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Perceptions and Knowledge on Triage of Nurses Workingin Emergency Departments of Hospitals in the Tamale Metropolis, Ghana.

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Abstract: *Triage is an essential function of staff in Emergency Department. The triage nurse is typically the first person a patient encounter when presenting for emergency care in the Emergency Department. Nurses' knowledge about triage is a key in triage decision making. Effective decision making can influence the health outcomes of presenting patients. The study aimed to assess the perceptions and knowledge of triage of nurses working in the Emergency Departments of hospitals in the Tamale Metropolis, Ghana. A quantitative descriptive cross-sectional study was conducted in the Emergency Department of hospitals in the Tamale metropolis. A sample of 65 nurses were selected from the Emergency Department of the three hospitals by using non-probability purposive sampling method.Data were collected by a self-administered questionnaire and analyzed using SPSS version IBM – 21 Results were analyzed by descriptive statistics and were represented in the form of tables, and figures. Out of the sixty-five (65) participants, 37(56.9%) were males Majority of the nurses 70.8% were of 21-30 years of age. Minimum age was 21years and maximum age was 41years. The study revealed that 62.6% of the respondents were knowledgeable about triage by correctly answering more than 50% of the questions, in the self-administered questionnaires. Majority of nurses (96%) in the Emergency Departments of the various hospitals had a very good perception about the importance of triage to the patient, care provider and the country at large.Current findings showed that as the nurses had increased years of working experience their triage knowledge level also improved. The current study findings revealed a little above average percent score (62.6%) about triage knowledge among nurses. To improve on this, workshops/in-service training should be carried out, followed by continuous professional development on a regular basis for nurses in the Emergency Departments.*

Key words: *Triage Knowledge, Triage Nurse, Working experience, Emergency Department.*

I. Introduction

Triage is an essential function of an Emergency Department (ED) and it is a term used to describe the sorting of patients for treatment priority in EDs [1]. The purpose and functionof triage is to first identify patients with life-threatening or emergency conditions who cannot wait to be seen and initiate appropriate interventions, and then allocate the patient to the right area within the ED [2]. The patient's first point of contact when presenting for emergency care in the ED is the triage nurse [3]. It is recognized that triage should be completed by a specifically trained and experienced registered nurse (RN) [4, 5] therefore clinical decisions made by triage nurses require complex cognitive process. The triage nurse must show the ability for critical thinking in environmentswhere available data are limited, incomplete or ambiguous [6]. Triage nurses' knowledge and experience have been cited as important factors in triage decision-making [3] in most tertiary hospitals globally. The triage nurse performs a brief, focused assessment and assigns the patient a triage acuity level, which is a proxy measure of how long the patient can safely wait for a medical examination and management [2]. Wrongful allocation of patients in the triage room by the triage nurse will adversely affect the outcome of clients who are admitted to the ED with severe medical/surgical conditions.

The number of patients arriving at EDs has increased over the past few years in developed high income countries but also in low income countries, partly because of self-referrals, resulting in overcrowded ED [7]. This raised a concern of the need for a system that prioritizes patients in the order of urgency [8, 9, 10]. Many hospitals in low-income countries lack a formal triage system [11] in their EDs. In low income countries, emergency care, including triage is often one of the weakest links in health systems as compared to developed countries; but if well-organized it can be life-saving and cost-effective [12]. Clinicians usually see the patients on a 'first-come-first-served' basis. There is often no ED and patients are seen in either the wards or the outpatient clinic when they arrive [13]. This practice does not create room for critical and emergency cases to be

managed immediately. Presently most hospitals have EDs which are always overcrowded. This high number of patients visiting the ED can have an impact on the quality of healthcare by channeling the resources intended for emergency cases to individuals who have potentially less urgent needs [14]. Therefore, there is an unanimity that triage is an important system in the ED that reduces waiting times and ensures that all patients visiting to ED receive the proper treatments [3].

Unfortunately, there are serious concerns about nurses' knowledge level about triage in the EDs [15]. A study in Australia indicated that 42% of the nurses had not been trained for triage and 14% also mentioned that although they had participated in the triage training courses, they did have the zeal to implement triage [16]. A study done by Ali, Taverner, Ghani, Kussor and Naz [17], showed that a large number of nurses (69%) hadpoor knowledge of triage as they correctly responded to less than 50% of the questions in self-administered questionnaires. Also,Fathoni, Sangchan and Songwathana [5], in their study found, triage knowledge among nurses at a low level. Nurses working in the emergency centres in Dar es Salaam, Tanzania, demonstrated significant deficits in knowledge and skills regarding triage ofpatientsin the ED [18]. The above mentioned studies suggested that triage is implemented in the hospitals yetnurse's knowledge about triage is limited.This should be a concern for hospital management boards and policy makers because the lack of knowledge may affect health care delivery in the EDs and can further affect patients that present with life threating conditions.

To enhance the triage skills and knowledge of nurses, continuing education and training courses related to triage and advanced management of medical emergencies are key aspects to improve quality care and patient safety [5]. Due to limited research within Ghana regarding triage, there is the need to assess the perception and triage knowledge of nurses working at the EDs of hospitals in the Tamale metropolis.

Objective: The present study aimed to assess the perception and knowledge of triage of nurses working in the Emergency Departments of hospitals in the Tamale Metropolis, Ghana.

II. Methodology

Study design and Instrument

A quantitative descriptive cross-sectional study was conducted within EDs of three government hospitals in the Tamale Metropolis. A multicenter structured questionnaire was developed by the researcher and was based on existing literature on triage in EDs and the advice of emergency specialists (nurses and doctors). The questionnaire consisted of 35 closed and open ended questions, covering the following; demographic data, triage knowledge level, waiting time limits, triage colors and nurses' perception about triage. The questionnaire was pre-tested with three ED nurses at TTH, which resulted in the revision of the questionnaire for more clarity. During the study these three ED nurses were excluded from the study in-order to prevent biasness because they had pre-answered the questionnaire and had clues about the knowledge assessment part of the instrument.

Sampling

Non-probability purposive sampling method was employed for the study due to the small sample size of 96 nurses in the three EDs of the various hospitals. The study participants were 65 nurses working in the EDs of the three hospitals. Twenty-four (24) nurses were recruited from the ED of TTH, 20 and 21 nurses were also recruited from EDs of Tamale Central Hospital (TCH) and Tamale West Hospital (TWH) respectively. The study included all registered and enrolled nurses who were working in the EDs of each selected hospitals and excluded nurses who were on leave (study, maternity and annual leave) during the data collection period and nurses that participated in the pilot study.

Data collection

Data were collected using a multicenter structured questionnaire. The structured questionnaire was developed by the researcher and was based on existing literature on triage in EDs and the advice of emergency specialist (nurses and doctors). After ethical clearance was obtained to conduct the study, permission was sought from the Nurse Managers of EDs of the various hospitals, the questionnaires were then administered to ED nurses that were willing to participate. The purpose of the study was explained, and a time frame of about two hours was allocated to each participant, making sure that participant never referred to any information that would assist them to answer the knowledge part of the questionnaire. They were also discouraged to discuss their responses to the questions among themselves so as to determine their individual level of knowledge. A respondent was considered knowledgeable to a respective knowledge question after a correct response and vice versa. And after the participants had finished answering the questionnaire, the researcher immediately collected the answered questionnaires and placed them in a sealed envelope. Questionnaires were administered in the morning and afternoon shifts, at the time in which participants would be less busy. Participants were given time to seek clarification pertaining answering the questionnaire. The questionnaires were administered for a period of four weeks due to the busy nature of the EDs.

Data analysis

The data collected were cleaned, coded and analyzed using Statistical Package for Social Sciences version 22 after exported data from Microsoft excel which was used for data entry. Descriptive statistics using percentages and frequencies were used to analyze the data. Content analysis was done for open ended questions, and all authors had to read over and over again to make sure what was transferred was exactly what participants reported.

Ethical consideration

Permission to conduct the study was obtained from TTH and the other two government hospitals respectively. Ethical clearance was obtained to conduct the study. Before engaging participants, the purpose of the study was explained to each study participant When participants agreed to participate in the study, they were asked to sign a written consent and a verbal consent was sought from them. Participants were assured of confidentiality and anonymity. Participants were also informed that they had the right to refuse to participate or withdraw from the study at any particular point during the data collection process without repercussion.

III. Results

The purpose of this study was to assess the perceptions and knowledge of triage of nurses working in the Emergency Departments of hospitals in the Tamale Metropolis, Ghana. The study involved 65 nurses working in the ED of various hospitals.

Demographic characteristics

Out of the sixty-five (65) participants, 37(56.9%) were males Majority of the nurses 70.8% were of 21-30 years of age. Minimum age was 21years and maximum age was 41years. With regards to nursing ranks, it was interesting to note that 21(32.8%) were staff nurses, whiles the majority were 22(33.8%) were senior staff nurses and above.in relation to the specialty areas of nurses, majority (87.7%) were registered general nurses with only 9.2% were emergency nurses. In relation to participants' education level, majority of the nurses 33(50.8%) were diploma degree holders. With the place of work of participants, 24 (36.9%) nurses were from Tamale Teaching Hospital, and the rest from Tamale Central Hospital, and Tamale West Hospital. Majority of nurses 33(50.7) had two or more years work experience at the ED of various hospitals, 30(46.1%) nurses had less than two years work experience at the ED. Most nurses 52(80%) at the ED had attended workshop/in-service training on triage but 13(20%) nurses had not attended any form of workshop/in-service training.

Table 1; Demographic characteristics

Variables	**Frequency (N)**	**Percentage (%)**
Age		
21-30	46	70.8
31-40	17	26.1
41-50	2	3.1
Gender		
Male	37	56.9
Female	28	43.1
Nursing ranks		
Enrolled nurse	22	33.8
Staff nurse	21	32.3
Senior staff nurse	11	16.9
Nursing officer	7	10.8
Senior nursing officer	3	4.6
Principal nursing officer	1	1.5
Specialty area		
Emergency nursing	6	9.2
Critical care	1	1.5
Med-surgical	57	87.7
Missing	1	1.5
Level of education		
Master's degree	-	-
Bachelor's degree	10	15.4
Diploma	33	50.8
Certificate	22	33.8
Place of work/hospital		
Tamale Teaching Hospital	24	36.9
Tamale Central Hospital	20	30.8
Tamale West Hospital	21	32.3
Working experience at ED		

Less than one year	17	26.2
One year	13	20.0
Two years	17	26.2
Three years	11	16.9
Four years and more	5	7.7
Missing	2	3.1
Attended workshop/in-service on triage		
Yes	52	80
No	13	20
If yes how many times?		
None	13	20
Once	31	47.8
Twice	14	21.5
Thrice	6	9.2
Four times	1	1.5

Nurses knowledge level about triage in the ED

Nurses knowledge level of triage was assessed using the South African Triage Scale (SATS), Nursing were made to define or explain what triage correctly", identifying triage colors and it significance", "relating Triage Early Warning Sign and the waiting time" at the ED according to SATS.

Table 2 Triage knowledge level of ED nurses.

Variable /items	**Knowledgeable**	**Not knowledgeable**
What is triage?	40(61.5%)	25(38.5%)
Triage colors indications	46(70.8%)	21(29.2%)
TEWS/waiting time limits	36(55.4%)	29(44.6%)

With respect to assessing nurses' knowledge level about triage system in the ED, most nurses 40(61.5%) were able to define triage correctly, some defined triage as "*the process of assessment of a patient on arrival to the ED to determine the priority for medical care based on the clinical urgency of the patient's presenting condition"*. Most nurses (45%) also defined triage as "*sorting up patients in the emergency units according to the severity of the patient's condition and providing medical care".* The nurses used some key words (prioritizing, sorting, categorizing and allocating) in defining triage. Majority of the study participants 46(70.8%) had very good knowledge level about triaging colors as defined by the South African Triage Scale; they were able to relate the condition or state of the patient to the triage colors after assessment. Also considering triage waiting time and TEWS at the ED, 36(55.4%) of nurses had adequate knowledge by relating TEWS with the patients waiting time limit at the ED according to SATS. The overall level of knowledge about triage among nurses in the EDbased on the South African Triage Scale was 62.6% in the three hospitals used for the study within the Tamale Metropolis. The overall knowledge level of nurses about triage was based on nurses "defining triage correctly", "identifying triage colors and its significance", "relating TEWS and the waiting time" at the ED according to SATS. The table 2 above represents nurses' knowledge level about triage.

Nurses perception about triage system in the ED

Nurses' perceptions abouttriage systems in the EDs of the three government hospitals within the Tamale Metropolis were based on multi-center questionnaire which was administered to the nurses. The findings revealed that 30(46.2%) of nurses perceived they had very good knowledge on triage, 24(36.9%) of nurses said they had quite good knowledge of triage whiles 10(15.4%) said they had reasonable knowledge. Also 65(100%) of nurses in the ED said triage in the ED was important to the patient whereas64(98.5%) of nurses also responded that triaging was important to the care provider (nurses, doctors, porters, emergency technicians). The majority of nurses 55(84.6%) had the perception that triage was important to the country but minority 10(15.4%) could not tell whether triage was important or not.

Majority of nurses (92.3%) said triage system should not only be implemented in ED but also in the other departments of the hospital. A higher number of nurses 62(95.5%) agreed and strongly agreed that nurses at ED should undergo training/workshops on triage.Most nurses (92.4%) agreed and strongly agreed that sufficient content about triaging should be integrated in the nursing curricula. When nurses were asked whether waiting time in the ED is a major source of patient dissatisfaction, majority of nurses 43(66.2%) agreed and strongly agreed, 12(18.4%) of nurses disagreed and strongly disagreed and the rest of the nurses remained neutral. The study participants 14(21.5%) agreed that, triage method should be known and applied by clinical nurse practitioners only but the majority 51(78.5%) of study participants disagreed.

Table 3 Working experience in relation with triage knowledge.

Working experience at ED	Frequency (N)	Knowledge level (%)
Less than one year	17	40%
One year	13	41%
Two years	17	62%
Three years	11	74%
Four years and more	5	80%
Missing	2	-

From the above table 3, nurses who worked for a year or less than a year scored below average of the knowledge level assessment questionnaire. Nurses who worked for two years had an average knowledge score of slightly above average (62%). Nurses that had three years and four or more years working experience had 74% and 80% respectively.

Figure 1: Working experience in relation with triage knowledge

IV. Discussion

This study involved a multicenter questionnaire based research study to assess the perception and knowledge level about triage among nurses in emergency department of the three government hospitals within the Tamale Metropolis. Among these government hospitals within the Tamale metropolis, only one of the hospitals had a formalized triage room staffed with triage nurses. The study revealed 89.2% of the nurses working in the EDs were without formal training in either emergency/trauma/critical/intensive care nursing. This high percentage may have a negative impact, as it is in these courses that training on triaging of patients is taught in detail. It has been found that lack of training on triaging has a correlation with inaccurate triage decisions as triage knowledge has been identified as a key cause that influences accuracy of triage decisions in the ED [3].

The current study findings showed 44.6% of nurses lacked knowledge on waiting time limits/TEWS. Extended waiting time can potentially result in unnecessary delays in rendering immediate emergency care and as a result, increase the risk of avoidable deaths and disabilities. Also dissatisfaction with healthcare delivery may arise as clients wait in the queue for excessive periods. The most important reason for performing triage in an emergency department is to make sure that each patient is treated in the order of clinical urgency and that the treatment is appropriate and timely [15, 19] without undue delays.

The study findings showed overall level of knowledge about triage among participants was a little above average (62.6%) in the three government hospitals in Tamale Metropolis. The overall knowledge level of nurses about triage was based on nurses" defining triage correctly", identifying triage colors and it significance", "relating TEWS and the waiting time" at the ED according to SATS. Similar knowledge scores about triage were observed with nurses in EDs of other countries. A study done by Aloyce, Leshabari and Brysiewicz on assessment of knowledge and skills of triage amongst nurses working in the emergency centres in Dar es Salaam, Tanzania showed 33%of the respondents were not knowledgeable about triage but 67% were knowledgeable about triage which is in accordance with the current study [1]. The current study also agrees with the findings ofMalekshahi and Mohammad-zadeh in 2004, where nurses' knowledge level about triage was also a little above average (53.9%) [20]; and the study of Goransson, Ehrenberg and Ehnfors, which showed participants' knowledge level was 57.7% [19]. In disparity to the current study findings, astudy done by Ali, Taverner, Ghani, Kussor, and Naz [17] revealed a large number of participants (69%) having poor knowledge as

they correctly answered less than 50% of the questions in the self-administered questionnaires. Also current findings are not in accordance with a study done by Marahaghi and Roudbari [14] which reported that nurses had little knowledge about the hospital triage; 39.94% of the responses to the knowledge level questions were correct in their study. They concluded that nurses are not equipped with the knowledge of triage in the hospitals in Iran. In a study by Abbasi, Nosrati, Nabipour and Emami [21] in 2004 showed that the knowledge level of the staff about triage and nuclear treatment was 39.7% which is not in accordance with the current findings. The possible reason for the differences could be due to the higher percentage of nurses (80%) at the ED of the various government hospitals in the Tamale metropolis had the opportunity to attend workshops/in-service training on triage. Also most nurses in the current generation have available access to internet where resources on triage could be accessed to enhance their knowledge on triage.

The study revealed 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. This increase in knowledge about triage could be due to the work exposure, also attending a lot of workshops/in-service training on triaging in the ED and also available internet resources on triage. Congruent with previous studies [5, 22, 23] working experience was correlated with triage skills/knowledge particularly for those who continued working at ED for more than five years, and those experienced emergency nurses had more abilities in triage skill than nurses with less years of working experience. A study done by Hicks, Merritt and Elstain [24 found that more years of experience increased the decision-making consistency in triage skill ($r = .42$, $p = .004$). In contrast to the current findings, Considine, Botti and Thomas [3] reviewed four studies which established that there was no significant association between experience and triage decision making in triage skill. The more experienced and less experienced emergency nurses could have the same ability to perform triage.

Majority of nurses (96%) had good perception about their personal knowledge level or understanding about triage in the ED but still emphasized that workshops/in-service training on triage should be organized on regular basis to enhance nurses' knowledge. Participants however still emphasized that sufficient content on triage should be integrated to the nursing curricula. Participants also responded that waiting time limits in the ED is a major source of patient dissatisfaction. Majority of study participants also indicated that triage was important to the patient, care provider and the country at large and therefore the need for continuous professional development on a regular basis of nurses in the EDs.

V. Limitation

The limitation of this study was that, not all participants did participate, some participants were on study, maternity, and annual leave respectively. And also because of the busy nature (dealing with emergency cases) of emergency departments most participants had no time to participate

VI. Conclusion

The study findings revealed that nurse's knowledge level about triage in the EDs of various government hospitals in the Tamale metropolis was a little above average score. As nurse's knowledge about triage is a key toolin triage decision making, there is the need to improve on nurse's knowledge level and skills in triaging at the ED, because little above average score of nurses' knowledge about triage is not impressive. To improve on the knowledge level, workshops/in-service training should be carried out, followed by continuous professional development on a regular basis for nurses in the EDs. Nurses in the EDs of the various hospitals should be encouraged to undergo training in emergency, critical care and trauma nursing, as this will go further to enhance their knowledge on triage which will further reduce mortalities in the EDs.

VII. Recommendation

Although the study findings revealed a little above average score in triage knowledge level, there were still deficits in the triaging knowledge and skills of nurses working in the EDs of the surveyed Hospitals in the Tamale metropolis. With these findings it is therefore imperative to establish formal unit-based triaging training programmes that will help to establish and improve emergency nurses' knowledge and skills on triaging in Tamale Metropolis Hospitals EDs

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