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RESEARCH ARTICLE

ASSESSING AWARENESS OF BASIC LIFE SUPPORT AMONG NURSING STAFF WORKING IN THE WARD (S) OF A LEADING TERTIARY CARE CENTER IN KOLKATA: A CROSS-SECTIONAL AUDIT

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Abstract

A profound understanding of BLS is crucial for nursing staff assigned to the general ward in a hospital. Consistently staying updated will enable early identification of sick patients, leading to better patient outcomes. Making regular audits and mandatory monitoring of nurses' knowledge of BLS will ensure enhanced quality of care.

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Introduction:-

Basic knowledge of emergency care is of utmost importance for nursing staff to effectively handle and respond to emergencies. Among the essential components of emergency care is Basic Life Support (BLS), which encompasses a range of vital actions. This includes the ability to swiftly recognize sudden cardiac arrest, promptly activate the emergency response systems, perform early cardiopulmonary resuscitation (CPR), and utilize an automated external defibrillator (AED) for rapid defibrillation. (1,2) A comprehensive understanding of basic cardiac life support knowledge and practices is crucial for healthcare providers as it directly contributes to reducing mortality rates and improving survival ratios. (1,2)

BLS serves as a basic level of medical care provided by healthcare workers, and courses are designed to train participants in promptly identifying life-threatening emergencies, delivering high-quality chest compressions, administering appropriate ventilations, and utilizing an AED at the earliest opportunity. Healthcare workers within a hospital setting are obligated to possess adequate knowledge and awareness of BLS and CPR. The provision of immediate and efficient CPR, built upon a solid foundation of knowledge and practical skills, holds significant importance in enhancing patient survival rates. (3-5)

Timely CPR and defibrillation within the first three to five minutes following a collapse have shown survival rates ranging from 49% to as high as 75%. (6) Notably, CPR has been proven to double or triple survival rates in witnessed sudden cardiac arrest cases. (7) Hence, the effective implementation of BLS is crucial for improving survival rates and overall outcomes. However, the attitude and level of knowledge among healthcare professionals vary worldwide. While the demand for BLS courses continues to increase in developed countries, routine BLS training is lacking in underdeveloped and developing nations. (8,9) For example, a recent survey conducted in Egypt revealed suboptimal and inadequate CPR knowledge among medical students and junior doctors, although the participants demonstrated positive attitudes and eagerness towards training. (10) Similar findings were reported by Saquib et al. in a cross-sectional study involving interns in Saudi Arabia. (11) Notably, the available literature is scarce concerning the level of BLS knowledge among nursing staff working in general medicine or surgical wards in India. Therefore, this audit aimed to evaluate the BLS knowledge of the nursing staff working at a tertiary care center in the western region of India. This assessment aimed to facilitate early recognition of critically ill patients in the wards and enhance their management, leading to improved clinical outcomes.

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Methods: -

Study Setting:

This study was carried out as a cross-sectional analytical audit at a distinguished hospital located in Kolkata, West Bengal. To ensure the anonymity of the institution, the name of the hospital is withheld.

Study Period:

The study was conducted over a period of 1 month (December 2022)

Participants:

The study included nursing staff members from various general wards, namely medicine, surgery, neurology, obstetrics and gynaecology, and pediatrics, within the designated center. Those nursing staff who expressed unwillingness to participate in the study or provided incomplete responses were excluded from the analysis.

Study design:

Data collection for this study involved the utilization of a self-administered questionnaire comprising three sections. The questionnaire utilized in this study was developed based on the content of the BLS eBook (2020), aiming to assess the level of awareness among participants.

The first section focused on gathering demographic and academic information, including age, gender, years of nursing experience, prior experience in performing BLS, and self-assessed knowledge regarding BLS and its updates. The second section consisted of ten objective questions primarily requiring "yes" or "no" responses, along with three additional objective questions, to assess participants' awareness of BLS. The third section aimed to evaluate participants' knowledge of BLS through a set of ten multiple-choice questions. This section covered the participant's initial response and adherence to BLS guidelines and CPR techniques when faced with urgent situations. Additionally, it assessed technical knowledge regarding BLS, including compression depth for adults and infants, compression rates, and other related aspects.

To encourage maximum participation, the study was conducted during the participants' regular work shifts. The nursing supervisors or in-charges actively participated in the survey to motivate the staff. Furthermore, prior permission was obtained from the nursing superintendent to conduct the study, and she approved a designated 10 to a 15-minute segment of the participants' work time to be allocated for questionnaire completion. While the participants completed the questionnaire, one of the authors of the study was present in the room to provide assistance and address any questions or concerns raised by the participants.

Statistical Analysis:

The data collected were entered into Microsoft Excel for Mac Version 16.73 and analysed accordingly. Categorical variables were reported as frequencies and percentages, whereas continuous variables were presented as means \pm standard deviations.

Ethical Considerations:

The audit was conducted after obtaining prior permission from the managing director, medical superintendent, and nursing superintendent of the hospital. It was conducted with the understanding that all data used in the analysis had been anonymized and de-identified to protect confidentiality. The authors of the study confirm that they have obtained the necessary consent forms from the participants.

Participants provided their consent for the publication of their sociodemographic data and results in the journal, with the understanding that all potentially identifying information had been removed to ensure confidentiality. To maintain privacy and data security, the collected data were accessible solely to the investigators and stored securely in an encrypted, password-protected Excel spreadsheet (Microsoft Corp., Redmond, WA). These measures were implemented to uphold privacy and maintain the confidentiality of the participants' information.

Results:-

A total of 132 nursing staff members participated in the audit, with 113 (85.6%) being female nurses. The mean age of the population was 24.96 (SD: 2.11) years. The majority of participants had completed a three-year diploma course in General Nurse-Midwifery (GNM) (n-101; 76.5%), followed by a four-year Bachelor's (n-23; 17.4%)

course. Surprisingly, only 22 (16.6%) had attended a BLS/(Advanced Cardiac Life Support) ACLS provider course. Most of the participants (n=38; 28.8%) had 1-2 years of nursing experience and were recruited from the medicine or surgical wards (n=108; 81.8%) of our hospital. Further demographic details can be found in Table 1.

Table 1:- Demographics characteristics, prior completion of Basic Life Support (BLS)/ Advance Cardiac Life Support (ACLS) programs, years of experience in the nursing field, and the distribution of staff from different wards.

Variables	Frequency 132 (n-%)
Age: (SD : Standard Deviation) years	24.96 (SD : 2.11) years
Male	19 (14.4)
Female	113 (85.6)
Auxiliary Nurse Midwifery – diploma course in Nursing (2 years)	5 (3.8)
General Nurse Midwifery - diploma course in Nursing (3 years)	101 (76.5)
Bachelor of Science in Nursing – 4 years course	23 (17.4)
Post Bachelor of Science in Nursing – 2 years course (after GNM)	3 (2.3)
<i>Previously trained in BLS/ACLS: 22 (16.6)</i>	
Within 1 year	13 (59.1)
1 year – 2 years	4 (18.2)
More than 2 years and not updated	5 (22.7)
<i>Nursing staff's level of experience</i>	
Less than 6 months	27 (20.5%)
6 months – 1 year	15 (11.4%)
1 year – 2 years	38 (28.8%)
2 years – 3 years	35 (26.5%)
3 years – 4 years	12 (9.1%)
4 years – 5 years	2 (1.5%)
More than 5 years	3 (2.2%)
<i>Allocation of nursing staff from different wards.</i>	
General surgery or medicine ward	108 (81.8)
Neurology ward	14 (10.6)
Obstetrics and gynecology ward	6 (4.5)
Pediatric ward	4 (3.1)

While most participants (n=110; 83.3%) claimed to be aware of cardiac massage and capable of performing it, it was surprising to find that only a few were confident enough to perform CPR when needed (n=16; 12.1%). Additionally, basic knowledge such as the time interval for administering Adrenaline injection was not known by the majority (n=12; 9.1%). On a positive note, most participants (n=121; 91.7%) were familiar with the code blue activation phone number at our center. Detailed findings are presented in Table 2.

Table 2:- Responses provided for the subjective type questions.

Questions	Correct response n (%)
Are you already aware of cardiac massage and able to perform it? Y/ N	110 (83.3)
Do you know the compression force (rate) for cardiac massage? Y/ N	110 (83.3)
Do you believe a lifeless person without breath and/or heartbeat can be saved? Y/N	71 (53.8)
Are you confident enough to perform CPR in case of need? Y/N	16 (12.1)
Are you aware that CPR should be initiated at the earliest for a better outcome? Y/N	118 (89.4)
What is the code blue telephone number of our hospital?	121 (91.7)
Are you aware of the contents of the crash trolley? Y/N	125 (94.7)
What are the two shockable rhythms?	74 (56.1)
What is the time interval between the administration of injection adrenaline?	12 (9.1)
What is the full form of CPR?	127 (96.2)

Table 3 displays the responses to the multiple-choice questions. It was observed that less than 50% of participants answered correctly to questions regarding their response to someone suddenly collapsing, being unresponsive with gasping sounds and no pulse (n-64; 48.5), as well as the appropriate actions during high-quality CPR on an adult (n-60; 45.4%) and the initial steps of using a defibrillator (n-33; 25.0%). However, it was encouraging to note that the majority understood the importance of early CPR (n-120; 90.9%), the role of a defibrillator (n-109; 82.6%), and the need to provide effective breaths (n-111; 84.1%) in a code blue scenario.

Table 3:- Responses provided for the multiple-choice questions and answers sourced from the 2020 BLS eBook.

Questions	Correct response n (%)
What ratio for compression to breath should be used for 1-rescuer infant CPR*? a. Give 5 compressions to 1 breath. b. Give 15 compressions to 2 breaths. c. Give 20 compressions to 2 breaths. d. Give 30 compressions to 2 breaths.	37 (28.0)
You witnessed someone suddenly collapse. The person is unresponsive, you hear gasping sounds, and there is no pulse. What should you do next? a. Call code blue/ help. b. Begin CPR even though gasping is normal breathing. c. Monitor the patient, consider gasping as normal breathing. d. Give rescue breaths, the gasps are not normal breathing.	64 (48.5)
Why is a defibrillator important? a. There is a 100% success rate. b. It is not important for cardiac arrest. c. It prevents rearrest from occurring. d. It can restore regular cardiac rhythm.	109 (82.6)
While performing high-quality CPR* on an adult, what action should you ensure is being accomplished? a. Allowing the chest to recoil to at least one inch. b. Maintaining a compression rate of 90-120/ minute. c. Placing hands on the upper one-third of the sternum. d. Compressing to a depth of at least two inches.	60 (45.4)
Which adult patients need high-quality CPR*? a. Has a pulse and is having trouble breathing. b. Has no pulse and no normal breathing. c. Has a strong pulse and is breathing. d. Unresponsive with low random blood sugar level.	120 (90.9)
How can you ensure that they are providing effective breaths when using a bag and mask device? (choices) a. Observing the chest rise with each breath. b. Always having O2 attached to the bag. c. Allowing air to release around the mask. d. Delivering breaths quickly and forcefully.	111 (84.1)
Which action is most likely to have a positive impact on a patient's survival? a. Performing high-quality CPR*. b. Checking the pulse frequently. c. Providing rescue breaths. d. Checking random blood sugar levels.	97 (73.5)
When the defibrillator arrives what is the first step for using it? a. Press the shock button. b. Apply the pads to the chest. c. Turn on the defibrillator. d. Clear the patient.	33 (25.0)
'Early defibrillation is a link to the adult chain of survival.' Why is it important to survival?	55 (41.7)

a. It provides normal respiration.	
b. It prevents respiratory arrest.	
c. It prevents cardiac arrest.	
d. It eliminates the abnormal rhythm.	
Why is allowing complete chest recoil important when performing high-quality CPR*?	
a. The rate of chest compression will increase.	79 (59.8)
b. It will reduce the risk of rib fractures.	
c. The heart will adequately refill between compressions.	
d. There will be a reduction in rescuer fatigue.	

CPR* : Cardio-Pulmonary Resuscitation

Discussion:-

Nurses play a critical role in the healthcare industry, actively engaging in patient care. (12) Regularly monitoring their competency in BLS is imperative to ensure their skills remain current and enhance patient outcomes. The audit results revealed mixed responses in both subjective and multiple-choice questionnaires. Specifically, the subjects exhibited limited knowledge regarding critical components of CPR, such as recognizing cardinal signs of arrest, assessing carotid pulse, changing compressors, determining the location of chest compressions, and understanding indications for defibrillation. While they demonstrated adequate awareness of certain aspects, such as calling for help and understanding the principles of high-quality CPR (rate, depth, and chest recoil), they lacked practical proficiency in implementing these skills. Basic aspects of CPR, such as the correct sequence of compressions and ventilations, were not consistently understood by the participants. Interestingly, age and years of experience were not correlated with higher scores, highlighting the necessity for regular BLS training among the senior staff as well. Surprisingly, a significant number of staff members were not certified in BLS/ACLS, suggesting the need for the recruitment department to take note and ensure that nursing candidates receive at least BLS training before commencing their jobs, with regular updates thereafter. Although BLS classes were regularly conducted by the emergency department, attendance and correct responses were lacking. The findings of this study align with previous research conducted in Bahrain, which reported a pass rate of only 15% (out of 200 subjects) in the CPR skills test, using a standard pass mark of 85.6%. (13) Furthermore, a recent study conducted in Botswana revealed poor CPR knowledge and skills among nurses working in various healthcare settings, even after a gap of more than 6 months following their initial CPR training. (14)

Limitations of this audit: The practical skills of basic life support were not evaluated. Additionally, a considerable number of nurses did not volunteer to participate in the study. To provide a more comprehensive analysis, it would have been beneficial to conduct a comparative study involving nurses from the emergency department and intensive care unit, as they are constantly exposed to critically ill patients and would have valuable insights to contribute.

Conclusion:-

The majority of the study population consisted of qualified GNM staff. However, only a few individuals in this cohort had received prior training in BLS or ACLS. Most of the nurses had 1-2 years or 2-3 years of experience. The majority of them lacked confidence in performing CPR when faced with a situation requiring it. Furthermore, their knowledge about certain crucial aspects was minimal, including the compression-to-breath ratio for 1-rescuer infant CPR, the use of defibrillators, and the appropriate time interval between administering injection adrenaline. Unexpectedly, a majority of participants demonstrated a lack of knowledge regarding the management of a patient experiencing a sudden collapse, being unresponsive with gasping sounds and no pulse, as well as the correct actions to be taken during high-quality CPR on an adult.

Our Recommendation:-

All nursing staff receives training in at least BLS, with a preference for advanced cardiac life support by any certified and recognised body. Regular upgrading and re-auditing using the same questionnaire after 6 months would also be beneficial to assess progress and advancement.

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Conflicts of interest:

There are no conflicts of interest.

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