The Research of Medical Science Review
ISSN: 3007-1208 & 3007-1216 Volume 4, Issue 3, 2026

ASSESSMENT OF NURSES' KNOWLEDGE RELATED TO CARDIOPULMONARY RESUSCITATION, A DESCRIPTIVE CROSS SECTIONAL SURVEY

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DOI: https://doi.org/10.5281/zenodo.21927933

Keywords
Knowledge CPR, Nurse

Article History
Received: 31 January 2026
Accepted: 16 March 2026
Published: 30 March 2026

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Abstract

Introduction: *Cardiopulmonary resuscitation (CPR) is considered a core emergency skill in which all health care professionals especially nurses must be proficient. Training of nurses has an impact on the efficiency and outcome of cardiopulmonary resuscitation (CPR), and thus, assessment of CPR knowledge among nurses is very important to improve training program.*

Methods: *The questionnaire comprised of three parts about CPR knowledge: the first dealing with general questions to understand the importance of CPR in clinical practice; the second comprising the main goal and accuracy of CPR intervention; and the last consisting of questions targeting the indications, methods, and effectiveness of CPR. Descriptive statistics and multiple response analyses were done by IBM SPSS version 20.*

Results: *The staff nurses had moderate knowledge about the importance of CPR in clinical practice, stood poor in knowing main goal and accuracy of cardiopulmonary resuscitation (CPR) and had moderate knowledge related to its indications and effectiveness. Only (86.6%) were completely aware about the universal compression ventilation ratio, 79.6% were aware of the current compression depth. In addition, 63.2% of participants have only indicated the order of CPR being CAB (compression, airway, and breathing).*

Conclusion: *Knowledge of CPR is poor among the nurses. However, skills of CPR have to be improved by current training programs at regular intervals. Their knowledge and practical approach have to be updated with the current guidelines in CPR.*

INTRODUCTION

Cardiopulmonary Resuscitation – is a lifesaving emergency technique which is performed when the heart stops beating. The American Heart Association (AHA) refers to cardiopulmonary resuscitation (CPR) as a part of the **"chain of survival".(Okonta and Okoh 2015).** CPR, is an emergency procedure performed in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing. It is indicated in those who are unresponsive with no breathing. That is why nurses need to enhance their knowledge and skills related to CPR to provide effective life support during time of emergency. **(Kavitha, Manjula et al. 2022)**

Sudden Cardiac Arrest Association (SCAA) with American Heart Association (AHA), defines cardiac arrest as: **"the suspension of mechanical activity of heart, leading to absence of pulse, unconsciousness, and temporary suspension of breathing." (Iqbal, Nisar et al. 2021)**

Globally, cardiovascular diseases (CVDs) constitute the leading cause of death. About 17.3 million individuals died from cardiovascular diseases (CVDs) in 2008, according to the World Health Organization. This accounted for 30% of all deaths worldwide. In the general population, cardiac arrest leads to myocardial infarction in 75 percent of cases. 91% of cardiac arrest deaths in those under 55 occur outside of a hospital, making this percentage much higher for this age group. Early defibrillation and cardiopulmonary resuscitation (CPR) may be helpful in several situations to increase survival and neurologic outcomes. **(Ghauri, Javaeed et al. 2019)**

A study in Ghana, on the trend of CVD admission, showed an increase in the percentage of CVD admissions from 4.6% to 8.2%, representing a 78% increase over a decade.**(Appiah, Sarfo et al. 2017)**. About **200,000** people in Pakistan die each year from coronary heart disease (CHD), or **410/100,000** of the population. **(Ahmad, Munir et al. 2017)**. Still there isn't enough information available in Pakistan, for nurses to improve their knowledge and abilities by receiving high-quality CPR training.

. Therefore it is essential that nurses who care patients at risk for cardiac dysrhythmia have a thorough understanding of accurate electrode placement. They must also use current principles when determining the optimal leads to use in monitoring specific types of dysrhythmia.**(Hassan and Hassan 2012)**

It is crucial for healthcare professionals to be ready to provide CPR on individuals who have CVD in such a situation. Because nurses spend a lot of time with patients and are frequently the first to notice when a patient is having an in-hospital cardiac arrest, nurses are likely to be the first responders in an emergency. Thus, in order to improve their abilities for usage in the future, nursing staff would benefit from having adequate information and a high level of self-efficacy about CPR. **(Moon and Hyun 2019)**

In-hospital cardiac arrest (IHCA) affects more than 200 000 patients annually in the United States and is reported to be associated with poor survival.**(Girotra, Nallamothu et al. 2012)**. Efforts at improving IHCA outcomes have focused primarily on the timeliness and quality of resuscitation (e.g., early defibrillation)**(Chan, Krumholz et al. 2008)**.This is because time is the essence when treating a cardiac arrest victim. Once the heart stops beating and blood flow stops, a person will lose consciousness within 15 seconds. Within another 30 to 60 seconds, he will stop breathing, and irreversible damage to his brain cells will follow after several minutes of oxygen deprivation. That is why CPR knowledge is vital for health care providers especially nurses.**(Ponraj, Zhiqiang et al. 2012)**

CPR's chances of reviving the heart are slim. Its major objective is to re-establish a portion of the blood's oxygenated flow to the heart and brain. The objective is to postpone tissue death and increase the chance of a successful resuscitation without brain injury or death. In order to help blood move through the veins and oxygenate tissues that might otherwise be depleted of oxygen, CPR serves as a primary means of preserving life. The unconscious person is given breaths in order to give them oxygen. The chest compressions, which imitate the heartbeat, help to move blood to other parts of the body so that the tissues can

receive as much oxygen as possible. CPR needs to be performed until paramedics arrive, but if there are multiple trained parties another individual make takes over if the person who starts performing CPR becomes fatigued. CPR will succeed in inducing heart rhythm and should be continued until the patient is breathing or is declared dead.**(Trubuhovich 2019)**

Despite this, we still lack a clear knowledge of the precise mechanisms causing the benefits. CPR maintains some level of systemic and cerebral perfusion while assisting left ventricular filling, preventing right ventricular distension, and possibly altering cellular mechanisms of ischemic conditioning. These actions all appear to improve cardiac hemodynamics. **(Rea, Cook et al. 2008)**

A growing body of research suggests that CPR is considerably more than a straightforward "yes/no" treatment. The depth and force of compression, the amount and rate of chest recoil (decompression), the rate of compression, the frequency and volume of ventilation, and the amount and timing of CPR interruptions are all components of the composite features of CPR. **(Rea and Page 2010)**. A significant factor is the skill level of nurses in basic life support (BLS) skills. Most research about nursing resuscitation skills focuses on teaching methods, frequency of updates or contents of sessions. Little improvement in the retention of resuscitation skills has been noted**(Dwyer and Williams 2002).** Since in some countries, such as Iran, the nurses are responsible for initiating the CPR and performing basic life support until the CPR team arrives, it is necessary that they are informed of and follow the CPR rules.**(Janatolmakan, Nouri et al. 2021)**

CPR Components with Guideline for Adults include Chest compression depth i.e. 1.5-2 inches (38-53mm), Chest compression rate i.e. 100/min, Chest recoil i.e. complete recoil after each compression, Hands-off time i.e. Minimize all CPR interruptions, Ventilation rate i.e. 8–10/min, Ventilation volume i.e. 500 mL/breath and Ventilation cycle i.e. 1–2 s. **(Bobrow 2008)**

CPR can be given in four steps: 1.Chest compression, 2.Airway maintaining, 3.Breathing support and 4. Defibrillation. Hence the current order of updated cardiopulmonary resuscitation (CPR) intervention for all age groups except newborns is Chest compressions, Airway, Breathing (CAB).**(Field, Hazinski et al. 2010)**

International recommendations for CPR in adults are to ensure safety; activation of emergency services secure airway then start performing 5 to 6 cm deep chest compressions at the rate of 100 to 120 per minute permitting adequate chest recoil in between compressions Minute. After 30 chest compressions two rescue breaths should be given till the time AED arrives its switched on and rescuer must follow the instructions. There are recommendations to change rescuer every 2 minutes if situation permits so.**(Berg, Soar et al. 2020)**

The Sudden cardiac death (SCD) is the second leading cause of death in India (7 lakhs individual each year) after coronary heart disease (CAD). Basic Life Support (BLS) is used to diagnose sudden cardiac arrest (SCA), which is then followed by activating the emergency response system, which includes cardiopulmonary resuscitation (CPR) and rapid defibrillation with an automated external defibrillator (AED). **(Juliet, Bala et al. 2022)**

Understanding the postarrest syndrome informs post resuscitation care. This syndrome consists of four parts i.e. post-arrest brain dysfunction, post-arrest myocardial dysfunction, systemic ischemia/reperfusion response, and persisting precipitating pathology. Therefore, each patient's care needs to be specifically designed to match their unique pathological profile. **(Neumar, Nolan et al. 2008)**

Components of Postarrest Care are Hypothermia to maintain core temperature 32–34°C for 24–48 h, Emergent coronary angiography and revascularization in patient with high suspicion of acute coronary syndrome, Comprehensive intensive care management to include(i.e. • Ventilation and oxygenation, • Control of blood sugar, • Optimizing hemodynamics, • Prevention of thromboembolic disease, • Control of seizures, • Prevention of infection), Treatment of persistent triggering condition(s), Rehabilitation and Implantable cardioverter-defibrillator placement. **(Neumar, Nolan et al. 2008)**

Everywhere in the world, healthcare personnel are required to complete training programs and/or receive certification in cardiopulmonary resuscitation techniques such basic life support, advanced cardiac life support, pediatric advanced life support, and neonatal resuscitation. It has been demonstrated that CPR skills decline more quickly than CPR knowledge. It has been suggested that regular training, follow-up interventions, and annual recertification be implemented as a result of the observed skill deterioration intervals, which ranged from 2 weeks of initial training with progressive deterioration until participants reached pre training levels at 1 and 2 years after initial training. Because of this, the CPR component needs to be updated every 12 months, while the whole certificate needs to be renewed every 3 years. **(Adekola, Menkiti et al. 2013)**

According to studies on hospital medical staff, just 10% of nurses are sufficiently skilled in performing CPR, demonstrating the poor level of knowledge and competence of these team.**(Abdollahi, Yazdi et al. 2010)**. Although different members of the resuscitation team with different specialisations resuscitate patients, the critical role and position of nurses in the resuscitation team, identification of patients with critical conditions, prevention of cardiac arrest, timely and ethical resuscitation, as well as follow-up care, are undeniable for promoting the outcomes of resuscitation in hospitalised patients. Nursing knowledge has a very important role in observing the standards, protocols, and order of CPR steps **(including massage, medication, and endotracheal intubation)**, which have a significant impact on the speed of operation and how to perform the CPR process, and ultimately the performance of medical staff.**(Vadeboncoeur, Bobrow et al. 2007)**. Because nurses are among the first members of the resuscitation team who encounter patients in need of CPR in the early stages and have a very sensitive role in the life of the patient. Nurses must also have sufficient knowledge, skills, and confidence in CPR. The presence of trained nurses is very effective in the outcome of resuscitation and the presence of a person with more skills and high self-efficacy can have a tremendous impact on the outcome of resuscitation. (Kuchaki, Taheri et al. 2022)

METHODOLOGY

Introduction

This chapter explains the research methods that will be used to investigate the research problem. According to Polit and Beck (2008), research methodology is a methodical and scientific technique to gathering and analyzing data. The study design, setting, sample size, data collection tool, data collection method and data analysis are all included.

MATERIALS AND METHOD

Study design:

Study design used in this study was descriptive cross-sectional study.

- **Study setting:**

The area of this study was Sheikh Zayed Hospital Lahore.

- **Study Duration:**

Study duration was one year

- **Study population:**

The population of this study was staff nurses of the Sheikh Zayed Hospital Lahore.

- **Sample Size Calculation**

If we apply confidence level 95%, margin of error 5% and population proportion 15.4% then sample size is: 201

By Manual:
If we compute z=1.96 (remember that z for a 95% confidence level is 1.96), €=0.05 and p ̂=0.154 then sample size is:

$$N = (z^2 \times p\hat{}(1-p\hat{}))/€^2$$

Where,
Z is the z-score
€ is the margin of error
P^ is the population proportion
N is the population size
Then,

N = (〖(1.96)〗 ^2×(0.154)(1-0.154))/ 〖(0.05)〗 ^2
n = 200

- **Sampling Technique:**

Convenience sampling technique

- **Inclusion Criteria:**

1. Staff nurses having more than one year of clinical experience.
2. Staff nurses who are willing to give consent
3. Available at the time of data collection.
4. Staff nurses who got special training related to cardiopulmonary resuscitation.

- **Exclusion Criteria:**

1. Staff nurses who are not involved in direct patient care(head nurses, teaching faculty, nurses of administrative post).

- **Sample size:**

The sample size of the study was 201 staff nurses.

- **Research tools:**

Close ended questions were used concerning assessment of Nurses' knowledge related to cardiopulmonary resuscitation, a descriptive cross sectional survey.

- **Data collection:**

Data was collected from Sheikh Zayed Hospital after acquiring permission letters from the concerned authorities from hospital located in Lahore, Punjab.

- **Data Analysis:**

Data was analyzed by Statistical Package for Social Science (SPSS), version 20.

- **Knowledge Evaluation Criteria**

The questionnaire comprised of three parts, first one dealing with general questions in regard to the importance of CPR in clinical practice, second one consisted of the main goal and accuracy of CPR intervention, and the last segment comprised of questions targeting the indications, methods, and effectiveness of CPR. To understand the knowledge in depth and avoid bias, certain statements were deliberately reframed as negative questions. The answered questions were rewarded as follows: correct scores received positive points whether the questions were written in a negative manner or not, and the incorrect questions received no points.

Excellent knowledge: If the respondent gives >80% correct answers from the structured questionnaire.

Good knowledge: If the respondent gives 60-80% correct answers from the structured questionnaire.

Poor knowledge: If the respondent gives <60% correct answers from structured questionnaire.

Variables Under Study:

Research Variables

Nurses' knowledge related to cardiopulmonary resuscitation

Demographical variables

Name
Age
Educational Status: BSN/Post RN/GN
Clinical Experience
Contact
Time Since Last CPR Training
Do You Have Valid CPR Certificate

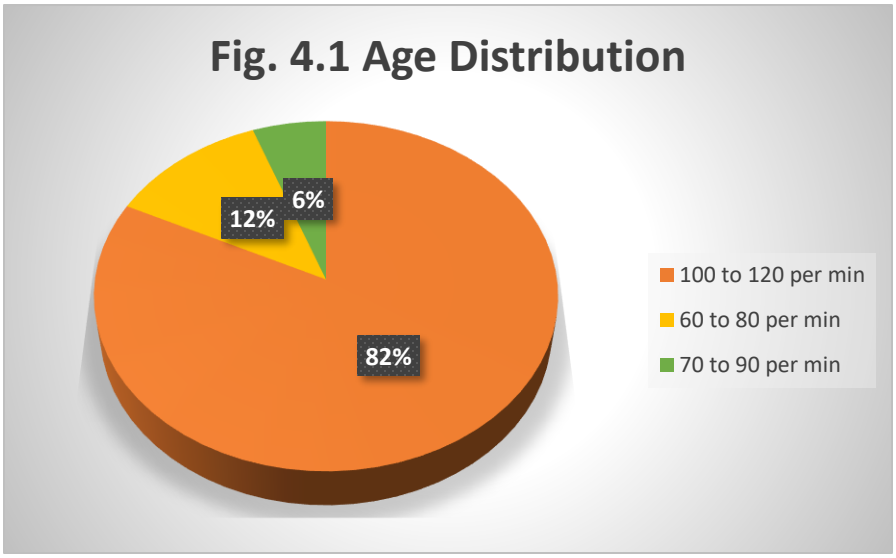
- **Ethical consideration:**

The study was conducted after getting permission from the IRB of SKZMDC according to their ethical rules and regulations. Informed consent from all the responders was also sought and the participation was voluntary. Anonymity of participants was maintained.

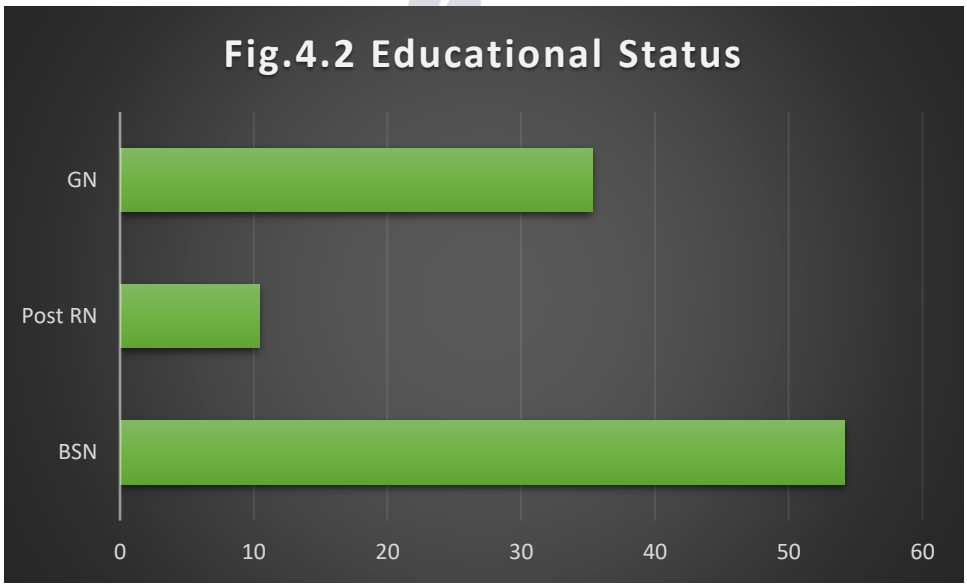
RESULTS

4.1. Age Distribution of Study Participants

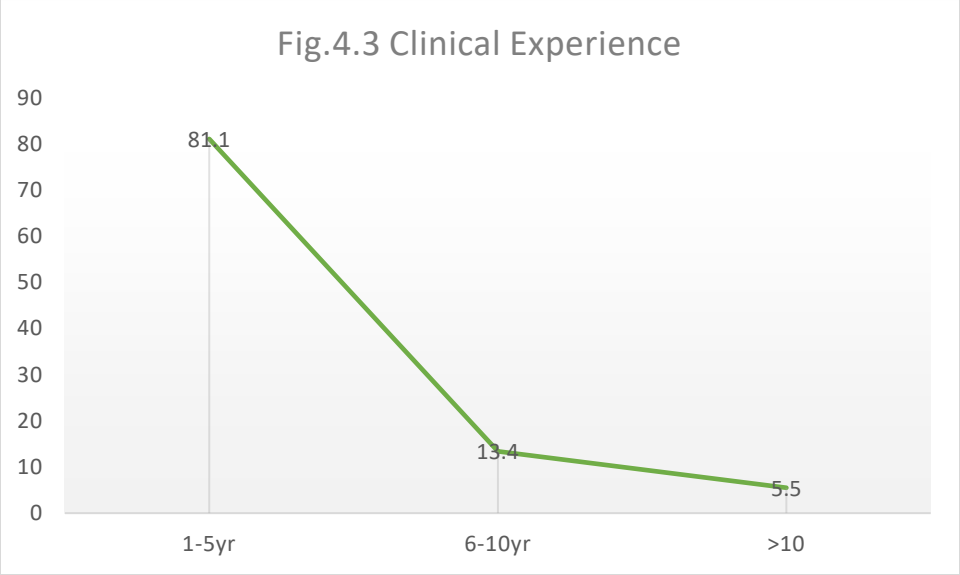
The age of study participants was in between the range of 20 to 49 years. The minimum age was 20 years old and the maximum age was 49 years old. Out of total 201 participants, 179(89.1%) were between the range of 20-29 years, 21(10.4%) were between the range of 30-39 and 1(0.5%) were between the range of 40-49 years.



4.2. Educational Status of the Study Participants
Out of total 201 participants, 109(54.2%) were BSN students, 21(10.4%) were Post RN students and 71(35.3%) were general nursing students. **(Table 4.2)**



4.3. Clinical Experience of Study Participants
Out of total 201 participants, 163(81.1%) had clinical experience of 1-5 years, 27(13.4%) had clinical experience of 6-10 years and 11(5.5%) had more than 10 years. **(Table 4.3)**



4.4. Time since Last CPR Training

Out of total 201 participants, 159(79.1%) had CPR training for more than 2 years and 42(20.9%) had CPR training for less than 2 years.

Table 4.4. Time since last CPR training

Time since last CPR training		Frequency	Percent
	More than 2 years	159	79.1
	Less than 2 years	42	20.9
	Total	201	100.0

4.5. CPR certificate of Study Participants

Out of total 201 participants, 172(85.6%) do not have CPR certificate and only 29(14.4%) had CPR certificate. **(Table 4.5)**

Table 4.5. Do you have valid CPR certificate

CPR certificate		Frequency	Percent
	No	172	85.6
	Yes	29	14.4
	Total	201	100.0

4.6. Awareness about CPR Importance

Out of total 201 participants, 197(98.0%) selected yes and 4(2.0%) selected no. **(Table 4.6)**

Table 4.6. I am aware about importance of CPR in clinical practice

Importance of CPR		Frequency	Percent
	Yes	197	98.0
	NO	4	2.0
	Total	201	100.0

4.7. CPR Knowledge is Mandatory to All Health Professionals
Out of total 201 participants, 200(99.5%) selected yes and 1(0.5%) selected no. **(Table 4.7)**

Table 4.7. Is CPR knowledge mandatory to all health care professionals?

CPR knowledge mandatory to all health professionals		Frequency	Percent
	yes	200	99.5
	don't know	1	.5
	Total	201	100.0

4.8. CPR is Basic Emergency Need
Out of total 201 participants, 187(93.0%) selected yes and 14(7.0%) selected no. **(Table 4.8)**

Table 4.8. Is CPR a basic emergency need?

CPR is basic emergency need		Frequency	Percent
	yes	187	93.0
	no	14	7.0
	Total	201	100.0

4.9. I Would Like to Participate in CPR Awareness Program
Out of total 201 participants, 199(99.0%) selected yes and 2(1.0%) selected no. **(Table 4.9)**
Table 4.9. I would like to participate in CPR awareness program

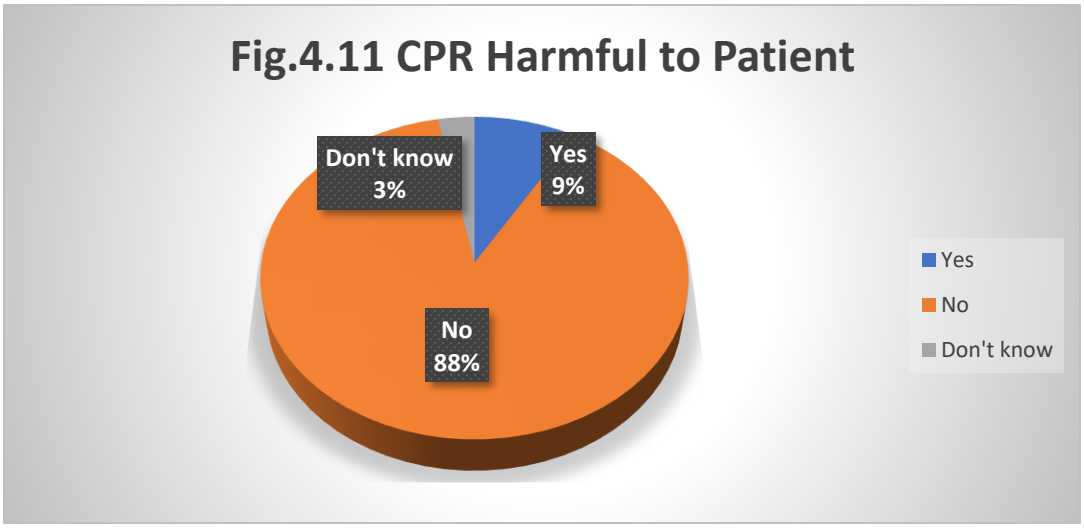
Participation in CPR awareness program		Frequency	Percent
	yes	199	99.0
	no	2	1.0
	Total	201	100.0

4.10. Is CPR procedure Is Arduous or Unethical?
Out of total 201 participants, 9(4.5%) selected yes and 182(90.5%) selected no. **(Table 4.10)**

Table 4.10. Is CPR procedure is arduous or unethical

CPR is arduous or unethical		Frequency	Percent
	Yes	9	4.5
	No	182	90.5
	don't know	10	5.0
	Total	201	100.0

4.11. Is CPR harmful to patient?
Out of total 201 study participants, 17(8.5%) selected yes, 177(88.1%) selected no, and only 6 (3%) selected don't know. **(Table 4.11)**



4.12. CPR waste of manpower & time

Out of total 201 study participants, 5(2.5%) selected yes, 191(95%) selected no, 5(2.5%) selected don't know.

(Table 4.12)

Table.4.12. Is CPR a waste of man power and time

CPR waste of manpower & time		Frequency	Percent
	yes	5	2.5
	no	191	95.0
	don't know	5	2.5
	Total	201	100.0

4.13. CPR intervention mandatory to Medical Undergraduates

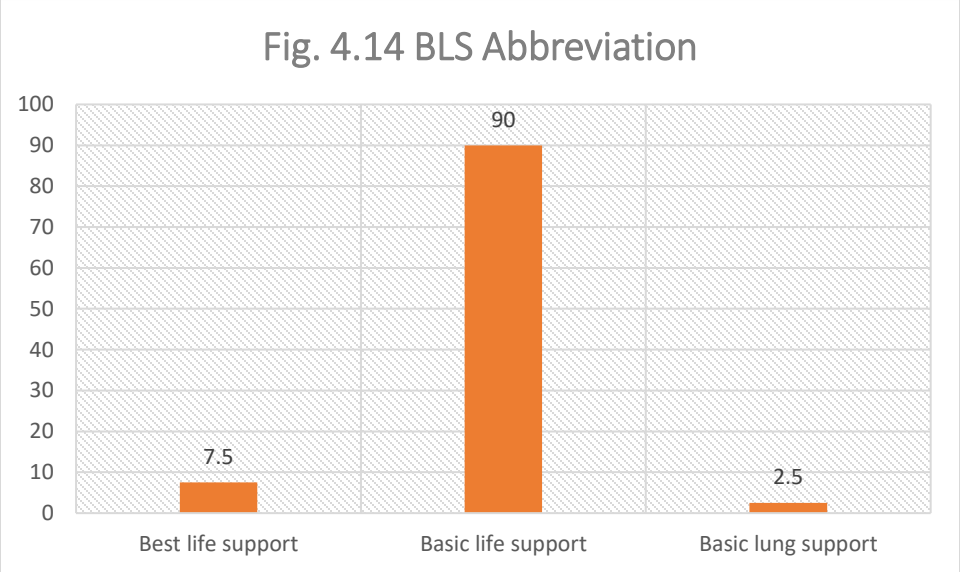
Out of total 201 study participants, 181(90%) selected yes, 14(7%) selected no, and 6(3%) selected don't know. **(Table 4.13)**

Table.4.13. Is teaching CPR intervention is mandatory to medical undergraduates

Teaching CPR to medical undergraduates		Frequency	Percent
	yes	181	90.0
	no	14	7.0
	don't know	6	3.0
	Total	201	100.0

4.14. Abbreviation of BLS

Out of total 201 study participants, 15(7.5%) selected Best life support, 181(90%) selected Basic life support. Only 5(2.5%) selected Basic lung support. (Table 4.14)



4.15. Current Order of CPR

Out of total 201 study participants, 63(31.3%) selected Airway, Breathing, Chest Compressions, 127(63.2%) selected Chest Compression, Airway, Breathing, 9(4.5%) selected Airway, Chest Compressions, Breathing, and only 2(1%) selected Breathing, Chest Compressions, Airway. **(Table 4.15)**

Table.4.15. Current order of CPR

Current order of CPR		Frequency	Percent
	Airway, breathing, chest compressions	63	31.3
	chest compression, airway, breathing	127	63.2
	airway, chest compression, breathing	9	4.5
	breathing, chest compression, airway	2	1.0
	Total	201	100.0

4.16. Recommended Universal Compression: Ventilation

Out of total 201 study participants, 174(86.6%) selected 30:2 for Adults, 24(11.9%) selected 15:2 for Infants and only 3(1.5%) selected 3:1 for Newborns. **(Table 4.16)**

Table.4.16. Recommended universal compression to ventilation ratio

Universal compression : ventilation		Frequency	Percent
	30:2 for adults, children and infant if a single rescuer is present	174	86.6
	15:2 in infants and children if at least 2 rescuers are present	24	11.9
	3:1 in newborns unless a cardiac cause is known	3	1.5
	Total	201	100.0

4.17. Chest Compression According to Recommended Procedure

Out of total 201 study participants, 160(79.6%) selected Depth in Adults about 5cm, 1(0.5%) selected One Handed Chest Compression for Adults, 33(16.4%) selected Depths in Adults about 2cm, and 7(3.5%) selected depth in Adults about 3cm. **(Table 4.17)**

Table.4.17. Regarding chest compression the following procedures are recommended

Recommended chest compression procedure		Frequency	Percent
	Depth in adults is about 5 cm	160	79.6
	In adults rescuers should use one hands for the chest compressions	1	.5
	Depths in adults about 2 cm	33	16.4
	Depth in adults is about 3cm	7	3.5
	Total	201	100.0

4.18. Best Strategy for High Quality CPR

Out of total 201 study participants, 22(10.9%) selected Compression: Ventilation 15:2, 163(81.1%) selected Compression: Ventilation 30:2, 5(2.5%) selected One ventilation every 6 seconds, 11(5.5%) selected Continuous Chest Compressions without pause & 10 ventilation/minute. **(Table 4.18)**

Table.4.18. Best strategy to perform high quality CPR on a patient with advanced

Best strategy for high quality CPR		Frequency	Percent
	Administer compressions and ventilations with a ratio of 15:2	22	10.9
	Administer compressions and ventilations with a ratio of 30:2	163	81.1
	Administer only one ventilation every six seconds during compression pause	5	2.5
	Administer continuous chest compressions without pause and 10 ventilations per minute	11	5.5
	Total	201	100.0

4.19. Mistakes during CPR Application

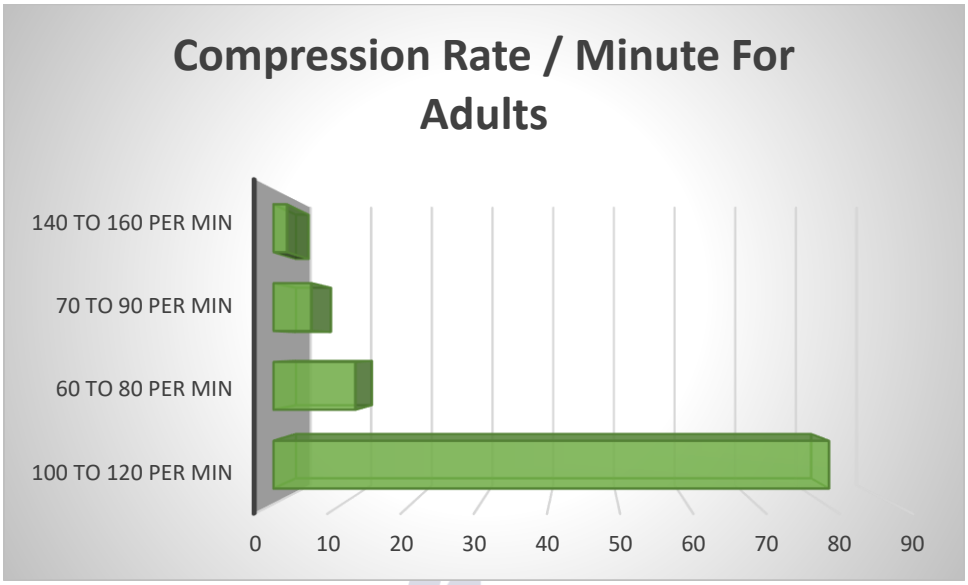
Out of total 201 study participants, 12(6%) marked Not obtaining vascular access, 57(28.4%) marked Prolonged Ventilation Periods, 15(7.5%) marked Not performing Endotracheal Intubation, and 117(58.2%) marked Prolonged during chest compressions. **(Table 4.19)**

Table.4.19. Mistake during treatment of CPR

Mistake during CPR application		Frequency	Percent
	Not obtaining vascular access	12	6.0
	Prolonged periods without ventilations	57	28.4
	Not performing endotracheal intubation	15	7.5
	Prolonged interruptions of the chest compressions	117	58.2
	Total	201	100.0

4.20. Compression Rate for Adults

Out of total 201 study participants 162(80.6%) selected 100-120/min, 24(11.9%) selected 60-80/min, 11(5.5%)) selected 70-90/min. And 4(2%) selected 140-160/min. (Table 4.20)



4.20. Chest compressions should be started within _____ of recognition of cardiac arrest

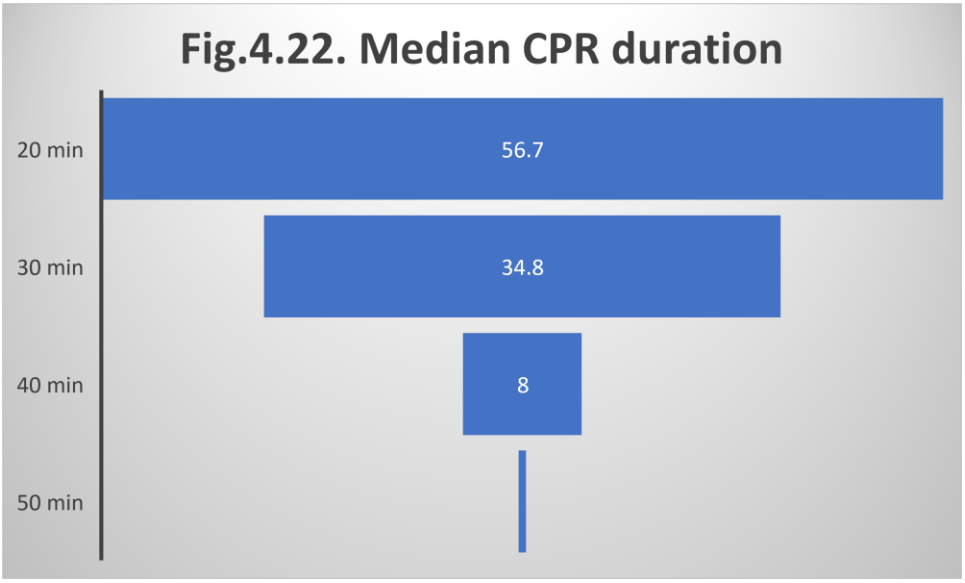
Out of total 201 study participants, 34(16.9%) selected 10sec, 123(61.2%) selected 20sec, 13(6.5%) selected 15sec and 31(15.4%) selected 2sec. **(Table 4.21)**

Table.4.21. Chest compressions should be started within _____ of recognition of cardiac arrest

Starting of chest compression should be within		Frequency	Percent
	10 sec	34	16.9
	20 sec	123	61.2
	15 sec	13	6.5
	2 sec	31	15.4
	Total	201	100.0

4.22. Median professional CPR duration was

Out of total 201 study participants, 114(56.7%) selected 20min, 70(34.8%) selected 30min, 16(8.0%) selected 40min and 1(.5%) selected 50min.



4.23. Purpose of CPR

Out of total 201 study participants, 5(2.5%) selected no effect on breathing, 2(1.0%) selected tissue death, 187(93.0%) selected circulate oxygenated blood and 7(3.5%) selected drop in saturation.

Table.4.23.purpose of CPR

Purpose of CPR		Frequency	Percent
	No effect on breathing	5	2.5
	Cause tissue death	2	1.0
	Circulate oxygenated blood	187	93.0
	Cause drop in saturation	7	3.5
	Total	201	100.0

4.24. What will be the first response when find someone unresponsive in the middle of road

Out of total 201 study participants, 30(14.9%) selected open airway, 60(29.9%) selected start chest compression, 99(49.3%) selected look for safety and 12(6.0%) selected two breathings. **(Table 4.24)**

Table.4.24.What will be the first response when find someone unresponsive in the middle of road

First response when find someone unresponsive		Frequency	Percent
	Open airway	30	14.9
	Start chest compression	60	29.9
	Look for safety	99	49.3
	Give two breathings	12	6.0
	Total	201	100.0

4.25. AED stands for

Out of 201 total study participants, 136(67.7%) selected Automated External Defibrillator, 43(21.4%) selected Automated electrical defibrillator, 17(8.5%) selected Advanced electrical defibrillator and 5(2.5%) selected Advanced external defibrillator. **(Table 4.25)**

Table.4.25. AED stands for

AED stands for		Frequency	Percent
	Automated external defibrillator	136	67.7
	Automated electrical defibrillator	43	21.4
	Advanced electrical defibrillator	17	8.5
	Advanced external defibrillator	5	2.5
	Total	201	100.0

4.26. CPR is an emergency procedure which is attempted in an effort to return life in cardiac arrest

Out of total 201 study participants, 196(97.5%) selected true, 4(2.0%) selected false and 1(.5%) selected don't know. **(Table 4.26)**

Table.4.26. CPR is an emergency procedure which is attempted in an effort to return life in cardiac arrest

Is CPR an emergency procedure		n	Percent
	True	196	97.5
	False	4	2.0
	Don't know	1	.5
	Total	201	100.0

4.27. CPR has always attempted inside of the hospital not outside

Out of total 201 study participants, 48(23.9%) selected true, 150(74.6%) selected false and 3(1.550 selected don't know.

Table.4.27.CPR has always attempted inside of the hospital not outside

CPR has always attempted inside hospital not outside		Frequency	Percent
	True	48	23.9
	False	150	74.6
	Don't know	3	1.5
	Total	201	100.0

4.28. CPR is generally only effective if performed within 6-7 minutes of stoppage of blood flow to vital organs

Out of total 201 study participants, 76(37.8%) selected true, 106(52.7%) selected false and 19(9.5%) selected don't know. **(Table 4.28)**

Table.4.28. CPR is generally only effective if performed within 6-7 minutes of stoppage of blood flow to vital organs

Is CPR only effective within 6-7 min of blood flow stoppage		Frequency	Percent
	True	76	37.8
	False	106	52.7
	Don't know	19	9.5
	Total	201	100.0

4.29. Artificial respirations are more appropriate than CPR, if a person is not breathing but has palpable pulse

Out of total 201 study participants, 115(57.2%) selected true, 51(25.4%) selected false and 35(17.4%0 selected don't know. **(Table 4.29)**

Table.4.29. Artificial respirations are more appropriate than CPR, if a person is not breathing but has palpable pulse

Artificial respirations are more appropriate than CPR, if a person is not breathing but has palpable pulse		Frequency	Percent
	True	115	57.2
	False	51	25.4
	Don't know	35	17.4
	Total	201	100.0

4.30. It is always better to be calm and contented while conducting CPR rather than look frightened

Out of total 201 study participants, 170(84.6%) selected true, 24(11.9%) selected false and 7(3.5%) selected don't know. (Table 4.30)

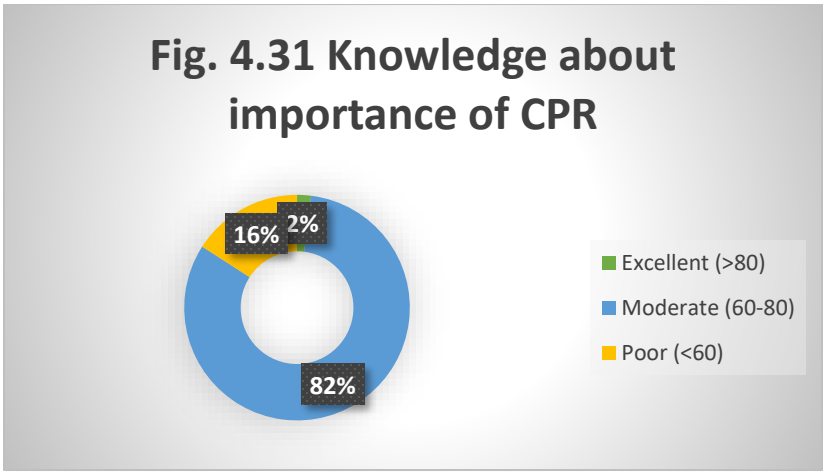
Table.4.30. It is always better to be calm and contented while conducting CPR rather than look frightened

It is always better to be calm and contented while conducting CPR rather than look frightened		Frequency	Percent
	True	170	84.6
	False	24	11.9
	Don't know	7	3.5
	Total	201	100.0

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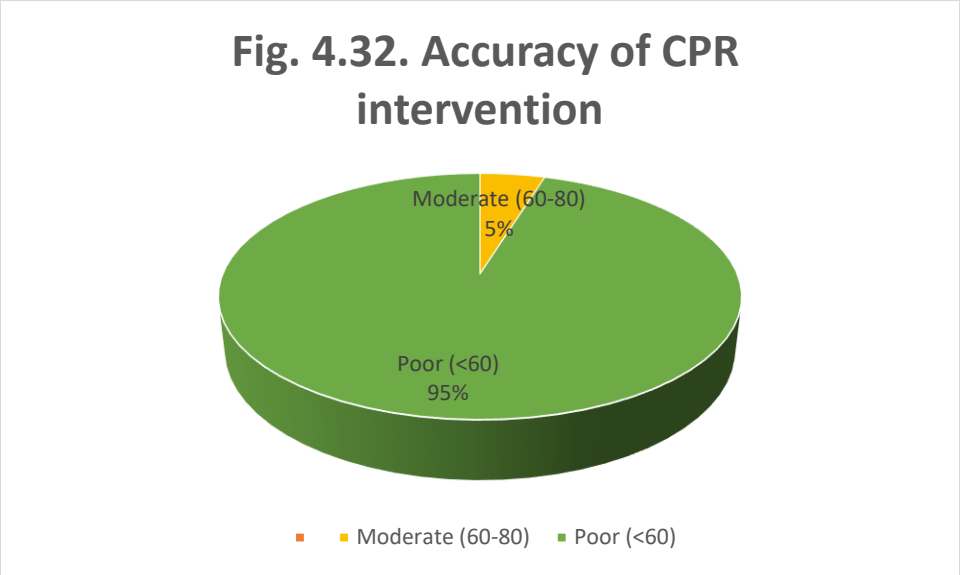
A. Knowledge about Importance of CPR

Out of total 201 participants, 4(2.0%) participants have excellent knowledge about importance of CPR, 165(82.1%) have moderate knowledge about importance of CPR and 32(15.9%) have poor knowledge about importance of CPR. **(Table 4.31)**



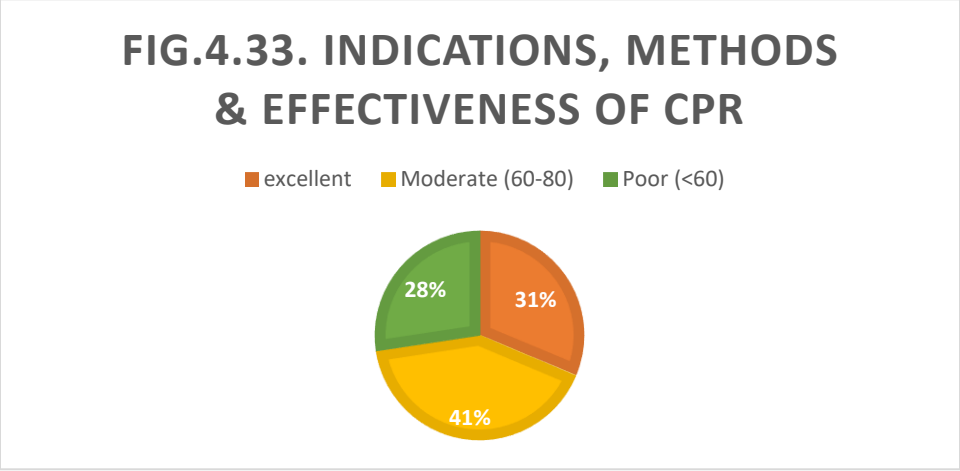
B. Main goal & accuracy of Cardiopulmonary Resuscitation (CPR)

Out of total 201 study participants, 1(5%) had accurate knowledge about CPR intervention, and 200(99.5%) had poor knowledge about CPR intervention. **(Table 4.32)**



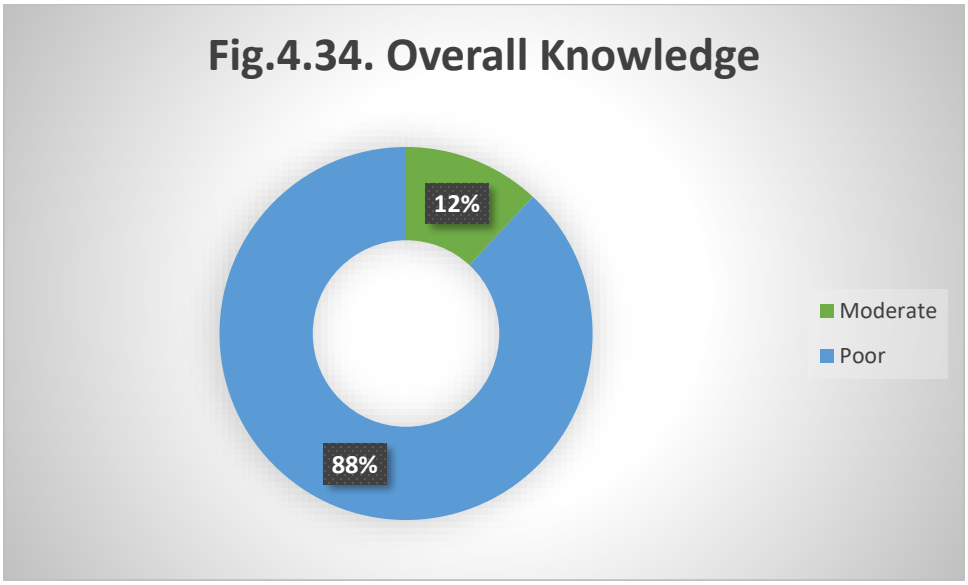
C. Indications , Methods & Effectiveness of CPR

Out of total 201 study participants, 63(31.3%) had excellent knowledge about indications, methods & effectiveness of CPR, 83(41.3%) had moderate knowledge and 55(27.4%) had poor knowledge. **(Table 4.33)**



4.34. Total Knowledge about Importance, Main Goal and Accuracy, and Indications, Methods and Effectiveness of CPR.

Out of total 201 study participants, 24(11.9%) have overall moderate knowledge and 177(88.1%) have overall poor knowledge about importance, goal and accuracy, and indications, methods and effectiveness of CPR. **(Table 4.34)**



DISCUSSION

The estimated total score of CPR knowledge among nurses was poor in our study. However, the score of awareness of CPR was better than the score of skills of CPR. In a specific analysis, it was found that both their knowledge and practical approach were not up to date with the current guidelines of CPR. Return to a prior quality of life and functional state of health is the ultimate aim of CPR and post-CPR care. High-quality CPR is the cornerstone of first aid and emergency medical care that can optimize outcomes beyond return of spontaneous circulation. **(Vural, Koşar et al. 2017)**

The doctors, nurses and paramedical staff should be instructed to complete CPR courses, as they are routinely facing life-threatening situations, and the knowledge of CPR will be definitely useful especially in hospital SCAs. Our findings of CPR knowledge among nurses are very important to plan new CPR courses for these Health care professionals to improve the outcome of SCAs in which an effective CPR must be performed immediately to save many lives. We believe that victims of SCAs could have been saved to some extent with an increase in CPR knowledge of health care professionals. **(Vural, Koşar et al. 2017)**

The World Health Organization (WHO) estimates that 17 million people died in 2008 from cardiopulmonary diseases. Administering a fast standard CPR or even just hands-only-CPR in victims older than 12 years of age can improve the chances of survival up to 10 percent. Contribution of an automated external defibrillators (AEDs) to CPR procedure within 1–2 minutes Increases survival rate up to 60%. **(Vural, Koşar et al. 2017)** The knowledge of CPR plays a vital role in the final outcome of acute emergency situations. **(Vural, Koşar et al. 2017)**. Thus, the knowledge and experiences of CPR were examined in 201 nurses with whom 172(85.6%) do not have CPR certificate and only 29(14.4%) had CPR certificate. Awareness of the importance of CPR was present in 98.0% nurses, but the knowledge and experience about CPR was found generally poor in nurses. In comparison, another study conducted by **(Vural, Koşar et al. 2017)** found 88. 5% of total respondents were aware of the importance of CPR.

In our study, out of total 201 participants, majority (81.1%) had clinical experience range between 1-5 years. This result is supported by previous study conducted in Mangalore **(Varughese and D'Silva 2018)** in which majority 92.1% of the subjects were females and highest education of the respondents were with BSc Nursing with 1 -5 years

(2.5±3.9) of clinical experience. On the contrary another study conducted by **(Tíscar-González, Blanco-Blanco et al. 2019)** found majority (35.2%) had work experience of >20 years. In another study conducted by **(Munezero, Atuhaire et al. 2018)** found majority (34.4%) had clinical experience range between 6-10 years.

The age of study participants was in between the range of 20 to 49 years. The minimum age was 20 years old and the maximum age was 49 years old. Out of total 201 participants, majority of the respondents (89.1%) were between the ranges of 20-29 years. In comparison with another study conducted by **(Araujo, Araújo et al. 2022)** found that 37.5% were between the ranges of 19-30 years. On the contrary another study conducted by **(Almeida, Araújo et al. 2011)** 37% of the total respondents were between the range of 30-39 years.

CPR techniques are simple. Even though immediate response to a cardiac arrest challenging in resource limited and developing countries, having the basic knowledge, skill and attitude Is an essential part of medical service providers **(Mendhe, Burra et al. 2017)**. In our study, only 20.9 % of respondents had CPR training for less than 2 years. On the contrary another study conducted by **(Araujo, Araújo et al. 2022)** found 35.7% had CPR training equal to or less than 1 year. In another study **(Mendhe, Burra et al. 2017)** 69% of the study participants have not performed CPR any time while only 29% of the participants (30% MBBS interns and 28% nursing Interns) have performed CPR. In another study conducted by **(Kaihula, Sawe et al. 2018) f**ound a total of (67%) participants reported to have previously performed CPR on an adult patient; of these, (46%) reported to have done CPR 1–3 times in the past 1 month.

Nursing staff are usually the first to notice a cardiac arrest in the hospital. They are the ones who frequently contact the helpline. As a result, these professionals must have up-to-date technical knowledge and practical skills in order to contribute more effectively to cardiac arrest maneuvres**.(Moule and Albarran 2002).**Therefore nurses knowledge related to Basic Life Support (BLS) should be advanced and up-to-date. We conducted a descriptive cross-sectional survey to assess the nurses knowledge related to CPR, out of total 201 study participants more than 90% of the participants knew the correct meaning of the BLS acronym. On the contrary a study conducted by **(Kwiecień-Jaguś, Mędrzycka-Dąbrowska et al. 2020)** A detailed analysis of correct answers given by the respondents showed that more than 66% of them knew the meaning of the BLS acronym. Another study conducted by (Isa, Rahmad et al. 2022) at a private hospital in Seremban for more than 96.5% of the respondents answered the question "What is the abbreviation of BLS?" correctly.

The sequence Compression, Airway, Breathing (CAB) is still recommended in the literature because it reduces delays in starting chest compression. The evaluation of responsiveness and the presence of adequate breathing must be done concurrently and quickly, with the goal of calling the emergency helpline as soon as possible.**(Machado, Moreira et al. 2019).** Major portion of our study participants were aware of the accurate sequence of CPR application and 63.2% of the respondents answered the question "Current order of updated CPR intervention in adults?" correctly. In comparison another study held in Nigeria 67.1% of the participants knew the current updated order of CPR interpretation.**(Olateju and Amoran 2014).**

However another study conducted by (Vural, Koşar et al. 2017) unfortunately, only 21.8% were aware of the current upgraded order of CPR intervention, being C-A-B from previous A-B-C.

This study highlighted the importance of chest compressions and changed the compression: ventilation ratio for adult CPR to 30:2. The 30:2 ratio is intended to simplify teaching, promote skill retention, increase the number of compressions given, and reduce interruption to compressions.**(Deschilder, De Vos et al. 2007).**The recommended universal compression : ventilation is 30 : 2 in adults. The result of the study we conducted was that about 86.6% out of total 201 study participants were aware of the recommended universal ratio of chest compression to ventilation. On the contrary a questionnaire study conducted by **(babu**

Amberkar, Alur et al. 2014) only 84% of the respondents partially answered in a correct manner.

The majority (67.7%) of the participants have good knowledge about the full form of AED (Automated Electrical Defibrillator). This machine is present in hospital and is used during emergency situation of cardiac arrest. The AED records the unconscious person's medical data (heart rhythm and information about cardiopulmonary resuscitation), which may be important for further diagnosis and treatment. This result is supported by previous study in which majority (59.6%) of the participants have good knowledge about AED full form.(Asadi, Zia Ziabari et al. 2021)

CPR is an emergency procedure which is attempted in an effort to return life in cardiac arrest. The knowledge of CPR plays a vital role in the final outcome of acute emergency situations related to cardiac arrest. Majority (97.5%) of the nurses are aware about importance of CPR in cardiac arrest patients. This result was supported by a study in which (94.50%) participants are aware about importance of CPR in cardiac arrest patients.(Vural, Koşar et al. 2017)

When someone suffers sudden cardiac or respiratory arrest, cardiopulmonary resuscitation (CPR) may restart their heart and breathing. CPR attempts can be traumatic: physically for patients and emotionally for their relatives. (Mockford, Fritz et al. 2015). CPR procedure is not limited to hospital setting. It can be provided outside of the hospital when needed. Cardiopulmonary resuscitation (CPR) provided by community citizens is of paramount importance for out-of-hospital cardiac arrest (OHCA) victims' survival. (Mathiesen, Bjørshol et al. 2016). Majority (74.6%) of the participants are aware that CPR has not been always attempted inside hospital but it can be performed outside the hospital. This result was supported by a study conducted in which 67% nurses are aware about this.(Vural, Koşar et al. 2017).

LIMITATIONS:

- A larger sample size could provide a more comprehensive picture of nurses' CPR knowledge.
- A skill gap was not assessed, which could reveal a definite and clear picture of health care providers', particularly nurses', knowledge regarding the indications, methods, and effectiveness of CPR application.
- There was no control group in the study.

RECOMMENDATIONS:

- There is a dire need to have basic & advanced courses, teaching, sessions, workshop, seminars for nurses to keep them updated regarding knowledge & importance of CPR.
- To reduce the complications related to wrong CPR application, Government should invest more in resourses to hightlight the indications, methods and effectiveness of CPR.
- To improve knowledge and attitude of nurses, there is a need to have periodic in-service trainings for nurses related to their crucial role in health care setting.
- Hospitals should keep all CPR-related equipment, particularly the Automated External Defibrillator (AED), in working order in all emergency departments.
- There is an urgent need for provision of advanced CPR training sessions for all health care providers especially nurses , so that they can work confidently in their workplace.
- There should be atleast a monthly maintaince checkup of all the CPR related equipments to reduce the risk of delayed response in case of an emergency.

CONCLUSION:

This questionnaire survey demonstrated that up-to-date cardiopulmonary resuscitation (CPR) skills in staff nurses were insufficient. Most of the nurses were aware about resuscitation but not able to independently done. Most of the nurses have no sense of cardiopulmonary resuscitation which could have negatively impacted the effective CPR performance. This can be improved by well-designed certified training programs. At least, certified programs training basic skills of CPR should be a mandatory component in the all health-associated fields like medical, paramedical, and nursing colleges and faculties. From this

study, we suggest that all members of our community and health care professionals especially nurses should join CPR training programs.

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