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A quasi-experimental study to assess the effectiveness of self-instructional module on knowledge regarding triage system among staff nurses at selected hospital

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Abstract

Background: Emergency care is typically sought for serious acute medical conditions. Longer waiting times in the emergency department not only contribute to patients' dissatisfaction with the care received but may also result in delays in diagnosis and treatment. The objectives of the study are: -

1. To find out how well-versed the staff nurses were in the triage system before the exam.
2. To assess the efficacy of a self-study module teaching staff nurses about the triage system.
3. To ascertain the association between demographic characteristics and pre-test knowledge.

Materials and Methods: Using a suitable sampling technique, 500 participants were selected for the evaluation, which included a one-group pre-and post-test design. Using a structured knowledge questionnaire, staff nurses were given a SIM to help them learn more about the triage system. This was done as a pre-test. The post-test was completed after the seventh day. **Results:** Staff nurses do not possess sufficient expertise in the triage method, according to the report. Before the implementation of SIM, the average knowledge score was 13.53; however, after its implementation, there was a significant increase, nearly doubling to 27.20. A statistically significant difference exists between the knowledge scores, with a t-value of 1.671 and a p-value less than or equal to 0.05. Analyzing the data by area reveals that triage meaning, triage system, and triage nurse have a higher mean percentage of actual gain (56.25), whereas triage techniques have a lower one (18.60).

Keywords: Triage; Staff nurses; knowledge

Introduction:

When it comes to providing medical treatment, the emergency room is a crucial component. The triage technique is helping emergency rooms throughout the world treat more patients with a wide variety of

conditions, from relatively minor ones to those that might potentially be fatal [1-3]. To minimize the danger of serious complications or death caused by delays in providing prompt treatment, all patients who arrive at the emergency department must be

evaluated and given priority. The purpose of triage in an emergency room setting is to sort patients according to their clinical urgency [4-6]. In an ED, triage is used to sort patients according to their clinical urgency so that they can get the treatment they need quickly. All patients visiting the emergency department could experience delays and additional expenses if the triage decision is not made correctly [7,8]. You can bet that the vast majority of people who visit the emergency department are sick and in dire need of medical attention. As a result, seriously unwell individuals may have to wait longer to get emergency treatment [9,10]. As soon as a potentially life-threatening situation is detected, the triage nurse must assess the situation, make a decision, and act accordingly [11]. The triage nurse's decisions are crucial in starting emergency care. Prior research has demonstrated that nurses are under-informed when it comes to triaging patients. The healthcare system still hasn't figured this out. Nurses' triage knowledge could be up to date, which could lower the mortality rate caused by treatment-beginning delays [12]. As a result, the investigator was driven to conduct this study. To guarantee a high level of client service, this study aims to increase understanding of triage and how to improve successful triaging. To examine and understand the data from this study, descriptive and inferential statistics were employed.

Methods:

The optimal and most appropriate method of evaluation in this study was a one-group pre-test-post design. The term "evaluative research" refers to studies that use scientific methods and procedures to assess a treatment, policy, practice, or problem. The value of the activity is demonstrated through the use of analytical methods. The research followed a pre-experimental design, meaning it consisted of a single group taking a pre-and post-test. The purpose of this study was to determine whether or not staff nurses who participated in a SIM gained any new knowledge.

A one-group pre-test-post design (O1 X O2) was used to determine the efficacy of the experimental treatment in this investigation. On the same day that the SIM (X) was administered, a pre-test (O1) using a knowledge questionnaire was also administered.

The sample size was determined by power analysis with the formula

$$n = \frac{Z^2 p(1-p)}{d^2}$$

d²

There were 500 participants in the study. The hospital in Madhya Pradesh known as Amaltas Medical College served as the site of the study. The knowledge scores served as the dependent variable in this study, while the SIM on the triage system served as the independent variable. Studies have shown that nurses can improve their clinical competency with the help of SIM, and the program is specifically made for self-directed learning.

Members of the nursing staff make up the study's population. Registered nurses from the Amaltas Medical College hospital make up the study's sample. There are 500 participants in the study. Using the convenience sampling method, the researchers in this study maintained a steady sample size of registered nurses. A knowledge questionnaire and a SIM were the tools/instruments utilized in this investigation. Of the 650 registered nurses working in the hospital, 500 were deemed eligible to participate in the study and hence included in the final data set.

We collected the data from June 1, 2022, to January 12, 2023. The administration and nursing superintendent of the hospital gave their official written consent before any data was collected. The staff nurses were informed about the study's goal and given assurances that their names and responses would be confidential. This was done to ensure that they would cooperate and respond quickly. The staff members were asked to provide their informed permission. First, the pre-test knowledge

questionnaire was given, and then SIM was given. The post-test began 8 days after SIM was implemented and continued for another 30 days. For the statistical analysis, the SPSS-21 package was utilized.

Results:

To meet the inclusion requirements, a convenience sample of 500 registered nurses from various departments was used. Seventy-three percent of the samples fell between the 21–30 age bracket. While the majority of participants were female (74.19) and a minor group of samples (9.57.53%) belonged to the age group of 41-50. Staff nurses working at the Amaltas Medical College hospital who were both willing and able to participate in the study were considered eligible to participate, while temporary nurses and staff nurses who were unwilling to participate were considered to be exclusionary.

Table 1 displays the results of the staff nurses' knowledge questionnaire regarding the triage system. Approximately 47.31% of the respondents scored between 10 and 14 on the pre-test. Just 4.30 percent got scores between 5 and 9. In the 20–24 range, 8.61% of the participants scored. A third of those who took the survey received a score in the 15–19 range. While on the other hand, they all performed above average on the post-test. All of the students' post-test scores were much higher than their pre-test scores, with the difference being nearly twice as large. The results show that the staff nurses' knowledge scores increased after using SIM.

A SIM was prepared, which is a self-contained instructional material regarding the triage system, which is designed for use by the staff nurses.

The tabulated value ('t' (59)=1.71, $P \leq 0.005$) is significantly lower than the computed 't' value (5.37), hence, the study hypothesis is accepted at the 0.005 level of significance. Second Table This

proves that SIM successfully raised the level of triage system awareness among the nursing personnel.

When considering the results of the pre-test knowledge tests on the demographic variables that were part of this research. The staff nurses had an average pre-test knowledge score of 14.44. Subjects were categorized according to demographic criteria based on the number of times they scored above or below the mean knowledge score. The purpose of this research was to identify any correlations between participants' demographic information and their pre-test knowledge scores using a chi-square test. We found that demographic variables like age, prior knowledge of the triage system, and hospital policy were significantly associated with the pre-test knowledge score at the $p < 0.005$ level of significance. Gender, qualification, experience, and area of work were not significant in this study, so we accepted the research hypothesis.

Staff nurses' age (in years and region of employment) was found to be significantly correlated with their pre-test knowledge score. [Table 3] Both the computed table values of the working area (6.05) and the chi-square value (8.08) were much more than the table value (5.99).

Nursing staff demographics (gender, education level, years of experience, and familiarity with the triage system) were evaluated using the chi-square test. Tabled values are greater than the computed chi-square values. This study did not find these variables to be significant. The results of the demographic study support the acceptance of the null hypothesis. Of the seven demographic factors considered in this analysis, two stood out as particularly relevant: staff nurses' prior knowledge and hospital policy. As a result, we accept the research hypothesis and reject the null hypothesis.

Table 1
pre and post-test knowledge scores of staff nurses.

Knowledge	Pre-			Post		
	F	%	CF	F	%	CF
05-09	04	4.30	4.30	-	-	
10-14	44	47.31	51.61	-	-	
15-19	37	39.78	91.39	-	-	
20-24	8	8.61	100	41	44.09	44.09
25-29	-	-		48	51.61	95.7
30-34		-		4	4.30	100
	93	100	100	93	100	100

Maximum score=34

Table 2
Pre-test and post-test knowledge of staff nurses on Triage System.

Group	Mean knowledge score		Mean difference	Standard deviation	Df	't' Value
	Pre-test	Post-test				
Staff Nurses from selected hospitals.	2.87	3.23	0.36	.089	92	5.37*

t (92) = 1.99, P ≤ 0.005, * significant

Table 3

Association between pre-test knowledge scores and selected demographic variables

Sl. No.	Variables	χ^2	Df	Table value	Level of significance
1	Age	8.08	2	5.99	**
2	Gender	1.54	1	3.84	**
3	Qualification	1.95	3	7.82	**
4	Experience	4.46	3	7.82	**
5	Area of working	6.05	2	5.99	**
6	Previous Knowledge	2.74	1	3.84	*
7	Hospital Policy	8.53	4	9.49	*

P < 0.005 level of sig,

** not sig, * Significant

Discussion:

After administering a systematic knowledge questionnaire to check the staff nurses' prior understanding of the triage method, data was analyzed using descriptive statistics. There are a total of 34 questions on the knowledge, understanding, and application sections of the survey. There was no rhyme or reason for the arbitrary grading system; scores ranged from very good (28-34) to ordinary (17-23), mediocre (14-16), and extremely poor (0-14). Even though 46% of the samples had some basic understanding of the triage system, the data showed that the average pre-test knowledge score was 14.44. Various research corroborates these results. The time it takes to initially provide analgesics is reduced when staff nurses know triage procedures, according to an observational, multicenter, prospective, cohort study that was carried out in 20 emergency departments in

the US and Canada [13]. Staff nurses do have some grasp of the triage system, according to one study. The results of a prospective study on the knowledge of staff nurses regarding eTRIAGE at the University of Alberta's Department of Emergency Medicine and Faculty of Medicine and Dentistry were similar. When comparing study nurses and duty triage nurses who used eTRIAGE, the researchers found that both groups tended to gain more knowledge as they continued their education. That nurses are familiar with the triage system is a presumption [14].

Researchers observed that after completing the self-instructional module, participants' average post-test understanding of the triage system was 23.60, which was nearly double their pre-test score of 14.44. Compared to the estimated 't' value of 28.59, the tabular value of 't'(92)=1.99, P < 0.005 is significantly lower. Since this is the case, we can conclude that the research hypothesis is correct and

rule out the null. This demonstrates that the self-instructional module successfully improved the staff nurses' comprehension of the triage system. At the 0.05 level of significance, all of the regions with estimated 't' values were shown to be statistically significant for improving staff nurses' knowledge in the area-wise analysis. When comparing the samples' knowledge scores before and after the study, 90% achieved scores over 70% on the post-test. Multiple studies have shown that staff nurses can significantly increase their knowledge with the help of instructional or self-instructional materials. Researchers in Wardha City examined premenopausal women to determine the efficacy of a self-education program that addressed menopause symptoms and coping mechanisms. In the one group that went through the testing procedure, the average score before (2.84 ± 1.23) was higher than the average score after (17.56 ± 1.37), according to the data analysis.⁴ Compared to the average score (21.0) before the test, the average score after the triage system evaluation was nearly double (27.2). Each research demonstrates that SIM helps increase nurses' knowledge [15].

Results from the knowledge-selected variables Chi-square test indicate a statistically significant relationship between the pre-test knowledge score and factors such as prior knowledge and hospital policy on patient prioritization. Contrarily, the demographic characteristics of age, gender, degree, experience, and region of working were not significantly associated with the pre-test knowledge. At a significance level of 0.0005, the computed χ^2 values of prior knowledge (104.879) and hospital policy (63.951) are higher than the tabled value 55.76, thus rejecting the null hypothesis (H₀) that no association will exist with the chosen demographic variables and accepting the research hypothesis (H₂). Previous studies have shown that understanding a subset of demographic variables is crucial. Some studies have shown that there will be an association with specific variables.

Another study reviewed the emergency department triage system at Box Hill Hospital in Victoria, Australia, and found a direct correlation with outcomes including death, length of stay, intensive care unit (ICU) duration, and resource utilization [16]. St. Stephen's Hospital in Tis Hazari, Delhi, was the site of a prospective study that aimed to assess a severity-based triage scoring system. All factors and age had a significant association with survival status ($P < 0.001$), except for heart rate and breathing rate [17]. Age was not a major factor in pre-test knowledge, but prior knowledge and hospital policy to prioritize patients were. One disadvantage is that the study used purposive sampling approaches, which limit generalisability, and it was undertaken for a small representative group of the complete community in a designated context. No control over confounding factors, such as data provided by other health experts, the media, or ongoing education, was exercised by the investigator. The study's strongest point is that the nurses' knowledge was significantly enhanced by the SIM (self-instructional module).

A larger sample with various demographic features can be used to repeat a similar study, which is one suggestion for future research. This study's results will be useful for healthcare organizations looking to close the gap between classroom learning and real-world practice by implementing simulation methods. The study's tiny sample size prevents it from meeting the conditions for generalizing the findings, even though it has proved the impact of education programs.

Conclusion:

An important aspect of any emergency room is the triage process. fair triage system knowledge is necessary since it is difficult for a triage system to achieve 100% sensitivity and specificity. Therefore, it is crucial to strike a fair balance between over-and under-triage. The majority of registered nurses on staff have a rudimentary understanding of the triage method, but that's far from enough to implement it effectively. Therefore, staff nurses will be able to

learn more about the triage method with the help of a self-instructional module. Staff nurses' understanding of the triage system significantly improved following the implementation of the self-instructional module, according to post-test measures. Accordingly, the research found that staff nurses learned a lot about the triage system using a self-instructional program.

Ethical considerations:

Ethics code: 92/358995, 2023/05/21, from the Amaltas Institute of Nursing Sciences in Madhya Pradesh, was used to authorise the study. Each participant was informed that their participation was completely voluntary and that they were free to resign from the study at any moment after receiving an explanation of the study's objectives. Also, everyone who took the survey was told their answers would remain private.

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