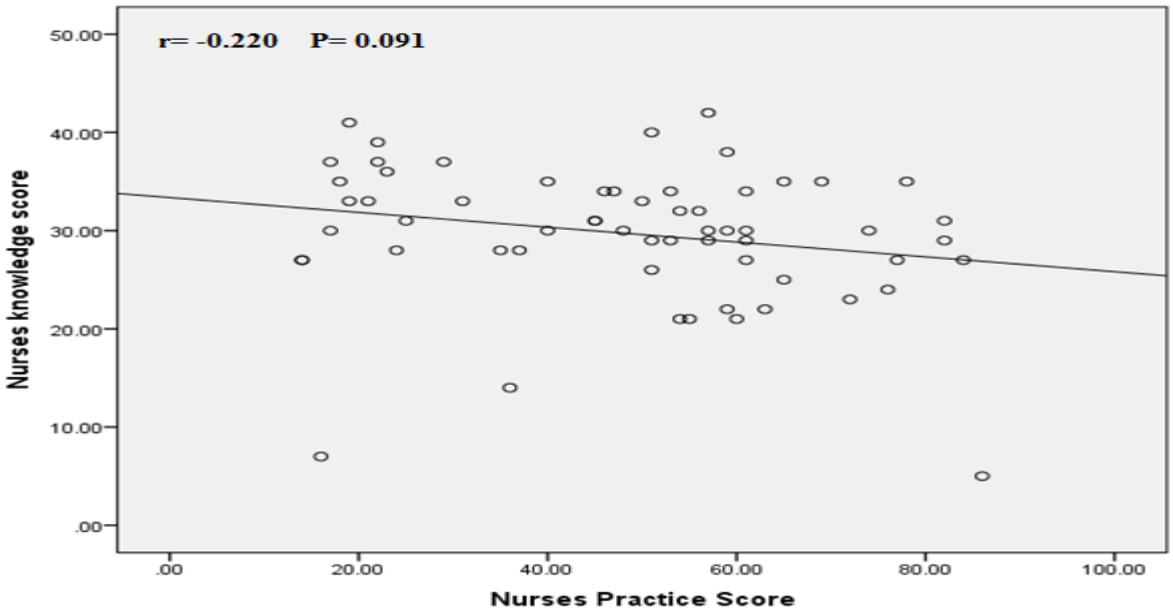

Figure (3): Correlation between total knowledge and practices score among ICU nurses (N=60)

Table (1): This table showed that the mean age of the studied nurses is (29+4.24) years; the highest percent (46.7%) aged 25 to 30 years old, and 37 (61.7%) were females. Most of the sample (76.7) were living in the urban area, 33 (55%) had a diploma, and 29 (48.3) were single. The studied sample included 40 nurses (66.7%) were working at general ICU, 37 (61.7%) working for less than five years with mean years (5.47+3.15), 27(45%) worked during the night shift, and 33 (55%) works for more than eight hours daily with mean hours (9.82+2.76). All the studied nurses (100%) did not attend a previous delirium training program.

Table (2): Revealed the distribution of nurses' knowledge scores regarding delirium. It was found that the majority of ICU nurses had poor knowledge as regards definition, incidence, subtypes, assessment, risk factors, clinical manifestations, and management and nursing care of delirium.

Figure (1): Shows total nurses' knowledge level regarding delirium. It was found that 85% of nurses had a poor level of knowledge, and 15% of them had a fair level of knowledge regarding delirium patients' care.

Figure (2): shows the total nurses' practice level regarding delirium. It was found that 65% of nurses had a poor level of practice and 21.7% of them had a fair level of practice. While only 13. 3% of nurses had a good level of practice regarding delirium patients' care.

Table (3): Reveals the distribution of nurses' practice scores regarding delirium. It was found that majority of ICU nurses had poor practice as regards the assessment of delirium, providing nutritional support, effective communication, pain management, skin care, sensation, safety, prevention of infection, and sleep/wake pattern.

Table (4): This table shows relationship between demographic, some important work-related variables and mean scores of knowledge & practices among nurses. It was found that, the highest mean score of knowledge among nurses were related to nurses who work during the morning shift, working from 5 to 10 years and aged more than 30 years (32.67±4.12, 32.40±4.70 & 31.89±5.84) respectively.

Whereas, the highest mean score of practices among nurses was related to nurses who work for more than 10 years, working at the coronary care unit and worked during the evening shift (59.33±13.01, 54.10±8.12 & 53.83±19.77) respectively. There were no statistically significant differences between demographic data and mean score of knowledge & practices except working time and practice **(P=0.029).**

Figure (3): Shows that there is negative and non-significant correlation between total nurse`s knowledge score and their total practice score regarding care for patients with delirium.

Discussion

Delirium among older people leads to high mortality rates and poor quality of life of patients after discharge from the hospital. Previous studies had also shown that several non-pharmacological nursing interventions could significantly reduce the incidence of delirium and are highly effective in improving the management of delirium among older people. Nurses, being frontline caregivers, are strategically placed to tackle the problem of delirium more effectively.

Equipping nurses with the necessary knowledge and skills can be an effective way of improving the care of older people in hospitals **(Weheida et al., 2018).**

In the study which was carried out by **Camarena., (2017),** it was suggested the need for an established best practices protocol in the ICU. The authors claim the lack of assessment and ability to recognize delirium comes from a lack of knowledge about this disease from those caring for patients. Often misdiagnosis occurs because of the similar symptoms between delirium and behavioral changes unrelated to delirium. They argue that ignorance in the clinical manifestations and clinical significance of delirium often causes undesirable cognitive impairments in patients.

In the present study: it was noticed that the mean age of studied nurses was 29.18±4.25 which is similar to that recorded by **Akechi et al., (2010)** & **Abusaad et al., (2017)** who found that mean age nurses (29±9 & 29.32±4.72) respectively. This age is considered early exposure to working in ICU setting after graduation, as 60.7% of nurses in the present study had duration working in ICU for less than five years.

In the same context, the current study showed that nearly half of nurses' aged in the study sample was from 25 to 30 years old. This result is supported by **Weheida et al., (2018)** & **Lieow et al., (2019),** who reported that half of their study sample age was less than 30 years old.

Concerning sex, the study revealed less than two-thirds of nurses were females. This result is supported by **Pinto & Biancofiore., (2016),** who found that less than two-thirds of their sample was females.

The current study revealed that three-quarters of study nurses were living in the urban area. These findings are supported by the previous study by **Ghoneam et al., (2015)** found that two-thirds of them were lives in the urban area. Whereas, these findings are contrary to other studies reported by **Weheida et al., (2018**) found that three-quarters of study nurses were live in the rural area.

As regards to the level of education, the current study showed that more than half who working at ICU had diploma degree which is similar to others **(Van De Steeg et al., 2015; El–Nosary et al., 2016, Selim & Ely, 2017, Awad., 2019).** Because more nurses graduated from diploma of nursing than a bachelor degree.

Regarding marital status, the present study reported that half of the nurses were single. This finding is similar to previous studies reported by **Park & Chang., (2016) & Jang & Yeom., (2018)** and revealed that half of the nurses were single.

The current study showed that the mean duration of nurses working in ICU was 5.47±3.15 years, whereas about less than two-thirds of them were working for less than 5 years working in ICU; these may be explained as most of the studied nurses were aged less than 30 years.

This finding was similar to a previous study reported by **Varghese et al., (2014**), who found that the mean duration of nurses working in ICU was 5.2±13.58 years, and two-thirds of them were working in ICU less than 5 years. Also, **Selim & Ely., (2017)** reported that the mean duration of nurses working in ICU 5.8+ 3.7 years and about half of them is working for less than 5 years. However, the current result disagrees with **Tsang et al., (2019**) who reported that the mean nurses working in ICU were 9.8±9.0.

Regarding the previous attendance training program about delirium, the present study showed that all nurses did not attended any previous training. This finding is supported by many other previous studies as **(Morsy et al., 2015, Ghoneam et al., 2015, Glynn & Corry, 2015, El–Nosary et al., 2016, Sinvani et al., 2016; Koo & Yang., 2016; Detroyer et al., 2016; Abusaad et al., 2017, Selim & Ely, 2017, Van Velthuijsen et al., 2018; Oh., 2018; Awad., 2019)** who documented that entire of the studied nurses did not attend any previous programs about delirium.

In the same line: **(Park & Chang, 2016, Kim & Lee., 2016, Padilla, 2016, Xing et al., 2017, Monfared et al., 2017, Jang & Yeom, 2018, Lieow et al., 2019, Alharbi, 2019)** reported that 50-60% of studied nurses did not receive training or education about delirium.

It is a worldwide notion that reported in many studies that ICU nurses did not receive enough training about delirium. Lack of in-service training programs that are very important in improving the quality of care regarding patients with delirium may be the main factor.

The present study showed that the majority (84%) of the studied nurses had significant poor knowledge (29.7±7.0 from a total of 60 grades). This observation is consistent with many other previous studies as **(Younis & Abo Elfetoh., 2014, Morsy et al., 2015, El–Nosary et al., 2016, Abusaad et al., 2017, Monfared et al., 2017, LaMantia et al., 2017, Selim & Ely, 2017, Ramoo et al., 2018, Clyne, 2019)** who found that range from 70-90% of nurses had a poor knowledge with lowest in the mean score of total knowledge

In the same context, others **(Park & Gu, 2013, Park., 2014 Park & Chang, 2016, Kim & Lee, 2016, Koo & Yang, 2016, Jang & Yeom, 2018, Preeyawadee et al., 2017, Awad., 2019; Lieow et al., 2019)** reported, range from 50-<70% of nurses had poor knowledge. On the other hand, some previous study conducted by **Kim & Eun, (2013)** reported, 60% of them had a fair knowledge.

This result might be related to the fact that all of them did not receiving any previous training about caring patients with delirium, lack of protocols and guidelines on delirium, curriculum gaps during training, lack of funding for organizing regular workshops as reported by nurses. Also, another cause for lack of knowledge is that more than half of them hold a diploma of nursing, and all of the books are written in English and their learning in Arabic language. These obstacles did not enable them to acquire knowledge about delirium.

When studying the sub-items of knowledge regarding delirium, the majority of ICU nurses had a poor knowledge of definition, incidence, subtypes, assessment, risk factors, clinical manifestations, and management and nursing care of delirium. These findings are in agreement with **Morsy et al., (2015) & El–Nosary et al., (2016)** who reported that the majority of ICU nurses had a low knowledge in all the above-mentioned sub-items.

In the same line, previous studies conducted by **(Park & Chang, 2016, Oh., 2018 Lafi & Salem, 2018),** showed that majority of ICU nurses had the lowest knowledge regarding sub-items of delirium as assessment, risk factors, clinical manifestations, and nursing management of delirium.

Regarding how ICU nurses evaluate patients for delirium, all the studied nurses in the present study reported that they never heard about Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), and more than half of them examine the patient for their ability to follow a command or observe agitated behavior. When occur they asked for psychiatric consultation to evaluate the patient for abnormal behaviors. This could be due to that they had never received training about assessing and handling delirium.

These results are in agreement with **Young et al., (2012)** who found that delirium screening tools (CAM-ICU) was unfamiliar to most ICU nurses at the meeting, with 82% reporting either having never used or having never heard about it. In this regard, the study of **Elfeky & Ali, (2013),** revealed that if nurses trained about delirium patients in ICU, their assessment will be effective. They added that the ability to identify delirium in the ICU improves when a validated and standardized delirium assessment tools is used.

The present study showed that about two-thirds of the studied nurses had poor practices with significant lower in the mean score of total practice. This result may be related to lack of nurses' educational training, lack of control and lack of continuous evaluation of nurses, lack of hospital policy to assess or deal with patients suffering from delirium, lack of professional responsibility, increase the number of patients and nurses' work overload. In addition, nurses' practices are based on traditions and imitations.

This observation was reported by many other previous studies **(Solberg et al., 2013, Younis & Abo Elfetoh, 2014, Morsy et al., 2015, El–Nosary et al., 2016; Pinto & Biancofiore, 2016, Abusaad et al., 2017, Monfared et al., 2017, Selim & Ely, 2017; Tsang et al., 2019, Alharbi, 2019)** who found that range from 60-80% of nurses had poor practice with lowest in the mean score of total practice.

In the respect with previous studies reported by many another **(Park & Gu, 2013, Park & Chang., 2016, Kim & Lee, 2016, Koo & Yang, 2016, Jang & Yeom., 2018, Oh, 2018)** stated that, range from 50-<60% of nurses had a poor practice. Also, previous studies conducted by **(Kim & Eun, 2013, Rawson et al., 2017)** found that 60% of nurses had fair practices.

When studying the sub-items of nursing practice regarding delirium, it was found that majority of ICU nurses had a poor practices as regards the assessment of delirium, providing nutritional support, effective communication, pain management, skin care, sensation, safety, prevention of infection, and sleep/wake pattern. These findings are in accordance with those of **(Ghoneam et al., 2015)** which showed that the majority of them in all of the above sub-items had lower practice except assessment of delirium; however, the authors excluded assessment of delirium of their research.

In the respect, previous studies conducted by **(Varghese et al., 2014, Park & Chang, 2016, Kim & Lee, 2016, Oh., 2018),** classified sub-items of practice regarding delirium, as the assessment of risk factors and nursing intervention of delirium showed that majority of ICU nurses had a lowest mean score practice

Despite all nurses not used delirium screening tools in their daily assessment of patients, only one-quarter of the participated nurses in the current study reported that identify delirium with a group of symptoms and use of the label confusion by nurses rather than a term of delirium; this illustrates the magnitude of the problem.

The previous results in agreement with **(Morsy et al., 2015, Özsaban & Acaroglu., 2016; El–Nosary et al., 2016)** who revealed that all of the nurses not used delirium assessment tools during a daily routine in ICU.

Studies by **(Devlin et al., 2011, Wells., 2012, Solberg et al., 2013),** indicate that although nurses are in a unique position to recognize delirium, they do not make an adequate assessment in their daily practice. According to the studies, the possible barriers to delirium assessment are lack of knowledge about delirium, absence of assessment tools, assessment tools not being used, the misconception

that the tools are complicated, the difficulty of assessing intubated and sedated patients, absence of sedation protocol guidelines lack of awareness about the magnitude of the delirium in the ICU as a significant syndrome among ICU patients, and time constraints**.**

The present study showed that there were no statistically significant relations between demographic and some important work-related variables and mean knowledge score. This could be explained ICU nurses in Yemen have a low level of knowledge about ICU delirium and need accurate and valid knowledge to be able to provide optimal nursing care. This results in agreement with **Kim & Eun, (2013),** who reported that no significant relationship between demographic and some important work-related variables and mean knowledge score.

In the same line; **Jang & Yeom, (2018),** who found that there no significant differences between demographic and some important work-related variables and mean knowledge score, except there, were statistically significant differences between knowledge and their levels of education. Also, this result disagrees with **Ramoo et al., (2018),** who reported statistically significant differences between nurses' knowledge score and their age groups and duration of work in ICU.

The present study showed that there were no statistically significant differences between demographic and some important work-related variables and mean practices scores. This could be explained ICU nurses in Yemen have a lower level of practices about ICU delirium and need accurate and valid skills to be able to provide optimal nursing care. This result in agreement with **Koo & Yang, (2016)** and **Park & Chang, (2016),** who reported that no significant relationship was found between demographic and some important work-related variables and mean practice score.

In the same line **El–Nosary et al., (2016)** found that there no significant differences between demographic and some important work-related variables and mean practice scores except there were statistically significant differences between knowledge and their levels of education. While, these results disagree with **Kim & Lee, (2016),** who found that there were significant differences between demographic and some important work-related variables and mean practice scores.

The findings of this study revealed that, negative and non-significant correlation was found between nurse's knowledge and practice scores. This could be explained nurses with less knowledge about delirium in the ICU were more likely to have a lower level of effective nursing practice regarding its management. In the same context, with **Younis & Abo Elfetoh., (2014)** & **El–Nosary et al., (2016),** who reported that there was no correlation between the knowledge of delirium and nursing practice for intensive care nurses**.**

Conclusion

Nurses working in ICU had poor level of knowledge and practice regarding care of delirium patients.

Recommendations

Based on the current study findings, the following recommendations are suggested

- Education program regarding the care of delirium patients in ICU is essential for nurses to improve their knowledge and practices.
- Nursing care of patients with delirium is necessary to be included in the curriculum of nursing schools.
- Repetition of the study on a larger probability sample from the different geographical areas in Yemen to figure out the main aspects of these problems.

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