

NURSES' KNOWLEDGE AND THEIR PRACTICES REGARDING POST INTENSIVE CARE SYNDROME OF CRITICALLY ILL PEDIATRIC PATIENTS

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Abstract

Background: Survival rates for children who require intensive care for the treatment of life-threatening illness or injury have dramatically improved worldwide. In pediatric critical care, decreased mortality has been accompanied by increased morbidity. This has resulted in a shift in the contemporary focus of the international critical care community from mortality reduction alone to the optimization of survivor outcomes. **Aim:** to assess nurses' knowledge and their practices regarding post intensive care syndrome of critically ill pediatric patients. **Method:** a descriptive design has been used to conduct this study in the Pediatric Medical Intensive Care Unit affiliated with the Mansoura University Children's Hospital, was conducted with all available nurses in pediatric intensive care setting. Data was collected by using a questionnaire sheet for socio-demographic characteristics and knowledge and observational checklists for practices were used to collect data. **Results:** the vast majority of the studied nurses had insufficient knowledge about post intensive care syndrome and ABCDEF bundle and almost of them had unsatisfactory practices about ABCDEF bundle. **Recommendation:** it is recommended to implement educational intervention for nurses about post intensive care syndrome to improve their knowledge and practices about PICS and ABCDEF bundle.

Key words: PICS, ABCDEF bundle, Knowledge, Practice, Educational intervention.

Introduction

Surviving a critical illness is a turning point in the lives of survivors and their families in the pediatric intensive care unit (PICU). Post-intensive care syndrome (PICS) and post-intensive care syndrome family (PICS-F) are defined as a cluster of complications and impairments from experiencing critical care that occurs in both PICU survivors and their family members. Conditions of PICS convey a considerable burden including reduced quality of life and substantial physical, cognitive and psychological disability (Rawal, Yadav & Kumar, 2017).

The first concern of caring for a critically ill child remains the underlying

condition of the child and the introduction of stabilizing treatments (Gulla & Sachdev, 2016). Great improvement in critical care has resulted in a significant decrease in mortality and increase in the number of survivors in PICU (Herrup, Wiczorek & Kudchadkar, 2017). Although, advances continue to improve the physiological challenges facing critically ill children, it is also necessary to address and improve the cognitive and psychological consequences. Children undergo numerous stressors associated with critical illness and the practice environment of PICU (Makic, 2016).

According to the Society of Critical Care Medicine (SCCM), (2018), more than 5 million patients are admitted to the United States annually. ICUs for critical or invasive treatment, airway support, respiration, or ventilation, or stabilization of acute or life-threatening medical conditions. The most common symptoms of PICU admission include respiratory illness, heart disease, and neurological disorders.

Significance of the study

Post intensive care syndrome (PICS) is being recognized as a public health burden due to the associated neuropsychological and functional disability (Jackson et al., 2014; Esses, 2017). It was estimated that the admission rate of pediatric patients for Pediatric Medical Intensive Care unit of El-Mansoura University Children's Hospital (MUCH) in 2019 is 223 children. However, PICS in children have been studied far less than in the adult, nevertheless PICS-related morbidities impact a significant proportion of children discharged from PICUs

(Herrup, Wieczorek & Kudchadkar, 2017; SCCM, 2013).

The aim of this study was to

Assess nurses' knowledge and their practices regarding post intensive care syndrome of critically ill pediatric patients.

Research questions

- What is nurses' knowledge about PICS?
- What is nurses' knowledge about the ABCDEF bundle?
- What are nurses' practices about the ABCDEF bundle?

Subjects and Method

Research Design

A descriptive design has been used to conduct this study.

Setting

This study was carried out in the Pediatric Medical Intensive Care Unit (PMICU) affiliated with Mansoura University Children's Hospital (MUCH).

Subjects

All available nurses, who were working in the previously mentioned pediatric intensive care unit (n=50), with different educational background and were willing to participate in the study.

Tools of Data Collection:

Data were collected through the following tools (Appendix II):

Tool I: Questionnaire Sheet for the studied nurses

It was developed by Esses (2017) and was adapted by the researcher, was revised by the supervisors and translated into the Arabic language and data were collected by the researcher. Used in which for multiple choice questions. It was divided into two parts:

Part (1): It was concerned with socio-demographic characteristics of the studied nurses; including age, sex, educational level, experience' years in PMICU, and previous attendance of training programs about PICS and ABCDEF bundle.

Part (2): It was concerned with knowledge of nurses about PICS, PICS-F as; definition, common forms of physical, cognitive and psychological impairments, causes and risk factors, signs and symptoms, treatment and prevention and items of ABCDEF bundle.

Tool II: Observational checklists

It was developed by the researcher to assess nurses' practical level related to care of children for implementation of the ABCDEF bundle protocol, which are:

ABCDEF bundle protocol

It was developed by Balas et al., 2014; Bassett et al., 2015; Klompas, 2015 and was adopted by the researcher, was revised by the supervisors and translated into Arabic language. Used in form of checklists. It was composed of six main items: assess, prevent and manage pain, breathing trials (spontaneous and awakening protocol), choice of analgesic and sedation, delirium assessment and management, early mobility and exercise and family engagement and empowerment

Operational design

Preparatory phase

This phase included a review of the past and current related literature and studies, using available books, periodicals, magazines and articles to get acquainted with the various aspects of the study research problems and develop the study tool.

Administrative design:

- A formal approval was obtained from the Research Ethical Committee of Mansoura Faculty of nursing to conduct the study.
- A written permission to conduct the study was obtained from the manager of MUCH after explaining the purpose of the study
- A written permission to conduct the study was obtained from the head of Pediatric Medical Intensive Care Units in MUCH after explaining the purpose of the study.

Ethical considerations

The researcher followed ethical research principles as the following: an official approval was obtained from the Research Ethics Committee of Mansoura Faculty of Nursing, participants were informed that participation in the study is voluntary, oral informed consent was obtained from each participant before the

beginning of the study and after explaining the aim of the study, anonymity and confidentiality of the collected data were assured throughout the study phases, the study did not cause physiological or psychological harm to the participant and any participant has the right to withdraw at any stage freely without any responsibilities.

Statistical design:

1- Scoring system

a) Knowledge scores

Scores were estimated to assess nurses' knowledge regarding post intensive care syndrome of critically ill pediatric patients and ABCDEF bundle; in which each complete correct answer was given a score two while each incomplete correct answer was given a score one and zero was supposed for incorrect, missed or unknown answers.

- ❖ The total scores of knowledge of studied nurses were 58 grades (100%), which categorized according to the median score of 35 (60%) as:
 - Insufficient if less than 35
 - Sufficient if equal or more than 35, which subdivided into:
 - ✚ Good: if obtained score ranges between 35 to less than 46 (60- less than 80%)
 - ✚ Excellent: if obtained score ranges between 46 to 58 (80-100%)

b) Practices score

Scores were estimated to assess nurses' practices regarding ABCDEF bundle; in which each correctly done step was given a score of two, while incorrectly done step was given a score one and zero was given for not done through direct observation (concurrent assessment). The total scores of studied nurses' practice were 44 grades (100%), which categorized according to the median score 26 (60%) as:

- Unsatisfactory if less than 26
- Satisfactory if equal or more than 26, which subdivided into:
 - ✚ Good: if obtained score ranges between 26 to less than 35 (60-less than 80%).
 - ✚ Competent: if obtained score ranges between 35 to 44 (80-100%).

2-Statistical analysis

The collected data were coded and entered to the statistical package of social sciences (SPSS) version 24. After complete entry, data were explored for detecting any error, then, it was analyzed by the same program for presenting frequency tables with percentages. Qualitative data were presented as number and percent. Besides, Quantitative data were described as mean / SD as appropriate. The study data were tested for normality by Kolmogorov-Smirnov test. For normally distributed variables, repeated measure ANOVA was used to indicate an actual difference between more than two related groups. And for not normally distributed variables, Friedman test was utilized for comparison between more than two related groups. Wilcoxon signed-rank test was conducted to test the difference of the target group knowledge and observed practice categories mean ranks. Spearman and Pearson correlation (r) was performed to measure the strength and the direction of the relationship between the main study variables. It can range from -1 to 1. An r of -1 indicates a perfect negative linear relationship between variables, an r of 0 indicates no linear relationship between variables, and an r of 1 indicates a perfect positive linear relationship between variables.

The Chi-Square, Monte Carlo and fisher's exact test were used to check whether the variables are independent of each other or not.

Level of significance

For all the statistical tests mentioned above, the threshold of significance is set at a level of 5% (p-value). The results were considered:

- Not significant when the probability of error is greater than 5% ($p > 0.05$).
- Highly significant when the probability of error is less than 0.1% ($p < 0.001$).

Results:

Table (1): mentioned the characteristics of the studied nurses and previous attendance of training program about PICS and ABCDEF bundle, this table illustrated 52% of the studied nurses were in the age group 30-<40 years, 74% of them were females and 56% of them had a bachelor's degree. In addition 62% of the nurses had ≥ 10 years of experience, and 6% & 8% of them previously attending training program about PICS and ABCDEF bundle.

Table (2): clarified nurses' knowledge about PICS and ABCDEF bundle, this table clarified that, 94% of the studied nurses had insufficient knowledge and no one of them had excellent sufficient knowledge about PICS and ABCDEF bundle.

Table (3): presented nurses' practice about ABCDEF bundle, this table revealed that, 98% had unsatisfactory practices and no one of them had competent satisfactory practices about ABCDEF bundle.

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Table (1): Distribution of the studied nurses according to their characteristics and previous attendance of training program about PICS and ABCDEF bundle(n=50)

Nurses' characteristics		No.	%
Age	20-<30ys	18	36
	30-<40ys	26	52
	40-<50ys	6	12
	Mean ± SD =	32.6 ±6.56	
Gender	Male	13	26
	Female	37	74
Level of education	Secondary school diploma nurses	10	20
	Technical diploma nurses	12	24
	Bachelor's degree	28	56
Years of experience	1-<5years	13	26
	5-<10years	6	12
	≥10 years	31	62
	Mean ± SD =	9.68±4.43	
Previous attendance of training program about PICS	Yes	3	6
	No	47	94
Previous attendance of training program about ABCDEF bundle	Yes	4	8
	No	46	92

Table (2): Number and percentage distribution of total nurses' knowledge about PICS and ABCDEF bundle (n=50)

Items of knowledge		No.	%
Nurses' knowledge about PICS			
Insufficient		45	90
Sufficient	Good	3	6
	Excellent	2	4
Median (Range)		11(21)	
Nurses' knowledge about ABCDEF bundle			
Insufficient		47	94
Sufficient	Good	3	6
	Excellent	0.00	0.00
Median (Range)		12(23)	
Total nurses' knowledge about PICS and ABCDEF bundle			
Insufficient		47	94
Sufficient	Good	3	6
	Excellent	0.00	0.00
Median (Range)		23.5(44)	

Table (3): Number and percentage distribution of total nurses' practices about ABCDEF bundle (n=50)

Total practices		No.	%
Total nurses' practices about ABCDEF bundle			
Unsatisfactory practices		49	98
Satisfactory practices	Good	1	2
	Competent	0.00	0.00
Median (Range)		9(25)	

Discussion

The results of the present study showed that more than half of the studied nurses were in the age group 30-<40 years, more than one third of them in in the age group 20-<30 years while least of them in the age group 40-<50 years, moreover, less than three quarters of them were females(**table1**), this findings is disagreement with **Zhu, Xia and Li (2018)**, in their study about "Management of early mobilization in intensive care units: a multicenter cross-sectional study" who mentioned that, more than three quarters of nurses in the age group ≤ 25 years, more than two thirds of them in the age group 26-40 years and more than half of them in the age group 41-55 years and more than two quarters of them were males.

The present study revealed that less than two thirds of nurses had ≥10 years of experience, and the least of them previously attending the training program about PICS and ABCDEF bundle (**table 1**). This finding is in disagreement with **Aitken, et al. (2017)**, whose conducted a study about "Perspectives of patients and family members regarding psychological support using intensive care diaries: An exploratory mixed methods study " in three PICUs at two university hospitals and one local hospital in Norway who reported that one quarter of the nurses had ≥10 years of experience, also **Zhu, Xia and Li (2018)**, who mentioned that vast majority of nurses had ≥10

years of experience and vast majority of them had critical attending experience, **Salvadore (2018)**, in his study about " Implementation of the Critical Care Pain Observation Tool" in Australia who mentioned that more than two thirds of nurses receive training on pain assessment as a part of ABCDEF bundle this year, less than one quarter received training last year, and least of them received training > 5 years ago.

The present study showed that less than one quarter of nurses have secondary school diploma nurses, less than one quarter of nurses have technical diploma nurses and more than half of them have bachelor's degree (**table 1**). From the researcher's point of view, critical units depends on high nurses with higher level of qualifications and skills that are commensurate with critical care. This findings goes in line with a study of **Barnes-Daly, Phillips and Ely (2017)** about "Improving hospital survival and reducing brain dysfunction at seven California community hospitals: implementing PAD guidelines via the ABCDEF bundle in 6,064 patients" in California, who found that the least of nurses have diploma and less than one fifth of them have technical degree, slightly less than three quarter of them have a bachelor's degree.

Concerning to knowledge about PICS, the present study revealed that, vast majority of nurses had insufficient

knowledge about PICS (**table 2**). From the researcher point of view, PICS is not recognized to health care providers as a cluster of physical, cognitive and psychological impairments that affect survivors' PICU. These findings are parallel to a study done by **Solverson, Grant and Doig (2016)** in their study about "Assessment and predictors of physical functioning post-hospital discharge in survivors of critical illness" in southern Alberta, who mentioned that nearly two thirds of them were unfamiliar with the term PICS and the vast majority of them perceived new-onset physical weakness, sleep disturbances, and delirium as common health concerns amongst PICU survivors.

Regarding knowledge of nurses about ABCDEF bundle, the present study, clarified that, vast majority of nurses had insufficient knowledge about ABCDEF bundle (**table 2**). From the researcher point of view, ABCDEF bundle is a recent medical terminology to health care providers and even if nurses have a part of knowledge, each part of ABCDEF bundle is applied separately from the other. This finding is in disagreement to a study done by **Pun (2016)**, about "The ABCDEF bundle: A concept to align the people, processes and technology in the ICU", and found that more than half of nurses had sufficient knowledge about ABCDEF bundle

The results of the present study revealed that there is no one of the nurses had competent satisfactory practices about ABCDEF bundle (**Table 3**). This finding was congruent with **Camarena (2017)**, in his study about "Supporting Nurse Education in the Implementation of a Pediatric Delirium Assessment Protocol in the Pediatric Intensive Care Unit" who

mentioned that about a quarter of nurses had satisfactory practices about ABCDEF bundle

Conclusion

The results of the present study it can be concluded that:

There was insufficient nurses' knowledge about PICS and ABCDEF bundle and also there were unsatisfactory nurses' practices about the ABCDEF bundle.

Recommendation

In the light of the findings of the current study, the following recommendations are suggested:

For the nurses

1. Implement the educational intervention for nurses about PICS and ABCDEF bundle improve their knowledge and practices about PICS and ABCDEF bundle
2. Regular and continuous courses about PICS and ABCDEF bundle in the intensive care unit should be provide to all nurses.

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Statement of Competing Interests

'the authors have no competing interests'.

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