Journal Of Nursing Practice
https://thejnp.org/
ISSN: 2614-3488 (print); 2614-3496 (online) Vol.9 No.2. January 2026. Page.268-276

Differences in Triage Accuracy for Respiratory Emergency Cases between Academic and Professional Level Nursing Students Using the Early Warning System Score (EWSS)

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ABSTRACT

Background: EWSS functions as a cumulative scoring framework that standardizes the clinical assessment of acute illness severity through systematic evaluation of vital sign measurements.

Purpose: EWSS is a simple scoring system utilizing the Track & Trigger method based on patients' vital signs to detect early signs of clinical deterioration. It employs physiological parameters to identify patients with severe infections and facilitate triage decisions based on the severity level.

Methods: The objective of this study is to compare the accuracy of triage determination in respiratory emergency cases between two groups of students: academic-level nursing students and professional-level nursing students, using the Early Warning System Score (EWSS) instrument. The research was implemented at nursing undergraduate education institutions in Malang City and Malang Regency. The sample consisted of 100 nursing students, divided into two groups: 50 academic-level students and 50 professional-level students. Each respondent was given 10 respiratory emergency vignette cases and performed triage assessments using the EWSS instrument.

Results: The analysis showed that the Mann-Whitney test has a significance value 0.45, indicating no significant difference in triage accuracy using EWSS between academic-level and professional-level students. Almost all respondents were able to accurately determine triage for both groups using the EWSS method.

Conclusion: EWSS can be broadly utilized by both academic and professional-level nursing students. The triage instrument based on patients' clinical signs and symptoms, EWSS is expected to be widely adopted, including by the general public.

Keywords: early warning score system, nursing students, respiratory emergencies, triage

Received November 10, 2025; Revised December 12, 2025; Accepted January 3, 2026
DOI: https://doi.org/10.30994/jnp.v9i2.720

BACKGROUND

The Early Warning Score System (EWSS) functions as a composite scoring framework designed to standardize the evaluation for chronic disease severity (Damayanti, 2019). This system is widely implemented in emergency units to predict the risk of critical conditions, monitor patients' clinical status, and support medical decision-making. Its primary goal is to enhance patient safety, particularly for those in critical conditions (NICE, 2020). EWSS represents a simplified scoring approach utilizing a structured approach for continuous monitoring and timely clinical intervention method based on patients' vital signs to detect early signs of clinical deterioration. It employs physiological parameters to identify patients with severe infections and facilitate triage decisions based on the severity level. EWSS is a modified version of the National Early Warning Score (NEWS), incorporating additional independent risk factors for patients over 65 years of age, reflecting the latest clinical conditions (Song, et al., 2020). The management of patients experiencing respiratory emergencies is a crucial skill for nurses, as such cases are commonly encountered in clinical settings. In these situations, nurses face new challenges that can affect their psychological well-being, especially when dealing with infections involving the respiratory system (Hu et al., 2022). As novice healthcare providers, nursing students play a vital role in managing the growing number of respiratory emergency cases, particularly in promoting and implementing health protocols. Professional students say that it requires knowledge regarding how to detect the surveillance of respiration systems where practice is often encountered in cases of pnemonia since the Covid-19 pandemic until now where often encounters the congestion of respiration This is consistent with the rising incidence of pneumonia in clinical settings in the post–COVID-19 period (Meckawy et al., 2022).Previous research conducted by researchers to test EWSS to determine virulence virulence covid-19 in nursing students has been obtained result of the precise relationship of severity assessment conducted prior to and following the use of EWSS.The next research carried out to find out the old relationship of the clinic's experience with the progress of ewss' use indicates a significant relationship(Ardiyani, V.M., Sutriningsih, A. and Andinawati, M, 2021). Nursing students, who represent novice members of the healthcare workforce, play a crucial role in addressing the increasing cases of respiratory emergencies, especially regarding the promotion and application of health protocols. As prospective as professionals preparing to enter clinical practice, they require adequate triage skills to address diverse emergency situations, especially respiratory-related cases, which are often encountered in clinical practice. Based on this phenomenon, this research aimed to determine the difference in triage accuracy using the EWSS method for students at academic and professional levels.

OBJECTIVE

The study aimed to identify the triage ewss the. students use of academic and professional level

METHODS

This study utilized a quasi-experimental design involving two treatment groups without control group. This research measured triage accuracy based on the EWSS method in both groups. First Group consisted of students at the academic level who were given respiratory emergency cases (vignettes), while Group 2 comprised students at the professional level presented with the same cases. Ten clinical case questions (vignettes) were developed and reviewed by two reviewers from the East Java branch of the Indonesian National Nurses Association (APNI). The triage outcomes were compared to assess the accuracy differences between the two groups.The triage determination was conducted using the EWSS method, with

triage categorization based on eight clinical symptom indicators of the patients, based on National early warning score (news) 2 publish by Royal College of physicians (RCP) A modified version for respiratory emergencies using the following eight indicators below (RCP, 2017) :

Table 1. Indicators EWSS based on eight clinical symptom

Parameter	assesment	Score
Signs of pneumonia indicate on lung CT scan	Yes	5
History of contact with confirmed COVID-19 patients/with respiratory symptoms	Yes	5
fever	Yes	3
age	≥ 44 year	1
Sex	male	1
Maximum temperature (onset to hospital)	≥ 37.8 C	1
symptoms of respiratory problems (cough, shortness of breath)	≥ 1 symptomps	1
The ratio of neutrophils to lymphocytes	≥ 5,8	1

Based on the total scores presented in the table above, categorization was performed according to the criteria outlined in the table below (RCP, 2017):

Table 2. Clinical Risk based on Score EWSS

Score	Clinical risk level/emergency level	Response (handling)
1-4	Low	observation
5-6	Medium	Initiate an immediate response
7 and more	High	Emergency intervention

The study was implemented across selected institutions providing undergraduate and professional nursing programs in Malang at 2024, using a quota sampling method with 100 respondents. Fifty respondents were at the academic level, and 50 were at the professional nursing level. Each respondent was presented with 10 respiratory emergency cases in ten of vignettes questions that had been reviewed by the research team. For each question, a correct triage categorization was scored as 10, while an miss triage received a score of 0. A comparative analysis of scores between the two groups was conducted using the Mann–Whitney test.

RESULTS

Tabel 3. Table age respoden

	N	Min	Max	Mean	Std. Dev
Age	100	20,00	26,00	23,1650	1,64442
Valid N (listwise)	100				

Table 1. describes data from the 100 respondents participating in the study show that the mean age of respondents is 23 years. The age of participants ranged between 20 and 26 years.

Table 4. General Characteristics of Respondents (n=100)

Characteristics	n	%
Sex		
male	43	43

ISSN: 2614-3488 (print); 2614-3496 (online) Vol.9 No.2. January 2026. Page.268-276

female	57	57
Emergency Subject Value		
A	34	34
B	40	40
C	24	24
D	2	2
Clinical Experience		
no	50	50
1-12 month	50	50
Knowing EWSS Before		
Yes	21	21
no	79	79

Table 4 The characteristics of the 100 respondents are illustrated, showing that 57% were female and 43% were male. Emergency nursing course grades were predominantly in the B range. Most respondents lacked clinical experience, and only a limited proportion had prior knowledge of the EWSS triage system.

Tabel 5. Tests of Normality

	Grup	Kolmogorov-Smirnova			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
score	Akademik stage	,185	50	,000	,877	50	,000
	Profresional stage	,193	50	,000	,879	50	,000

Table 5. Show the results of the data normality test for the academic and professional groups are presented. A significance value of 0.000 ($p < 0.05$) was obtained for both triage groups, indicating non-normal data distribution. Therefore, the Mann–Whitney test was applied to compare the two groups.

Tabel 6. Descriptive Data on Triage Accuracy in Academic-Level and Professional-Level Nursing Students

	N	Minimum	Maximum	Mean	Std. Deviation
Akademik level	50	10,00	100,00	78,8000	20,76496
Professional level	50	40,00	100,00	83,2000	13,61871
Valid N (listwise)	50				

Table. 6 shows that the minimum score in the academic-level student group is 10, and the maximum score is 100, with a standard deviation of 20.7. In the professional-level student group, the minimum and maximum scores are both 40, with a standard deviation of 13.6. Average score for academic-level group is 78, while the average score for the professional-level group is 83.2. Pre- and post-test scores were obtained from the cumulative results of ten clinical cases presented in the form of vignette-based questions, with scoring criteria measured on a ratio data scale.

Tabel 5. Man whitney test

Test Statisticsa	
	score
Mann-Whitney U	1143,500
Wilcoxon W	2418,500
Z	-,752
Asymp. Sig. (2-tailed)	,452

Table 5. describe the result of Mann-Whitney test, a significance value of 0.452 was obtained, which is greater than 0.05. Results from the Mann–Whitney analysis showed no difference in triage accuracy between academic and professional respondents.

DISCUSSION

The research results indicate that both academic-level and professional-level respondents demonstrated good triage determination using the EWSS method, with an average score of 78 for academic-level students and 83 for professional-level students. The absence of differences in scores between the two groups may be influenced by students' understanding of the Early Warning Scoring System (EWSS), as students at the academic level are able to comprehend the EWSS algorithm well and apply it appropriately in the triage of the given clinical cases. Education has a significant impact on nurse performance, applies not only to the professional level but also to the academic level. This aligns with the theory proposed by Mangkuprawira, which states that work experience enables individuals to learn and behave better, thereby increasing their work productivity (Maryam, S., 2014).Knowledge of clinical evidence concepts and practical experience are essential aspects for a nurse. This is because professional experience and knowledge play a significant role in improving the quality of nursing care provided to patients. Therefore, adequate understanding of clinical evidence is necessary to perform nursing interventions accurately. Additionally, nurses must understand the meaning of clinical evidence and its application process to correctly implement this concept in practice.The lack of significant differences between academic-level and professional-level student groups highlights that EWSS, as a triage tool for respiratory emergency cases, can be easily applied based on the mastery of basic clinical symptoms in patients. Mastery of EWSS across the three triage is closely linked to the accuracy of emergency level determination for clinical cases.

EWSS one of triage for emergencies respiratory cases significantly impacts the significan of triage decisions made by nursing students. This is in line with evidence suggesting that simulations and case-based learning enhance nurses' understanding of EWSS score determination (Saab et al., 2017; Damayanti, Trisyani, and Nuraeni, 2019; Foley and Dowling, 2019; Alias and Ludin, 2021; Indrawati and Yulianto, 2023; Millizia, Rizka, and Mellaratna, 2023). Based on findings at the research site, relevant theories, and previous studies, it can be concluded that learning through case studies enhances understanding and skills. This is likely due to the presentation of case studies in vignette format, which promotes better understanding by engaging learners more effectively. Knowledge, skills, and clinical experience are key factors supporting high-quality nursing care. The influence of colleagues who understand the concept of nursing care also plays a significant role. This aligns with Ligita's (2012) findings, which state that nurses' ability to utilize research findings improves when they work in practice

environments surrounded by colleagues with strong knowledge and research experience. Such environments can facilitate understanding of the concept of Evidence-Based Practice (EBP) (Ligita, T., 2012).

The implementation of the Early Warning Score System (EWSS) among healthcare professionals has proven highly beneficial in clinical settings. EWSS can identify at-risk patients earlier by using various parameters. Experts have noted that this method offers significant benefits to patients by enabling rapid detection of clinical deterioration (Spencer et al., 2019; Suwaryo, Sutopo, and Utoyo, 2019; Angkasa, 2022; Meckawy et al., 2022; Mirawati and Deswita, 2022). EWSS is highly effective for monitoring and early detection before patients reach a more critical condition, supporting appropriate referral pathways or interventions. Studies indicate that EWSS can function as an early warning tool to inform further clinical actions. Deterioration in patient status is typically manifested through respiratory, cardiovascular, and neurological symptoms. Effective monitoring is a fundamental component of early patient assessment. Therefore, enhancing nursing practice plays a vital role in lowering morbidity and mortality (Jayasundera et al., 2018; Dewi, Susila, and Darmawan, 2020; Mirawati and Deswita, 2022; Fauziah and Adiutama, 2023; Lindayani, Nurhidayah, and Rochadi, 2024). Based on findings at the research site, relevant theories, and previous studies, show that the accuracy of EWSS can serve as a method for early detection for emergency case, there by adverse health outcomes.

The application of EWSS for healthcare professionals emphasizes its significant benefits in clinical settings, where it can identify at-risk patients earlier using eight fisiologis parameters.The key parameters is the change in vital signs. According to experts, this approach provides added value by identifying early signs of patient deterioration (Spencer et al., 2019; Suwaryo, Sutopo, and Utoyo, 2019; Angkasa, 2022; Meckawy et al., 2022; Mirawati and Deswita, 2022). EWSS provides substantial benefits in patient monitoring and early detection of clinical deterioration, allowing timely referral and appropriate clinical interventions before further decline occurs. Evidence indicates that EWSS functions as an effective early warning tool to guide subsequent clinical decision-making. Indicators of patient deterioration are commonly manifested in respiratory, cardiovascular, and neurological functions. Systematic and accurate patient observation represents a critical initial step in recognizing changes in patient condition. Consequently, the enhancement of nursing practice is essential to reduce morbidity and mortality outcomes (Jayasundera et al., 2018; Dewi, Susila, and Darmawan, 2020; Mirawati and Deswita, 2022; Fauziah and Adiutama, 2023; Lindayani, Nurhidayah, and Rochadi, 2024). Based on results from the research context, supporting theories, and previous studies, EWSS triage accuracy can be considered a valuable early detection mechanism for identifying patient deterioration and reducing morbidity and mortality.

CONCLUSION

The Early Warning Scoring System (EWSS) can be introduced to nursing students at the academic level as a triage method that specifically assesses the severity of respiratory cases. This is evidenced by the lack of significant differences in the accuracy of triage determination in respiratory emergency cases, whether among novice nurses at the academic level or junior nurses at the professional level.

ACKNOWLEDGMENT

1. Ministry of Education, Culture, Research and Technology. Development Agrement number : 109/E5/PG.02.00PL/2024 as Funding Source
2. We are grateful for the support of:
   a. Faculty of Health Sciences, Tribhuwana Tunggadewi University, Malang, Indonesia

b. Kendedes College of Health Sciences, Malang,Indonesia
c. Maharani College of Health Sciences, Malang, Indonesia
d. Faculty of Health Sciences, Brawijaya University, Malang, Indonesia
e. Widyagama Husada College of Health Sciences, Malang, Indonesia
f. Faculty of Health Sciences, Muhammadiyah University of Malang, Malang, Indonesia
g. Widya Cipta Husada College of Science, Malang, Indonesia
h. Kepanjen University, Malang, Indonesia

CONFLICTS OF INTEREST

No Potensial Conflicts of Interest

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