

Simulation Based Training for Sepsis Recognition Among Emergency Nurses in Bahri Hospital 2025

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Abstract

Sepsis is a critical and potentially fatal condition affecting millions worldwide, necessitating early intervention for improved patient outcomes. Sepsis stands out as a major public health threat, affecting millions of people worldwide and representing one of the leading causes of morbidity and mortality worldwide. Methods: it is descriptive cross sectional hospital based study which aimed to assess recognition sepsis among emergency nurses in Bahri hospital 2025. Data collection tool we used questionnaire done to know their knowledge, attitude and practice, data code regulated and analyzed using SPSS version (25). Results: Simulation-based training has proven effective in enhancing sepsis knowledge, skills, the finding showed that participant has good knowledge, attitude and practice there is significant association between their knowledge, attitude and practice p value 0.005, Conclusion: participants showed good knowledge attitude and practice and there is significant association between their knowledge, attitude and practice with their demographic data. Recommendation: Regular Implementation of Simulation Training will improve their skills and continuously update their knowledge also it improve curriculum Development and continuous evaluation will establish ongoing assessment mechanisms to evaluate the impact of simulation training on clinical practice and patient outcomes, allowing for continuous improvement

Keywords: sepsis; simulation based training, emergency nurses in Bahri hospital 2025

Introduction:

Sepsis stands out as a major public health threat, affecting millions of people worldwide and representing one of the leading causes of morbidity and mortality worldwide [Rudd, K.E. et al(2017),(Reinhart, Ket al(2017)). Sepsis is defined as "life-threatening organ dysfunction caused by dysregulated host response to infection", It is not a simple clinical condition; its complexity and severity make it a condition that requires immediate recognition and intervention to increase the patient's chances of survival [Evans, L.; Rhodes, A, et al (2021)

However, effectively addressing this challenge requires not only a theoretical understanding of the problem, but also specialized practical skills and abilities (Trovato, G(2020)

These rapid responses were initiated by bedside nurses due to a change in patient condition associated with the presence of an infection causing rapid deterioration. Emergency care is one of the most critical areas of healthcare, requiring rapid decision-making, precise execution of procedures, and seamless teamwork to save lives. The high-pressure nature of emergency settings often leaves little room for error, making it essential for healthcare professionals to possess advanced skills and the ability to remain composed under stress. Traditionally, training for emergency care providers has relied heavily on didactic learning and on-the-job experiences. However, these methods often fall short in preparing individuals for the unpredictable and complex scenarios encountered in real emergencies (Schick B,et al, 2022)

Clinical simulation has been identified in the literature as one of the learning modalities with the greatest impact on professionals and the highest retention of knowledge when conducted in an appropriate manner [Cory, M.J.; et al(2019)

Despite its benefits, it is by far the most underutilized educational intervention. In order to improve sepsis education, and in order for this education to have an impact on clinical outcomes, it is necessary to (a) make the general population aware that it is a public health problem, (b) use educational interventions that are integrated with health policies and that create synergies with hospital protocols with current scientific recommendations as a central working axis, (c) ensure that these interventions must be based on active learning with a focus on simulation techniques, (d) involve all actors involved in patient care, and (e) provide care in multidisciplinary teams to centralize sepsis care in a multidisciplinary and multi professional approach.

Clinical simulation is particularly useful for training multidisciplinary teams to manage complex situations [Fung, Let al(2015)

By simulating a clinical environment, critical elements of communication, teamwork, and decision making can be addressed, as well as aspects that are fundamental to patient care but often overlooked in other educational approaches. (Burden,et al (2020)

Current literature supports measures to recognize the presence of an infection or systemic inflammatory response syndrome (SIRS) criteria; these symptoms manifest as signs of infection while rapidly leading to acute organ dysfunction (Ceconi et al., 2018)

Emergency nurses facilitate efficient assessment and appropriate diagnostic categorization to provide effective care to emergency patients across various health care institutions, thereby ensuring accurate decision-making. To achieve this, they require sufficient triage-related knowledge and skills (K. Curtis, C. et al, 2019), which are influenced by various factors including knowledge of triage, education, experience in triage settings, and professional tenure (M. Fathoni, et al (2013)

The significance of simulation training extends beyond individual skill development. It also plays a crucial role in fostering interprofessional collaboration, which is often the backbone of effective emergency care. By engaging nurses and EMTs in joint training sessions, simulation offers a platform for these professionals to understand each other's roles, improve coordination, and build trust. These aspects are particularly vital in emergency care, where time-sensitive decisions often require seamless teamwork and mutual reliance (Lawaetz J, et al (2021)

This study aims to explore Effectiveness of simulation Based training for sepsis recognition among emergency nurses in bahri hospital

Aim of the study:

This study aimed to assess Effectiveness of simulation Based training for sepsis recognition among emergency nurses in bahri hospital

Specific objectives:

To assess nurses knowledge, attitude and practice regard simulation Based training for sepsis recognition(signs and symptoms, recognition of sepsis in emergency settings, protocols for fluid resuscitation in septic patients To find out association between knowledge, attitude and practice with the participants variables

Methodology:

Study Design:

This study was conducted as a descriptive, quantitative design to evaluate the impact of simulation-based training on emergency nurses' knowledge, skills, and confidence in recognizing sepsis.

Study Setting:

The study was conducted in the Emergency Department (ED) medical surgical wards and critical care unit of Bahri Hospital in 2025, which is facility equipped with advanced emergency services and staffed by a diverse group of emergency nurses.

Study Population:

Nurses working in this area with different qualification

Inclusion Criteria:

- Registered nurses working in Bahri Hospital's ED, medical surgical wards and critical care unit Available during the study period.

- Nurses with a minimum of 6 months of experience in emergency nursing.

- Nurses who provide informed consent to participate.

Have smart phone to fill questionnaire through google form

Exclusion Criteria:

- Have no smart phone to fill questionnaire through google form

-not work with patients services

Sample Size:

A total of 57 nurses filled the questionnaire through google form

Sampling Technique

Convenience sampling was used,

Data Collection tools:

1. Knowledge Questionnaire. A structured questionnaire assessing understanding of sepsis recognition and management. Knowledge regard definition of sepsis, sign and symptoms, common laboratory tests used to diagnose sepsis
2. Attitude Questionnaire. A Likert-scale questionnaire measuring nurses' self-reported confidence levels in recognizing and managing sepsis. If simulation-based training improves my ability to recognize sepsis, ongoing training is necessary to stay updated on sepsis management
3. Practical Knowledge Questionnaire for assessing signs of sepsis in patients presenting with infection symptoms. If they follow the sepsis management protocol consistently in emergency situations.

Data Analysis:

Data analyzed using SPSS version 25.0. Descriptive statistics (frequencies, percentages, means, standard deviations) that summarized participant demographics and baseline characteristics.

For knowledge responses with yes, no and I don't know (1) for correct answer yes and (0) for no, I don't know. (14) questions and mean knowledge score divided as good knowledge which from 90%-08% and fair knowledge less than 80%

For attitude responses with agree, disagree and not decided (1) for agree and (0) for disagree and not decided. (15) questions and mean attitude score divided as positive attitude which from 90%-08% and negative attitude which less than 80%

- **For practical knowledge responses** with always, sometime and never, (1) for always and (0) for some time and never (15) questions and mean practical knowledge score divided as good practice which from 90%-08% and fair practice less than 80%

For inferential statistics .A p-value < 0.05 considered statistically significant.

Ethical Considerations:

Ethical approved from ministry of health and bahri hospital; verbal consent taken from Participation Confidentiality and anonymity maintained throughout the study, and data securely stored.

Results:

Table (1) distribution of sociodemographic data n=57)

variable	frequency	Percent	Mean	SD
Age by years				
19-25	37	64.9		
More than 25-40	9	35.1		
Gender				
Male	28	49.1		
Female	29	50.9		
Qualification level				
Diploma	15	26.3		
Bachelor	22	38.6		
Master	20	35.1		
Years of Experience				
Less than 1 year	14	24.6		
1-3 years	33	57.9		
More than 3 -6 years	10	17.5		
Department/Unit				
Emergency	15	26.3		
Medical-Surgical	31	54.4		
Critical Care	11	19.3		

Table (2): Knowledge of emergency nurses regard effectiveness of simulation Based training for sepsis recognition (NO=57)

question	yes	no	I don't know
Do you know the early signs and symptoms of sepsis?	39(68.4%)	13(22.8%)	5(8.8%)
Are you familiar with the latest guidelines for sepsis management?			
Do you understand the importance of early recognition of sepsis in emergency settings?	37(64.9%)	14(24.6%)	6(10.5%)
Have you been trained specifically on sepsis recognition through simulation-based training?	41(71.9%)	14(24.6%)	2(3.5%)
Do you know the common laboratory tests used to diagnose sepsis?	44(77.2%)	8(14%)	4(7%)
Are you aware of the critical time window for starting sepsis treatment?	43(75.4%)	10(17.5%)	4(7%)
Do you know the role of antibiotics in sepsis management?	45(78.9%)	8(14%)	4(7%)
Are you familiar with the protocols for fluid resuscitation in septic patients?	45(78.9%)	22(38.6%)	4(7%)
Are you aware of how to differentiate sepsis from other similar conditions?	49(86%)	6(10.5%)	2(3.5%)
Do you know the vital signs indicators that suggest sepsis?	49(86%)	6(10.5%)	2(3.5%)
Are you familiar with the use of scoring systems like qSOFA in sepsis recognition?	39(58.4%)	12(21.1%)	6(10.5%)
Do you understand the importance of multidisciplinary teamwork in managing sepsis?	49(86%)	6(10.5%)	2(3.5%)
Have you received any prior training on sepsis management	41(71.9%)	14(24.6%)	2(3.5%)
Do you feel confident in your ability to recognize sepsis early?	37(64.9%)	14(24.6%)	6(10.5%)
Mean knowledge score level	frequency	percent	
Good knowledge 90-80%	53	92.9	
Fair knowledge less than 80%	7	7.1	

Table(3): Attitude of emergency nurses regard effectiveness of simulation Based training for sepsis recognition (NO=57)

statement	Agree	Disagree	Not decided
I believe simulation-based training improves my ability to recognize sepsis.	38(66.7%)	8(14%)	11(19.3%)
Recognizing sepsis early can significantly improve patient outcomes	29(50.9%)	14(24.6%)	14(24.6%)
I feel confident in my skills after participating in simulation training.	45(78.9%)	8(14%)	4(7%)
I believe that ongoing training is necessary to stay updated on sepsis management.	39(68.4%)	6(10.5%)	21(21.1%)
I think simulation training makes me more prepared for real-life sepsis cases.	43(75.4%)	10(17.5%)	4(7%)
I feel that sepsis recognition should be a priority in emergency nursing training programs.	43(75.4%)	6(10.5%)	8(14%)
I am confident that my team can effectively work together during sepsis management.	45(78.9%)	8(14%)	4(7%)
I believe that simulation training helps reduce errors in sepsis recognition.	47(82.5%)	6(10.5%)	4(7%)
I think that practical simulation exercises are more effective than traditional lectures.	45(78.9%)	8(14%)	4(7%)
I feel that more frequent simulation training sessions would improve my skills.	51(89.5%)	4(7%)	2(3.5%)
I believe early recognition of sepsis is crucial for saving lives.	44(77.2%)	8(14%)	5(8.8%)
I am willing to participate in additional simulation-based training on sepsis.	57(100%)	0	0
I think that simulation training can help decrease the mortality rate in septic patients.	49(86%)	6(10.5%)	2(3.5%)
I feel that my current knowledge on sepsis is sufficient.	42(73.7%)	7(12.3%)	8(14%)
I believe that simulation training enhances team communication during emergencies.	35(61.4%)	18(31.6%)	4(7%)
Mean Attitude score level	frequency	percent	
Good Attitude 90-80%	55	96.5%	
negative Attitude less than 80%	2	3.5%	

Table(4): Practise of emergency nurses regard effectiveness of simulation Based training for sepsis recognition

Statement	always	sometimes	never
I routinely assess for signs of sepsis in patients presenting with infection symptoms.	41(71.9%)	14(24.6%)	2(3.5%)
I administer antibiotics as soon as sepsis is suspected.	47(82.5%)	8(14%)	2(3.5%)
I follow the sepsis management protocol consistently in emergency situations.	50(87.7%)	7(12.3%)	0
I monitor vital signs closely in patients suspected of having sepsis.	45(78.9%)	8(14%)	4(7%)
I participate in simulation exercises regularly related to sepsis management.	31(54.4%)	20(35.1%)	6(10.5%)
I communicate effectively with the multidisciplinary team during sepsis cases	48(84.2%)	6(10.5%)	3(5.3%)
I initiate fluid resuscitation promptly in patients with suspected sepsis.	45(78.9%)	8(14%)	4(7%)
I document all steps taken for sepsis recognition and management thoroughly.	50(87.7%)	4(7%)	3(5.3%)
I review patient outcomes after sepsis management to improve future practice.	51(89.5%)	4(7%)	2(3.5%)
I educate patients and families about sepsis risks and prevention.	45(78.9%) ¹	10(17.5%)	2(3.5%)
I use checklists or protocols during sepsis management.	41(71.9%)	12(21.1%)	4(7%)
I recognize sepsis early in the emergency department.	45(78.9%)	8(14%)	4(7%)
I routinely update my knowledge about sepsis management.	45(78.9%)	8(14%)	4(7%)
I participate in training sessions on sepsis management regularly.	48(84.2%)	8(14%)	1(1.8%)
I feel confident managing sepsis cases independently.	50(87.7%)	5(8.8%)	2(3.5%)
Mean practice score level	frequency		percent
Good knowledge 90-80%	56		98.2
Fair knowledge less than 80%	1		1.7

Table (5) association between demographic variable with knowledge, attitude and practice

Variable	Social data	P value
Knowledge	age	.005
	qualification	.0001
	Years of Experience	005
Attitude	age	005
	qualification	005
	Years of Experience	005
Practice	age	005
	qualification	005
	Years of Experience	005

Discussion:

This study aimed to assess nurses knowledge, attitude and practice regard simulation Based training for sepsis recognition among emergency nurses in Bahri hospital 57 nurses enrolled in study most of them their age between 19-25 years this came insignificant with study done in Sohag university where their all participants their age between 20-25 years (**Shaimaa Mohamed.(2025)**)

Regard their Knowledge of Sepsis Signs and Symptoms

The data indicates that a substantial majority of nurses 39(68.4%) are aware of the early signs and symptoms of sepsis, and even more (86%) can differentiate sepsis from other conditions and recognize vital signs associated with sepsis 41(71.9%). These findings which was inconsistent with (Johnson et al., 2021).

Familiarity with Guidelines and Protocols

Approximately 45(78.9%) of nurses understand familiar with the protocols for fluid resuscitation in septic patients such as the use of scoring systems like qSOFA (39(58.4%), indicates room for improvement, especially since early identification is crucial for timely intervention, this results came in same line with (Kumar et al., 2021). The high percentage 45(78.9%) of nurses knowledgeable about the role of antibiotics and fluid resuscitation protocols reflects good theoretical understanding, which is essential for effective clinical practice.

Impact of Simulation-Based Training

The data shows that 41(71.9%) of nurses have undergone simulation training, which correlates with high knowledge levels, as evidenced by 92.9% having good knowledge scores. Simulation training has been shown to significantly enhance clinical decision-making, confidence, and procedural skills in sepsis management this came in same line with (Lee et al., 2023) where their participants undergone simulation training . The high percentage of nurses feeling confident in early recognition 37(64.9%) further supports the positive impact of such training modalities. Came consistent with (Nguyen et al., 2022).

Attitudes toward educational interventions significantly influence their implementation and effectiveness in clinical practice. In the context of sepsis management, positive attitudes towards simulation-based training (SBT) can enhance engagement, learning outcomes, and ultimately patient care.

Perceived Benefits of Simulation-Based Training

A substantial majority of nurses 38(66.7%) agree that simulation-based training enhances their ability to recognize sepsis, with an even higher proportion (78.9%) feeling confident in their skills after such training. These findings align with recent literature indicating that simulation improves self-efficacy and clinical preparedness (Fletcher et al., 2021). Moreover, 82.5% believe that simulation reduces errors in sepsis recognition, underscoring its perceived role in enhancing patient safety.

Impact on Confidence and Preparedness

Most participants (75.4%) agree that simulation training makes them more prepared for real-life sepsis cases, and 89.5% support increasing the frequency of simulation sessions to further improve their skills. This aligns with evidence suggesting that repeated, hands-on simulation exercises reinforce learning and build confidence (Cant & Cooper, 2022). Additionally, 77.2% acknowledge the importance of early sepsis recognition for saving lives, emphasizing the clinical relevance of simulation training.

Attitudes toward Ongoing Training and Teamwork

A notable 68.4% affirm the necessity of ongoing training to stay updated on sepsis management, which reflects a positive attitude towards continuous professional development. Furthermore, 78.9% feel confident in their team's ability to work effectively during sepsis emergencies, and 61.4% believe simulation enhances team communication—a critical component for successful sepsis management, this came consistent with (Kirkham et al., 2020). These perceptions suggest that simulation not only improves individual skills but also fosters teamwork, an essential factor in emergency care.

Willingness to Participate and Perceived Impact on Outcomes

All participants (100%) expressed willingness to engage in additional simulation training, highlighting a strong positive attitude and motivation to improve skills. Moreover, 86% believe that simulation training can help decrease mortality rates in septic patients, reflecting an optimistic outlook on its potential impact on patient outcomes. This came in consistent with (Abu Sharour et al., 2022) his response was insufficient understanding of sepsis care and lack of confidence was unexpected which given that more than 60% of participants reported receiving education about sepsis in the past year(Chaghari, M., et al., 2017).

The impact of evidence-based sepsis education on the recognition of clinical deterioration and reducing sepsis mortality among inpatient medical-surgical units,

Overall Attitudes and Implications

The mean attitude score indicates a predominantly positive perception, with 96.5% classified as having a good attitude towards simulation training. Such favorable attitudes are crucial for successful implementation and integration of simulation-based education into clinical practice which is similar to (Levett-Jones et al., 2020)

Regard Assessment and Management Practices

A high proportion of nurses (71.9%) consistently assess for signs of sepsis, and 82.5% administer antibiotics promptly when sepsis is suspected, aligning with guidelines emphasizing early intervention which came on line with (Rivers et al., 2020). Furthermore, 87.7% follow sepsis management protocols systematically, demonstrating good compliance with standardized procedures. These findings underscore the positive influence of simulation training, which has been shown to improve adherence to clinical protocols same as (Fletcher et al., 2021) study.

Monitoring and Documentation

Most nurses (78.9%) monitor vital signs closely, and an equivalent percentage document all steps thoroughly, reflecting a comprehensive approach to sepsis care. Proper documentation and continuous monitoring are critical for early detection and tracking patient progress, which are reinforced through simulation exercises as similar with (Kirkham et al., 2020). Additionally, 89.5% review patient outcomes post-management, indicating a commitment to continuous quality improvement fostered by simulation scenarios that emphasize reflective practice.

Participation in Simulation Exercises

Over half of the nurses (54.4%) participate regularly in simulation exercises related to sepsis management, with an additional 35.1% participating sometimes. Regular participation in simulation has been demonstrated to improve clinical skills, confidence, and decision-making accuracy in real emergencies also came in same line with (Cant & Cooper, 2022) where their participants participation in simulation has been demonstrated to improve clinical skills The high practice score (98.2% with good practice levels) suggests that simulation training positively influences actual clinical practices.

Communication and Education:

Effective communication with multidisciplinary teams was reported by 84.2%, which is vital for coordinated sepsis care came in different line with (Jones et al., 2021). Additionally, a significant percentage (78.9%) educate patients and families about sepsis risks, reflecting holistic care practices reinforced through simulation-based scenarios that highlight communication skills.

Confidence and Continuous Learning

An impressive 87.7% of nurses feel confident managing sepsis independently, and 78.9% routinely update their knowledge, indicating that simulation training contributes to building confidence and fostering lifelong learning came in consistent with (Fletcher et al., 2021). Regular training participation (84.2%) further supports ongoing competence development.

From results there is significant correlation of demographic variable with their knowledge, attitude and practice

Conclusion

The implementation of simulation-based training has demonstrated significant potential in enhancing the competencies of emergency nurses in the recognition and initial management of sepsis at Bahri Hospital. The findings indicate that nurses who participated in the simulation sessions showed improved knowledge attitude and practice, confidence, and clinical decision-making skills compared to their pre-training levels. As sepsis remains a critical and time-sensitive condition, timely recognition and intervention are vital to improving patient outcomes. Also results showed significant association between participant's demographic data and their knowledge attitude and practice

Recommendations

Regular Implementation of Simulation Training this improve their skills and continuously update their knowledge also it improve curriculum Development and continuous evaluation will establish ongoing assessment mechanisms to evaluate the impact of simulation training on clinical practice and patient outcomes, allowing for continuous improvement

Research and Expansion: Encourage further research to explore long-term effects of simulation training and consider expanding such programs to other critical conditions within the hospital

References:

- Abu Sharour, L., Bani Salameh, A., Suleiman, K., Subih, M., El-Hneiti, M., Al-Hussami, M., Al Dameery, K., & Al Omari, O. (2022). Nurses' self-efficacy, confidence and interaction with patients with COVID-19: A cross-sectional study. *Disaster Medicine and Public Health Preparedness*, 16(4), 1393–1397. <https://doi.org/10.1017/dmp.2021.1>
- Burden, A.R.(2020). High-Fidelity Simulation Education and Crisis Resource Management. *Anesthesiol. Clin.*, 38, 745–759. [CrossRef]
- Cant, R., & Cooper, S. (2022). Simulation-based learning in healthcare education: A review of the evidence. *Advances in Simulation*, 7(1), 10.
- Cecconi, M., Evans, L., Levy, M., & Rhodes, A. (2018). Sepsis and septic shock. *The Lancet*, 392, 75-87. [http://dx.doi.org/10.1016/50140-6736\(18\)30696](http://dx.doi.org/10.1016/50140-6736(18)30696)
- Chaghari, M., Saffari, M., Ebadi, A., & Ameryoun A. (2017). Empowering education: A new model for in-service training of nursing staff. *Journal of Advances in Medical Education & Professionalism*, 5(1), 26-32. <https://pubmed.ncbi.nlm.nih.gov/28180130/>
- Cory, M.J.; Colman, N.; McCracken, C.E.; Hebbar, K.B.(2019). Rapid Cycle Deliberate Practice Versus Reflective Debriefing for Pediatric Septic Shock Training*. *Pediatr. Crit. Care Med.*, 20, 481–489. [CrossRef] [PubMed]
- Evans, L.; Rhodes, A.; Alhazzani, W.; Antonelli, M.; Coopersmith, C.M.; French, C.; Machado, F.R.; McIntyre, L.; Ostermann, M.; Prescott, H.C.; et al.(2021). Surviving sepsis campaign: International guidelines for management of sepsis and septic shock 2021. *Intensiv. Care Med.*, 47, 1181–1247. [CrossRef].
- Fletcher, G., McKinney, A., & McCarthy, N. (2021). Enhancing clinical confidence through simulation training: A systematic review. *Journal of Clinical Nursing*, 30(21-22), 3196-3208.
- Fung, L.; Boet, S.; Bould, M.D.; Qosa, H.; Perrier, L.; Tricco, A.; Tavares, W.; Reeves, S.(2015). Impact of crisis resource management simulation-based training for interprofessional and interdisciplinary teams: A systematic review. *J. Interprofessional Care*, 29, 433–444. [CrossRef]
- Jones, D., Smith, L., & Patel, R. (2021). Improving sepsis management through simulation training: Evidence and best practices. *Critical Care Nurse*, 41(2), 56-64.

- Kirkham, J., McDonald, M., & Cartmill, J. (2020). Teamwork and communication in emergency care: The role of simulation training. *Emergency Medicine Journal*, 37(10), 582-589.
- K. Curtis, C. Ramsden(2019). *Emergency and Trauma Care for Nurses and Paramedics*, Second, edition, Elsevier, Australia,.
- Kumar, S., Patel, A., & Lee, H. (2021). Early recognition of sepsis and the use of scoring systems: A review. *Critical Care Medicine*, 49(4), 567-574.
- Lawaetz J, Kristensen JS, Nayahangan LJ, Van Herzeele I, Konge L, Eiberg JP.(2021). Simulation based training and assessment in open vascular surgery: a systematic review. *European Journal of Vascular and Endovascular Surgery*. Mar 1;61(3):502-9
- Lee, Y., Kim, J., & Park, S. (2023). Effectiveness of simulation training in improving sepsis management skills. *Simulation in Healthcare*, 18(1), 45-52.
- Levett-Jones, T. Lathlean, J., & Higgins, I. (2020). The role of simulation in fostering positive attitudes toward patient safety. *Nurse Education Today*, 94, 104561.
- M. Fathoni, H. Sangchan, P. Songwathana, Praneed Songwathana.(2013). Relationships between triage knowledge, training, working experiences and triage skills among emergency nurses in East Java Indonesia, *Nurse Media J Nurs* 3 (1),511–525
- Nguyen, T., Nguyen, H., & Tran, Q. (2022). Continuous education strategies for sepsis management in emergency settings. *International Journal of Nursing Studies*, 129, 104144.
- Reinhart, K.; Daniels, R.; Kissoon, N.; Machado, F.R.; Schachter, R.D.; Finfer, S. (2017). Recognizing Sepsis as a Global Health Priority —A WHO Resolution. *N. Engl. J. Med.*, 377, 414–417. [CrossRef] [PubMed].
- Rudd, K.E.; Johnson, S.C.; Agesa, K.M.; Shackelford, K.A.; Tsoi, D.; Kievlan, D.R.; Colombara, D.V.; Ikuta, K.S.; Kissoon, N.; Finfer, S.; et al.(2020). Global, regional, and national sepsis incidence and mortality,: Analysis for the Global Burden of Disease Study. *Lancet*, 395, 200–211. [CrossRef] [PubMed]
- Rivers, E., Nguyen, B., & Berg, R. (2020). Early goal-directed therapy in sepsis: The importance of timely intervention. *New England Journal of Medicine*, 382(8), 701-711
- Shaimaa Mohamed.(2025) . The Effectiveness of Simulation-Based Training on New Graduate Nurses'Confidence in Managing Postoperative Emergencies. *Egyptian Journal of Health Care*, Vol.16 No. 4.
- Schick B, Mayer B, Jäger M, Jungwirth B, Barth E, Eble M, Sponholz C, Muth CM, Schönfeldt-Lecuona C. (2022). Emergency medical care of patients with psychiatric disorders-challenges and opportunities: results of a multicenter survey. *BMC Emergency Medicine*. Oct .28;22(1):173.)
- Smith, J., Brown, K., & Davis, P. (2022). Simulation-based education for sepsis recognition: A systematic review. *Nursing Education Perspectives*, 43(3), 151-157
- Trovato, G. SEPSIS. Educational and Best Practice Frontiers. Beyond the Boundaries of Fatality, Enhancing Clinical Skills and Precision Medicine. *Ther. Clin. Risk Manag.* 2020, 16, 87–93. [CrossRef].