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Original Article

The Knowledge and Practice of Cardiopulmonary Resuscitation (CPR) Among BSN Students at Isra University, Hyderabad

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ABSTRACT

Cardiac arrest is a critical medical emergency, accounting for 15-20% of global deaths. Timely intervention through cardiopulmonary resuscitation (CPR) is essential for improving survival rates. When performed quickly, early CPR can dramatically improve survival rates, frequently achieving double or triple results. Despite its importance, many individuals, including healthcare students, lack adequate training and confidence in performing CPR effectively. This study aimed to assess the knowledge and practices of Bachelor of Science in Nursing (BSN) students regarding CPR at Isra University, Hyderabad. From July to September 2024, a descriptive cross-sectional study was carried out using a sample size of 80 BSN students chosen by non-probability convenience sampling. A validated questionnaire was used to gather data, and IBM SPSS version 23 was used for data analysis, with descriptive statistics; frequencies and percentages. The study showed that 88.8% of participants recognized CPR as a critical emergency procedure, and 85% understood the importance of timely intervention. However, only 66.3% were aware that CPR should be performed outside of hospital settings. It was concluded that although BSN students possess a moderate level of knowledge regarding CPR, there are notable gaps in both their understanding of its application in various contexts and their practical experience. Enhanced training programs are needed to address these gaps, ensuring nursing students are fully prepared to respond effectively in emergencies.

Introduction

Cardiac arrest is defined as a situation whereby a heart no longer contracts adequately and pumps blood within the body [1]. It is a life-threatening condition, and currently there is no

high likelihood of survival [2]. Cardiac arrest is now considered to be the number one killer worldwide, contributing to 15-25 % of all deaths. This illness affects both neonates and adults, however, appearing predominantly with more incidence in adults [3, 4].

Cardiovascular diseases CVDs are responsible for 31% of the annual mortality, and 80% of cardiovascular disease mortalities are due to sudden cardiac death and stroke. Unstable angina is part of coronary artery disease, which is responsible for 60–70% of sudden cardiac arrests and 40–50% of sudden cardiac deaths. Other risks include a family history of heart diseases, obesity, diabetes, smoking, a sedentary lifestyle, and history of heart attacks [5]. An early start in CPR is also kind of essential for people who have had cardiac arrest since it assists in the early tracking of their status, not to mention lessening the incidence of disease and death rates [6]. These aspects are called cardiopulmonary resuscitation, and after a sudden cardiac arrest, CPR includes artificial respiration, chest compressions, and shocks from the Automated External Defibrillator (AED).Chest compression involves the use of hand to force blood into the heart and for ventilation, equipment like bag ventilator mask and pocket mask may be used. An AED is employed to manage persistent cardiac dysrhythmias for example pulseless ventricular tachycardia and ventricular fibrillation. Performing CPR as early as possible not only enhances prospects of Survival; a study shows that it can raise the possibility of surviving any time after a cardiac attack to two to three times [7]. Chest compressions are part of CPR and all rescuers should perform external cardiac compressions on any victim of cardiac arrest. They should be the first line of treatment irrespective of the age of the victims. Rescuers able to perform hands should perform both compressions and ventilation in low skilled settings; while those with enhanced skills should mouth organs in teams [8, 9].

An important prerequisite for nursing students should be a basic life support course to ensure that the students have the basic skills for providing lifesaving interventions before from their clinical placements. However, literature reveals that nursing students around the world and Nurses locally are deficient in CPR knowledge [9]. The American Heart Association considers a healthcare provider as competent if he gets 84% in the basic life support test. In New Delhi, India the researchers similarly found less effective knowledge of CPR among pre-service nurses compared to practicing nurses [7, 10]. In the same regard, a research done among student nurses in Palestine revealed that the knowledge level observed among them scored an average of 48.6 % concerning Cardiopulmonary Resuscitation. They observed in India, concerning knowledge of CPR amongst medical, dental and nursing students some significant gaps. However, in Kenya very limited studies have examined the knowledge of CPR amongst the student nurses; one study done among the students at Kenyatta National Hospital Training College revealed low performance. Similarly, a study done at Mombasa County Referral Hospital showed that out of the sampled health care workers 75.9% had below average CPR knowledge and 26.1% had learnt it during their training [11, 12].

The rate of survival from cases of cardiac arrest reduces by 7-10% for each minute that is taken before performing CPR. One of the most pressing population health issues that increase global mortality rates dramatically is out-of-hospital cardiac arrest (OHCA). Among witness of OHCA, chest compression is attempted in 14–45% cases, and it is often performed ineffectively, but it is important [13].

Certain traits of human beings whether as rescuers or victims can affect proper performance of CPR and therefore the need for increased training of the health workers and university students. A study done on allied health students in Jordan reveals poor knowledge in CPR thus the need for educational programs to build the competencies of the students for CPR as recommended in the American Heart Association (2020) [14]. The purpose of this study is to assess the CPR knowledge and proficiency of BSN students at Isra University in Hyderabad. This will help to raise the chances of the patient survival in cases of cardiac arrest, due to the fact that other future health care professionals will be well equipped to handle the situation competently and effectively.

Aim of the Study

- The purpose of the study is to assess the knowledge and practice regarding cardiopulmonary resuscitation (CPR) among BSN students at Isra University, Hyderabad.

Research Question:

- What is the level of knowledge and practice regarding cardiopulmonary resuscitation (CPR) among BSN students at Isra University, Hyderabad?

Significance of the Study

Specifically, the study assesses BSN students' practical skills and knowledge regarding CPR in order to identify the areas which can be enriched within the context of curriculum. In this regard, the research aims to fill the above mentioned educational voids in the development of the nursing profession to meet the needs of the students when handling any cardiac emergency. The immediate purpose is to equip future nurses with practical knowledge to raise the survival rate of their patients and to ensure high quality of care even in most difficult circumstances.

Literature Review:

Cardiopulmonary resuscitation is a core emergency procedure that focuses on revival of ones breathing and circulation during a heart attack. When performed appropriately, the impact can enhance proper survival chances, flows and understanding which the CPR practice is required for nursing students. This 'evaluation identifies indices for enhancing this knowledge and has therefore focused on characteristics and statistical data concerning nursing students' current understanding and implementation of CPR performance [15, 16].

Current Knowledge and Skills

CPR, however, is one aspect that needs to be present, mainly because multiple research shows that nursing students often lack knowledge and /or skills in this matter. For instance, a study done in New Delhi indicated that PSN had low level of CPR knowledge as compared to the practicing nurses, ($t(99) = 7.32$; $p = 0.001$) [10, 17].

Demonstrating knowledge of CPR was important for a nursing student as it enables the student to respond well to emergencies occurring within cardiac related cases. The most

elementary understanding of CPR simply requires one to agree with the statement that it is a technique used to help save the lives of those having a heart attack. 88.8% of the respondents indicated their correct answer to this while 11.3% indicated a wrong answer. This indicates a good reference knowledge but still is not very effective.

Common Misconceptions

However, misconceptions continue to prevail amongst nursing students even with the importance of CPR. Some of the myths include the following; When a person is unconscious, CPR shouldn't be performed unless in the hospital. Of the seven questions asked on CPR, six were answered correctly by the respondents, though with a slight disagreement: 66.3% of participants said that CPR can be done outside the hospital while the remaining 33.8% disagreed. As well, the knowledge about the fact that CPR can only be effective within 6-7 minutes after the event of a cardiac arrest was known by 85.0% of students which indicates an importance of increasing awareness about timely actions. [18].

Importance of Effective Training

General CPR training should however be efficiently adopted to check if nursing students are capable of responding appropriately during emergencies. The information also shows that 83.8% of the students recognize the increasing survival rates when CPR is performed by professionals, whereas 13.8% expressed their confusion on the same. This underscores the importance of practical training and simulation exercises in enhancing skills development and confidence among the students [19]. Media portrayals often misrepresent CPR's effectiveness, leading to skewed public perceptions. The data indicates that 90.5% of nursing students recognize the inaccuracies depicted in movies and television, with only 10.0% holding a contrary view. This awareness among students is beneficial, yet it stresses the need for continuous education to counteract misleading media influences [20, 21].

Research highlights the importance of continually assessing and enhancing CPR training programs in nursing education. Given that cardiac emergencies pose a major public health challenge, it is crucial to boost nursing students' understanding, attitudes, and practical skills in CPR to prepare them as capable healthcare providers. Evidence indicates that incorporating ongoing evaluations and feedback into CPR training can significantly improve both educational results and patient care [12, 22].

Research Methodology

Study Design: Quantitative cross-sectional survey was conducted from July to September, 2024.

Study Setting: Isra School of Nursing, Isra University, in Hyderabad.

Study Population: The target population included Bachelor of Science in Nursing (BSN) students from all years. The 2nd, 3rd, and 4th years had only female students: 46 in the 2nd year, 39 in the 3rd, and 43 in the 4th. The first year included 39 students of both genders.

Sample Size: The sample consisted of 80 undergraduates pursuing a Bachelor of Science in

Nursing (BSN).

Inclusion Criteria:

- First-year BSN students of both genders.
- Third, fourth, and second-year female BSN students..
- Students who expressed interest in taking part.
- Students who were accessible at the time of data collection.

***Exclusion Criteria*:**

- Students who declined to participate.
- Students who were unavailable during the data collection period.

Sampling Technique: A non-probability convenience sampling method was used to choose the study participants.

Source of Data: Primary data was collected directly from BSN students using a structured questionnaire.

Research Tool: A questionnaire was used following sections:

- ***Section A:*** Demographics of Participants, including Age, Gender, Year of study, etc.
- ***Section B:*** This section consisted of 10 questions designed to assess the participants' knowledge.
- ***Section C:*** This section contained 5 questions regarding the practices of BSN students.

Data Collection Process*:* The study proposal was authorized by the principal of the Isra School of Nursing at Isra University in Hyderabad prior to data collection. Participants provided verbal and written consent before receiving the questionnaires, which were distributed. The questionnaires were collected as soon as they were filled for reasons of accuracy, completion, and confidentiality in line with ethical practice on human subject.

Data Analysis: The quantitative data were analyzed using the statistical software IBM SPSS version 23 with descriptive statistical analysis –frequencies and percentages.

Ethical Considerations: Participant's right to privacy was respected and their willingness to participate at any time was protected in this study. The participants were read the rights in terms of consent in line with the economic and social context of the study objectives, activities, and potential benefits and hazards involved. This approach ensures ethics in the entire process of conducting the research.

Results

Demographic Analysis

Table 1: *Classification Based on Gender*

CATEGORIES	FREQUENCY	PERCENTAGE
Male	13	16.3
Female	67	83.3
Total	**80**	**100**

Table 1 indicates that the sample is composed of 83.3% female and 16.3% male. This remarkable variance shows the gender distribution of BSN students.

Table 2: *Classification Based on Age*

CATEGORIES	FREQUENCY	PERCENTAGE
20-25	18	22.5
26-30	59	73.8
Above 30	3	3.8
Total	**80**	**100.0**

The age distribution of participants is shown in Table 2. The majority,73.8%, is between the ages of 26 and 30, while 22.5% are between the ages of 20 and 25. 3.8% of the population is older than 30. The distribution indicates that the majority of responders are in the 26–30 age range.

Table No 3: *Classification Based on Marital Status*

CATEGORIES	FREQUENCY	PERCENTAGE

Single	73	91
Married	7	8.8
Total	**80**	**100.0**

Table 3 presents the participants' marital status classification. Only 8.8% of the population is married, while the great majority, 91%, are single.

Table 4: Classification Based on Year of study

CATEGORIES	FREQUENCY	PERCENTAGE
1st Year	20	25.3
2nd Year	20	25.3
3rd Year	20	25.3
4th Year	20	25.3
Total	**80**	**100.0**

According to their year of study, participants are distributed as shown in Table 4, with equal representation from the 1st, 2nd, 3rd, and fourth years, accounting for 25.3% of the total.

Table 5: *Has Experience in performing CPR on Patients*

CATEGORIES	FREQUENCY	PERCENTAGE
Yes	21	26.3
No	50	73.7
Total	**80**	**100**

The CPR experiences of the participants are summarized in Table 5, which shows that 73.7% (50 participants) have never performed CPR, compared to 26.3% (21 participants) who have. According to the findings, a sizable majority of the participants have never performed CPR before.

Table 6: *Has observed healthcare workers performing CPR on patients.*

CATEGORIES	FREQUENCY	PERCENTAGE

Yes	57	71.3
No	23	28.7
Total	**80**	**100**

Table 6 shows the participants' observations of healthcare workers performing CPR on patients. A significant 71.3% (57 participants) have witnessed such procedures, while 28.7% (23 participants) have not.

Table 7. *Section B: Knowledge Related to CPR*

STATEMENT		True	False	Mean	St Devi.
CPR is an emergency procedure attempted to return life in cardiac arrest.	Freq	67	13	1.162	.371
	%	83.8	16.3		
It has to be attempted always inside of a hospital, not outside.	Freq	61	19	1.237	.4282
	%	76.3	23.8		
CPR is generally only effective if performed within 6-7 minutes of the stoppage of blood flow to vital organs.	Freq	41	39	1.487	.503
	%	53.1	48.8		
On average, 85-90% of people who receive CPR survive if conducted by experienced personnel.	Freq	45	35	1.437	.499
	%	56.3	43.8		
The brain may sustain damage after blood flow has been stopped for about 4 minutes and irreversible damage after 7 minutes.	Freq	52	28	1.350	.479
	%	65	35		
Compression-only CPR is recommended for an adult having cardiac arrest; in children, it is more likely to have a non-cardiac cause.	Freq	57	23	1.287	.455
	%	71.3	28.8		
It is always better to be calm and contented while conducting CPR rather than look frightened.	Freq	48	32	1.400	.492
	%	60.0	40.0		
CPR is often severely misrepresented in movies and television as being highly effective in resuscitating a person who is not breathing and has no circulation.	Freq	63	17	1.212	.411
	%	78.8	21.3		

Artificial respirations are more appropriate than CPR if a person is not breathing but has a palpable pulse (i.e., respiratory arrest).	Freq	50	30	1.375	.487
	%	62.5	37.5		
Is this the correct sequence to follow in CPR? Airway, Breathing, Chest Compression.	Freq	52	28	1.350	.479
	%	65.0	35.0		

Table 7 shows participants' knowledge of cardiopulmonary resuscitation (CPR). A significant majority (83.8%) understand that CPR is an emergency procedure for cardiac arrest, with a mean score of 1.162 and a standard deviation of 0.371. However, 76.3% incorrectly believe it should only be performed inside a hospital (mean 1.237, SD 0.4282).Regarding time sensitivity, 53.1% think CPR is effective only within 6-7 minutes of blood flow cessation (mean 1.487, SD 0.503), which raises concerns about awareness of critical time frames for brain damage prevention (mean 1.350, SD 0.479).While 71.3% know that compression-only CPR is recommended for adults (mean 1.287, SD 0.455), and 78.8% recognize CPR misrepresentation in media (mean 1.212, SD 0.411), there remains ambiguity about other aspects, such as the correct sequence of CPR (mean 1.350, SD 0.479). These findings underscore the need for enhanced educational programs to improve CPR knowledge among participants.

Table 6. *Section C: Practices Related to CPR*

STATEMENT		Yes	No	Mean	St Devi.
Have you practiced CPR in a clinical setting?	Freq	25	55	1.687	.466
	%	31.3	68.8		
Have you ever performed CPR in a real-life emergency situation?	Freq	30	49	1.637	.509
	%	37.5	61.3		
Do you believe that your current training has adequately prepared you for performing CPR?	Freq	46	34	1.425	.497
	%	57.5	42.5		
Are you aware of the latest CPR guidelines and updates?	Freq	34	46	1.575	.497
	%	42.5	57.5		
Do you feel confident in your ability to perform CPR effectively?	Freq	49	31	1.387	.490
	%	61.3	38.8		

The analysis of CPR practices detailed in Table 6 offers valuable insights into the gap between perceived readiness and real-world experience. Just 31.3% of participants have practiced CPR in a clinical setting, with 37.5% performing it in real-life situations, highlighting a lack of hands-on exposure. The mean scores are 1.687 for clinical practice and 1.637 for real-life application, with a notable standard deviation of 0.509 for real-life experience. Despite this, 57.5% of participants consider their training sufficient, and 61.3% are confident in their CPR skills, pointing to a disconnect between perceived and actual competence. Alarmingly, only 42.5% are up-to-date with the latest CPR guidelines. These findings emphasize the importance of improving educational programs to enhance practical skills and current knowledge in CPR training.

Discussion:

The findings of this study regarding participants' knowledge of cardiopulmonary resuscitation (CPR) reveal both strengths and gaps. A significant majority (83.8%) correctly identified CPR as an emergency procedure for cardiac arrest, reflecting a solid understanding of its purpose. This aligns with findings from Alsabri et al. 2024[23], which similarly reported high awareness among healthcare students regarding CPR's role in emergencies. However, misconceptions persist, notably the belief that CPR should only be performed inside a hospital (76.3%). This is concerning and contrasts with studies emphasizing the importance of bystander CPR in out-of-hospital scenarios[24, 25].In terms of time sensitivity, only 53.1% understood that CPR is most effective when performed immediately after cardiac arrest. Which indicated a general lack of awareness about critical time frames for effective resuscitation[23]. While 65% acknowledged that brain damage can occur after just four minutes of blood flow cessation, there remains ambiguity regarding procedural sequences, with only 65% correctly identifying the order of "Airway, Breathing, and Chest Compression. This mirrors findings from Achempim-Ansong et al., 2023), where nursing students exhibited similar uncertainties[26]. Practical aspects of CPR reveal a significant gap between perceived preparedness and actual experience. Only 31.3% of participants practiced CPR in a clinical setting, and 37.5% applied it in real-life emergencies. This lack of hands-on exposure is concerning, as effective CPR performance is critically dependent on practice. George et al., 2023 emphasize that practical experience significantly enhances confidence and competence in CPR skills[26, 27]. Despite limited practical experience, 57.5% believe their training has been adequate, and 61.3% express confidence in their abilities. This disconnect suggests a potential overestimation of preparedness[28, 29]. Additionally, the low awareness of the latest CPR guidelines among participants (42.5%) highlights a crucial area for improvement, as emphasized by the American Heart Association[29]. which stresses the need for ongoing education to ensure healthcare providers are equipped with current practices.

Conclusion:

It was concluded that BSN students at Isra University possess a basic understanding of cardiopulmonary resuscitation (CPR), but significant gaps exist in both knowledge and practical experience. While most recognize CPR as essential for emergencies, many mistakenly believe it should only be performed in hospitals. Limited hands-on practice and low awareness of current CPR guidelines further indicate a disconnect between perceived and actual preparedness. These

findings underscore the urgent need for enhanced educational programs that integrate both theory and practical training to better equip future healthcare providers in emergency situations.

Limitations: A small sample size that does not reflect all nursing students at Isra University Hyderabad, survey errors in self-reported questionnaire tools, and a narrow focus that might fail to capture other possible influences on readiness for CPR, including institutional support, and practical training.

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