



A study to evaluate the methods of oxygen delivery systems in tertiary care center Mumbai

Bhagyashree Baliram Sanap

CVTC Nursing, L.T.C.N SNTD University, Mumbai, Maharashtra, India

Abstract

Methods of oxygen delivery systems in tertiary care center Mumbai evaluated with

Objectives

To identify the methods of oxygen delivery system used in tertiary Care Center.

To prepare guidelines for different methods of oxygen delivery systems.

To compare methods of oxygen delivery systems with prepared guidelines.

To recommend suggestions for improvement based on the study findings.

Method: The research approach used in this study was the exploratory non- experimental approach. Research approach in this study was the exploratory non- experimental approach. Selected hospital in Mumbai. Study done in B.M.C. Hospital (medical ward 4, 4A, 9, 11, 12 and EMS, ICU)

Result: In this study, the population comprised of all the patients who were receiving oxygen therapy using different oxygen delivery systems. the age varied from 15 years to 97 years Majority (36%) samples were in the age group 36years-55years Majority of the samples were females 67% and 37% of the samples were males. With regard to the education of the samples, majority (36%) samples were receiving oxygen therapy had completed their primary education. Majority (57%) of the samples were diagnosed under medical conditions and (43%) of the samples were diagnosed under surgical conditions. With regard to the duration of illness it varied from 1 day to 120 days. Majority (93%) of the samples had been ill for 1-20 days, (4)% samples were ill for 21-40days, (1%) sample were ill for 41-60 days, (1%) sample was ill for 61-80 days (1%) sample was ill for 81days and above. With regard to the duration of oxygen administration it varied from 1 day to 120 days.

Majority (90.32%) of the samples were administered oxygen therapy for 1-5 days, (5%) of the sample were administered oxygen therapy for 6-10 days, (2%) of the sample were administered oxygen therapy for 11-15 days, (2%) of the samples were receiving oxygen therapy for 21 days and above. With regard to the oxygen flow rate, Majority (29%) of the samples were administered oxygen at 8 liter, (27%) of the samples were administered oxygen at 6liter, (24%) of the samples were administered oxygen at 2 liter, (18%) of the samples were administered oxygen at 4 liter,(2%) of the sample were administered oxygen at 10liter. With regard to the of written orders, Majority (59%) of the samples had written orders present in their record file, (41%) of the samples had no prescribed orders in their record file

Comparison among All Different Oxygen Delivery System

1. Compliance to the guidelines using nasal cannula were-22.12%
2. Compliance to the guidelines using Face Mask were-30.52%
3. Compliance to the guidelines using Non –rebreathing Mask were-24.68%
4. Compliance to the guidelines using Partial breathing Mask were-30.91%
5. Compliance to the guidelines using Venturi Mask were-25.21%
6. Compliance to the guidelines using nasal Tracheostomy tube were-37.46%
7. Compliance to the guidelines using Endotracheal Tube were-24.63%
8. Compliance to the guidelines using Ventilator Invasive were-28.52%
9. Compliance to the guidelines using Ventilator Non-invasive were-31.65%

Methods of oxygen delivery system were compared using Annona. Calculated F value 1.4008(8,270) was lesser than the tabulated value 1.9727 at 0.05 level of significance hence there is no significance among the different oxygen delivery systems.

Conclusion: It can be concluded that, as per the prepared guideline were followed minimally and there is need to follow the prepared guidelines to provide the effective oxygen therapy. There is no significance difference among the all oxygen delivery system, and there is need to improve. The prepared guidelines will be helpful for the hospital staff in future for better care.

Keywords: evaluate, methods, oxygen delivery system, nasal cannula:, simple face mask, venturi mask, partial non-breathing mask, total rebreathing mask, tracheostomy, endotracheal tube, ventilator, invasive, noninvasive

Introduction

“Even the laziest person will fight for oxygen when drowning.”

— J.R. Rim

Many people think that a human being is created at the time of conception but this belief is not supported by the bible. The fact that a living sperm penetrates a living ovum resulting in the formation of a living fetus does not mean that the fetus is a living human being. According to the bible, a fetus is not a living person with a soul until after drawing its first breath. After God formed man in Genesis, He “breathed into his nostrils the breath of life and it was then that the man became a living being”. Although the man was fully formed by God in all respects, he was not a living being until after taking his first breath^[1]. Breathing is the process that moves air in and out of the lungs, to allow the diffusion of oxygen and carbon dioxide to and from the external environment into and out of the blood. "Breathing" sometimes also refers to the equivalent process using other respiratory organs such as gills in fish and spiracles in certain arthropods. For organisms with lungs, breathing is also called pulmonary ventilation, which consists of inhalation (breathing in) and exhalation (breathing out). Breathing is one part of physiological respiration required to sustain life^[2]. Aerobic organisms (all animals, most plants and many micro-organisms) require oxygen at cellular level to release energy by metabolizing energy-rich molecules such as fatty acids and glucose. This is often referred to as cellular respiration. Breathing is only one of the processes that, delivers oxygen to where it is needed in the body and removes excess carbon dioxide. After breathing, the next process in this chain of events is the transport of these gases throughout the body by the circulatory system. And then their uptake or release from the respiring cells. Breathing fulfills another vital function that of regulating the pH of the extracellular fluids of the body. It is in fact, this homeostatic function which determines the rate and depth of breathing. The medical term for normal relaxed breathing is eupnoea^[3].

The air we inhale is roughly composed of (by volume)

1. 78.62% nitrogen
2. 20.84% oxygen
3. 0.96% argon
4. 0.04% carbon dioxide
5. 0.5% water vapor^[4]

In addition to air, underwater divers often breathe oxygen-rich or helium-rich gas mixtures. Oxygen and analgesic gases are sometimes given to patients under medical care. The atmosphere in space suits is pure oxygen. Also our reliance on this relatively small amount of oxygen can cause over activity or euphoria in pure or oxygen-rich environments^[5].

Breathing is controlled by factors such as:

- A. Air pressure
- B. Brain stem Rhythmicity Centre

Materials and Methods

The research approach used in this study was exploratory non-experimental approach. In this study Survey design was selected. Selected hospital of Mumbai done in B.M.C. Hospital (medical ward 4, 4A, 9, 11, 12 and EMS, ICU In this study, the population comprised of all the patients who were receiving oxygen therapy using different oxygen delivery systems. All patient receiving oxygen by different methods of oxygen delivery system such as nasal cannula, face mask, venturi mask, Tracheostomy, ventilator. 279 patients received oxygen therapy with Oxygen delivery system of 31 each. Patients who were receiving oxygen therapy using different Oxygen delivery system included in study and Patient who are receiving Nebulization excluded from study. Technique used for sample selection was purpose sampling & tool was an observation check list and the technique was observation. Tool validation was done by 15 experts from the field of 11 Nursing, chest physician, Anesthetic, medicine Department. The reliability of tool was analyzed by ‘Interpreter’ method & the reliability coefficient value obtained by Pearson correlation was found to be 0.90. The pilot study was conducted from 20th Oct2016 to 29th Dec 2016 from 10am to 4pm. The data gathering process commenced on 29th Oct2016 till 29th Dec 2016. Demographic data and Medical data analyzed using frequency and percentage and prescribed in the form of graphs and tables. Prepared guideline of observational checklist was analyzed by frequency, percentage and mean percentage then ‘mean’ refers to the scores of each different oxygen delivery system drawn & the comparison was made in different oxygen delivery system itself, the inferential statistic method Annova applied to evaluate the association between the selected different oxygen delivery system in tertiary care center

Sample Collection and Preparation

All patients receiving oxygen by different methods of oxygen delivery systems such as Nasal cannula, Simple Face mask, Non-rebreathing mask, Partial rebreathing mask, Venturi masks, Tracheostomy, Endotracheal tube and Ventilator (Invasive/ Non-invasive). 279 patients were studied receiving oxygen as therapy through different oxygen delivery system. In this study 31 patients were included in the study from each type of oxygen delivery system. Patients who are receiving oxygen therapy using different Oxygen delivery systems included in this study and Patients who are receiving Nebulization are excluded from study. The data gathering process was from 29th October 2016 to 29th December 2016. Permission to conduct the study was obtained from the Dean of the hospital, Head of Medicine Department and the sister in-charge of the Medicine department in selected hospital.

The researcher introduced herself to the participant or relatives of the participant, discussed the study in detail with each participant, and obtained their consent for participation in the study. The observation was done by the researcher as per the observational checklist which consisted of prepared guidelines. The investigator received a good response from the participants. The investigator thanked all the participants and the concerned authorities for their co-operation during the study.

Conclusion

During the study it was observed that, all the samples were on the Oxygen therapy they receiving the oxygen at different flow rate of oxygen, sometimes the orders were not prescribed by physician, sometimes there is a lot of leakage of the oxygen through the tubing's and central supply port also. Many time samples were changed from one method to another method. Sometimes there were less supply of humidifier bottles and oxygen tubing length were not adequate and the quality of NIV mask provided from hospital was very poor and because of that samples were shifted from general ward to intensive Unit. There is lot of scope to conduct this study at different sector and different levels of hospital. The recommended prepared guidelines will really helpful for nursing staff and students who provide oxygen therapy through different methods.

References

1. Baswanthappa BT. Nursing research 1st Edition New Delhi, Jaypee Brothers, 1998.
2. Polit and Beck, Nursing research 9th edition, 2012.
3. Allen and Copeland, Nursing Research 5th Edition, 1998.
4. Peter raven, George Johnson, Kenneth Mason, Jonathan Losos, Susan Singer. "The capture of oxygen: Respiration" Biology, 8th ed, Mc Graw-Hill Science /Engineering/Math, 2007. ISBN 0-07-322739-0
5. Kevin T, Patton, Gary A. Thibodeau. Anatomy & Physiology 7th ed, Mosby, 2009. ISBN 0-323-05532-X
6. Dhama PS, Chopra G, Shrivastava HN. a Textbook of Biology, Jalandhar, Punjab, Pradeep Publications, 2015, V/101
7. <http://www.thechristianleftblog.org/blog-home/the-bible-tells-us-when-a-fetus-becomes-a-living-being>
8. <https://www.quora.com/How-did-human-life-came-into-existence>.
9. <https://www.brainyquote.com/quotes/quotes/c/charlesduh663480.html>
10. jdowns@hsc.usf.edu