

Influence of Designed Scenario-Based Learning Regarding Simple Triage and Rapid Treatment on Nursing Students' Competencies.

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ABSTRACT

This study aimed to evaluate the influence of scenario-based learning methods regarding simple triage and rapid treatment on nursing students' competencies. Materials and Methods: A quasi-experimental design was utilized. A 150 nursing students was included in the current study. Three tools were used for data collection. Tool I: Nursing Students' Assessment Questionnaire. Tool II: Nursing students' observational practice checklist. Tool III: Nursing students' attitude assessment scale regarding triage. Results: all of the nursing students studied had poor knowledge pre-implementation, then advanced to nearly half had good knowledge regarding triage post-implementation of the designed scenario-based learning. Also, all of nursing students had an incompetent practice level pre-implementation, then progressed to all of them had competent practice level regarding total practice of triage post-implementation. Less than fifth had a positive attitude toward triage pre-implementation of the designed scenario-based learning, then enhanced to less than quarter post-implementation of the designed scenario-based learning regarding triage. Conclusion: A statistically significant difference existed prior to pre- and post-implementation of the designed scenario-based learning knowledge, practice, and attitude toward triage.

Keywords: Scenario-Based Learning, Simple Triage, Rapid Treatment (START Triage), Nursing Students' Competencies.

INTRODUCTION

Triage is the prioritization of patients by the severity of their conditions, allowing for the most appropriate care to be delivered to as many patients as possible, quickly. When a patient is not effectively triaged upon arrival, subsequent specialist care may be insufficient due to inadequate initial care, stressing the importance of a dynamic decision-making process that assesses immediate medical needs upon entering an emergency department (1). Maintaining triage systems supports patients in gaining definitive healthcare support based on their specific clinical requirements. The systems screen patients to specific care units for uniform reception, evaluation, and management, thereby decreasing the opportunity for mistakes and exposure. Furthermore, effective triage diagnoses unnecessary healthcare in advance, thereby shortening the complete hospital stay and reducing the overall hospital expenses (2).

START is one of the most widely used globally alongside its competitors. Jump START, for instance, is specifically designed to address the needs of children and infants below the age of eight years (3). Problem-solving and case study learning are examples of active learning approaches combined with Scenario-Based Learning. This type of assignment asks students to complete a narrative sequence composed of a complex or poorly structured problem, which is a form of a problem they must resolve. Students are then required to

consider their theoretical knowledge, and apply critical and systemic thinking to a specific problem situated in a contemporary context (4).

SBL is a form of immersive training designed to keep learners fully engaged. SBL is different from traditional e-learning, which typically consists of passive reading of text followed by answering questions. SBL requires learners to make decisions continuously, and to keep for a sequence of screens, decisions that influence the direction of the story. Such interactivity guarantees that learners are actively engaged (5).

The fundamental purpose of the education of nurses is the acquisition of clinical competence, which is the integration of knowledge and skills of the profession, effective and interpersonal communication, advanced problem-solving and decision-making, and the clinical competence (6). In their profession, nurses have to utilize their competences, skills, and personal traits in each clinical case in which they come across. Nursing competence is the capability to operate and embody the knowledge, skills, values and experiences through and acquired during practice (6). Nursing credentials comprise the body of knowledge, skills, attitudes and ethics which nurses must possess to give safe and quality care to patients (7).

Nursing competence is a complex integration of professional judgment, values and attitudes, and skills. Therefore, a system thinking approach is imperative to the profession. In nursing practice, they are expected to use knowledge and skills and modify them to the circumstances (8). In disaster situations, nurses lack the knowledge and skills to understand, apply, analyze, synthesize, evaluate, and make sound clinical decisions. There is a need to build on the disaster health systems curriculum and develop critical thinking in undergraduates regarding disasters and triage in order to prevent death and to offer effective care in emergencies (9). To optimize the learning experience and basic skills nursing facilities, students require adequate pre-training. Nursing students should be properly prepared through their courses to ensure effective practice at their profession upon completion of their studies.

This study aimed to evaluate the influence of scenario-based learning methods regarding simple triage and rapid treatment on nursing students' competencies.

MATERIALS AND METHODS

Research Hypothesis: The present study hypothesized that the application of a scenario-based learning program would enhance the level of competencies of nursing students regarding simple triage and rapid treatment.

Research design: A quasi-experimental design was used to achieve the study's objectives.

Setting: The study was carried out in the Nursing Faculty's learning and simulation labs at the Modern University for Technology and Information.

Subjects: This study recruited a convenience sample. There were 120 students: 82 males and 68 females.

Study tools:

I. Tool I: Nursing Students' assessment questionnaire:

It was developed by the researcher to assess nursing students' knowledge regarding START triage.

It included two parts as follows:

Part (1): Demographic characteristics of nursing students include age, gender, nationality, level of education, working status, previous clinical experience in the ER department, and previous education or training courses regards to triage.

Part (2): This part was developed by the researcher after reviewing the relevant literature (Bazyar et al., 2019; Purwadi et al., 2020). It included knowledge regarding triage, such as multi-causality situations, primary survey and rapid assessment, patient categorization, START triage approach, and patient tagging.

Scoring System:

The total knowledge assessment consisted of 58 multiple-choice questions (MCQ). Each accurate response received one point, while erroneous answers received zero points. The total score of knowledge was 58, allocated as follows: Section I: Knowledge regarding triage (17 questions) for 17 scores.

Section II: Triage step: Rapid Initial Assessment (19 questions) for 19 scores.

Section III: Triage step: Assigning Triage Categories (15 questions) for 15 scores.

Section IV: Triage step: Treatment and Disposition (7 questions) for 7 scores.

Based on statistical analysis, the knowledge level was divided into three categories: poor, moderate, and good.

- < 50 % considered poor knowledge (scores less than 29)
- 50 % - < 75% considered moderate knowledge (scores from 29 to 43.5)
- ≥ 75 % considered good knowledge (scores from 43.5 to 58)

II. Tool II: Nursing students' observational practice checklist:

The researcher created this specific tool after a thorough analysis of the body of literature relevant to the triage of casualties in healthcare settings (START, 2023; Bhalla et al., 2015). With this tool, the researcher seeks to determine nursing students' competencies regarding the application of the START Triage in a multiple casualty situation.

The nursing students' observational practice checklist was made up of 22 steps. For every step a nursing student performed, they received 1 score. For each step they did not perform, they received 0 scores. The scores achieved from all the practice steps were then summed and converted to a percentage score.

There was some statistical analysis done to determine the levels of practice, and this was graded as competent and incompetent, and this was defined as follows:

- levels of practice at < 90% were graded as incompetent (scores < 20.7).
- levels of practice at ≥ 90 % were graded as competent (scores ≥ 20.7).

Tool III: Assessment of nursing students' attitudes regarding triage:

By reading relevant literature [9], the researcher was able to prepare this tool to assess the attitudes of students and make decisions regarding the use of their practical and clinical judgment in a multi-casualty situation. The respondents self-evaluated the extent of their agreement within a 5 point Likert-type rating scale ranging from 1 (strongly disagree) to 5 (strongly agree) on each of the 24 items.

Scores Concerning the Attitudes of Nursing Students Regarding Triage

The anticipated total score for nursing students' attitudes concerning triage is in the range of 24 to 120.

Nursing students' attitudes measured via statistics were classified as follows:

- Min=<50%(negative attitude. score range 24<60).
- 50%<75% neutral attitude. score range 60<90).
- ≥ 75 % positive attitude. score range 90 to 120).

Administrative Design:

Communication requesting permission to begin the study was undertaken with the Faculty of Nursing's Dean at Modern University for Technology and Information via a formal letter outlining the study's purpose. Before the start of the study, another formal letter was sent to the Head of the Critical Care and Emergency Nursing Practice Course.

The pilot study was conducted with 15 students, which is 10% of the total students from whom sample was taken. This was to determine the clarity, applicability, feasibility, and usefulness of the tools employed. The sample included the participants from the pilot study.

Field Work:

1. The period of time allocated for the collection of data for this study was from March 2024 to April 2024.
2. The participants for the study were selected from a total of 150 students who registered for the Critical Care and Emergency Nursing Practice course in Spring 2024.
3. Consent was obtained from nursing students prior to the commencement of the exercise in order to start the simulation practice.

Approach:

Assessment phase:

Using suitable recent literature, the researcher created scenario-based learning materials on simple triage. These materials were crafted in such a manner to help prepare nursing students testify for competency-related queries. Students were requested to complete on the specified date Tool I (Nursing Students' assessment questionnaire) as well as Tool III (Nursing students' attitude assessment triage).

Then (Tool II) Nursing students' observational practice checklist was used after dividing the students into 25 groups to be observed by the researcher during their practice. Each group consists of six students, with one student for each bed in the adult skills lab. Colored cards (Red, Yellow, Green, and Black) were provided beside each bed to be used by students. Every student was asked, once assigned to a bed, to register his name, group, and bed number on the observational checklist and give it back to the researcher. Then scenarios were distributed to each student, and the students were asked to assign a color beside the manikin after reading the scenario, while the researcher observed the practice using (Tool II) Nursing students' observational practice checklist.

Afterwards, the researcher prepares the lab for the next group by changing the scenarios and assembling the cards together to be used again by the next group of students. Time spent for every group was five minutes of practice by the student and two minutes of preparation of the lab for the next group of students by the researcher. Total Time spent in the practice was three hours. No feedback was provided to students regarding their performance.

Implementation phase

The students attended a lecture for two hours in the form of a Microsoft PowerPoint Presentation about START Triage. The lecture included the definition of triage, types of triages, the START triage algorithm, primary survey, and patient categorization by the START triage. Demonstration for the practice part was started by displaying a video showing how the START triage is performed. Then the researcher demonstrated START triage, and students' questions were answered. At the end, every student was asked to practice the START triage algorithm in different scenarios as a re-demonstration of the START triage algorithm.

Evaluation Phase

One week later, the students were asked again to fill out (Tool I) Nursing Students' assessment questionnaire and (Tool III) Nursing students' attitude assessment regarding triage in one and a half hours. Then (Tool II) Nursing students' observational practice checklist was used by the researcher to assess the students' practice, as well as what was done in the assessment phase. At the end of the day, the researcher stapled the three tools' documents (Tool I) Nursing Students' assessment questionnaire, (Tool II) Nursing students' observational

practice checklist, and (Tool III) Nursing students' attitude assessment regarding triage together to be statistically analyzed.

Statistical design

Once the data was obtained, the quantitative data was entered into an Excel spreadsheet created by the researcher. The spreadsheet document was then imported into Statistical Packages for the Social Sciences version 28.0 (SPSS®). Qualitative data (nominal and ordinal) were presented as frequencies and percentages. Quantitative data were expressed as means and standard deviations.

The significance of the results was considered as follows:

- P-values greater than 0.05 were considered non-significant (NS) differences.
- P-value of <0.05 was judged as a significant (S) difference.
- P-value of <0.001 was judged to be a highly significant (HS) difference.

RESULTS AND DISCUSSION

Table 1 shows that 98% of nursing students were between 20-25 years old, with a mean and standard deviation of 20.9 ± 2.16 , 54.7% were males, and 98.7% were Egyptians. In addition, 72% had a secondary level of education, and 75.3% didn't have work. Meanwhile, 97.3% had no experience, and 96.7% had no previous education regarding triage. Finally, all studied samples had no courses regarding triage.

Figure (1) presents that all studied nursing students (100%) had poor knowledge pre-implementation of the designed scenario-based learning. Then advanced to 49.3% had good knowledge of triage after the post-implementation of the designed scenario-based learning.

Figure (2) exhibits that all studied nursing students (100%) had an incompetent practice level at pre-implementation of the designed scenario-based learning, then progressed to 100% had competent practice level regarding total practice of triage post implementation of the designed scenario-based learning.

Figure (3) clarifies that only 2% had a positive attitude toward triage at pre-implementation of the designed scenario-based learning, then enhanced to 22% post-implementation of the designed scenario-based learning regarding triage.

Table 2 reveals that there was a highly statistically significant relation between total practice and total attitude. On the other hand, there was no significant relation between total knowledge and total practice regarding the designed scenario-based learning.

Discussion

Nursing educators face significant obstacles in fostering students' critical thinking skills and translating their knowledge into practical nursing actions. The main problem that requires unique approaches is the lack of learning opportunities for lectures and practical training for critical care nursing students. Numerous studies have investigated alternative teaching and learning methods like problem-based learning in various nursing programs. Conversely, SBL research studies are insufficient in critical care nursing, especially in Egypt (10). The present study was conducted aiming at evaluating the influence of scenario-based learning methods regarding simple triage and rapid treatment on nursing students' competencies.

Demographic data of the nursing students under the present study

As regards to age of the studied nursing students, the findings of the current study indicated that most of the nursing students examined were within the age range of 20 to 25 years old, with a mean and standard deviation of 20.9 ± 2.16 . This might be attributed to the fact that the nursing students under study are second-year university students. This result was similar to (11), who reported that a high percentage of the nursing students studied were aged between 20 and 29 years, with a mean and standard deviation of 32.15 ± 7.47 years.

Concerning gender, the findings of this study indicated that more than half of the nursing students were male. The greater share of participants being males could be due to choosing nursing as an educational pathway to obtain a degree and a job. This corresponds to (12), where the participants were of equal number to males and females.

Further and as a result of collecting the data in Egypt, the majority of the nursing students were Egyptian, as the study sample had to be. The study also found that fewer than three quarters of the nursing students were of a secondary educational level and most of them had graduated from a technical secondary school.

This aligns with the current trend of students opting for technical education due to the variety of educational opportunities it provides. This result was supported by (Heidarzadeh et al., 2020), who stated that all the participants were high school graduates. However, no previous studies addressed the working status of undergraduate nursing students.

Pertaining to the level of education, this result was supported by (13) who announced that all the nursing students studied were high school students. No studies discussed this finding of working status for undergraduate nursing students.

Meanwhile, the findings of the current study indicated that the majority of nursing students studied had no experience or previous education regarding triage, respectively. This could be explained by the fact that the researched nursing students had a secondary level of education and had no work. Also, the nursing curriculum at a Modern University for Technology and Information (the location for the current study) does not include triage themes for second-year students; therefore, the studied nursing students had no prior triage education. This result was similar to (14), whose study revealed that the nursing students studied didn't have years of experience. Conversely, this result differed from (12), who indicated that over fifty percent of the nursing students investigated have clinical experience and courses related to triage.

Lastly, none of the nursing students have courses regarding triage. The nursing students are in their second year at university. International trauma courses require that applicants be graduates of nursing schools rather than students. As a result, the nursing students had no prior education in triage. This finding aligned with (9), whose study found that all students (100%) did not receive any training courses about triage. In contrast, the (15) study discovered that more than half of the nursing students surveyed had taken triage courses.

Total level of knowledge regarding triage:

The current study results presented that all studied nursing students had poor knowledge pre-implementation of the designed scenario-based learning, then advanced to near half of them had good knowledge regarding triage post-implementation of the designed scenario-based learning. The researcher's explication that the poor level of knowledge pre-implementation of the Scenario-Based Learning was that most studied nursing students had a secondary school, and the minority had a technical institute degree, so they had never worked. They had no years of experience, also they didn't attend any courses or education related to START triage.

This result is in the same line as (15), who reported that the prior level of triage knowledge among the emergency nurses was low (3%) before training. Subsequently, the training led to a preliminary enhancement in knowledge. Also, the current study is conversely to (16), whose study discovered that over half of them possessed average knowledge about emergency triage.

Total level of practice regarding triage

The current study revealed that the implementation of the designed scenario-based learning showed a significant improvement in students' performance. The competent practice levels achieved post-intervention were attributed to various teaching methods, including videos, lectures, demonstrations, re-demonstrations, and the use of the START triage algorithm as part of the training. Conversely, the pre-intervention incompetence in practice could be linked to inadequate prior knowledge, insufficient training programs, and

lower educational levels, with three-quarters of participants having only secondary education. This shows the need for more education and scenario-based training in emergency nursing for the improvement of the triage and skill set.

This is affirmed by (17), who showed that the educational program had a significant impact on nurses, resulting in a positive change in triage skill set. This finding differs from (18), who in her study on triage knowledge and practice claimed that nurses had a reasonably high practice level even prior to the intervention.

General attitude towards triage:

Prior to the introduction of scenario-based learning, a small number of nursing students had a positive attitude towards triage. Following the intervention, this attitude improved noticeably, with a little over one-fifth of students showing a positive attitude. The researchers indicated that the low initial attitudes stemmed from a lack of education, given that the majority of students had only attained a secondary level of schooling, and a lack of experience and/or training in triage.

These findings align with (19), who stated that the investigated nurses had a positive attitude following the introduction of the knowledge-based program and one month later, with a highly statistically significant difference between pre, post, and follow up.

In contrast, (20) stated that nurses studied had better knowledge and attitude than before interactive training programs, with a statistically significant difference

Correlation between total knowledge, total practice, and total attitude regarding the designed scenario-based learning

The present study results showed that there was a positive correlation between total attitude & total practice. This might be ascribed to the success attained in practicing skills after executing the designed scenario-based learning, which represented the students' sense of competence (attitude).

This result was supported by (21), who showed that there was a positive correlation between total nurses' knowledge and their attitude, where $r=0.347$, as $P=0.014$. Also, this finding is in the same line as (22), who showed that there was a positive correlation between attitude and the level of nurses' practices regarding triage.

CONCLUSION

Based on the findings of the current study, it could be concluded that: The use of scenario-based learning for simple triage and rapid treatment proved effective and improved the competencies of nursing students. This underscores the essential importance of employing innovative teaching methods.

RECOMMENDATIONS

For nursing education:

- A training program ought to be implemented for nursing educators/faculty to help them understand how to create scenario-based education and utilize it as a teaching method.
- Continuous and proper training / educational programs for nursing educators to increase their tutoring abilities, skills, and knowledge of scenario-based education as an effective teaching method.

For further research:

- Conducting the study again with a larger sample from various universities in Egypt.
- Assess nursing educators' views, understanding, self-assurance, and contentment concerning scenario-based education as a method for teaching and assessment.
- Enhancement of upcoming training programs by recognizing the obstacles and requirements encountered by nursing students following disaster triage training.

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Table (1): Demographic data of nursing students studied (n=150).

Items	N	%
Age		
20 < 25	147	98
25< 30	3	2
Mean ±SD	20.9±2.16	
Gender		
Female	68	45.3
Male	82	54.7
Nationality		
Egyptian	148	98.7
Nigerian	2	1.3
Educational Level		
Secondary school	108	72
Technical Institute	42	28
Working Status		
ER	4	2.7
ICU	16	10.7
Department	17	11.3
Not working	113	75.3
Years of Experience in the ER department		
No experience	146	97.3
1 < 5	4	2.7
5 < 10	0	0
Previous education regarding triage		
Yes	5	3.3
No	145	96.7
Courses regarding triage.		
No courses	150	100
Basic Life Support	0	0
Advanced Cardiovascular Life Support	0	0
PHTLS	0	0
Advanced Trauma Care for Nurses	0	0
Trauma Care Training Program	0	0

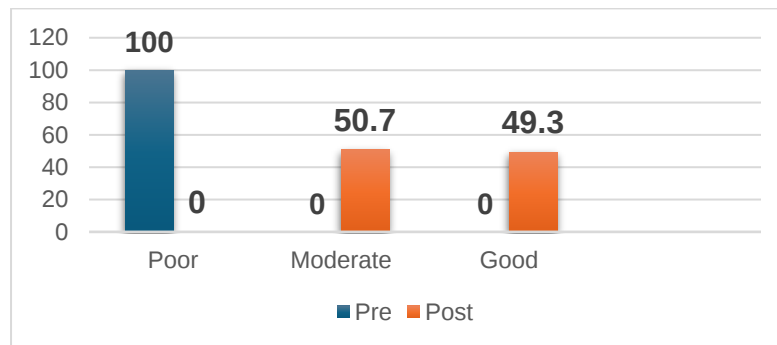


Figure 1: Total level of knowledge regarding triage

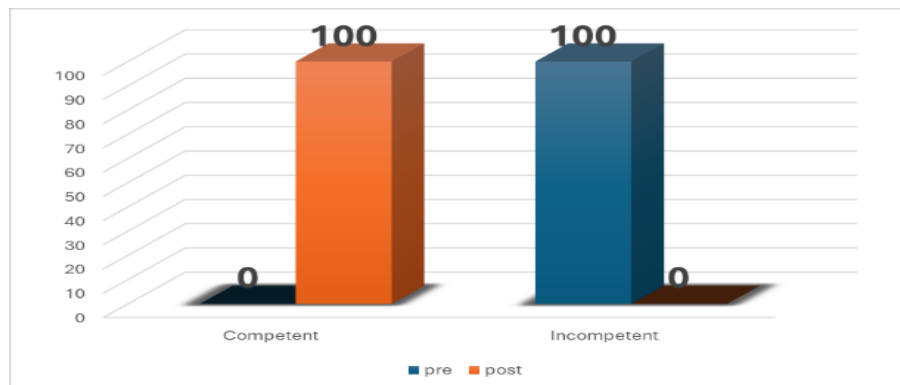


Figure 2: total practice regarding triage

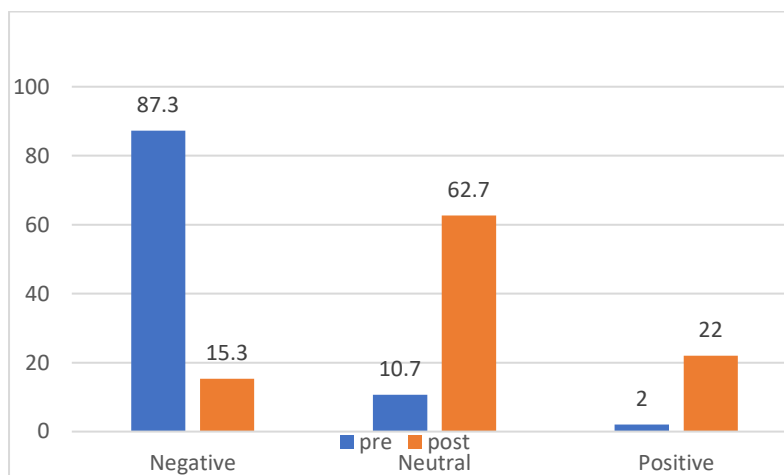


Figure (3) Total attitude regarding triage

Table (2): Correlation between total knowledge, total practice, and total attitude regarding Designed Scenario-Based Learning

Items	Total Practice (Post)				X2	P value
	Incompetent		Competent			
	N	%	N	%		
Total knowledge						
Poor	0	0	0	0	0.75	0.38
Moderate	2	33.3	74	51.4		
Good	4	66.7	70	48.6		
Total attitude						
Negative	6	100	17	11.8	34.51	0.0000
Neutral	0	0	94	65.3		

Positive	0	0	33	22.9		
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P>0.05=Not significant P≤0.05 Significant P≤0.001 Highly significant

Table (3): Correlation between total knowledge, total practice, and total attitude regarding the designed scenario-based learning.

Items	R	P value
Total knowledge & total practice	0.07	0.3
Total knowledge & total attitude	0.089	0.27
Total attitude & total practice	0.35	0.000**

P>0.05=Not significant P≤0.05 Significant P≤0.001 Highly significant

DISCLOSURE STATEMENT

Ethics approval and consent to participate: The scientific research ethical committee at the faculty of nursing at Ain Shams University provided research approval for this study with the number 25.05.717. The dean of the Faculty of Nursing / Modern University for Technology and Information approved the study's conduct before its commencement.

Consent for publication: The researcher described the study's objective and aim to the students who participated in the study, as well as the importance of protecting the anonymity and confidentiality of the subject data. Informed consent was obtained from all the nursing students who participated in this study. Study instruments were supplied to each student, and each subject's confidentiality was maintained throughout the data gathering process.

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AI usage: the authors declare not use AI.

Author's contribution: The authors confirm their contribution to the paper as follows: study conception and **Design:** Sally Saad; theoretical calculations and modeling: Amany Safwat; data analysis and validation: Dalia Amin. Draft manuscript preparation: Dina Maarouf. All authors reviewed the results and approved the final version of the manuscript.

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