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THE EFFECTIVENESS OF MEDIA DISC TRIAGE ASSESSMENT ON CLINICAL REASONING SKILLS OF AUSTRALASIAN TRIAGE SCALE (ATS) IN NURSING STUDENTS

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ABSTRACT

Australasian Triage Scale (ATS) is a tool used by emergency department nurses to assess a patient's health status and prioritise services based on the severity of the patient's condition. Clinical Reasoning skills are cognitive processes in the form of theoretical applications and clinical abilities of a nurse in evaluating, diagnosing, and providing nursing care for patients based on information and condition. Objective: This study aims to evaluate the effectiveness of using learning tools by using media Disc Triage Assessment to improve clinical reasoning skills using ATS triage. Method: The research method used was quasi-experimental without control group design. A total of 193 nursing diploma students who passed the Emergency Nursing course were selected using purposive sampling. Therefore, the sample is 35 students. Data analysis was performed using Wilcoxon test. Result: The results were significant improvements across five domains of Nurses Clinical Reasoning Skills (NCRS): Assessment, Diagnosis, Intervention, Implementation, and Evaluation, all with p-values < 0.05. Conclusions: This has a significant positive effect on improving students' clinical reasoning skills in determining triage ATS. This shows can be effective in improving the ability of students to determine triage levels and make informed clinical decisions.

Keywords: australasian triage scale (ATS); clinical reasoning skills; media disc triage assessment

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INTRODUCTION

Australasian Triage Scale (ATS) is a patient prioritization tool used by triage staff in emergency departments in various countries, including Australia and New Zealand. The ATS is used to assess the severity of a patient's condition and prioritize patient care based on the severity of the patient's condition (Australasian College for Emergency Medicine, 2019). Traditionally, triage training is conducted face-to-face using lecture or face-to-face training. However, with the advancement of information technology, the use of learning materials such as videos or e-learning can also be used as an alternative method of triage training (Pradanie et al., 2021). These studies show that the use of learning media can improve the understanding and skills of triage officers in conducting patient priority assessments using ATS (Pradanie et al., 2021).

Study by Yusuf & Handayani (2020) explored the implementation of ATS in the emergency department of a referral hospital in Indonesia. The results indicated that ATS could be successfully implemented in Indonesia, improving triage performance by reducing service times and improving patient satisfaction. However, the study also highlighted some challenges in implementing ATS, such as inadequate staff training and limited understanding of the triage scale. Based on research conducted by Varndell et al. (2019) in Autralia, there were only 35% of nurses who conducted triage appropriately, 45% of nurses who under

triage, and 20% of nurses who over triage. Several studies have been conducted to evaluate the effectiveness of using learning media in triage training, including the use of videos and e-learning.

Clinical reasoning is also necessary for processing the information obtained to determine the diagnosis of a disease and to apply clinical and evaluative actions that can be performed as treatment for the issues identified in the patient (Lisiswanti & Tritama, 2017). Clinical reasoning can be defined as a complex set of thoughts in the diagnostic decision-making process that involves experience, skills, and reflective thinking (Majumder et al., 2019). Study was conducted on 42 triage officers from the emergency department of the Gatot Soebroto Central Military Hospital in Jakarta, using a pre-test and post-test research The results showed that there was a significant increase in the skills of the yard officers after the video training. design (Pradanie et al., 2021). In addition, most respondents also stated that video is an effective learning medium and makes the material easier to understand (Haines & Long, 2013; Pradanie et al., 2021). Research in Australia revealed that educational aids were more effective in training triage staff compared to face-to-face methods without aids, increasing confidence in patient assessments. Similarly, a study among nursing students in Indonesia found that teaching aids could improve learning of the ATS triage method, leading to increased accuracy in patient triage. This emphasizes the potential benefits of using educational materials in training healthcare professionals in triage procedures (Haines & Long, 2013).

One of the learning methods that can be used to improve the knowledge and skills of yard officers in the use of ATS is the use of educational materials. Several studies have been conducted to evaluate the effectiveness of the use of teaching aids in triage training with ATS. These studies show that the use of educational aids can improve the knowledge and skills of triage officers in performing priority assessments of patients with the ATS (Haines & Long, 2013). Preliminary research studies conducted among the students of the University of Kusuma Husada Diploma 3 Nursing, class of 2021, show that the triage materials were given to the students. However, the accuracy value in determining patient triage averaged 60%, and most students had limited experience with the ATS triage method before. In addition, this study also shows that the use of teaching aids has the potential to increase the learning effectiveness of the ATS classification method among students, which aims to determine whether the use of teaching aids can increase the effectiveness of students' ATS learning. sorting method. In the context of using teaching aids, it is important to pay attention to the design and development of appropriate teaching aids in order to achieve the expected training objectives. Therefore, it is necessary to conduct further research to evaluate the design and development of the most effective teaching aids in triage training using ATS using Disc Triage Assessment media. Therefore, the purpose of this research is to know the impact of media disc triage assessment on clinical reasoning skills of australasian triage scale (ATS) in nursing students of Kusuma Husada University Surakarta.

METHOD

The research method used was quasi-experimental with a pre post test without control group design. The population is diploma nursing student in Kusuma Husada University. Total population is 193 students who passed the Emergency Nursing course in semester 4. The sampling technique used is purposive sampling, where samples are selected based on specific inclusion and exclusion criteria. For inclusion, the criteria are as follows: nursing diploma students who have completed training BTCLS and passed the Emergency Nursing course. The exclusion criteria include students with no prior experience in performing ATS triage, and

students who did not attend the pretest and/or posttest. Therefore, the sample is 35 students. Data analysis was performed using the Wilcoxon test because the data were not normally distributed. Shapiro-wilk test to check the normality was more than 0.05, the mean value is not normally distributed. The researcher first completed ethical clearance at Kusuma Husada University Surakarta with the number: 2097/UKH.L.02/EC/IV/2024.

The instruments used in this research were using media Disc Triage Assessment prepared by researchers and using Nursing Clinical Reasoning Scale (NCRS). Nurses Clinical Reasoning Scale (NCRS) is a tool used to assess the clinical reasoning skills of nurses. It helps evaluate how nurses process clinical information, make decisions, and take actions in patient care (Hu et al., 2021). The scale typically involves the following key components: Assessment: Gathering patient information through observation, physical examination, and history taking. Diagnosis: Analyzing assessment data to identify patient problems or potential problems. Planning: Developing a plan of care based on the identified problems, setting goals, and determining appropriate interventions. Implementation: Carrying out the planned interventions to achieve the desired outcomes. Evaluation: Assessing the effectiveness of the interventions and making necessary adjustments to the care plan. The NCRS might include specific criteria or questions under each component to rate the nurse's performance. These could be scored on a Likert scale (e.g., from "strongly disagree" to "strongly agree") to provide a quantitative measure of clinical reasoning abilities. The tool is often used in educational settings to assess nursing students or in clinical settings to evaluate the ongoing competencies of practicing nurses.

RESULTS

In pre intervention, initial data is collected before the intervention is carried out. The data collected can be in the form of respondent characteristics, students' clinical reasoning skills in triage, and assessment of triage categories in certain cases. Data collection can be done using a questionnaire or pretest. Apart from that, observations can also be carried out to see directly how students carry out clinical reasoning using ATS triage. At the intervention stage, an introduction to the ATS triage learning media was carried out which was used to improve student skills. The learning media used is a triage assessment disc with the topic Australasian Triage Scale (ATS). After being given an introduction to learning media, students are directed to carry out case simulations using ATS triage with the help of the learning media provided. The data is collected after the intervention is carried out. The data collected was the same as in the pre-intervention stage. The post-test was carried out 30 days after the intervention phase was implemented. After that, an evaluation was carried out to determine the improvement in students' clinical reasoning skills in triage. Evaluation can be done with a written test.

Based on table 1, univariate data analysis shows the characteristics of respondents from 35 students of Kusuma Husada University Surakarta based on various aspects. Based on gender, there were 9 respondents (25.7%) male and 26 respondents (74.3%) female. All respondents had passed the Emergency Nursing course in Semester 4 (100%). In addition, all respondents also had experience in Basic Trauma & Cardiovascular Life Support (BTCLS) training (100%). In terms of clinical practice experience, all respondents had 1-2 years of clinical practice experience (100%).

Table 1.
Characteristics of Respondents

Category	f	%
Gender		
Male	9	25.7
Female	26	74.3
Passed the Emergency Nursing Courses		
Passed	35	100
Not passed	0	0
Experience of BTCLS Training		
Ever	35	100
Never	0	0
Experience of Practice in the hospital		
< 1 year	0	0
1-2 yeas	35	100
> 2 year	0	0

Table 2.
Clinical Reasoning Skills Before and After Given by Disc Triage Assessment Media

Kriteria	Pre-Intervention		Post-Intervention	
	f	%	f	%
Basic Clinical Reasoning	0	0,00	0	0,00
Intermediate Clinical Reasoning	4	11,4	1	2,90
Advanced Clinical Reasoning	26	74,3	20	57,1
Expert Clinical Reasoning	5	14,3	14	40,0

Table 2, data clinical reasoning skills before and after being given Disc Triage Assessment media showed significant changes. Before the intervention, respondents' clinical reasoning skills were in the intermediate (11.4%), advanced (74.3%), and expert (14.3%) categories, with none in the basic category. After the intervention, the distribution of skills changed with an increase in the advanced (57.1%) and expert (40%) categories, while the intermediate category decreased to 2.9% and no respondents were in the basic category. This suggests that the use of Disc Triage Assessment media is effective in improving students' clinical reasoning skills.

Table 3.
Bivariate analysis of the influence of Media Disc Triage Assessment on Clinical Reasoning Skills Base on Domain in NCRS Tools (n=35 responden)

Domain	*p value*	n
Assessment	0,000	
Diagnosis	0,001	
Planning	0,000	35
Implementation	0,000	
Evaluation	0,000	

Table 3, it is known that the p value in the Assessment Domain is 0.000 (<0.05), the p value in the Diagnosis Domain is 0.001 (<0.05), the p value in the Planning Domain is 0.000 (<0.05), the p value in the Implementation Domain is 0.000 (<0.05), the p value in the Evaluation Domain is 0.000 (<0.05) which means that there is an effect of the influence of Disc Triage Assessment Media on Clinical Reasoning Skills in the Assessment Domain, Diagnosis Domain, Planning Domain, Implementation Domain and Evaluation Domain. Table 4, it is known that the p value is 0.002 (<0.05) which means that there is an effect of the influence of Disc Triage Assessment Media on Clinical Reasoning Skills Determining the Australasian Triage Scale (ATS) on Students of Kusuma Husada University Surakarta.

Table 4.
Bivariate analysis of the influence of Media Disc Triage Assessment on Clinical Reasoning Skills Determining the Australasian Triage Scale (ATS) (n=35 responden)

Variable	*P value*	N
Pre-intervention Post-intervention	0,002	35

DISCUSSION

This study was conducted at the Nursing Study Program Students of Kusuma Husada University's Diploma Three Program in Surakarta. The number of samples used was 35 students. The sampling technique was purposive sampling and adjusted to the sample inclusion criteria. From the results of the research that has been done. A general description of the respondents based on age, gender, experience of passing the Emergency Nursing course, BTCLS experience and student practice clinic experience was obtained. According to a study by Lee, nurses with longer work experience showed better clinical reasoning (Lee et al., 2016). In the context of nursing student selection, reasoning skills are considered general competencies that do not necessitate nursing-specific knowledge. These skills encompass the ability to collect, process, and utilize information to make informed decisions, including identifying problems and setting goals (Vierula et al., 2020). The number of respondents based on gender was 9 respondents (25.7%) male and 26 respondents (74.3%) were female. A study of nurses in Canada and America has similarities in the gender distribution of nurses, where nursing school graduates who are actively working as nurses are female nurses (90.9% - 95%) (Meadus & Twomey, 2017). Decision-making skills in nurses are influenced by their behavioral and individual characteristics. The study found that age is a predictor of triage decision-making (TDM) in emergency department nurses, consistent with other research linking age to better clinical decision-making. As nurses age, their skills, accuracy, and critical thinking abilities improve, allowing them to make more rational decisions and draw on past experiences to handle similar situations more effectively (Soola et al., 2022).

The number of respondents based on BTCLS experience is 35 respondents (100%) have passed the Emergency Nursing course in Semester 4 and have BTCLS experience is 35 respondents (100%) have attended Basic Trauma & Cardiovascular Life Support (BTCLS) training. According to research conducted by Fathoni & Sangchan (2013), all subjects had attended Basic Life Support (BLS) and Advanced Life Support (ACLS), and about half of the study respondents had more than 5 years of work experience in the emergency room. Overall perceived triage skills were at a moderate level with a mean score of 75.12 (SD = 11.23). There was a significant positive correlation between triage skills and work experience, training experience, and triage knowledge. Based on research by Park & Kim (2017) similarly recommended conducting targeted education and training in emergency care to enhance nurses' competencies. In their study, item analysis showed positive outcomes regarding the skill competency of nurses. A notable finding was that nurses performed correctly in areas such as preparation, patient assessment, airway management, breathing, circulation, disability evaluation, exposure, foley catheter insertion, gastric tube placement, heart monitoring, pulse oximetry, x-ray procedures, and secondary surveys. The skills of nurses should be considered a critical competency, as they are directly linked to patient safety and the overall improvement of healthcare quality.

Recent advancements in emergency medicine have highlighted the potential of artificial intelligence (AI) systems to enhance triage accuracy. However, limitations remain, particularly with large language models like Chat-GPT, which have shown low reliability and

stability in replacing human experts such as triage nurses (Holanda et al., 2019; Zaboli et al., 2024). The agreement between AI systems and human experts has been low, with a higher tendency for over-triage. While predictive screening through machine learning based on extensive clinical data can assist healthcare professionals in decision-making, issues like over- and under-triage persist due to the inherent complexity and uncertainty of emergency department triage (Holanda et al., 2019). This study uses an instrument, namely the Nurses Clinical Reasoning Scale (NCRS) which consists of 15 questions with 5 domains, namely the Assessment Domain, Diagnosis Domain, Intervention Domain, Implementation Domain and Evaluation Domain. Data collection consists of an initial test (pretest) and a final test (posttest). Based on bivariate analysis that the p value is 0.002 (<0.05) which means that there is an effect of the influence of Disc Triage Assessment Media on Clinical Reasoning Skill in determining the Australasian Triage Scale (ATS) on Students of Kusuma Husada University Surakarta.

The study also examined the relationship between clinical reasoning skills, KTAS proficiency, and emergency nursing care (ENC). It found that clinical reasoning skills did not mediate the effect of KTAS proficiency on ENC, even though these skills are essential for diagnosing potential patient problems and making clinical decisions (Oh & Jung, 2024). Furthermore, the study demonstrated that perceived triage competency and clinical reasoning skills, starting with triage, had a multiple linear mediating effect on ENC. The findings suggest that to improve ENC, it is necessary to develop both perceived triage competency and clinical reasoning skills, along with a program to enhance triage proficiency. The study recommends creating an educational program focused on improving ENC, beginning with triage training (Oh & Jung, 2024). Hu et al (2021) conducted a study to assess the impact of simulation-based triage education on nursing students' clinical reasoning skills. Third-year nursing students were divided into intervention and control groups. The intervention group received 2 hours of simulated triage and one hour of debriefing, while the control group had a traditional 3-hour lecture. Post-test results showed significantly higher clinical reasoning scores in the intervention group. Simulation-based education improved students' self-reported clinical reasoning skills compared to lecture-based education.

The research involved 42 triage officers at a military hospital in Jakarta and found that video training significantly improved their skills. Most respondents agreed that videos made the material easier to understand. Previous studies have shown that educational aids can enhance the knowledge and skills of triage officers in using ATS for patient assessment (Pradanie et al., 2021). Research in Australia revealed that educational aids were more effective in training triage staff compared to face-to-face methods without aids, increasing confidence in patient assessments. Similarly, a study among nursing students in Indonesia found that teaching aids could improve learning of the ATS triage method, leading to increased accuracy in patient triage. This emphasizes the potential benefits of using educational materials in training healthcare professionals in triage procedures.This study uses an instrument, namely the Nurses Clinical Reasoning Scale (NCRS) which consists of 15 questions with 5 domains, namely the Assessment Domain, Diagnosis Domain, Planning Domain, Implementation Domain and Evaluation Domain. Data collection consists of an initial test (pretest) and a final test (posttest). Based on bivariate analysis that the p value is 0.002 (<0.05) which means that there is an effect of the influence of Disc Triage Assessment Media on Clinical Reasoning Skill in determining the Australasian Triage Scale (ATS) on Students of Kusuma Husada University Surakarta.

Many participants called for a unified teaching method that integrates theory, lab, and clinical training. This approach would align what is taught in the classroom with actual clinical practice, enhancing student engagement and motivation (Saifan et al., 2021). NCRS has been adopted widely in medical and nursing schools as a critical educational resource. By simulating real-life clinical scenarios, it helps students bridge the gap between theoretical knowledge and practical application. Studies suggest that the use of NCRS in educational settings significantly enhances students' ability to apply their knowledge in clinical reasoning. The study by Antonia Blanié et al. investigates the effectiveness of simulation through gaming compared to traditional teaching methods in enhancing nursing students' clinical reasoning skills for detecting patient deterioration. The randomized study aimed to assess which method better supports skill development in this critical area of nursing practice. Key findings suggest that simulation through gaming offers promising benefits, potentially outperforming traditional teaching methods by providing a more engaging and interactive learning environment. This approach could significantly contribute to improving nurses' abilities to recognize and respond to patient deterioration effectively (Blanié et al., 2020).

Simulation-based triage education is more effective in improving nursing students' clinical reasoning ability compared to lecture-based triage education. The implementation of simulation-based triage education can help prepare nursing students to better respond to disasters (Andreatta et al., 2010). The use of mobile applications, digital simulations, and educational games positively influences nursing students' clinical reasoning skills and motivation. Integrating new technologies into problem-solving and decision-making activities can further improve their reasoning abilities (Pérez-Perdomo & Zabalegui, 2024). Nurse educators need to take proactive measures in their teaching methods to cultivate students' clinical reasoning skills, thereby enhancing their clinical judgment. An initial approach is to implement strategies that incorporate clinical judgment and reasoning skills into the nursing curriculum (Gonzalez et al., 2021).This study evaluated the effectiveness of simulation methods using serious games compared to traditional training methods in improving clinical reasoning skills in nursing students. In this study, clinical reasoning skills were assessed immediately after training and one month later. The results showed that both the simulation method with serious games and the traditional training method were equally effective in improving nursing students' clinical reasoning skills.

According to research by Blanié et al. (2020) to evaluate the effectiveness of game simulation compared to traditional teaching methods in improving clinical reasoning skills in nursing students. The serious game group completed two clinical cases followed by debriefing, while the traditional method used text-based cases with follow-up lectures. Results showed no significant difference in script concordance tests (SCT) scores between the two groups, both immediately after training and one month later. However, the serious games group reported higher levels of satisfaction and motivation compared to the traditional group. Although there was no difference in clinical reasoning skills, this study suggests that serious games could be more engaging for university students.The study by Antonia Blanié et al. investigates the effectiveness of simulation through gaming compared to traditional teaching methods in enhancing nursing students' clinical reasoning skills for detecting patient deterioration. The randomized study aimed to assess which method better supports skill development in this critical area of nursing practice. Key findings suggest that simulation through gaming offers promising benefits, potentially outperforming traditional teaching methods by providing a more engaging and interactive learning environment. This approach could significantly contribute to improving nurses' abilities to recognize and respond to patient deterioration effectively Blanié et al. (2020).

Clinical reasoning process requires sufficient knowledge, especially fundamental principles, and the application of these principles to the cases encountered. This is particularly evident in the clinical reasoning processes of students and less experienced doctors. As doctors gain more experience, they rely less on basic sciences to solve cases. Experienced doctors have accumulated knowledge stored in their minds which they utilize as needed. Achieving satisfactory clinical reasoning skills requires strengthening through continued learning processes. Exposing students to numerous clinical cases enhances their clinical reasoning abilities. Teaching clinical reasoning involving standardized patients is an appropriate method for undergraduate medical education (Kumalasari et al., 2021).The research found that using posters significantly improved nurses' knowledge of the ATS, leading to more accurate triage decisions in the emergency room. This method of education was particularly effective in addressing common issues such as over-triage and under-triage, which can result in inappropriate patient care prioritization (Antara et al., 2023). The study concludes that visual educational tools like posters are a beneficial and practical approach to continuing education for nurses, ultimately contributing to better patient outcomes in emergency settings (Antara et al., 2023). Low self-esteem can also reduce nurses' ability to perform appropriate CR, increase the frequency of nursing errors, and thus undermine the trust of nurses among patients, colleagues, doctors and other health workers (Najafi & Nasiri, 2023). This study has several limitations, including the difficulty in accurately assessing clinical reasoning skills due to the complexity of the process. In addition, only two cases were used in the training, which may have limited the impact of the training. No comparison as a control group was conducted to avoid learning bias, making it difficult to compare the initial knowledge between the groups. Assessment of clinical reasoning skills using the Nurse Clinical Reasoning Scale (NCRS) has limitations as it relies on students' self-perception, which may not fully reflect actual competence in clinical practice.

CONCLUSION

This study evaluated the impact of the Disc Triage Assessment media on the clinical reasoning skills of nursing students at Kusuma Husada University, particularly in the context of the Australasian Triage Scale (ATS). The results showed a significant improvement in clinical reasoning skills across all five domains (Assessment, Diagnosis, Planning, Implementation, and Evaluation) after the intervention using media Disc Triage Assessment. Specifically, the use of Disc Triage Assessment media significantly enhanced students' abilities to determine the ATS, as evidenced by the shift in clinical reasoning skills from intermediate to advanced and expert levels. The study underscores the effectiveness of teaching aids, such as the Disc Triage Assessment media, in improving nursing students' understanding and application of the ATS. These findings align with previous research, which highlights the benefits of simulation-based and interactive learning methods over traditional lecture-based approaches. Overall, the implementation of Disc Triage Assessment media positively impacts nursing education by enhancing clinical reasoning skills, which are crucial for effective triage and patient care in emergency settings. Future research could expand on these findings by including a control group for comparison and exploring the long-term retention of clinical reasoning skills.

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