KNOWLEDGE ON TRIAGE MANAGEMENT AMONG NURSES IN A TERTIARY LEVEL HOSPITAL OF KATHMANDU

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AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration among all authors. Author SB did the proposal writing, data collection, analysis and report writing. Author LR did the conceptualization of the topic, literature review, finalization of the instrument, report writing and article writing. Authors SM and TKC did the literature review, result interpretation and discussion. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Triage refers to the sorting of injured or sick people according to their need for emergency medical attention. Triage management refers to the process of rapidly identifying victims who not only have life-threatening injuries but also have best chance of survival. An accurate triage decision helps patients receive the emergency service at the most appropriate time. A descriptive study was carried out among 124 nurses in a tertiary level hospital, Kathmandu Nepal. The objective of the study was to find out the knowledge on triage management among the nurses in a tertiary level hospital. Data was collected through self-administered questionnaire by using non-probability purposive sampling technique. The data were analyzed by using Statistical Package for Social Science (SPSS) version 16 by descriptive statistics and inferential statistics. Findings of the study revealed that more than one-fourth (28.2%) of respondents had good level of knowledge and more than one-third (37.1%) of respondents had inadequate level of knowledge on triage management. This study showed significant association between respondents' level of knowledge, age group and employment status. It is concluded that nurses have insufficient knowledge related to triage management. Continue in-service training regarding triage management would be pivotal for updating knowledge and efficient management of patient in emergency situation.

Keywords: Knowledge; nurses; triage management.

1. INTRODUCTION

Triage is the process of sorting people based on their need for immediate medical treatment as compared to their chance of benefiting from such care. This process is utilized in the healthcare community to categorize patients based on the severity of their injuries and, by extension, the order in which multiple patients require care and monitoring [1]. The knowledge of triage has been identified as a key factor that influences the accuracy of triage decisions [2].

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Nurses are often the first medical personnel on-site after disaster strikes [3-5]. In these situations, where resources are scarce, nurses are called upon to take roles as first responder, direct care provider, and triage officer [6]. Knowledge about triage is a key tool in triage decision making so there is a need to improve nurses' knowledge level and skills in triaging [7].

Inadequate knowledge on triage results in delay providing emergency care that may increase the risk of avoidable demise and disabilities [2]. Proper knowledge on triage help for effective prioritization of patients that will lessen the financial burden and overcrowding problems in emergency departments during disaster situation therefore triage nurses serve as the vital person of the acute care system [8].

Low level of knowledge among nurses on triage makes difficult to provide dedicated emergency care with rapid diagnosis and timely treatment [9]. It was found that more than a quarted (26.8%) of participants were not familiar with term triage, 67.9% defined triage correctly , only 10.7% received knowledge about triage from university programs, and most of the participants (71.4%) did not know the appropriate approach to prioritize the patients. Shortage of qualified staff was the major challenge [10].

The majority of participants (63.6%) demonstrated low level of triage knowledge and almost a half (47.9%) of participants had low level of triage skills [11].

Knowledge increases the nurses' self-perceived readiness which could greatly affect their ability to respond during emergency situation [12]. Therefore knowledge on triage among nurses is a key tool in triage decision making [7].

2. METHODOLOGY

Descriptive cross-sectional research design was used to identify the level of knowledge on triage management among nurses. Total 124 nurses with more than one year experience who were working in Tribhuvan University Teaching Hospital (TUTH), Kathmandu was selected by non-probability purposive sampling technique. Data were collected by self-administered structured questionnaire. Ethical approval was obtained from Maharajgunj Nursing Campus, TUTH and respondents prior to data collection. Data was collected from November 3-17, 2019. The data were edited, organized, coded and entered into SPSS version 16. Findings were presented in descriptive and inferential statistics.

3. RESULTS

Table 1 shows that the majority (70.2%) of the respondents were within age group 21-30 years with mean and standard deviation 30.09± 7.316. Most (82.3%) of the respondents were graduated. Majority of the respondents were staff nurses (86.3%), employed on a contract basis (60.5%), working in surgical ward (37.1%) and working experience was 1 to 10 years (76.6%) mean and standard deviation of working experience was 7.77 ±7.32. Most of them (93.5%) felt the need for refresher training on triage.

Table 2 shows that regarding the meaning of disaster, most of the respondents (89.5%) answered sudden, calamitous event that causes human, material and environment losses. Most of the respondents (89.5%) responded that preparedness and response was phase of disaster. Regarding the meaning of triage, majority of the respondents (85.5%) responded that determining priority of patients' treatments based on severity of their conditions and triage involves in response phase (54.0%).

Table 3 shows that purposes of triage was "to set out treatment priorities" regarding to the purposes of triage. Most (89.5%) of the respondents respond on "emergency department triage" as the types of triage. On settings of triage, most (96.8%) of respondents responded on emergency department. Regarding situation of triage, most (93.5%) of the respondents responded on natural disaster.

Table 4 shows more than half (57.3%) and (66.1%) of the respondents were able to state the full form of MASS system and START system respectively. Majority (76.6%) of respondents had knowledge on full form of SALT system. More than half (58.9%) of the respondents were knowledgeable that their hospital use START triage system. In question "START triage is based on", most (81.5%) of the respondents responded on respiratory effort.

Table 5 depicts that most (81.5%) of the respondents responded 'save as many lives as possible" on principles of triage. Majority (79.8%) of respondents responded to correct response for highest prioritization and more than half (55.6%) responded to correct response on lowest prioritization. Regarding the pulse to be assessed during disaster situation only least (15.3%) of respondents respond to correct response.

Table 1. Socio-demographic characteristics of the respondents n=124

Characteristics	Number	Percentage
Age(in a completed years)		
21-30	87	70.2
31-40	24	19.4
41-50	10	8.1
51-60	3	2.4
Mean ± SD (age) = 30.09 ± 7.316		
Educational level		
PCL Nursing	18	14.5
Bachelor Level	102	82.3
Master Level	4	3.2
Nursing position		
Staff nurse	107	86.3
Nursing officer	17	13.7
Employment status		
Contract	75	60.5
Permanent	49	39.5
Working area		
Surgical	46	37.1
Medical	35	28.2
Orthopaedic	20	16.1
ENT	8	6.5
Eye	7	5.6
Burn	4	3.2
Psychiatric	4	3.2
Work experience		
1-10 years	95	76.6
11-20years	18	14.5
21-30years	9	7.3
31-40years	2	1.6
Mean ± SD= 7.77 ±7.32		
Staff development program		
Received triage training in this hospital	80	64.5
Felt need of refresher training on triage	116	93.5

Table 2. Respondents' knowledge on disaster, disaster management and meaning of triage n = 124

Variables	Number	Percentage
Meaning on Disaster*		
Sudden, calamitous event that causes human, material and environment losses	111	89.5
Catastrophic situation that needs extraordinary emergency interventions	61	49.2
Event that causes serious disruption of functioning of society	54	43.5
Event that exceed society's ability to cope using its own resources	50	40.3
Phases of Disaster Management*		
Preparedness and Response	111	89.5
Recovery and Rehabilitation	87	70.2
Prevention and Mitigation	71	57.3
Reconstruction	60	48.4
Meaning of Triage*		
Determining priority of patients' treatments based on severity of their conditions	106	85.5
Sorting patients according to clinical urgency	78	62.9
Refers to categorization, classification and prioritization of patients	74	59.7
Process of allocation of limited resources during a disaster	36	29.0

Variables	Number	Percentage
Triage involves in		
Response phase#	67	54.0
Preparedness phase	26	21.0
Mitigation phase	25	20.2
Recovery phase	6	4.8

Multiple Response #Correct Response

Table 3. Respondents' knowledge on purposes, types, settings and situations of triage n = 124

Variables*	Number	Percentage
Purposes of Triage		
To set out treatment priorities	**114**	**91.9**
To separate victims into categories	87	70.2
To manage scarce resources	52	41.9
To expedite care of noncritical case	51	41.1
Types of Triage		
Mass casualty triage	**116**	**93.5**
Emergency department triage	111	89.5
Multi casualty triage	68	54.8
Inpatient triage	51	41.1
Settings of Triage		
Emergency department	120	96.8
Disaster field	110	88.7
Intensive care unit	22	17.7
Operation theatre	20	16.1
Situations of Triage		
Natural disasters	116	93.5
Major public accidents	100	80.6
Medical emergencies	73	58.9
Pandemic outbreak	65	52.4

Multiple Responses

Table 4. Respondents' Knowledge regarding Systems of Triage n = 124

Variables	Number	Percentage
MASS system stands for		
Move, Assess, Sort, Send#	71	57.3
Manage, Arrange, Separate, Send	18	14.5
Manage, Assess, Sort, Send	18	14.5
Move, Arrange, Separate, Sort	17	13.7
START system stands for		
Simple Triage and Rapid Treatment#	82	66.1
Start Triage and Rapid Treatment	21	16.9
Simple Treatment and Rapid Transfer	17	13.7
Simple Triage and Rapid Transfer	4	3.2
SALT system stands for		
Sort, Assess, Lifesaving intervention, Treatment#	95	76.6
Sort, Arrange, Lifesaving intervention, Treatment	19	15.3
Send, Assess, Lifesaving intervention, Treatment	10	8.1
Triage system used in respondents' hospital		
START system#	73	58.9
MASS system	42	33.9
SAVE system	6	4.8
SALT system	3	2.4

Variables	Number	Percentage
START system is based on*		
Respiratory effort	101	81.5
Pulse/ perfusion	94	75.8
Mental status / consciousness level	75	60.5
Ability to follow direction and walk	53	42.7

*Multiple Response #Correct Response

Table 5. Respondents' knowledge regarding principles of triage n = 124

Variables	Number	Percentage
Principle of Triage*		
Save as many lives as possible	101	81.5
Putting the right patient in right place at right time	100	80.6
Employ the most efficient use of available resources	77	62.1
Greatest good for the greatest number of casualties	62	50.0
Highest Prioritization		
Cases that cannot survive without immediate treatment#	99	79.8
Cases stable for the moment but require urgent treatment	19	15.3
Walking wounds/ minor injuries	4	3.2
Expectant/ dead cases	2	1.6
Lowest Prioritization		
Expectant/ dead cases#	69	55.6
Walking wounds/ minor injuries	48	38.7
Cases that cannot survive without immediate treatment	6	4.8
Cases stable for the moment but require urgent treatment	1	.8
Pulse Assessed during Triage		
Carotid Pulses	104	83.9
Radial Pulses#	19	15.3
Femoral Pulses	1	.8

*Multiple Response #Correct Response

Table 6. Respondents' knowledge on colour coding n = 124

Variable	Number	Percentage
Sequence of colour coding (Red, Yellow, Green, Black)	119	96.0
Indication of colour coding		
Red coding for most serious and life threatening cases	123	99.2
Yellow Coding for serious but not life threatening cases	120	96.8
Green coding for Walking wounded	119	96.0
Black for Expectant / Dead cases	121	97.6
Advantages of Colour Coding*		
Alerts providers to priorities	100	80.6
Assure that appropriate people receive appropriate care	95	76.6
Efficient use of scarce resources	60	48.4
Provide tracking system	54	43.5

*Multiple Response #Correct Response

Table 7. Knowledge regarding triage process n = 124

Variables	Number	Percentage
Patient is not breathing		
Open the Airway, tag Red if s/he starts to breath**#**	83	66.9
Tag Red, hopefully that s/he will begin to breath shortly	17	13.7
Tag Black and rapidly go to next patient	14	11.3
Don't waste time with tagging process, proceed to next patient	10	8.1

Variables	Number	Percentage
Elderly passenger, pain on neck & shoulder, history of cardiac illness, respiration 28, pulse normal, oriented and walking		
Green#	72	58.1
Red	26	21.0
Yellow	25	20.2
Black	1	0.8
Head injury passenger no respiration after head tilt, pulse none, unconscious		
Tag black#	62	50.0
Tag red	61	49.2
Tag green	1	0.8
Driver with blood from ears, laceration injury in face, respiration less than 30, pulse absent and unconscious		
Tag red#	107	86.3
Tag black	9	7.3
Tag yellow	7	5.6
Tag green	1	0.8

#Correct Response

Table 8. Association between level of knowledge and selected variables n = 124

Variables	Level of Knowledge			Chi Square	Fisher's Exact	p value
	Good	**Moderate**	**Inadequate**			
	No. (%)	No. (%)	No. (%)			
Age group						
21-30	27 (31.0)	30 (34.5)	30 (34.5)		14.959	.008
31-40	2 (8.3)	13 (54.2)	9 (37.5)			
41-50	5 (50.0)	0 (0.0)	5 (50.0)			
51-60	1 (33.3)	0 (0.0)	2 (66.7)			
Educational Level						
PCL Level	4(22.2)	6(33.3)	8(44.4)		0.582	.771
≥ Bachelor	31(29.2)	37(39.4)	38(35.8)			
Nursing position						
Staff nurse	29(27.1)	41(38.3)	37(34.6)		4.998	.094
Nursing officer	6(35.3)	2(11.8)	9(52.9)			
Employment status						
Contract	26(34.7)	31(41.3)	18(24.0)	13.99		.001
Permanent	9(18.4)	12(24.5)	28(57.1)			
Working area						
Medical	10(28.6)	13(37.1)	12(34.3)	1.214		.876
Surgical	15(32.6)	14(30.4)	17(37.0)			
Others	10(23.2)	16(37.2)	17(39.0)			
Work experiences						
1-4	15(30.6)	19(38.8)	15(30.6)		2.846	.845
5-8	12(30.0)	12(30.0)	16(40.0)			
9-12	2(18.2)	5(18.2)	4(36.4)			
13 and above	6(25.0)	7(25.0)	11(45.8)			

p value <.05 denotes significant association

Table 6 shows most (96%) of the respondents responded to correct response on sequence of color coding. Most of respondents (99.2%) responded to correct response for red coding. For yellow color coding, most of the respondents' (96.8%) responded to the correct option. Most (96%) and (97.6%) of the respondents answered to correct response for indicate of green coding and black coding respectively. Regarding the advantages of color coding, most (80.6%) of the respondents responded on "alerts providers to priorities".

Table 7 depicts more than half (66.9%) of respondents responded opening the airway when the patient is not breathing. Other responses included green tag (by 58.1%) is used for elderly with normal vital signs, pain on neck & shoulder, history of cardiac illness, black tag (by 50%) for head injury passenger no respiration after head tilt, pulse none, unconscious and red tag (by 86.3%) for "driver with blood from ears, laceration injury in face, respiration less than 30, pulse absent and unconscious".

Table 8 shows level of knowledge on triage management is statistically significant with age group (p=0.008) and employment status (p=0.001) of the respondents.

4. DISCUSSION

With respect to the level of knowledge regarding meaning of triage, more than half (52.4%) of the respondents had inadequate level of knowledge and more than one fourth (29.0%) had good knowledge level on meaning of triage. On meaning of triage, most (85.5%) of respondents responded as "determining priority of patients' treatments based on severity of their conditions", more than half (62.9%) responded on sorting patients according to clinical urgency and (59.7%) referred to categorization, classification and prioritization of patients. In a study conducted by Afaya et al., (2019), more than half (61.5%) of respondents defined triage as "the process of assessment of a patient to determine the priority for medical care based on the clinical urgency of the patient's presenting condition" and less than half (45.0%) of respondents defined triage as "sorting up patients in the emergency units according to the severity of the patient's condition and providing medical care". In contrast to study by [13], majority (73.2%) of respondents had good level of knowledge on meaning of triage, while less than one third (26.8%) of respondents had inadequate level of knowledge on meaning of triage.

Concerning the knowledge regarding the purpose of triage, most (91.9%) of the respondents answered to set out treatment priorities, majority(70.2%) of respondents answered to separate victims into categories and less than half (41.9%) and (41.1%) of the respondents answered to manage scarce resources and to expedite care of noncritical case respectively. Soontorn et al. [14] stated that the purpose of triage is to prioritize incoming patients and to identify those who cannot wait to be seen.

Regarding the knowledge related to the types of triage, most of the respondents responded mass casualty triage (93.5%) and emergency department triage (89.5%). On the setting of triage, most of the respondents responded to emergency department (96.8%) and disaster field (88.7%). On situation of triage, most (93.5%) of the respondents responded it is done on natural disaster.

In this study, only few respondents (9.8%) received in-service education related to triage respectively. This study is inconsistent with a study conducted on Iran, where just over half (50.8%) of the respondents had received triage training [15].Whereas, findings of a study conducted among nurses by Afaya et al., [7], most (80.0%)of the respondents had received in-service education on triage. In contrast to this study conducted among nurses, just over half (50.8%) of the respondents had received triage training [16]. Only 10.7% received knowledge about triage from university programs and triage system was not provided by any academic program, nurses did not know the proper method for sorting patient [10]. There was improvement in knowledge regarding triage system (60%) after implementation of structured teaching program on triage. So, it is concluded that the structured teaching program on triage was effective to improve the knowledge of staff nurses [17].

The findings of this study shows that more than one-third (37.1%) respondents had inadequate knowledge on triage management. In contrast to this finding, a study done by Afaya et al. (2019) revealed more than half (62.6%) and Haghigh et al. [18], showed more than one-third (39.9%) of respondents had good knowledge level on triage. There are other disparate findings : In Ethiopia, 51.5% [9], and in Iran 87.7% [19,8] and 94.3% [20], of the respondents had inadequate knowledge on triage management.

This study showed significant association between knowledge level and age group. This finding is supported by Reisi et al. [19]. This study showed no association between level of knowledge and educational level. The current study is inconsistent with the study conducted by Duko et al. [9], and [13], and [8], which showed significant association between knowledge level and educational level.

Result of the current study demonstrated significant association between the level of knowledge on triage management and employment status. The current study is supported by similarly study in Iran, which showed significant association between the level of knowledge and employment status [19].

The finding of current study showed no association between the level of knowledge and work experiences. This finding is supported by a study

conducted in Iran, which showed no significant association between knowledge level and work experience [20]. This finding is also similar to that of Reisi et al. [19], which revealed no association between knowledge level and working experience. In contrast to these findings, study conducted by [13] revealed statistical association between the level of knowledge and years of experience. This finding is inconsistent with the study conducted on Ethiopia, which showed significant relationship between level of knowledge and working experience [9]. Also current study findings are not in accordance with a study done by Afaya et al. [7], which revealed association between knowledge about triage and working experience.

The variation of the study findings may be due to variation in exposure to in-service education, different setting and variation in health delivery system of different countries.

5. CONCLUSION

On the basis of the study findings, it is concluded that more than one-third of the nurses had inadequate level of knowledge. This study shows nurses' level of knowledge regarding triage management tend to be affected by their age and employment status of the nurses. So it is recommended that in-service training is needed regarding triage for the nurses.

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Self.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

The ethical permission was obtained from Tribhuvan University Teaching Hospital, Kathmandu

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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