ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2018; 4(5): 140-146
www.allresearchjournal.com
Received: 03-03-2018
Accepted: 09-04-2018

Sunita Thite
Msc Nursing Student Dr. D.Y Patil College of Nursing Pimpri Pune, Maharashtra, India

Manisha Gaikwad
Assi. Professor, Dr. D.Y Patil College of Nursing Pimpri Pune, Maharashtra, India

Rupali Salvi
Asso. Professor, Dr. D.Y Patil College of Nursing Pimpri Pune, Maharashtra, India

Correspondence
Sunita Thite
Msc Nursing Student Dr. D.Y Patil College of Nursing Pimpri Pune, Maharashtra, India

A study to assess the knowledge and practices regarding use of intra-aortic balloon pump among staff nurses working in critical care unit in selected hospitals, Pimpri, Pune

Sunita Thite, Manisha Gaikwad and Rupali Salvi

Abstract
Introduction: A Descriptive study to assess the knowledge and practices of staff nurses working in critical care units regarding use of Intra-aortic balloon pump, was conducted by Mrs. Sunita Dhananjay Thite in partial fulfillment of the requirement of the award of a degree Master of Science in Nursing at the College of Nursing, Dr. D.Y. Patil University Pimpri, Pune, Maharashtra.
Methods Research Approach: The Research Approach refers to the way in which the Investigator plans and constructs in research process. The researcher has adopted the quantitative approach.
Result-it has been observed that above study showing there were the average knowledge and practice of staff nurses regarding use of Intra-aortic Balloon Pump in critical care unit. Since p-value corresponding to gender is small (less than 0.05), gender is the demographic variable which is found to have significant association with practices of staff nurses regarding Intra-Aortic Balloon Pump.
Conclusion: Nurse had average knowledge and practices on Intra-Aortic Balloon Pump, it is necessary to be aware of such measures. Without this knowledge, nursing practice and patient care are not of high standards.

Keywords: assess, knowledge and practices use of intra-aortic balloon pump, staff nurses

Introduction
A heart attack, or myocardial infarction, begins when a portion of the heart muscle suddenly loses its blood supply due to an obstruction of the coronary arteries. The obstruction is typically due to coronary arteriosclerosis. If the obstruction persists for more than a few minutes, the affected cardiac muscle tissue will begin to die this is known as a heart attack. Total circulation of heart is stopped at the time of cardiac arrest so we use advanced life support that is defibrillation and cardio version. 2
Critical care unit is a hospital facility for provision of intensive nursing and medical care of critically ill patients, characterized by high quality and quantity of continuous nursing and medical supervision and by use of sophisticated monitoring and resuscitative equipment's. Critical care nursing is the field of nursing with a focus on the care of the critically ill or unstable patients. Intensive care nurses are required to be comfortable with a wide variety of technology and its uses in the critical care setting. They should be skilled in handling equipment's such as hemodynamic and cardiac monitoring systems, mechanical ventilator therapy, Intra-Aortic Balloon Pumps, ventricular assist devices, continuous renal replacement equipment' extracorporeal mechanical oxygenation circuits central venous catheters and many other advanced life support devices.

Research Methodology
Research Approach
The researcher has adopted the quantitative approach.

Research Design
The researcher has adopted a Non-experimental Descriptive research design

Setting of the study
The setting for this study was Ruby Hall Critical Care Unit for pilot study and Aditya Birla Memorial Hospital Pune for actual study.

Population
In this study the population comprised those nurses who work in a hospital.

Sample
The sample selected for the present study comprised the Staff nurses working in the critical care unit.

Sample Size
Sample size is 100

Sampling Technique
A Non-Probability Purposive Sampling Technique

Sampling Criteria
The following criteria were set for the selection of sample:

Inclusion Criteria
1. Nurses working in critical care unit.
2. Nurses who are registered nurses.

Exclusion Criteria
1. Nurses who were not willing to participate in this study.
2. Those who had critical care experience less than 6 month.

Development of Tool
The tool was developed after the review of literature on the relevant topic, discussion with experts and respected guide.

Description of the Tool
The Researcher prepared a Demographic Data, a Structured Questionnaire and Observation Checklist were the tool for study. The tool included three sections:

Section I: Participants Demographic Data.
The baseline Performa consisted 6 items like age, gender, education, marital status total years of clinical experience and any course done related intra-aortic balloon pump.

Section II: Questionnaire to assess the level of knowledge.
It contains questionnaire, which helps to assess the nurse's level of knowledge. Questionnaire consists of 20 questions and 4 options. The questions include meaning of intra-aortic balloon pump (1 question) Indication OF Intra-aortic balloon pump (1question) contraindication of intra-aortic balloon pump (2question) Regarding procedure of intra-aortic balloon pump (3questio) Application of intra-aortic balloon pump (6 question) practice of intra-aortic balloon pump (3 question) complication of intra-aortic balloon pump (1 question) local complications (3 questions), types of local complications (1 question), Total mark is 20; each right answer carries 1 mark and wrong answer 0. Categories included in this section is excellent knowledge (16-20 marks), good knowledge (11-15 marks), average knowledge (06-10 marks) and poor knowledge (00-05 marks).

Section III: Observational Checklist.
It contained Observational Checklist to assess the practice of staff nurses regarding use of intra-aortic balloon pump working in critical care unit in selected hospitals.
Checklist consisted of 23 practices. It consists of yes or no type questions. Each 'yes' answer carries 1 mark and no answer 0.Categories of this section is excellent practices (19-23 marks), good practices (13 -18 marks), average level of practices (07-12 marks) and poor practices (00-06 marks).

Validity
Validity refers to the degree to which an instrument measures what it is supposed to be measuring [78].
Content validity is concerned with the sampling adequacy of the content area being measured. Content validity is of special relevance to individuals designing a test to measure knowledge in a specific content area. The content validity of an instrument is based on judgment. Experts in the content area may be called on to analyze the items [78].
The tool for validity was sent to 23 experts from different specialties i.e. Medical-Surgical Nursing, Medicine department, Statistics, Sociology, lay person, Medicine Department, The validity was established by 23 experts. They were requested to give their opinion on the appropriateness and relevance of the items in the tool. As a whole the suggestions and comments of experts included content corrections. The tool was found to be valid. The necessary modifications have been done as per the expert's advice.
In Section A-There were a few deductions in the choices and addition of an item had given in the demographic data.
E.g. In qualification it was advised to remove ANM. Nursing as option for choice.
E.g. advised to add question on any specific course done on critical care unit.
In Section B -Modification in the choices given and same questions were added according to the experts' advice.
E.g. Change in options of question number 5, 15 and 20.
E.g. modify the question no: 9, 13, 16, and 19.
E.g. remove question no: 2 and add new question no: 1
In Section C -Added practice according to the experts' advice.
E.g. modify the sequence of practices.
E.g. add more practices on management (added practice no: 21, 11, 15, and 13).
All suggestions given by the experts were taken in consideration and correction has been done as per that make relevant tool.

Reliability
The reliability of an instrument that yields Quantitative Data is a major concern for assessing its quality and adequacy. Essentially the reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to be measuring. The reliability of a measuring tool can be assessed in several different ways [78].
Reliability was assessed using test re-test method for knowledge section and inter-rated method of reliability for practice section.
The test re-test reliability was used for Structured Questionnaire. The Researcher administered the same Structured Questionnaire test to 10 staff nurses working in critical care unit hospital on two occasions with an interval of 30 minutes and then compared the scores obtained. The comparison procedure was performed objectively by

computing a reliability coefficient, which is numerical index of the magnitude of the test's reliability.
The Inter-rated reliability was used for Observation Checklist. To assess the degree to which observation checklist scores were consistent, the researcher used two different observers to observe and measures practices of 10 staff nurses independently, at the same time and then compared the scores obtained. The comparison procedure was performed objectively by computing a Cohen's Kappa, which is numerical index of the magnitude of the test's reliability.
For knowledge section, reliability was assessed using Test-retest method. Pearson's correlation coefficient was found to be 0.98. For practice section, Inter-rater method of reliability was used. Cohen's Kappa was found to be 0.85.Hence the tool is reliable.

Pilot Study
A pilot study is a small-scale version or trial run of the major study. The function of the study is to obtain information and assess the feasibility of the study for improving and to decide the plan for data analysis [78].
The pilot study was conducted between 1ST September 7th September 2016 on 10 selected nurses of critical care unit to assess the feasibility of the study and to decide the plan for data analysis. Prior permission was taken to collect the Samples from nursing superintendent in Ruby Hall clinic Pune. The Investigator approached the subjects, informed them regarding the objectives of the study and obtained consent after assuring the subjects about the confidentiality of the data.
The data was collected through a Questionnaire and Observation Checklist. The study was found to be feasible.

Procedure for data collection
The final study was conducted from 10th September to 30th September 2016. Samples were collected from Aditya Birla Hospital. Permission was taken from the medical Superintendent and also from the Head of the departments of critical care unit of Aditya Birla Hospital & Jahangir Hospital Actual data collection was done on 100 staff nurses meeting the criteria for the study.
The following schedule was followed for data collection:
The Researcher explained to the nursing in charges, nursing educators of different units and staff nurses about the research study statement and objectives to be conducted in Aditya Birla Hospital and Prior to data collection consent was taken from the samples, and they were assured that their identity would not be revealed in any case. 100 Staff nurses in different selected duty schedule and who were willing to participate in the data were selected. Each question was given 1 minute. Total time taken per respondent for questionnaire was 20 min and for Observation Checklist to observe practices total time given per respondent was 8 hours. In a day, an average of 3-4 staff nurses were taken as sample and data were collected.

Section II
An Analysis of Data Related To Knowledge Regarding Intra-Aortic Balloon Pump among Staff Nurses Working In Critical Care Unit

Table 1 : Knowledge regarding Intra-Aortic Balloon Pump among staff nurses working in critical care unit n=100

Sr. no	Knowledge	Frequency (f)	Percentage %
1	Poor (score 0-6)	0	0
2	Average (score 7-13)	39	39
3	Good (score 14-20)	61	61

61% of the staff nurses had good knowledge (score 14-20) and 39% of them had average knowledge (score 7-13).

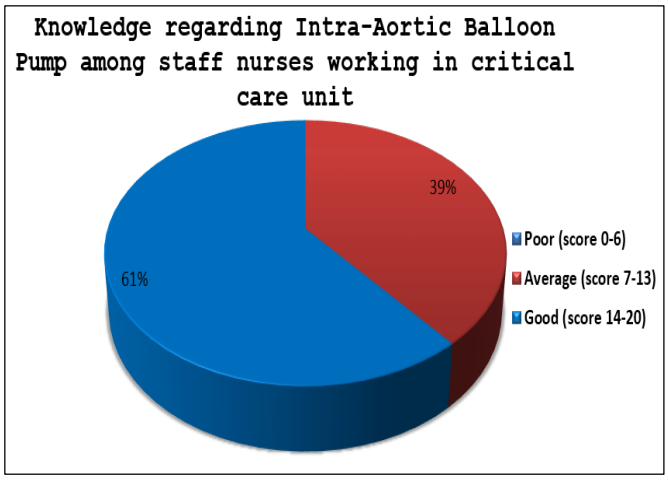

Fig 8: Pie diagram showing Knowledge regarding Intra-Aortic Balloon Pump among staff nurses working in critical care unit

Section III
Analysis of Data Related To Practices Regarding Intra-Aortic Balloon Pump among Staff Nurses Working In Critical Care Unit

Table 3: Practices regarding Intra-Aortic Balloon Pump among staff nurses working in critical care unit n=100

Sr. No	Practices	Frequency (f)	Percentage (%)
1	Poor (score 0-7)	0	0
2	Average (score 8-15)	42	42
3	Good (score 16-23)	58	58

58% of the staff nurses had good practices (score 16-23) and 42% of them had average practices (score 16-23).

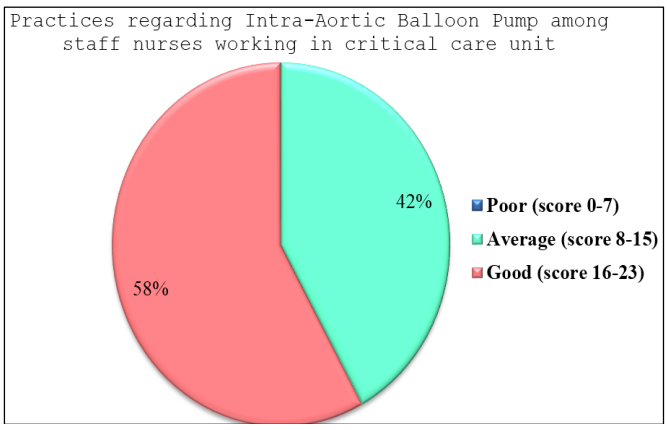

Fig 9: pie diagram showing Practices regarding Intra-Aortic Balloon Pump among staff nurses working in critical care unit

Section IV

Analysis of Data Related To Association between Knowledge and Practices Regarding Intra-Aortic Balloon Pump With Selected Demographic Variable

Association of knowledge and practices regarding Intra-Aortic Balloon Pump with selected demographic variable was assessed using Fisher's exact test. The summary of Fisher's exact test is tabulated below:

Table 4: Fisher's exact test for association between knowledge score regarding Intra-Aortic Balloon Pump with selected demographic variable n=100

Demographic variable		Knowledge		p-value
		Average	Good	
Gender	Male	14	31	0.156
	Female	25	30	
Age	25-35 years	28	39	0.515
	36-45 years	11	22	
Education	GNM	23	25	0.230
	B.sc	8	18	
	M.sc	8	18	
Marital status	Married	8	25	0.049
	Unmarried	31	36	
Years of experience	5-10 years	28	42	0.825
	10-15 years	11	19	
Any special course	Critical care unit	8	16	0.700
	Basic life support	24	32	
	Advanced cardiovascular life support	7	13	

Since p-value corresponding to marital status is small (less than 0.05), marital status is the demographic variable which is found to have significant association with knowledge of staff nurses regarding Intra-Aortic Balloon Pump.

Conclusion

Nurse had good knowledge and practices on Intra-Aortic Balloon Pump, it is necessary to be aware of such measures. Without this knowledge, nursing practice and patient care are not of high standards.

From the present study it can be concluded that staff nurses working in critical care unit of Aditya Birla hospital, Chinchwad, included in the study have good knowledge and practices regarding use ofIntra-Aortic Balloon Pump. There is significant association of the Demographic variable 'gender' with practices of staff nurses regarding Intra-Aortic Balloon Pump.

This chapter provided a summary of the study, a presentation of the main findings, limitations of the study as well as recommendations for nursing practice, education and research. This study was successful in achieving its aims and objectives as well as in using the research process appropriately. The researcher plans to publish the study in an accredited nursing journal.

Limitations of the study

The following were identified as limitations to the study:

The items that referred to observe the practices of staff nurses related to management of use of local complications of intra-aortic balloon pump, only assed how often various complications occurs on patients which was under care of particular nurse included in study.

Despite the final data collection instrument been considered valid by a group of critical care nursing experts, there is a possible lack of reliability as measured by the Cronbach's alpha coefficient which would require refinement and additional testing of the instrument before further use.

Recommendation of the study

A similar study may be replicated on large samples; thereby findings can be generalized for a large population.

A comparative study may be conducted among staff nurses working in critical care unit.

An Experimental Study may be conducted for assessing the effectiveness of protocol and interventions on use of intra-aortic balloon pump.

A health teaching may be planned for staff nurses regarding onuse of intra-aortic balloon pump.

There is also a need for motivate innovate nursing practices in nursing education and nursing services.

Conclusion

Nurse had good knowledge and practices on Intra-Aortic Balloon Pump, it is necessary to be aware of such measures. Without this knowledge, nursing practice and patient care are not of high standards.

From the present study it can be concluded that staff nurses working in critical care unit of Aditya Birla hospital, Chinchwad, included in the study have good knowledge and practices regarding use ofIntra-Aortic Balloon Pump. There is significant association of the Demographic variable 'gender' with practices of staff nurses regarding Intra-Aortic Balloon Pump.

This chapter provided a summary of the study, a presentation of the main findings, limitations of the study as well as recommendations for nursing practice, education and research. This study was successful in achieving its aims and objectives as well as in using the research process appropriately. The researcher plans to publish the study in an accredited nursing journal.

Acknowledgement

"Trust is the Lord with all your heart, and lean not on your own understanding, in all you ways acknowledge Him, and He shall direct your paths." First and foremost, praise and thanks to God, Almighty, for His showers of blessings throughout my research work to complete the research successfully. I would like to express my deep and sincere gratitude to Dr. Mrs. Khurshid Jamadar, Principal, Dr. D. Y. Patil College of Nursing, for continuous guidance and support for the study. I would like extend my profound gratitude and deep regard to my Research Coordinator, Mrs.

Rupali Salvi, Associate Professor, and guide. Mrs. Manisha Gaikwad, Assistant Professor, Dr. D. Y. Patil College of Nursing, for giving me the opportunity to do research and providing invaluable guidance throughout this research. Their dynamism, vision, sincerity and motivation have deeply inspired me. They have taught me the methodology to carry out the research and to present the research works as clearly as possible. It was a great privilege and honor to work and study under their guidance. I am extremely grateful for what they have offered me. I would also like to thank them for their friendship, empathy, and great sense of humor. I am extending my heartfelt thanks to my class coordinator, Mrs. Manisha Gaikwad, for expert guidance, sustained patience and valuable suggestions. I would like to take this opportunity to thank all experts in the field of Medical Surgical Nursing, Child Health Nursing, Community Health Nursing and Social Medicine and also in the field of Pediatric for their valuable suggestions & validation of the tool. I would like to convey my sincere thanks to all the hospital which has allowed and supported me to conduct this study, as well as to all the Nurses who rendered their valuable time for my study. I am grateful to Mrs. Vaishali Chirmude, Statistician, for her valuable guidance in the statistical analysis. I would like to thank Mrs. Archana Rathod, MA, Mphil, English for editing the content of dissertation. I am extremely grateful to my parents for their love, prayers, caring and sacrifices for educating and preparing me for my future. I am very thankful to my husband and my daughters for their love, understanding, prayers and continuing support to complete this research work. Finally, my thanks go to all the people who have supported me to complete the research work directly or indirectly. Mrs. Sunita D Thite.

References

1. Basvanthappa BT. Medical Surgical Nursing. Edition-1. Jaypee Brothers Publications. New Delhi, 350-395
2. Suzanne C. Smeltzer Brenda G. Bare Brunner. Suddarth's text book of Medical and Surgical nursing. 9th ed. Philadelphia: Lippincott publications, 2000, 725.
3. Urden Linda D, Joseph Davis K, Thelen A Lynne. Essentials of Critical Care Nursing. Sydney: Mosby year Book, 1992, 3-4.
4. Phipps Wilma J, Barbara Long C, Nancy Fugate Woods. Shafer's Medical Surgical Nursing. New Delhi: B.T. Publication, 1995, 404-405.
5. Okonta KE, Kanagarajan N, Anbarasu M, Intra-aortic balloon pump in coronary artery bypass graft-factors affecting outcome, J West Afr Coll Surg. 2011; 1(4):28-40. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4170280/
6. Selim Isbir C, Yildirim T, Akgun S, Civelek A, Aksoy N, Oz M *et al*. Coronary artery bypass surgery in patients with severe left ventricular dysfunction, Int J Cardiol. 2003; 90(2-3):309-16. https://www.ncbi.nlm.nih.gov/pubmed/12957767
7. Vidya Rajesh Gupta, Regina Dias. Effectiveness of Simulated Demonstration regarding Defibrillation Technique on Knowledge and Practices among Nurses, International Journal of Science and Research (IJSR), ISSN (Online), 2319-7064, 720-727.
8. Shinde M, Anjum S, Educational Methods and Media for Teaching in Practice of Nursing. Sneha Publication India (Dombivili), 2007.
9. Wikipedia, the free encyclopedia, ast modified on 21 May. 2016; 10:22. https://en.wikipedia.org/wiki/Intra-ortic_balloon_pump Texas Heart Institute, http://www.texasheart.org/Research/Devices/iabp.cfm
10. Overwalder PJ. Intra-Aortic Balloon Pump (IABP) Counterpulsation, The Internet Journal of Thoracic and Cardiovascular Surgery TM ISSN, 1524-0274, http://www.rjmatthewsmd.com/Definitions/IABP_Counterpulsation.htm
11. Kunadian Vijayalakshmi, Babu Kunadian, Victoria J, Whittaker Robert A, Wright James A. Hall, *et al*. Intra-Aortic Counterpulsation Does Not Improve Coronary Flow Early after PCI in a High-Risk Group of Patients, Journal of invasive cardiology, 2007, 19(8). http://www.invasivecardiology.com/article/7553
12. Heart disease statistics, cardio Smart, American college of cardiology, Last updated on, 2016. https://www.cardiosmart.org/Heart-Basics/CVD-Stats
13. Institute of Medicine (US) Committee on a National Surveillance System for Cardiovascular and Select Chronic Diseases. National Academies Press (US), 2011 https://www.ncbi.nlm.nih.gov/books/NBK83160/
14. Alarming statistics from India. Neocardiab care. Available at URL: www.neocardiab.com/alarming-statistics-india. htm
15. Perera D, Thomas M, Booth J. Elective intra-aortic balloon counter pulsation During High risk Percutaneous Coronary Intervention a Randomized controlled Trail Free, Journal of American Association, 2010, 304(8).
16. Intra-Aortic Balloon Pump indications. Nursing Study Tips. Available at URL, 2010. http://nursingstudytips.com/quick-nursing-subject-briefs/intra-aortic-balloon-pump- indications/44/
17. Naik N, Yadav R, Juneja R. Epidemiology of arrhythmias in India: Current Science. 2009; 97(3):411-413
18. Sefrin P, Paulus T. Resuscitation skills of hospital nursing staff. Anesthetist. 1994; 43(2):107-14.
19. Zheng ZJ, Croft JB, Giles WH, Mensah GA. Sudden cardiac deaths in the United States. 2001; 104(18):2158-63
20. Clarence W. Center for disease control and prevention. State specific mortality from sudden cardiac death. 2002; 51(6):123- 6
21. Hitt E. AHA guidelines: the ABCs of CPR rearranged to CAB. Available from, 2010. www.medscape.com
22. Black M, Joyce, Medical Surgical Nursing, Clinical Management of Positive Outcomes, 7th edition, Elsevier publication, 2:1641-1642.
23. Véronique L, Roger Alan S, Go Donald M, Lloyd-Jones, Robert J, Adams Jarett D. Berry, *et al*. Heart Disease and Stroke Statistics Update, Circulation. 2011; 123(4):e18-e209. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4418670/
24. Cardiac Procedures and Surgeries, American Heart Association, Updated, 2016, 16.

http://www.heart.org/HEARTORG/Conditions/HeartAttack/PreventionTreatmentofHeartAttack/Cardiac-Procedures-and-Surgeries_UCM_303939_Article.jsp#
25. Intra-Aortic Balloon Pump (IABP), Intensive Care Hotline, updated on, 2016. http://intensivecarehotline.com/intra-aortic-balloon-pump-iabp/
26. Kim KB, Lim C. Department of Thoracic and Cardiovascular surgery, Seoul National University Hospital, Korea, 2001, 1964-8.
27. Farto E, Thomas B. Department of Cardiology, Servicod Cardiologia, Hospital Fernado Fonsea, Amadora, 2002.
28. Isabella Debella D. Cardiovascular Nursing: General Aspects. Journal of National Medical Association, 49(2):107. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2641274/ www.oxforddictionaries,com/definition English/asses.
29. Brunner and Siddhartha Medical-Surgical Dictionary, 7th edition, 667-669.
30. Polit D, Beck C. Nursing Research: Generating and Assessing Evidence for Nursing Practice, 8thedi. Lippincott Williams & Wilkins publication, 2008.
31. Sultan Altayyar, Bram Rochwerg, Sami Alnasse. Intra-aortic balloon pump in patients with cardiogenic shock complicating myocardial infarction: a systematic review and meta-analysis of randomized trials (protocol), Syst Rev. Published online 2014 Mar 12. 2014; 3:24. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4008254/
32. Ahmad Y, Sen S, Shun-Shin MJ. Intra-aortic Balloon Pump Therapy for Acute Myocardial Infarction: A Meta-analysis, JAMA Intern Med. 2015; 175(6):931-9. doi: 10.1001/jamainternmed.2015.0569. https://www.ncbi.nlm.nih.gov/pubmed/25822657
33. Unverzagt S, Buerke M, de Waha A. Intra-aortic balloon pump counterpulsation (IABP) for myocardial infarction complicated by cardiogenic shock. Cochrane Database Syst Rev. 2015; 27(3):CD007398. doi: 10.1002/14651858.CD007398.pub3. https://www.ncbi.nlm.nih.gov/pubmed/25812932
34. Cheng JM, den Uil CA, Hoeks SE, van der Ent M. Percutaneous left ventricular assist devices vs. intra-aortic balloon pump counterpulsation for treatment of cardiogenic shock: a meta-analysis of controlled trials., Eur Heart J, 2009; 30(17):2102-8. doi: 10.1093/eurheartj/ehp292. Epub 2009 Jul 18. https://www.ncbi.nlm.nih.gov/pubmed/19617601
35. Burkhoff D, Cohen H, Brunckhorst C, O'Neill WW. A randomized multicenter clinical study to evaluate the safety and efficacy of the TandemHeart percutaneous ventricular assist device versus conventional therapy with intraaortic balloon pumping for treatment of cardiogenic shock. Am Heart J, 2006; 152(3):469-e1-8. https://www.ncbi.nlm.nih.gov/pubmed/16923414
36. Bahekar A, Singh M, Singh S, Bhuriya R. Cardiovascular outcomes using intra-aortic balloon pump in high-risk acute myocardial infarction with or without cardiogenic shock: a meta-analysis. J Cardiovasc Pharmacol Ther. 2012; 17(1):44-56. doi: 10.1177/1074248410395019. Epub 2011 Feb 18. https://www.ncbi.nlm.nih.gov/pubmed/21335478
37. Sjauw KD, Engström AE, Vis MM, van der Schaaf RJ. A systematic review and meta-analysis of intra-aortic balloon pump therapy in ST-elevation myocardial infarction: should we change the guidelines? Eur Heart J, 2009; 30(4):459-68. doi: 10.1093/eurheartj/ehn602. Epub 2009 Jan 23. https://www.ncbi.nlm.nih.gov/pubmed/19168529
38. de Waha S, Desch S, Eitel I, Fuernau G, Lurz P. What is the evidence for IABP in STEMI with and without cardiogenic shock? Ther Adv Cardiovasc Dis. 2012; 6(3):123-32. doi: 10.1177/1753944712446669. Epub 2012 May 8. https://www.ncbi.nlm.nih.gov/pubmed/22569335
39. Kim KB, Lim C. Department of Thoracic and Cardiovascular surgery, Seoul National University Hospital, Korea. 2008; 1964-8.
40. Farto E, Thomas Betal. Department of Cardiology, Servicod Cardiologia, Hospital Fernado Fonsea, Amadora, 2002.
41. Ajith Bhatia, Mali Patel. Department of Cardiothoracic Surgery and Heart Centre Ahmadabad, 2007, 1085-87.
42. Emmiler M, Ayva E. Department of Cardiovascular Surgery, Medical Faculty, Turky, 2008, 567-69.
43. Onorati F, Santarpino G. Cardiac Surgery Unit, Italy, 2009.
44. Wang L, Jiang Y. Department of Thoracic and Cardiothoracic Surgery, China, 2009.
45. Davidavicius G, Shannon J, Godino C. Incidence of overall bleeding in patients treated with intra-aortic balloon pump during percutaneous coronary intervention: 12 year Milan experience, Journal of Interventional Cardiology. 2012; 5(3):350-357
46. Harvey JC, Goldstein Jt. McCabe: Complications of percutaneous intraaortic balloon pumping. Circulation. 1981; 64(II):II-114. http://europepmc.org/abstract/med/7249311
47. Vales L, Kanei Y, Ephrem G, Misra D. Intra-aortic balloon pump use and outcomes with current therapies. J Invasive Cardiol. 2011; 23(3):116-9. https://www.ncbi.nlm.nih.gov/pubmed/21364242?dopt=Abstract
48. Alderman JD, Gabliani GI, McCabe CH. Incidence and management of limb ischemia with percutaneous wire-guided intraaortic balloon catheters. J Am Coll Cardiol. 1987; 9(3):524-10. 1016/S0735-1097(87)80044-X. https://www.ncbi.nlm.nih.gov/pubmed/3819199?dopt=Abstract
49. Elahi MM, Chetty GK, Kirke R, Azeem T, Hartshorne R, Spyt TJ. Complications Related to Intra-aortic Balloon Pump in Cardiac Surgery: A Decade Later, European journal of vascular and endovascular surgery, June. 2005; 29(6):591-594 http://www.ejves.com/article/S1078-5884 (05)00038-9/abstract?cc=y=
50. Wan YD, Sun TW, Kan QC, Guan FX, Liu ZQ, Zhang SG. The Effects of Intra-Aortic Balloon Pumps on Mortality in Patients Undergoing High-Risk Coronary Revascularization: A Meta-Analysis of Randomized Controlled Trials of Coronary Artery Bypass Grafting and Stenting Era. PLoS ONE. 2016; 11(1):e0147291. doi:10.1371/journal.pone.0147291 http://journals.plos.org/plosone/article?id=10.1371/journal. pone.0147291

51. Assis RB, Azzolin K. Centro Universitario Metodista, Brazil, 2009.
52. Pasquale, John Smith. Cardiac Surgery Department, UK, Ital Heart J. 2005; 6(4):361-362.
53. Solms A, Ohman EM. Institute of Medical Epidemiology, Germany, 2011, CD007398.
54. Tatar H, Cicek S, Demirkilic U. Vascular Complication of Intra aorticballoo Pumping: Unsheathed versus Sheathed Insertion society of thoracic surgeons, 2012, 2.
55. Christoph A, Werden K. Critical Care Medicine, Department of Medicine Ill, Germany, 2010, 152-60.
56. Zhang D, Chen Y. Department of Cardiology, China, Actacardiol, 2011, 499-504.
57. Mueller HS, Role of intra-aorticcounterpulsation in cardiogenicshock and acutemyocardialinfarction. Cardiology. 1994; 84(3):168-74.
https://www.ncbi.nlm.nih.gov/pubmed?cmd=Search&doptcm
58. Barron HV, Every NR, Parsons LS, Angeja B, Goldberg RJ, Gore JM *et al*. The use of intra-aortic balloon counterpulsation in patients with cardiogenic shock complicating acute myocardial infarction: data from the National Registry of Myocardial Infarction 2. Am Heart J, 2001; 141(6):933-939.
pmid: 11376306
https://www.ncbi.nlm.nih.gov/pubmed?cmd=Search&doptcm
59. Romeo F, Acconcia MC, Sergi D, Romeo A, Gensini GF, Chiarotti F *et al*. Lack of intra-aortic balloon pump effectiveness in high-risk percutaneous coronary interventions without cardiogenic shock: a comprehensive meta-analysis of randomised trials and observational studies. Int J Cardiol. 2013; 167(5):1783-1793.
doi: 10.1016/j.ijcard.2012.12.027.
pmid: 23295041
https://www.ncbi.nlm.nih.gov/pubmed?cmd=Search&doptcm
60. Perera D, Stables R, Clayton T, De Silva K, Lumley M, Clack L *et al*. Long-term mortality data from the balloon pump-assisted coronary intervention study (BCIS-1): a randomized, controlled trial of elective balloon counter pulsation during high-risk percutaneous coronary intervention. Circulation. 2013; 127(2):207-212.
doi: 10.1161/CIRCULATIONAHA.112.132209.
pmid: 23224207
61. Thiele H, Zeymer U, Neumann FJ, Ferenc M, Olbrich HG, Hausleiter J *et al*. Intraaortic balloon support for myocardial infarction with cardiogenic shock. N Engl J Med. 2012; 367(14):1287-1296.
doi: 10.1056/NEJMoa1208410.
pmid: 22920912
https://www.ncbi.nlm.nih.gov/pubmed?cmd=Search&doptcmck
62. Gu J, Hu W, Xiao H, Feng X, Song Z, Chen Y *et al*. Prophylactic intra-aortic balloon pump reduces C-reactive protein levels and early mortality in high-risk patients undergoing percutaneous coronary intervention. Acta Cardiol. 2011; 66(4):499-504. pmid:21894807
https://www.ncbi.nlm.nih.gov/pubmed?cmd=Search&doptcmneous%20coronary%20intervention
63. Dyub AM, Whitlock RP, Abouzahr LL, Cina CS. Preoperative intra-aortic balloon pump in patients undergoing coronary bypass surgery: a systematic review and meta-analysis. J Card Surg. 2008; 23(1):79-86.
doi: 10.1111/j.1540-8191.2007.00499.x.
pmid: 18290898
64. Chen S, Yin Y, Ling Z, Krucoff MW. Short and long term effect of adjunctive intra-aortic balloon pump use for patients undergoing high-risk reperfusion therapy: a meta-analysis of 10 international randomised trials. Heart. 2014; 100(4):303-310.
doi: 10.1136/heartjnl-2013-304198.
pmid: 23886602
65. Tharwat Ibrahim Rushdy. Warda Youssef Mohammed Morsy Hanaa Ali Ahmed Elfeky, Nurses' knowledge and practice regarding care of patients connected to intra- aortic balloon pump at Cairo university hospitals. Egyptian nursing journal.
http://erepository.cu.edu.eg/index.php/EJN/article/view/4344
66. Lewis Peter A, Ward, Darian Adriel and Courtney, Mary D. The intra-aortic balloon pump in heart failure management: Implications for nursing practice. Australian Critical Care. 2009; 22(3):125-131.
http://eprints.qut.edu.au/31523/1/c31523.pdf
67. Bateson M, Kennedy S. Poster Exploring Nurses' Experiences of Caring for Conscious Patients Receiving Intra-Aortic Balloon Pump Therapy for Heart Failure. European Journal of Cardiovascular Nursing. 2011; 10(1):S27-S27.
http://www.gla.ac.uk/media/media_218331_en.pdf
68. Jing H, Hong-mei Y, Chun-xue L, You-hong X, Xia Y. Postoperative Nursing of Percutaneous Coronary Intervention Therapy Combined with Intra-aortic Balloon Pump in Patients with Cardiogenic Shock Caused by Acute Myocardial Infarction [J]. Nursing Journal of Chinese People's Liberation Army, 2010, 3.
http://en.cnki.com.cn/Article_en/CJFDTOTAL-JFHL201003016.htm
69. Severi L, Vaccaro p, Covotta M, Landoni Lembo R, Menichetti A. Severe intra aorticballoon pump complications: A single center 12 year pump experience. Journal of Cardiothoracic and vascular Anesthesia: Italy, 2012.
70. Muniraju G, Pandey S, Chakravarthy M, Krishnamoorthy J, Narayan S, Jawali V. Intra-aortic balloon pump use does not affect the renal function in patients undergoing off pump coronary artery bypass surgery. Ann Card Anaesth. 2011; 14(3):188-91.
doi: 10.4103/0971-9784.83996.
https://www.ncbi.nlm.nih.gov/pubmed/21860190
71. Manohar VA, Levin RN, Karadolian SS, Usmani A, Timmis RM, Dery ME *et al*. The impact of intra-aortic balloon pump weaning protocols on in-hospital clinical outcomes. J Interv Cardiol. 2012; 25(2):140-6.
doi: 10.1111/j.1540-8183.2011.00708.x.
Epub 2012 Feb 1.
https://www.ncbi.nlm.nih.gov/pubmed/22295939
72. Kate O'Donovan, Continuing Education-Cardiology-Intra-aortic balloon pump therapy,
https://www.inmo.ie/magazinearticle/printarticle/8978
Bavin TK, Self-MA. Counterpulsatio