



# “EFFECTIVENESS OF STP ON KNOWLEDGE REGARDING CARE OF PATIENT WITH INTRA-AORTIC BALLOON PUMP (IABP) AMONG NURSES IN SELECTED HOSPITALS OF GUWAHATI, ASSAM: A PRE-EXPERIMENTAL STUDY.”

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## ABSTRACT

### BACKGROUND

Intra-aortic balloon pump (IABP) is the most widely used temporary mechanical circulatory assist device for supporting failing circulation since its introduction by Kantrowitz and colleagues in 1960s. The IABP assists the heart indirectly by decreasing the afterload and augments diastolic aortic pressure with subsequent enhancement in diastolic blood flow resulting in better perfusion of the peripheral organ as well as a possible improvement in the coronary blood flow. IABP is an effective mean of supporting the failing circulation in patient, but it is also associated with complications – ischemia, injury to artery, rupture of the balloon, injury to kidney, low platelet count leading to bleeding, infection, stroke, catheter migration, compartment syndrome, aortic dissection and liver ischemia. Cardiovascular nurses caring for these patients require skills and knowledge that enable prompt recognition and treatment of sometimes life-threatening complications associated with balloon pump therapy.

### OBJECTIVES OF THE STUDY

- To assess the level of pretest-posttest knowledge regarding care of patient with IABP among staff nurses in selected hospitals of Guwahati, Assam before and after administration of STP.
- To determine the effectiveness of STP regarding care of patient with IABP by comparing the pretest and posttest level of knowledge among nurses in selected hospitals of Guwahati, Assam.
- To find the association between the pre-test level of knowledge regarding care of patient with IABP, with selected demographic variables (age, professional qualification, total work experience, work experience in CTVS, any special training).

### METHODS AND MATERIALS

Pre experimental one group pre-test post-test design was used to accomplish the objectives. Study was undertaken on 60 staff nurses working in CTVS ICU of selected hospitals of Guwahati, Assam by using non probability purposive sampling technique and quantitative approach was adopted to achieve the study objectives. Staff nurses were selected on the basis of inclusion criteria. Pre-test knowledge was checked using structured knowledge questionnaire. The post-test was conducted on the seventh day after the administration of STP in the same manner.

## RESULTS

Out of 60 staff nurses, majority 30(50%) belongs to 21-25 years of age, 52(86.7%) were female, 39(65%) of the staff nurses were GNM, 29(48.3%) had one to five years of total working experience in CTVS ICU, 54(90%) have not attended any special training on care of patient with IABP and 42(70%) have not handled patient with IABP. In the pre-test knowledge, majority 31(51.67%) had moderately adequate knowledge with mean score of 16.56 (SD 4.58). In post-test knowledge, majority 37 (61.67%) had moderately adequate knowledge with a mean knowledge score of 21.66 (SD 3.32) and 23(38.33%) had adequate knowledge.

The calculated value of paired 't' (13.089) was more than the tabulated value (1.64) at 0.05 level of significance which indicated that the STP regarding care of patient with IABP was effective in improving the knowledge of the staff nurses.

## CONCLUSION

Based on the analysis of the findings of the study, the following inferences were drawn. There was evident increase in the knowledge after administration of structured teaching programme on care of patient with IABP. Thus it was proved that the structured teaching programme was an effective teaching method for creating awareness on importance of care of patient with IABP.

## KEY WORDS

Knowledge, Structured Teaching Program, IABP, CTVS ICU nurse

## INTRODUCTION:

The coronary artery disease (CAD) and myocardial infarction (MI) occurs when myocardial tissues are abruptly and severely deprived of oxygen. Ischemia can lead to necrosis of myocardial tissues if blood flow is not restored. CAD is a narrowing or obstruction of one or more coronary arteries as a result of atherosclerosis, which is an accumulation of lipid containing plaque in the arteries. Its causes decreased myocardial tissues perfusion. Acute myocardial infarction (AMI) complicated by cardiogenic shock is one of the leading causes of death in hospitalized patients and it accounts for 41.1%.

Patients with the clinical and biochemical signs and symptoms of hypoperfusion secondary to cardiac failure or cardiac arrest carry high short term mortality. Various mechanical circulatory devices have been developed to mitigate the adverse outcome of cardiogenic shock until treating the underlying cause. Intra-aortic balloon pump (IABP) is the simplest, cost effective, easy to implant and explants in the coronary catheterization laboratory.

The intra-aortic balloon inflates at the beginning of diastole synchronously with aortic valve closure and deflates before ventricular systole. Inflation of the balloon at the beginning of diastole displaced blood upward towards the aorta root and augments the diastolic pressure. The increase in diastolic pressure forces blood back to the coronary arteries is increased, with a resultant improvement in myocardial oxygen supply.

## OBJECTIVE OF STUDIES

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## HYPOTHESES

- H<sub>1</sub>: There is a significant difference between the pre-test and post-test knowledge of staff nurses regarding care of the patient with IABP
- H<sub>2</sub>: There is a significant association between pre-test score of knowledge regarding care of patient with IABP and selected demographic variables.

## METHODOLOGY:

A pre-experimental design was used in the study to accomplish the objectives using non- probability purposive sampling technique for obtaining adequate sample for the study. Study was done on 60 Staff Nurses working in CTVS of selected hospitals of Guwahati, Assam. Respondents were selected on the basis of inclusion and exclusion criteria; Structured knowledge questionnaire was used to assess the knowledge regarding IABP. STP was provided to the participants after pre-test. The post-test was conducted after seven days of STP.

## DESCRIPTION OF THE TOOL

In order to meet the objectives of the study, the following tools were constructed which consists of two sections:

SECTION I- Demographic data

SECTION II- Structured Knowledge Questionnaire

## DATA COLLECTION PROCESS

The data collection was scheduled from 28<sup>th</sup> September to 19<sup>th</sup> October 2023. A formal written application was obtained from the medical superintendent of the selected hospitals for conducting the research study by the investigator before collection of the data.

The investigator visited the hospital on the given respective dates and was introduced to the staff who fulfilled the pre determined inclusion criteria. The investigator explained the purpose of her study and she assured them of the confidentiality.

They were also informed that privacy as well as confidentiality will be maintained. All respondents had signed informed permission before the research was conducted. Demographic proforma was collected. The participants were provided with a structured knowledge questionnaire to evaluate their knowledge regarding IABP which took 20-25 minutes to complete in average. STP was provided to the participants after pre-test. The post-test was conducted after seven days of STP.

## RESULT

### SECTION I:

Frequency and percentage distribution of demographic variables of nurses.

**Table 1: Frequency and percentage distribution of demographic variables of nurses.**

n = 60

Demographic Variables	Frequency (f)	Percentage (%)
<b>Age in years</b>		
21 – 25	30	50.0
26 – 30	18	30.0
31 – 35	11	18.3
>35	1	1.7
<b>Gender</b>		
Male	8	13.3
Female	52	86.7
Others	-	-
<b>Professional qualification</b>		
G.N.M	39	65.0
B.Sc. Nursing	16	26.7
Postbasic B.Sc. Nursing	5	8.3
M.Sc. Nursing	-	-
<b>Total years of working experience in CTVS</b>		
<1 year	23	38.4
1 – 5 years	29	48.3
5 – 10 years	5	8.3
>10 years	3	5.0
<b>Any training attended regarding care of patient with IABP</b>		
Yes	6	10.0
No	54	90.0
<b>Handled patient with IABP</b>		
Yes	18	30.0
No	42	70.0

The table 1 portrays that most of the staff nurses, 30(50%) were aged between 21 – 25 years, 52(86.7%) were female, 39(65%) were GNM, 29(48.3%) had 1 – 5 total years of working experience in CTVS, 54(90%) had not trained attended regarding care of patient with IABP and 42(70%) had not handled patient with IABP.

## SECTION II:

Frequency and percentage distribution of pretest and post test level of knowledge regarding care of patient with IABP among staff nurses.

**Table 2: Frequency and percentage distribution of pretest and post test level of knowledge regarding care of patient with iabp among staff nurses**

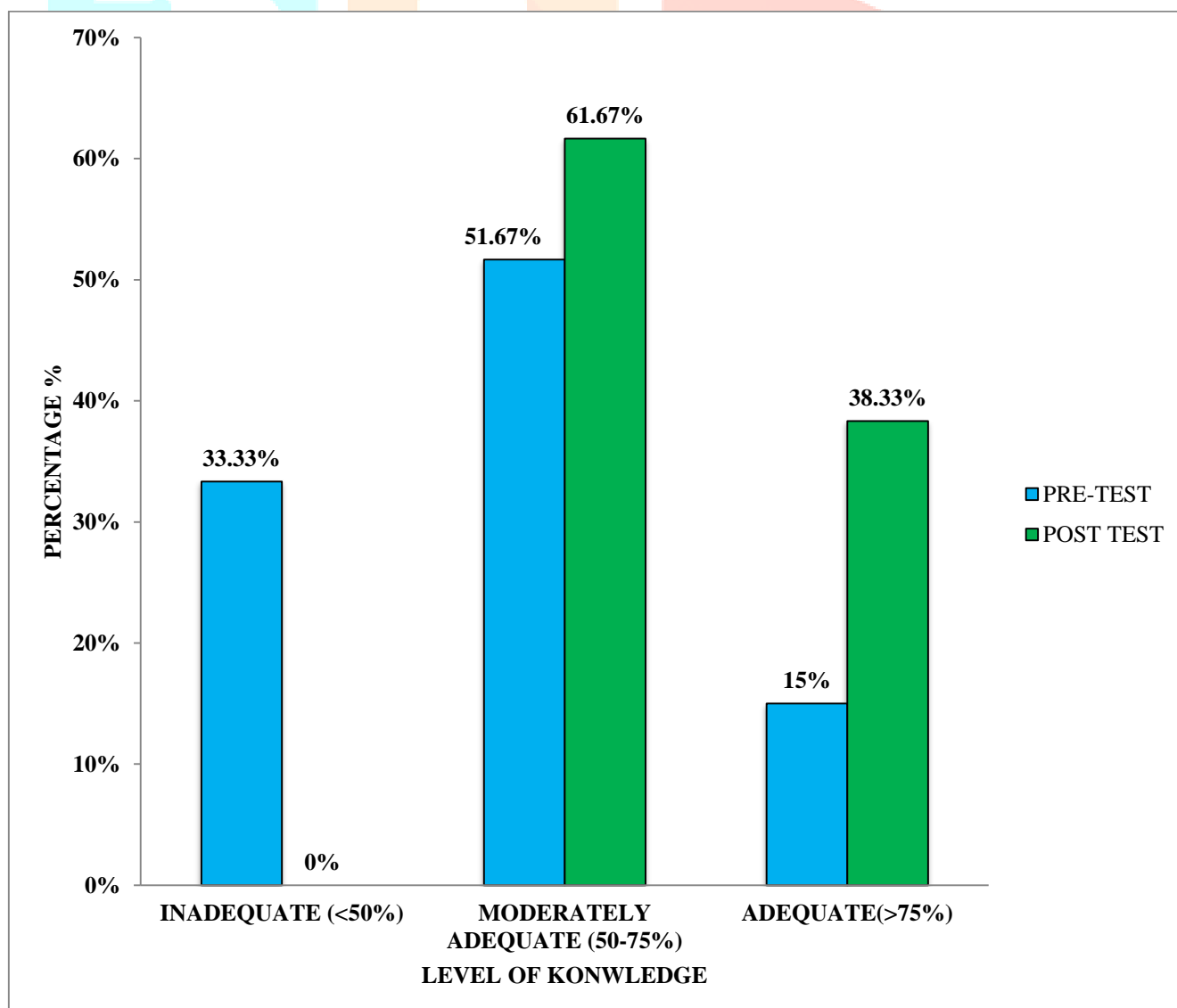
n = 60

Level of Knowledge	Pretest		Post Test	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Inadequate (<50%) ( 0-15)	20	33.33	0	0
Moderately adequate (50 – 75%) (15-22)	31	51.67	37	61.67
Adequate (>75%) (23-30)	9	15.0	23	38.33
Total	60	100%	60	100%

The table 2 depicts the frequency and percentage distribution of pretest and post test level of knowledge regarding care of patient with IABP among staff nurses.

It shows that in the pretest, 31(51.67%) had moderately adequate knowledge, 20(33.33%) had inadequate knowledge and nine (15%) had adequate knowledge regarding care of patient with IABP among staff nurses.

After the intervention, 37(61.67%) had moderately adequate knowledge and 23(38.33%) had adequate knowledge regarding care of patient with IABP among staff nurses.



**BAR DIAGRAM SHOWING PERCENTAGE DISTRIBUTION OF PRETEST AND POST TEST LEVEL OF KNOWLEDGE REGARDING CARE OF PATIENT WITH IABP AMONG STAFF NURSES**

## SECTION III:

Effectiveness of STP on knowledge regarding care of patient with IABP among nurses.

**TABLE – 3 Effectiveness of STP on knowledge regarding care of patient with IABP among nurses**

H<sub>1</sub>: There is significant difference between the mean pre-test knowledge score and the mean post-test knowledge regarding care of patient with IABP at 0.05 level of significance.

H<sub>0</sub>: There is no significant difference between the mean pre-test knowledge score and the mean post-test knowledge regarding care of patient with IABP at 0.05 level of significance.

n =60

Variables	Mean	S.D	Range of score	Mean Difference	Paired “t” test and p- Value
Pretest	16.56	4.58	7 - 26	5.10	t = 13.089 p=0.0001, S***
Post Test	21.66	3.32	15 - 28		

\*\*\*p<0.001, S – Significant

The Table 3 shows that the pretest mean score of knowledge was 16.56 with SD of 4.58 and the post test mean score of knowledge was 21.66 with SD of 3.32. The mean difference score was 5.10. The calculated paired “t” test value of t=13.089 and p = 0.0001. Since p value is less than 0.001, H<sub>0</sub> was rejected and H<sub>1</sub> was accepted which inters that there was significant difference between mean pre-test and post-test knowledge score regarding IABP care among staff nurses. This shows that administration of STP on knowledge regarding IABP care among staff nurses was found to be effective in improving the post-test knowledge score which was also evident from the increase in the mean score from 16.56 to 21.66.

## SECTION IV:

Association of pretest level of knowledge regarding care of patient with IABP among nurses with their selected demographic variables.

**Table- 4**

n = 60

Demographic Variables	Inadequate		Moderately Adequate		Adequate		Fisher Exact test p-value
	f	%	f	%	f	%	
<b>Age in years</b>							p=0.186 N.S
21 – 25	13	21.7	15	25.0	2	3.3	
26 – 30	5	8.3	9	15.0	4	6.7	
31 – 35	2	3.3	7	11.7	2	3.3	
>35	0	0	0	0	1	1.7	
<b>Professional qualification</b>							p=0.114 N.S
G.N.M	15	25.0	21	35.0	3	5.0	
B.Sc. Nursing	5	8.3	7	11.7	4	6.7	
Postbasic B.Sc. Nursing	0	0	3	5.0	2	3.3	
M.Sc. Nursing	-	-	-	-	-	-	
<b>Total years of working experience in CTVS</b>							p=0.212 N.S
<1 year	11	18.3	9	15.0	3	5.0	
1 – 5 years	8	13.3	18	30.0	3	5.0	
5 – 10 years	1	1.7	2	3.3	2	3.3	
>10 years	0	0	2	3.3	1	1.7	
<b>Any training attended regarding care of patient with IABP</b>							p=0.846 N.S
Yes	2	3.3	4	6.7	0	0	
No	18	30.0	27	45.0	9	15.0	
<b>Handled patient with IABP</b>							p=0.048 S*
Yes	2	3.3	12	20.0	4	6.7	
No	18	30.0	19	31.7	5	8.3	

\*p<0.05, S – Significant, p>0.05, N.S – Not Significant

## INTERPRETATION

The data presented in Table X represents the following:

- 1. Age:** The calculated p value was 0.186. Since the p value was more than 0.05 level of significance, there was no significant association between knowledge and age.
- 2. Professional qualification:** The calculated p value was 0.114. Since the p value was more than 0.05 level of significance, there was no significant association between knowledge and professional qualification.
- 3. Total years of working experience in CTVS:** The calculated p value was 0.212. Since the p value was more than 0.05 level of significance, there was no significant association between knowledge and total years of working experience in CTVS ICU.
- 4. Any training attended regarding care of patient with IABP:** The calculated p value was 0.846. Since the p value was more than 0.05 level of significance, there was no significant association between knowledge and training attended regarding care of patient with IABP.
- 5. Handled patient with IABP:** The calculated p value was 0.048. Since the p value was less than 0.05 level of significance, there was significant association between knowledge and handled patient with IABP.

Therefore,  $H_{02}$  was rejected and  $H_2$  was accepted which inters that there was significant association between pre-test knowledge score and selected demographic variable –handled patient with IABP.

## CONCLUSION

Based on the analysis of the findings of the study, the following inferences were drawn:

In the pre test knowledge, majority i.e. 31 (51.67%) had moderately adequate knowledge whereas in post test knowledge, majority i.e.37 (61.67%) had moderately adequate knowledge and 23 (38.33) had adequate knowledge. In pre test, mean knowledge score was 16.56(SD 4.58) whereas in post test, the mean knowledge score was 21.66(SD 3.32). The calculated value of 't' (13.089) and  $p=0.0001$ . Since p value is less than 0.001, it showed that STP regarding care of patient with IABP was effective in improving the knowledge of the staff nurses. There was significant association between pre test knowledge with handled patient with IABP whereas there was no significant association with age, professional qualification, total years of working experience in CTVS ICU and any training attended regarding care of patient with IABP.

## REFERENCES

1. Neelavathi, D. A pre experimental study to assess the effectiveness of capacity building program regarding care of patient with Intra Aortic Balloon Pump (IABP) upon the level of knowledge and practice among Nurses. 2017 August. [cited on 2023 June 22] Available from: [URL:http://repository-tnmgrmu.ac.in](http://repository-tnmgrmu.ac.in).
2. Zheng XY, Wang Y, Chen Y, Wang X, Chen L, Li J and Zheng Z. A meta-analysis and patient with or without cardiogenic shock. 2016 July. [cited on 2023 June 24] Available from [URL:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4939027](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4939027).
3. Khan TM. Intra Aortic Balloon Pump- Stat Pearls. 2023 April. [cited on 2023 June 24] Available from: [URL:https://www.ncbi.nlm.gov](https://www.ncbi.nlm.gov).
4. Hariprasath P. Textbook of Cardiovascular and Thoracic Nursing.1<sup>st</sup>Ed. New Delhi: Jaypee Brothers Medical Publishers (p) ltd; 2016.
5. Ghafoor Y, Sarwar H, Afzal M, Yaqoob A, Khan S and Ghafoor S. The effect of teaching programme on knowledge and caring practice of Intra Aortic Balloon Pump patient among ICU staff nurses. 2022 July [cited on 2023 June 23] Available from: [URL:https://www.researchgate.net/doi.org/10.53350/pjmhs22164273](https://www.researchgate.net/doi.org/10.53350/pjmhs22164273).
6. World Health Organization: Cardiovascular diseases, Retrieved from [URL https://www.who.int/health-topics/cardiovascular-diseases#tab=tab\\_1](https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1)
7. GBD 2019 Diseases and Injuries Collaborators: Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019, *Lancet* 396(10258):1129-1306,2020.
8. Manshadi S D, Eisenberg N, Montbriand J, Luk A and Nagle G R. Vascular complications with Intra Aortic Balloon Pump (IABP). 2022 November [cited 2024 Jan 27] Volume 4(Issue)[p.989-993] Available from, [URL:https://www.sciencedirect.com/doi.org/10.1016/j.cjco.2022.08.008](https://www.sciencedirect.com/doi.org/10.1016/j.cjco.2022.08.008).
9. Amin S K H, Elkattan B S A and Elhoty M E E. Nurses' performance regarding care of patients undergoing Intra-Aortic Balloon Pump Therapy. 2023 July [cited 2024 Jan 27] Available from, [URL:https://www.eurchembull.com/doi:10.48047/ecb/2023.12.si8.55](https://www.eurchembull.com/doi:10.48047/ecb/2023.12.si8.55).



10. Ghafoor Y, Sarwar H, Afzal M, Yaqoob A, Khan S and Ghafoor S. The effect of teaching programme on knowledge and caring practice of Intra Aortic Balloon Pump patient. 2022 April [cited on 2023 June] Available from: URL:<https://www.researchgate.net/doi:10.53350/pjmhs22164273>

11. Mahgoub A.A and Hafez A.I.A. Effect of implementing intra-aortic balloon pump teaching program on critical care nurses' knowledge and practice. 2017 [cited 2023 June 26] Volume 6(issue 1 Ver.IV)[P.54-62]. Available from, URL:<https://www.researchgate.net>

12. Polit FD and Hungler PB, Nursing research and principles and methods. 7<sup>th</sup> edition. Philadelphia: J.B. Lippincott Company; 2012.

13. System Theory in Nursing. Available from: URL:<https://currentnursing.com>

14. Polit FD. Hungler PB. Nursing research principles and methods. 6th ed. Philadelphia: Lippincott Company, 1999, P.378

15. Krlev A, Kalisnik J M, Bauer A, Sirch J, Fittkau M and Fischlein T. Impact of prophylactic Intra- Aortic Balloon Pump on early outcomes in patients with severe left ventricular dysfunction undergoing elective coronary artery bypass grafting with cardiopulmonary bypass. 2023 August.[cited on 2024 Jan] Available from: URL:<https://pubmed.ncbi.nlm.nih.gov/37209782/>

16. Bonios M J, Armenis I, Kogerakis N, Thodou A, Fragkoulis S, Gkouziouta A, et al. the effect of prolonged intra aortic balloon pump (IABP) support on right ventricular function in end stage heart failure. 2021 October [cited on 2024 Jan] Available from: URL:[https://academic.oup.com/eurhear/article/42/supplement\\_1/ehab7](https://academic.oup.com/eurhear/article/42/supplement_1/ehab7)

21. Iqbal M B, Al-Hussaini A , Rosser G, Rajakulasingam R, Patel J, Elliott K, et al. Intra-Aortic Balloon Pump Counterpulsation in the Post- Resuscitation Period is Associated with Improved Functional Outcomes in Patients Surviving an Out-of- Hospital Cardiac Arrest (OOHCA). 2016 December [cited on 2024 Jan] Available from: URL:<https://pubmed.ncbi.nlm.nih.gov>

22. Basavanthapa B T. Nursing research. 2<sup>nd</sup> ed. New Delhi: Jaypee brothers Publication; 2007.

23. Sharma Suresh K. Nursing research and statistics. 3<sup>rd</sup> ed. New Delhi: Elsevier, 2020.

24. Polit FD and Hungler PB, Nursing research and principles and methods. 7<sup>th</sup> edition. Philadelphia: J.B. Lippincott Company; 2012.

25. Polit FD, Beck TC. Nursing Research. 10th edition. New Delhi: Wolters Kluwer India Pvt Lid: 2017

