

Assessment of Knowledge, Skills and Preparedness of Nurses on Management of Mass Casualty in University of Maiduguri Teaching Hospital

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Abstract

This study aimed at assessing the knowledge, skills and preparedness of nurses on management of mass casualty in University of Maiduguri Teaching Hospital, Borno State, Nigeria. It was a descriptive survey study of 200 nurses selected by stratified random sampling technique from various wards/units of the hospital. Self-structured questionnaire was used to collect data from the nurses on the key aspects of the management of mass casualty. The instrument was pre-tested in Borno State Specialist Hospital and test retest correlation coefficient was 0.72. Permission was obtained from the ethical committee of the hospital, and unit Heads of the wards. The result revealed that, nurses in the University of Maiduguri Teaching Hospital have low knowledge but adequate skills, and was perceived to be psychologically ready for the management of critical mass casualty despite low knowledge. Development of a protocol and continuous education programmes for all working nurses was recommended to improve the level of preparedness in care of mass casualty.

Keywords

Assessment, Knowledge, Skills, Preparedness, Mass Casualty

1. Introduction

Disaster is a catastrophic event that often leads to great destruction, loss of lives, and properties. Whether the origin is natural or attributed to human causes, the outcomes can be devastating. Logue (2001) cited by Goodhue et al [1], defined disaster as an event that causes excessive morbidity and mortality in human lives. When an accident or disaster occurs involving large numbers of people, nurses are called upon to intervene, despite these many lives may be lost in critical mass casualty situations because resources may not

be mobilized efficiently. The challenge is, the more scarce the resources (material and human), the less efficient the organization and the ability of the victims to survive [2] [3]. It is paramount to state that, large scale disasters and local emergencies that disturb the normal delivery of health care to the community, temporary over strain the resources. In such situations nurses and other health care providers are expected to utilize their unique skills, abilities and understanding of the community environment to the betterment of the population by striving to deliver highest attainable level of care that the adverse circumstances allow [4] [5].

When the quantity and severity of injuries overwhelms the

operative capacity of health facilities, a different approach to medical treatment must be adopted. The principle of “first come, first treated,” which is applied in routine medical care, becomes inadequate in mass emergencies. Triage model becomes indispensable. This model consists of rapidly classifying the injured on the basis of the severity of their injuries and the likelihood of their survival with prompt medical intervention. Higher priority is granted to victims whose immediate or long-term prognosis can be dramatically affected by simple intensive care. Moribund patients who require a great deal of attention (with questionable benefit) have the lowest priority. Triage is the only approach that can provide maximum benefit to the greatest number of injured in a disaster situation [6] [7].

Research has shown that, adaptation and effective utilization of Triage model is predicated on knowledge, locally available skills and psychological readiness of the health care practitioner towards managing critical casualties [8]. The current security challenges (insurgence of Boko Haram) bedevilling Maiduguri and its environs results in high casualties. This leaves behind a great pressure on health care system and indeed health care professionals especially nurses who form a vast majority of the health care givers. This study examined the knowledge, skills and psychological preparedness of Nurses in University of Maiduguri Teaching Hospital (UMTH) on mass casualty management.

2. Methods and Materials

A non-experimental cross-sectional descriptive survey design was adopted for the study to enable the researchers describe nurses' preparedness on disaster management.

2.1. Study Setting

The research was conducted in University of Maiduguri Teaching Hospital (UMTH). The hospital is situated along Bama road, within Jere local government area of Borno state, north-eastern Nigeria. Borno state capital shares boundaries with three countries, Cameroon, Niger and Chad which are also witnessing terrorists' activities. UMTH is one of the tertiary health care institutions that serve as a referral centre for other peripheral hospitals from Adamawa, Taraba, Bauchi, Gombe, Yobe and Borno states. The region has been under emergency rule because of terrorist activities (Boko Haram) which had led to mass casualty, loss of lives and properties.

2.2. Sample and Sampling Technique

The population for this study consist of all nurses in UMTH. It is assumed that these sets of health professionals are vast in number and easily accessible to the researcher. A probability proportion to size sampling technique was adopted in this study to allocate the number of nurses to be selected per ward/unit and stratified random sampling was used to select 200 respondents from 330 nurses working in

University of Maiduguri Teaching Hospital. The 200 respondents were selected across various wards/units of the hospital to ensure equal represented from all the wards and units after the sample size was calculated using Yaro Yamen formula [9].

Using Yamens' formula to determine sample size

$$n = \frac{N}{1 + N(e)^2}$$

Where: n=sample size

N=total population

1= constant

e= alpha level of tolerance (0.05).

2.3. Instrumentation

The instrument for data collection was a self-developed and validated questionnaire. The instrument was pre-tested at Borno State Specialist Hospital using a test re-test method. Ten copies of the questionnaire were administered to the same nurses and repeated in a space of two weeks, the reliability coefficient of 0.72 was determined which made the instrument fit for use in the study. The questionnaire consists of four sections (section A – D). Section A elicited responses on the demographic data of the respondents. Section B with Multiple choice questions targeted knowledge of the respondents on critical casualty management. Score “1” was given for correct answer and “0” for incorrect answer. The total score was converted to percentage. The mean per cent for the correct and incorrect answers was taken, and further compared with McDonald's standard of learning outcome measured criteria. McDonald's standard of learning outcome measured criteria was used to categorize nurses, level of knowledge regarding critical casualty management. This set of criteria was developed in order to measure the actual performance of students' learning in the educational institution. This criterion is categorized into five groups [10].

Level of knowledge/practice	Composite percentage of scores
Very low	<60%
Low	60%-69.99%
Moderate	70%-79.99%
High	80%-89.99%
Very high	90%-100%

Section C dealt with the Skills on critical Casualty where respondents were asked to rate the three levels of skills ranging from 1 to 10. 1-3 = poor, 4-7 = good, 8-10 = excellent. Total scores obtained were converted into percentages and mean percentage was calculated. Section D focused on the psychological preparedness of the respondents as regards emotional readiness of nurses towards managing critical casualty.

2.4. Method of Data Collection

The researchers obtained approval from the research and ethical committee of UMTH. Consent was obtained from the respondents after explanation of the purpose and objective of the research. The researchers with the help of research

assistants then administered copies of the questionnaire directly to the respondents. After two hours, the instrument was retrieved, out of the 200 copies of the questionnaire administered; 100% were returned. The exercise lasted for four days (1-4th June, 2015). The identities of the respondents remained anonymous throughout the study period. The retrieved copies of the questionnaire and responses were treated with confidentiality after retrieval.

2.5. Data Analysis

Data collected was analysed manually using descriptive statistics of simple frequencies and percentages to answer research questions.

3. Results

Demographic Variables of the Respondents

Majority of the respondents were within the age bracket of 26-30 years. The mean age of respondents was 32 ± 7.9 years. Majority 81(40.5%), of respondents were nursing officers (NO). 51(25.5%) were senior nursing officers (SNO), 23(11.5%) were principal nursing officers (PNO), 20(10%) were assistant chief nursing officer (ACNO) and chief nursing officers (CNO) constitute 20(12.5%) of the total respondent. On working experience, 78(39%) of the nurses had 1-5 years working experience while 35(17.5%) had 6-12 years working experience, and 33(16.5%) had 13-18 years working experience. 31(15.5%) had 19-24 years working experience as well as 23(11.5%) of the respondents have more than 25 years working experience.

Table 1. Knowledge on Critical Casualty Management.

Variable	Correct Response f(%)	Incorrect Response f(%)
Cardiopulmonary resuscitation order	76(38)	124(62)
External Cardiac compression for minutes	63(31.5)	127(68.5)
Ratio of Breathing to compression during cardiopulmonary resuscitation.	139(69.5)	61(30.5)
What to do before doing mouth to mouth respiration.	157(78.5)	43(21.5)
Triage involves classifying patients	134(67)	66(33)
Mean percentage	56.9%	43.1%

The mean per cent of the correctly answered questions by the nurses as computed in table 1 was 56.9%. Comparing the mean per cent with McDonald's standard of learning outcome measured criteria;

Level of knowledge	Composite per cent scores
Very low	<60%
Low	60%-69.99%
Moderate	70%-79.99%
High	80%-89.99%
Very high	90%-100%

56.9% indicates very low knowledge of nurses on critical casualty management.

Table 2. Skills in Critical Casualty Management.

Variable	Poor skill (1-3) f(%)	Good skill (4-7) f(%)	Excellent skill (8-10) f(%)	Total
Emergency preparedness	38(19)	127(63.5)	35(17.5)	200(100)
Triage	61(30.5)	104(52)	35(17.5)	200(100)
Cardiopulmonary resuscitation	21(11.5)	101(50.5)	76(38)	200(100)
Air way Management	15(7.5)	94(47)	91(45.5)	200(100)
Setting intravenous lines	8(4)	76(38)	116(58)	200(100)
Barrier Nursing	21(10)	106(53)	73(37)	200(100)
Critical thinking problems solving skills	30(15)	114(57)	56(28)	200(100)
Mean Percentage	13.9%	51.6%	35.5%	

Table 2 showed that 13.9% of the respondents have poor skills, majority (51.6%) have good skills while 35.5% have excellent skills in management of critical casualty.

Table 3. Psychological Readiness of Nurses towards Managing Critical Casualties.

Variable	Frequency	Per cent (%)
Are you physically comfortable at work		
Yes	127	63.5
No	73	36.5
Total	200	100
Have you had promotions at when due.		
Yes	119	59.5
No	81	40.5
Total	200	100
How many weeks break do you take in a year?		
2-4 weeks	35	17.5
5-6 weeks	38	19
7-8 weeks	46	23
9-10 weeks	81	40.5
Total	200	100
Are entitle to casual leave from work?		
Yes	149	74.5
No	51	25.5
Total	200	100
How can you rate the relationship between you and your ward head?		
Cordial	171	85.5
Sour	29	14.5
Total	200	100

Table 3 shows 127(63.3%) of the respondents are physically comfortable at work, while 73(36.7%) are not comfortable. 119(59.5%) do had promotions when due, while 81(40.5%) do not even when they were due for promotion. 149(74.5%) said they are entitled to casual leave from work, while 51(25.5%) said otherwise. 35(17.5%) of nurses are entitle to 2-4 weeks annual leave in a year, 38(19.0%) had 5-6 weeks in a year, and 46(22.8%) said they had 7-8 weeks in a year while 81(40.5%) of nurse who are the majority said they had 9-10 weeks annual leave in a year. Majority 171(85.5%) of the respondents claimed to have a cordial relationship with their unit heads, while only few 29(14.5%) had a sour relationship with their leaders.

4. Discussion of Findings

Nursing is a profession that deals with human health and thus life. It therefore demands high professional knowledge for effective and efficient management of human health. In the course of the study it was revealed that nurses generally irrespective of their age, qualifications and years of experience had 60% composite scores indicating very low knowledge. This implies that long years of service do not translate significantly to improved knowledge of the participants on critical casualty management. Specifically, the respondents felt inadequately prepared for disaster handling. With less than 60% mean score on knowledge indicates the necessity to take more disaster management courses and drills to prepare themselves for disaster situations, despite all respondents being Registered Nurses with at least 5 years of work experience. Similar findings of unpreparedness among nurses in management of mass casualty were reported in previous studies elsewhere in China and north-central Nigeria [11] [12]. However, these findings are in contrast to Yin *et al* [13] and, Miller & Ferra [14] that reported high and good level of knowledge. The low level of knowledge observed on critical and mass casualty management may be attributed to lack of adequate training.

Generally, the respondents were perceived as competent in skills on critical casualty management. Only 13.9% of the respondents have poor skills, majority (51.6%) have good skills, while 35.5% have excellent skills in management of mass and critical casualty. Specifically, the nurses were perceived to be a little more competent in creative problem solving skills, in triaging, barrier nursing and participation in setting intravenous lines. This result aligned with that of Olchin & Kutz, [15] and Mitchell *et al* [16] who reported that nurses have adequate and good skills about triage, intravenous insertion, emergency management assessment and intervention skills. This competent skills observed among nurses in UMTH may probably be as a result of their long years of experience on the job.

Nurses in UMTH were perceived to be psychologically prepared to handle mass casualty as 63.5% of the respondents agreed to be physically comfortable at work. This result is supported by that of Yin *et al* [13] who reported in people's Republic of China that, nurses prepared for mass casualty care were those physically comfortable in their work place. Majority of nurse (59.5%) in UMTH had promotions at when due. The prompt promotion exercise may probably have being the motivating factor behind their psychological preparedness and as such act as an incentive for nurses to work harder and happily to ensure patient recovery. This assertion was supported by Hammad *et al* [17] and Chen *et al* [18] who identified that optimal performance of nurses at work is predicated by rewarded. Furthermore, this study revealed that 85.5% of the nurses were in cordial relationship with their leaders. Previous research had shown that good team leaders are very important in any organization as they are responsible for directing and monitoring the activities of their subordinates. A good team leader will create conducive

working environment for members of staff. This fact was supported by Hammad *et al* [17], who concluded that nurses feel comfortable, prepared and accept changes made by the leader working in the emergency department. Casual and annual leaves provide time for nurses to relax and have time to solve family issues and when they resume work, they are psychologically prepare to handle any case.

5. Implication for Nursing

Nurses form the majority within health care industry. The need to be fully integrated and involved in the achievement of managing critical casualty's victims by nurses cannot be overemphasized. Moving research findings into practice is important for the nursing profession as this could increase the standard of knowledge, skills and practice, improve quality of health care rendered to clients and prevent unnecessary waste of time and resources thus resulting into reduced cost of treatment. Also to manage disaster event or critical casualties' victims, clinical nurses need effective strategies for extracting relevant information.

6. Conclusion

Nurses in the University of Maiduguri Teaching Hospital have low knowledge but adequate skills, and was perceived to be psychologically ready for the management of critical mass casualty despite low knowledge. As disasters are a frequent occurrence, there is a global need for all healthcare workers to be aware and prepared in advance for their management. Locally, the experience of Boko Haram insurgency has alerted healthcare workers in Maiduguri to the importance of being prepared for any disaster that may strike.

Recommendations

Based on the findings of the research, the following recommendations were made:

1. Respondents did not feel adequately prepared for disaster but were willing to take continuing education programmes to prepare themselves. Hospital administrators should support the development of a protocol and provide continuing education programmes for all working nurses.
2. Nurse educators should incorporate disaster management elements in education programmes to ensure that all nurses are capable of contributing to immediate disaster response and management.
3. More nurses should be sponsored to specialize in mass casualty nursing.

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References

- [1] Goodhue CJ; Burke RV; Ferrer RR; Chokshi NK; Dorey F; Upperman JS (2012). willingness to respond in disaster: a paediatric nurse practioner national survey. *Journal of pediatric health care*. 26(4): 17-20; PMID2272617 USA.
- [2] Ihlenfeld, J. T. (2003). A primer on triage and mass casualty events. *Dimensions of Critical Care Nursing*, 22(5): 204-207.
- [3] Kilner, T. (2006). Triage decisions of pre-hospital emergency health care providers, using a multiple casualty scenario paper exercise. *Emergency Medicine Journal*, 19, 348-353.
- [4] Simon, R., & Teperman, S. (2009). The world trade centre attack: lessons for disaster management. *Critical Care*, 5, 318-320.
- [5] Lowe, D. K., Oh, G. R., Neely, K. W., & Peterson, C. G. (2009). Evaluation of injury mechanism as a criterion in trauma triage. *American Journal of Surgery*, 152(1): 6-10.
- [6] Hoey, G. A., & Schwab, C. W. (2004). Level I centre triage and mass casualties. *Clinical Orthopedics and Related Research*, 422, 23-29.
- [7] Risavi, B. L., Salen, P. N., Heller, M. B., & Arcona, S. (2007). A two-hour intervention using START improves pre-hospital triage of mass casualty incidents. *Pre hospital Emergency Care*, 5(2): 197-199.
- [8] Kilberg, L., Clemmer, T. P., Clawson, J. (2005). Effectiveness of implementing a trauma triage system on outcome: a prospective evaluation. *Journal of Trauma*. 10, 1493-1498.
- [9] Uzoagulu A. E (2011). Practical Guide to Writing Research Project Reports in Tertiary Institutions. Enugu, Cheston Limited, Nigeria. 53-55.
- [10] McDonald, M. E (2002). Systematic assessment of learning outcome: Developing multiple choice examinations. Sudbury MA: Jones and Bartett publishers. 220-222.
- [11] Fung, O. W. M, Loke A. Y & Lai, C. K. Y (2008). Disaster preparedness among Hong Kong nurses. *Journal of Advanced Nursing*. 62(6): 698-703. DOI: 10.1111/j.1365-2648.2008.04655.x
- [12] Ozoilo, K. N., Pam, I. C., Yiltok, S. J., Ramyil, A. V and Nwadiaro, H. C. (2013). Challenges of mass casualty: lesson learned from Jos crisis of 2001. *World journal of emergency surgery*. 8: 1749-1784.
- [13] Yin, H, He, H, Arbon, P, Zhu, J, Tan, J & Zhang, L (2012). Optimal qualification, staffing and scope of practice for first responder nurses in disaster. *Journal of Clinical Nursing*. 21(1-2): 264-271. DOI: 10.1111/j.1365-2702.2011.03790.x.
- [14] Miller, E. T; Ferra (2012), Disaster Preparedness priority. *Journal of the association of rehabilitation nurses*. 37 (3): 95-96.
- [15] Olchin, L. Krutz A. (2012). Nurses as first respondent in Mass casualty: Are you prepared? *Journal of trauma nursing*. 19 (2): 122-229.
- [16] Mitchell, ML, McKinnon, L, Aitken LM, Weber S, Birgan S, Sykes S (2016). Enhancing disaster preparedness of specialty on a nationalscale, Disaster prevention and management. 25(1): 11-26. <http://dx.doi.org/10.1108/DPM-02-2015-0026>
- [17] Hammad, K. S, Arbon, P, Gebbie, K & Hutton, A (2012). Nursing in the emergency department during a disaster: A review of the current literature, *Australian emergency Nursing Journal* AEN. 15(4): 235-244. doi:10.1016/j.aenj.2012.10.005.
- [18] Chen T. F, Chou, K R, Liao YM, Ho, CH, Chung, M. H, (2015). Constructive validity and reliability of the Chinese version of the disaster preparedness evaluation tool in Taiwan. *Journal of clinical nursing*. 24: 1132-1142. doi:10.1111/jocn.12721.