

Knowledge about the Quick Sequential Organ Failure Assessment and Recognition of Sepsis: A Survey among Emergency Nurses

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Abstract: The purpose of this study was to assess the knowledge of emergency nurses of quick Sequential Organ Failure Assessment (qSOFA) score, screening tool, and recognition, and importance of sepsis. A multicenter study including 110 ED nurses from six hospitals in Qingdao was conducted. A validated questionnaire was used to evaluate ED nurses' knowledge about qSOFA, sepsis 3.0, and early sepsis screening tool with qSOFA. The scores of knowledge about sepsis 3.0 and qSOFA were lower. The scores of the different characteristics of nurses were statistically different ($P < 0.05$). Colleagues, self-study, and school were the main source of knowledge about sepsis. Manager should improve the cognition of sepsis and strengthen staff training about sepsis in ED.

Keywords: emergency nurses; sepsis recognition; quick sequential organ failure assessment

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0 Introduction

Sepsis is one of the world's leading causes of fatal diseases while generating huge medical costs^[1]. In 2016, the Society of Critical Care Medicine and the European Society for Intensive Care Medicine released the International Consensus Sepsis 3.0 and proposed quick Sequential Organ Failure Assessment (qSOFA) for early selecting the patients with suspected infection. For the adult patients with suspected infection out-hospital, emergency, and general hospital ward setting, adult patient with suspected infection can be identified

rapidly as being more likely to have poor outcome typical of sepsis if they have at least of following clinical criteria that together constitute a new bedside clinical score termed qSOFA: Respiratory frequency ≥ 22 /min, altered mentation, and systolic blood pressure ≤ 100 mmHg^[2].

When a patient arrives at the emergency department, he or she was first triggered by ED nurse^[3]. The study suggested that early identification and timely treatment significantly increase 30-day survival, shorten days, when the patient stays in hospital and decreases expense^[4]. Few studies have explored the use of nurses' screening tools for sepsis in the emergency department. Studies show that the screen tool for sepsis can reduce the time of antibiotic^[5,6]. qSOFA has been recommended to screen for sepsis to potentially assist bedside clinician and nurses in identifying, among the patients with suspect infection out the ICU. Compared the qSOFA to SIRS, NEWS, and SOFA, it has superior, especially, then NEWS, SOFA, and SIRS^[7-9]. qSOFA has three simple criteria which directly perform without the need for a blood test and can be assessed quickly and repeatedly.

1 Object and research methods

1.1 Research object

A total of 110 emergency nurses from six three-level hospitals in Qingdao were selected as the research object. The inclusion criteria were as follows: (1) Obtain the relevant practicing certificate; (2) emergency nurses; and (3) participants who were volunteered to participate in this survey research.

1.2 Research methods

1.2.1 Tools

According to the Third International Consensus on sepsis in 2016, other references,^[2,3,7,10] and expert guidance, we accomplished the self-designed questionnaires. The contents of questionnaires were as follows: (1) General information: Age, gender, education, professional title, emergency work experience, as well as whether were triage nurse or not were included; (2) definition of sepsis 3.0, qSOFA, and application of qSOFA for screening infected patients and the time of using antibiotics: A total of seven questions of questionnaire and 1 point for each question. Hence, 1 point could be earned for the correct answer, 0 point for the wrong answer, and a maximum of 7 points could be earned; (3) knowledge source: On campus study, self-study, colleague exchange, academic conference exchange, and departmental training were included. These questions were set in the form of multiple-choice ones; and (4) application of qSOFA in departments. After being evaluated by six emergency critically illness experts (two nurse specialists, two chief physician, and two PhD students) and being revised repeatedly through preliminary experiments, the questionnaire was finalized. Cronbach's α was 0.897.

1.2.2 Survey methods

Using the convenient sampling method, the anonymous questionnaires were issued to emergency nurses. The researchers checked the completeness of questionnaires one by one on the spot and eliminated the invalid questionnaires^[11]. A total of 110 questionnaires were issued, and 110 ones were collected. After eliminating the invalid questionnaires, 100 valid ones were obtained totally.

1.2.3 Statistical methods

The data were analyzed using SPSS 22. The statistical description was expressed in the form of frequency and constituent ratio. Independent sample *t*-test, univariate analysis, and Pearson correlation analysis were used for

statistical analysis. $P < 0.05$ was considered statistically significant.

2 Results

2.1 The general information of the object [Table 1]

Table 1. General information of nurses

	<i>n</i>	Constituent ratio (%)
Gender		
Male	11	11
Female	89	89
Age		
18–25 years old	7	7
26–30 years old	44	44
31–35 years old	32	32
36–40 years old	7	7
>40 years old	3	3
Professional title		
Nurse	16	16
Senior nurse	57	57
Supervisor nurse	27	27
Education		
College	21	21
Bachelor	78	78
Postgraduate	1	1
Triage		
Yes	33	33
No	67	67

2.2 The recognition level of Sepses, qSOFA, and the time of utilization antibiotic among emergency nurses

The recognition of definition of sepsis 3.0 as well as the utilization of SOFA and qSOFA [Table 2]. There was a statistically significant difference in total points of nurses with different characteristics for the awareness on sepsis 3.0 and antibiotic time [Table 3]; the further

Table 2. Awareness of emergency nurses on sepsis 3.0 and antibiotic time

Item	Points	Correct rate (%)
Whether sepsis will threat to life or not	0.99±0.10	99
The definition of sepsis 3.0	0.63±0.48	63
Three varieties included in qSOFA	0.37±0.49	37
The application of qSOFA on the identification of high-risk populations	0.25±0.45	25
Antibiotics should be used as early as the diagnosis of sepsis is confirmed	0.77±0.42	77
Prolonged use of antibiotics will increase the mortality	0.88±0.33	88
The application of SOFA on the diagnosis of sepsis	0.47±0.50	47

comparison of the awareness of nurses with different characteristics on the awareness of qSOFA is shown in Tables 4 and 5.

Table 3. Awareness of emergency nurses with different characteristics on sepsis 3.0 and antibiotic time

Item	<i>n</i>	Average points	t/F	<i>P</i>
Education			3.396	0.038
College	21	4.00±1.14		
Bachelor	78	4.60±1.09		
Postgraduate	1	6.00±0.00		
Professional title				
Nurse	16	3.44±1.03	13.807	0.000
Senior nurse	57	4.49±1.02		
Supervisor nurse	27	5.11±0.97		
Triage			5.028	0.027
Yes	33	5.58±0.90		
No	67	3.96±0.80		

Table 4. Awareness of nurses with different characteristics on the content of qSOFA

Item	Points	t/F	<i>P</i>
Education		2.63	0.770
College	0.19±0.40		
Bachelor	0.41±0.49		
Postgraduate	1.00±0.00		
Professional Title		5.677	0.005
Nurse	0.06±0.25		
Senior nurse	0.37±0.49		
Supervisor nurse	0.56±0.50		
Triage			
Yes	0.64±0.49	5.485	0.021
No	0.24±0.43		

Table 5. The application of qSOFA in emergency nurses with different characteristics for screening high risk populations

Item	Points	t/F	<i>P</i>
Education			
College	0.19±0.40	1.714	0.186
Bachelor	0.26±0.78		
Postgraduate	1.00±0.00		
Professional title		3.491	0.034
Nurse	0.06±0.25		
Senior nurse	0.23±0.42		
Supervisor nurse	0.41±0.27		
Triage			
Yes	0.55±0.51	51.762	0.000
No	0.10±0.31		

2.3 The resource of sepsis knowledge of emergency nurses and relationship between early use of antibiotics and mortality [Tables 6 and 7]

Table 6. Sepsis related knowledge source

Item	<i>n</i>	Constituent ratio (%)
Self-study	48	48
Department training	0	0
Academic conference exchange	37	37
Colleague exchange (including ward round with doctors)	96	96
On campus study	39	39

Table 7. Influences of the use of antibiotics being delayed 1 h on the mortality of sepsis patients and septic shock patients

Item	95%CI	<i>P</i>
Sepsis	0.01–0.6	0.04
Septic shock	0.8–3.0	0.001

CI: Confidence Interval

3 Discussion

This study shows that the awareness of emergency nurses on sepsis 3.0, SOFA, and qSOFA needs to be improved urgently [Tables 2 and 3]. Through comprehensive analysis, the reasons for low awareness on sepsis 3.0, SOFA, and qSOFA were included: (1) ED pays less attention to sepsis than cerebrovascular and cardiovascular diseases. It is shown that the awareness of emergency nurses was that sepsis was a kind of life-threatening diseases. (2) Although the definition, diagnosis, and treatment of sepsis have been accepted, many doctors show less emphasis on sepsis, thereby causing nurses to pay less attention to sepsis. Van Sell and Kalofissudis pointed that theory was directly related to practice^[12]. This study showed that they lacked a certain theoretical basis on the identification, diagnosis, and treatment of sepsis.

This study showed that nurses with higher professional title earned more points than the ones with the lower professional title ($P < 0.038$), and triage nurses got more points than general emergency nurses. The reason may be that nurses with the high professional title have rich experience,^[13] and the triage nurses have rich experience. Triage nurses play a very important role in an emergency so that the role of emergency triage is usually held by nurses with rich experience. It showed that the application of screening tools by triage nurses could shorten the antibiotic use time.^[14] It is necessary

to improve the comprehensive ability of triage nurses so as to identify sepsis patients early.^[15]

Recognition of sepsis should be trained as an emergency nurse's ability.^[16] This study showed that nurses acquired sepsis-related knowledge from self-study, colleague exchange, academic conference, and on campus study; the knowledge about sepsis was not trained in ED, which leads to relatively poor awareness of nurses on sepsis-related knowledge, especially the new consensus and guidelines. This also showed that the emergency managers paid less attention to sepsis and the application of screening tools such as qSOFA.

4 Summary

This study showed that emergency nurses lack knowledge on sepsis 3.0. There are few opportunities for continuous education. Emergency managers should not only increase their own awareness on sepsis but also strengthen the theoretical study of the department staffs through department lectures, experts lecture, and continuous education. And then, the new knowledge could better guide clinical practice, improve early identification of sepsis, and strengthen medical cooperation to improve the prognosis of sepsis.

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