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Effect of an Educational Program Regarding Patients 'Triage on Nurses' Knowledge and Skills at Emergency Department

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Abstract: Emergency department (ED) maintains immediate care for 24 h daily. There are increasing patient's numbers entering ED with different diseases with unknown severity, urgency and definite diagnosis. Thus, this study aimed to evaluate effect of an educational program regarding patients' triage on nurses' knowledge and skills at emergency department. A quasi-experimental design with pre-post assessment was carried out on 52 nurses working in emergency departments (27 at Al-Amery and 25 at Alzohor hospital) by using structured knowledge questionnaire and observation checklist for primary assessment of triage. *Results*: Display that more than two-thirds of them were the ages of 30 years or more. Regarding to level of education, it was observed that less than two-thirds of the study group had university education, while (3.8%) of them only had a secondary education. There was marked improvement in total knowledge and skills pre and posttest and decreased slightly in follow up phase. *Conclusion*: The current study concluded that total knowledge triage among studied nurses showed marked improvement, as it was 3.8% in pre and become 98.1% in posttest and the level decreased slightly to 96.2% in follow up phase. *Recommendation*: The emergency nurses are needed adequate knowledge and skills to increase their triage level in practice to improve quality of care and patient safety.

Key words: Educational program · Nurses · Knowledge · Skills · Triage

INTRODUCTION

Triage is the method of gathering important data about clients needed emergency care and starting making a decision way using a valid and suitable triage acuity designed system [1]. Nurses should learn and developed vital practices to coordinate and delegate care with effective manner. Triage process is related in a nurse's duty regardless of concern place. Triage involves a nurse's early assessment with ability of critical thinking and prioritizes clients care based on suitable decision-making [2].

Patients' triage is an essential function of team of Emergency Departments (ED) and it is a term used to describe the sorting or classification of patients for treatment priority in EDs [3]. The aim and function of triage first is to define patients with life-threatening or emergency situations who cannot wait to be seen and initiate appropriate interventions and then allocate the patient to the right area within the ED [4].

With the fundamental point of triage including more difficult decisions when a concern is life threatening and the scarce resource potential is lifesaving, it is easy to see ethical issues when the question is "Who will live when not everyone can live? [5].

Triage has two sub-items called hospital and pre-hospital triage. As, occur when a crowding of clients in hospitals emergency ward or various casualties and injured patients at the accident area, triage is the way of providing the maximum resources for the maximum patients number [6].

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Significance of the Study: Triage is the point at which emergency care begins. The Australian college for emergency medicine state a "suitably experienced and trained registered nurse or medical practitioners" should perform that triage. The purpose of triage is to prioritize clients and to identify patients who cannot wait. The triage nurse does a brief, focused assessment and assigns the clients a triage acuity level, for a medical screening and management. In 2008, 123.8 m visits to U.S. EDs, only 18% of theses visits were seen within 15 m, leaving the others in the waiting room [7]. Therefore, the purpose of this study was to improve nurse's knowledge and practice regarding patient's triage.

Study Aim: To evaluate the effect of applying educational program regarding patients' triage on nurses' knowledge and skills at emergency department

Hypothesis: The following hypothesis was formulated to achieve aim of current study:

There will be positive changes in nurses' knowledge and practice working at emergency department after implementing the educational program.

MATERIALS AND METHODS

Design: A quasi-experimental design with pre-post assessment was utilized.

Sample and Setting: 52 nurses working in emergency departments (27 at Al-Amery and 25 at Alzohor hospital).

Ethical Considerations: The ethics committee approved the study protocol. The researcher explained the purpose of the study to the subjects'. Each subject was assigned a code number and names were not connected to test scores by the investigator. Participants signed an informed consent form.

Research Instrument: It consisted of two tools developed by the researcher after reviewing the related literature.

Tool (1) Consisted of Two Parts:

Part (1): Demographic Data: The demographic data form consisted of questions regarding age, gender, grade, marital status and experience years and attendance training courses related to triage.

Part (2): Structured Knowledge Questionnaire: Based on clinical experience and a literature review, the investigator designed a questionnaire to examine nurses' knowledge pre and post program. The questionnaire included 29 question. The knowledge section items (open ended, multiple choice, true and false, match and complete) about patient triage and was scored in the range of zero (0) to fifty (29), A total of 29 questions measured knowledge in the questionnaire. This questionnaire part was tested for reliability by Alpha Cronbach's test. The alpha reliability of this part was = 0.81. Knowledge level was considered satisfactory (≥ 60%), unsatisfactory (<60%).

Tool (2): Observation Checklist for Primary Assessment of Triage: Composed of five steps about patient assessment during primary triage includes: circulation, airway, breathing, disability and exposure. Each question scoring was a maximum score of one (1) and minimum score of zero (0) giving a cumulative minimum score of zero (0) and maximum score of five steps was considered satisfactory (≥ 60%), unsatisfactory (< 60%).

Content Validity: It was assured by a Jury composed of seven expertises of medical surgical department staffs for clarity, complete, understanding and ease for application, based on their opinion modifications was changed

Pilot Study: Undertaken before starting the data-gathering phase. It was on 10 % (7) of subjects to test the feasibility and applicability of the first and second tools and to count the time needed to finish the tools based on the pilot study needed modifications done. They were excluded from the study.

Fieldwork Description: Field study was started from first day of January (2017) to the last day of June (2017). The study was passed through the following phases:

Assessment: Assessment of nurses' knowledge was done by using Tool (1) part (2). The implementation of the nursing program using teaching aids (pictures and handouts) according to schedule based on the contents of this program.

The researcher collected data related to nurses' demographic data using Tool (1) Part (1) and nurses' practice related to triage were assessed by using (Tool II) before and after implementing nursing program.

Implementation Phase: Initially studied subjects were classified to four groups (13) then each group was collected at room separately for about half-hrs. The investigator explained the aim and gave handout involving procedure steps about triage knowledge and practice. The program was clear and concise form using various teaching methods as lecture using data show. The nurses were instructed to observe and understand the researcher carefully during the lecture of triage because every one of them will separately answer all questions on the questionnaire in front of the researcher and the researcher will evaluate them. At the end of the researcher's lecture, nurses were asked about any unclear steps, which needed explanation before answering.

3 month after application of the program the nurses' evaluation was done, using the same technique used in first evaluation and the same tool.

Evaluation Phase: The researcher evaluated the participated nurses after implementing the nursing program using tool I and tool II immediately after the program and 3 month after the program implementation.

Administrative Design: A written permission obtained from the director of each hospital through an official formal letters from the dean of The Faculty of Nursing, Port Said University to carry out the study after explaining aim and significance of the study.

Statistical Analysis of the Data

Descriptive Statistics: Percentage, mean, mean percentage and standard deviation will be used to explain demographic variables and compute pretest, post and follow-up test knowledge scores.

Inferential Statistics: Student's t test was utilized for two bunches and one ANOVA (f) test was utilized to compare more than two bunches for nonstop quantitative variables. The distinction was considered critical at $p \leq 0.000$.

RESULTS

Table (1) shows that more than two-thirds of the study group (69.2%) were in the age of 30 years or more. Regarding to level of education, it was observed that more than two-thirds (69.2%) of the study group had university education, while 3.8 % of them only had a secondary education. In relation to experiences years, the table reveals that slightly more than half (53.8%) of the studied sample were less than 5 years. Eventually, the table explains that majority sector (96.2%) of the study group reported; that each had not attended any training courses regards triage.

Table 1: Socio Demographic characteristics of studied nurses (n=52)

	No	%
Age		
Less than 20 years	7	13.5
20-30	9	17.3
30 or more	36	69.2
Education		
Secondary	2	3.8
University	36	69.2
Others	14	26.9
Experience		
Less than 5 years	28	53.8
5 to less than 10	8	15.4
10 or more	16	30.8
Hospital department		
Emergency	44	84.6
Inpatient	8	15.4
Triage training course		
No	52	100.0
Yes	0	0.0
Disaster management course		
No	52	100.0
Yes	0	0.0

Table (2) shows that basic knowledge of triage. The table revealed marked improvement in all basic knowledge as definition, purpose, types, levels in post and follow tests than pre test

Table (3) shows that basic knowledge of triage. The table revealed marked improvement in all knowledge related to differences for triage types as pediatric and adults types in posttest than pre and decreased slightly in the follow up phase.

Table (4) shows that general knowledge of triage. The table revealed marked improvement in all knowledge related to triage items, stages, cases and places as pediatric and adult's types in posttest than pre and decreased slightly in the follow up phase.

Table (5) shows that basic knowledge of triage. the table revealed marked improvement in all skills related to assessment of airway, breathing, circulation, exposure and disability as pediatric and adults types in posttest and follow up phase with highly statistical significant differences between pre post and follow-up stage (p=<.05).

Table 2: Basic knowledge for triage among studied nurses (n=52)

	Satisfactory		Unsatisfactory	
	No	%	No	%
Definition				
Pre	6	11.5	46	88.5
Post	50	96.2	2	3.8
Follow	48	92.3	4	7.7
Purpose				
Pre	6	11.5	40	88.5
Post	51	98.1	1	1.9
Follow	49	94.2	3	5.8
Types				
Pre	2	3.8	50	96.2
Post	52	100.0	0	0.0
Follow	50	96.2	2	3.8
Number of levels				
Pre	6	11.5	46	88.5
Post	50	96.2	2	3.8
Follow	44	84.6	8	15.4
Priorities				
Pre	2	3.8	50	96.2
Post	50	96.2	2	3.8
Follow	48	92.3	4	7.7
Different levels				
Pre	0	0.0	52	100.0
Post	43	82.7	9	17.3
Follow	41	78.6	11	21.2

Table 3: Differences for triage types of studied nurses (n=52)

	Satisfactory		Unsatisfactory	
	No	%	No	%
Pediatric triage time				
Pre	20	38.5	32	61.5
Post	52	100.0	0	0.0
Follow	50	96.2	2	3.8
Telephone triage				
Pre	38	73.1	14	26.9
Post	52	100.0	0	0.0
Follow	50	96.2	2	3.8
Who apply it in emergency				
Pre	34	65.4	18	34.6
Post	52	100.0	0	0.0
Follow	50	96.2	2	3.8
Adult triage time				
Pre	2	3.8	50	96.2
Post	49	94.2	3	5.8
Follow	47	90.2	5	9.6

Table 4: General knowledge for triage characteristics of studied nurses (n=52)

	Satisfactory		Unsatisfactory	
	No	%	No	%
Triage items				
Pre	0	0.0	52	100.0
Post	48	92.3	4	7.7
Follow	46	88.5	6	11.5
Triage stages				
Pre	0	0.0	52	100.0
Post	49	94.3	3	5.8
Follow	47	88.5	5	9.6
Triage cases				
Pre	0	0.0	52	100.0
Post	50	96.2	2	3.8
Follow	47	90.4	5	9.6
Triage places				
Pre	0	0.0	52	100.0
Post	47	90.4	5	9.6
Follow	43	82.7	9	17.3

Table 5: Skills of triage of studied nurses (n=52)

	Pre		Post		Follow up		
	No	%	No	%	No	%	f
Circulation							
Undo	20	38.5	3	5.8	6	11.5	.000*
Uncompleted	6	11.5	0	0.0	0	0.0	
Completed	26	50.0	49	94.2	46	88.5	
Airway assessment							
Undo	39	75.0	3	5.8	3	5.8	.000*
Uncompleted	4	7.7	0	0.0	0	0.0	
Completed	9	17.3	49	94.2	49	94.2	
Breathing							
Undo	3	5.8	0	0.0	0	0.0	.000*
Uncompleted	9	17.4	0	0.0	1	1.9	
Completed	40	76.9	52	100.0	51	98.1	
Exposure							
Undo	13	25.0	3	5.8	5	9.6	.000*
Uncompleted	2	3.8	0	0.0	1	1.9	
Completed	37	71.2	49	94.2	46	88.5	
Disability							
Undo	20	38.5	0	0	0	0.0	.000*
Uncompleted	6	11.5	0	0	1	1.9	
Completed	26	50.0	52	100	51	98.1	

F test (ANOVA) with repeated measures *: Statistically significant at $p \leq 0.05$

Fig. (1) explains the total knowledge triage among studied nurses. The figure revealed marked improvement in total knowledge level as it was 3.8% in pre and become 98.1% in posttest and the level decreased slightly to 96.2% in follow up phase.

Fig. (2) mentioned the total skills level of triage among studied nurses. The figure revealed marked improvement in total skills level as it was 19.2% in pre and become 84.6% in posttest and the level decreased slightly to 76.9% in follow up phase.

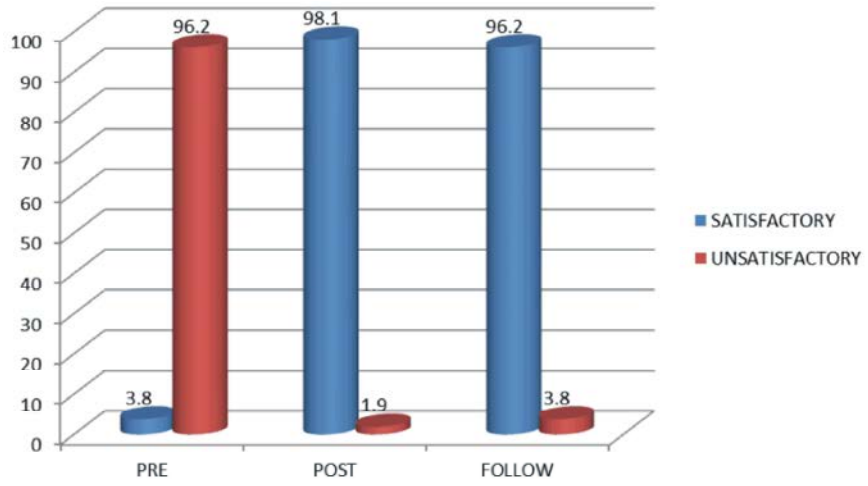

Fig. 1: Total knowledge level of studied nurses (n=52)

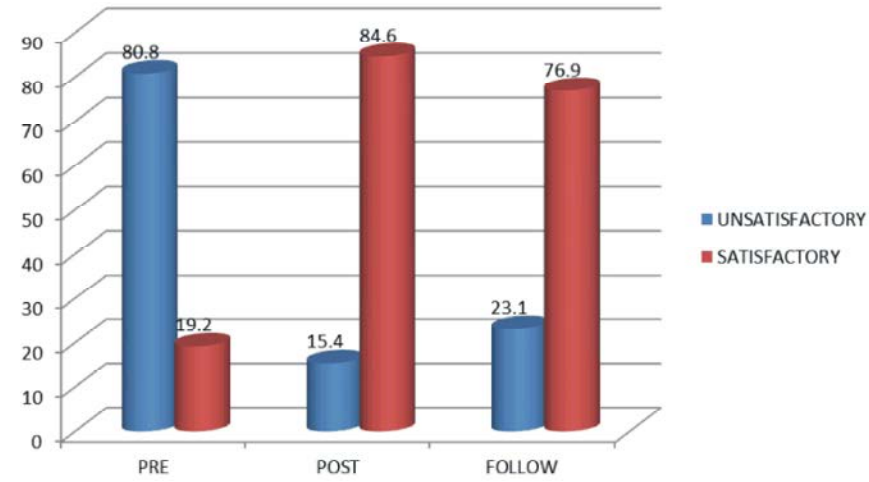

Fig. 2: total skills level of studied nurses (n=52)

Table 6: Relation between total knowledge of the study group with their socio- demographic data throughout the educational program (n=52)

	Total knowledge								
	Pre			Post			Follow		
	M	SD		M	SD		M	SD	Significant
Age (years)									
20-less than 30	2.875	3.138	t=.898	19.250	.85635	t=-0.440	19.000	1.21106	t=0.000
30 or more	2.277	1.666	P=..373	19.361	.83333	P=.662	19.000	1.12122	P=1.00
Education degree									
Secondary	3.166	1.572	F=2.049	1.333	.577	F=3.576	.0277	.842	F=.037
University	3.166	1.572	P=0.140	1.333	.577	P=0.036	.0277	.842	P=.964
Others	3.142	1.636		.928	.600		.0714	.876	
Experience									
Less than 5 years	.1160	.880	F=1.277	.0535	.336	F=0.682	1.000	.442	F=2.591
5-less than 10	1.160	.880	P=.288	.0535	.336	P=.510	1.000	.442	P=.085
10 years or more	.339	.688		.3035	.262		.3125	.345	

Table (6) puzzles out the relation between total knowledge of the study group and their socio-demographic data throughout the educational program. As exhibited in the table, there was no statistical significant association between socio- demographic data of the study group and their total knowledge score throughout the three levels of the educational program.

DISCUSSION

Triage putting the clients in the right place at the right time to take the right care level and appropriate resources allocation to meet medical needs of client. This hospital place allows for assignment of the caretaker to proper assessment and management place [8].

Study revealed marked improvement in total knowledge level as it was 3.8% in pre and become 98.1% in posttest and the level decreased slightly to 96.2% in follow up phase. These results agree with Aloyce *et al.* [3] assessment of nurse's knowledge and skills of triage amongst nurses working in the emergency centers in Dar es Salaam, Tanzania found deficit in nurses' knowledge and skills working in ECs of the surveyed national hospital and the district hospital in Dar es Salaam region.

Concerning to basic knowledge of triage, the results indicated that there were poor nurses' knowledge level preprogram implementation, but marked improvement in all basic knowledge as definition, purpose, types, levels in post and follow tests. The cause might be that the majority nurses working in emergency department did not have training course of triage knowledge and work experience of nurses might related to their knowledge.

This result is comparable to the study-conducted by Naidoo [9] an evaluation of the emergency care training workshops in the province of Kwa Zulu-Natal, South Africa mentioned that; subjects have improvement in knowledge and skills and the knowledge objective measure improved markedly (p value 0.001). Also, agree with Jordi *et al*. [10] who mentioned that nurse's accuracy and self-perceived ability found that; 69 nurses from four EDs involved in the study. They scored 59.6 % of the case study correctly.

Fathoni *et al*. [11] found knowledge and skills mean scores of subjects were 5.69 and 5.78 respectively, as a poor level. [12] Showed that knowledge level is very low, regarding a disaster face. The study carried out by Kilner [13] who mentioned that knowledge and performance of the level of physicians and nurses were equal and even far higher than the other staff.

The findings of the study revealed that; marked improvement in total skills level as it was 19.2% in pre and become 84.6. % in posttest and the level decreased slightly to 76.9% in follow up phase. These results agree with Pouraghaei *et al*. [14] who revealed that training courses regarding initiate triage procedure have a great influence on increasing EMS staff knowledge and performance. In addition, the total score of the test had improved from 22.02 to 28.54 after program.

In addition the results agree with Aghababaeian *et al*. [15] studying the effect of triage video training through START style on awareness level of emergency medical staffs and their performance. The knowledge and performance mean scores of clients pre training were 5.8 and 5.5, which were improved to 12.69 and 14.36, respectively.

There was no statistical significant association between socio- demographic data of the study group and their total knowledge score throughout the three levels of the educational program. These results disagree with Afaya *et al.* [16] who found correlation between nurses? knowledge about triage and working experience in the ED. As the working years in the ED increased nurses? knowledge level about triage improved. Also Duko *et al*. [17] found correlation between triage skill, working and triage experience and between triage knowledge, working, Educational and triage experience.

In addition to, agree with Kalantarimeibidi *et al*. [18] who found no significant relation between academic degree, marital status and gender of subjects and knowledge and practice average scores during 6 weeks post the educational workshop.

Finally, it seems that the education program positively affected the knowledge and skills of ED nurses regarding clients' triage. Therefore, expanding the theoretical and practical courses of education is vital to update the service presentation knowledge and quality.

CONCLUSIONS

The current study concluded that total knowledge triage among studied nurses showed marked improvement, as it was 3.8% in pre and become 98.1% in posttest and the level decreased slightly to 96.2% in follow up phase. Also marked improvement in total skills level as it was 19.2% in pre and become 84.6% in posttest and the level decreased slightly to 76.9% in follow up phase. In addition, no statistical significant association between socio- demographic data of the study group and their total knowledge score throughout the three levels of the educational program.

Recommendations: The findings recommended that:

- The emergency nurses needed proper knowledge and skills to improve their triage level in practice to improve quality of care and patient safety.
- The necessity to continue training and workshops about patient's triage especially for nurses working at ICU units.
- The importance of implementation of the emergency units triage system to have effective prioritization of clients that in turn will decrease the financial burden and the overcrowding concerns in EDs.
- All hospitals need to standard a triage system, which can be effectively used during emergencies and disasters.

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