



UNIVERSITY *of*
RWANDA

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE ON OXYGEN
ADMINISTRATION AMONG NURSES AND MIDWIVES AT ONE OF DISTRICT
HOSPITAL, KIGALI RWANDA**

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College of Medicine and Health Sciences

School of Nursing and Midwifery

Master of Sciences in Nursing (Critical Care and Trauma Track)

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**UNIVERSITY of
RWANDA**

RESEARCH PROJECT

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE ON
OXYGEN ADMINISTRATION AMONG NURSES AND MIDWIVES AT
ONE OF DISTRICT HOSPITAL, KIGALI RWANDA**

By

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215041835

A dissertation submitted in partial fulfillment of the requirements for the

degree

of

**MASTER OF SCIENCES IN NURSING (CRITICAL CARE AND TRAUMA
TRACK)**

In the College of Medicine and Health Sciences

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Co-Supervisor: Mr. HAVUGITANDA Placide

DECLARATION

I firstly do hereby declare that this **research thesis** submitted in partial fulfillment of the requirements for the degree of **MASTERS OF NURSING SCIENCE: CRITICAL CARE AND TRAUMA NURSING**, at the University of Rwanda/College of Medicine and Health Sciences/School of Nursing and Midwifery, it is my original work and has not previously been submitted elsewhere. Also, I do declare that a complete list of references is provided showing all the sources of information quoted.

Student name and number

NSABIMANA Ephrem 215041835

Signed.....

Date: 12th September, 2019

DEDICATION

I dedicate this work to my family members, starting from my wife NIYONAMBAJE Jeannette who has helped me and encouraged me affectionately during this hard journey. To my first daughter ISHIMWE KALIZA Ella who has suffered in her first thousand days (1000) of life to this hard work.

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I will always thank my family, my wife NIYONAMABAJE Jeannette and my first born ISHIMWE KALIZA Ella for their unconditional love, support, patience and concern and always believing in me. Thank you for keeping me focused and motivated. I would not have done this without you.

I would like to thank HAVUGITANGA Placide, my Co-supervisor, for his invaluable guidance and encouragement throughout this process. His help and advice have been indispensable. Thank you for being so approachable and patient with all the revisions. I'm ever grateful to you for taking me in and I find myself fortunate to work with you. Thanks for everything.

In an advance way, I would like again to thank Prof. BHENGU Busisiwe R, my Supervisor, for her invaluable contributions towards my work. I thank her contribution in the development of the conceptual frame-work and formulation of the tool/questionnaire used in this study.

I would like to thank Masaka Hospital administration who allowed me to continue my studies while working in the hospital and the facilitation you gave to make my studies easy. Thank you I will always remember you.

Finally, I offer my deepest gratitude to GOD for making his choicest blessing on me. Nothing could have been possible without his love and grace.

ABSTRACT

Background: Oxygen administration simply means giving oxygen. This makes oxygen to be considered as a drug which is prescribed to prevent or treat hypoxemia. The purpose of oxygen to be given is to bring oxygen saturation (SpO₂) to normal range or near normal range.

The aim of the study: This study was to assess knowledge, attitude and practice on oxygen administration among nurses and midwives at Masaka District Hospital.

Research methodology: The study was a quantitative, descriptive research using a cross-sectional design. The study was conducted at Masaka District Hospital. The target population was all nurses and midwives working in that institution. A non-probability convenient sampling procedure was used. Structured questionnaire and check list for observation on practice session developed by the researcher and validated by supervisor was used in data collection. Descriptive and inferential statistics were used in analysis and SPSS version 21.

Results: Among 70 nurses and midwives included in the study, 29 from them were also observed for practice session. The majority of all respondents (56.8%) were female, 68.6% were married, 60.0% were aged 30-39 years, 68.6% were holding advanced diploma, 54.3% were having working experience of 5-10 years and 45.7% were had working experience in their current departments of 2-3 years. Poor knowledge of nurses and midwives was found at 37.643%, positive attitude of 85.6% and poor practice of 32.59%. The associated factors of demographic variables with knowledge, attitude and practice respectively with p-value of ≥ 0.005 were level of education and working experience, marital status and working experience and level of education on practice.

Conclusion: This study showed that there is a clear knowledge and practice gaps among nurses and nurses who were working at Masaka District Hospital and positive attitude. The possible associated factors were also identified which includes; differences in working experience, level of education and marital status on attitude. It is recommended that nurses and midwives must be given training on oxygen administration, be updated and National oxygen administration guideline or Hospital protocol must be developed.

Key terms: knowledge, attitude, practice, Assessment, nurse staffs, midwife staffs and oxygen administration.

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LIST OF ACRONYMS AND ABBREVIATIONS

%: Percentage

SD: Standard deviation

ABG: Acid Blood Gases

AC: After Jesus Christ

BP: Blood Pressure

COPD: Chronic Pulmonary Obstructive Diseases

CXR: Chest x-ray

FIO₂: fraction of inspired oxygen

Hct: Hematocrit

Hgb: Hemoglobin

IRB: Institutional Review Board

KAP: Knowledge, Attitude and Practice

LTOT: Long Term Oxygen therapy

NICU: Neonatal Intensive Care Unit

O₂: Oxygen

ICU: Intensive care unit

PICU: Pediatric Intensive Care Unit

PR: Pulse Rate

RR: Respiratory Rate

SPO₂: Oxygen saturation

UHSM: University Hospital of South Manchester

CHAPTER 1: INTRODUCTION

1.1. INTRODUCTION

The section presents the study background, the study objectives both general and specific and corresponding research questions, the problem statement, significance of the study, definition of key terms, organization of the study and chapter conclusion.

1.2. BACK GROUND

Oxygen administration has an essential role in preventing and managing hypoxemia in both acute and chronic situations. It has to be used to achieve the normal oxygen saturation of 94%–98% in most normal conditions (Aloushan, 2017 P 1).

A body to function correctly needs an oxygen concentration at a certain level. Sometimes, this oxygen level is not sufficient in the body so that it needs supplement in artificial oxygen. Although Oxygen saves live, its inappropriate use is associated with complications. The treatment target of oxygen Saturation is 94-98% for patients with health threatening conditions and 88-92% for patients that are at high risk of respiratory problems of hypercapnia (Browne & Crocker, 2013:4).

During oxygen administration, it needs to be careful; this is because it has an effect on the lung tissue. If oxygen is given at high concentration of oxygen can cause oxygen toxicity and production of surfactant can also impaired by high concentrations which finally cause the collapses alveoli. Therefore, these alveoli which are responsible for crucial of gaseous exchange are affected to due high oxygen concentration. All health care professionals who meet with the patients who are in need of oxygen administration, they have to plan how that supplemental oxygen can be stopped without causing the related risks (Lemma, 2015:2).

Patients whose blood gases are severely affected, they requiring high oxygen supplement, in this situation, it mandatory recommended to use a simple face mask that is able to deliver a high oxygen concentration which has flow rate from 12-15L/minute, in other case with acute and chronic, the oxygen flow rate that can be adjusted according to physiological change, age of the patient and the availability of oxygen delivery device to be used (Lemma, 2015:11).

The reason of prescribing oxygen to be administered is to help the patients who are in need of it and to minimize the energy that may be required on the respiratory muscles. Many years ago, the theories were developed on regarding to unfavorable impacts of oxygen treatment have been discussed (Lemma, 2015:1).

Data from Europe revealed that, there are various risks if oxygen is given inappropriately like tissue damage and cardiac arrhythmias which will finally lead to organ damage such as renal damage, and other organs. The poor knowledge of nurses regarding oxygen administration was an associated factor (Mahmoud, Alseed, Awad, Ahmed, & Elhussein, 2016: 2-3).

A study done in United States of America on patients with Chronic Pulmonary Obstructive Diseases (COPD) showed that, the prescribed oxygen was not given as prescribed. It was the same as in Portugal where poor practice of the nurses and midwives on oxygen administration to the patients has been mentioned (Brill & Wedzicha, 2014:3; Mahmoud et al., 2016: 2).

The data from a study done in Ethiopia showed that, there are observed gaps on knowledge, attitude and practice of nurses on oxygen administration on patients of accident and emergency department. This study further revealed that, the associated factors are lack of oxygen administration training and oxygen administration guidelines (Lemma, 2015, p.29).

In Rwanda, there is no study found except one that is unpublished which was done at accident and emergency of UTHK, apart from that, there no any other study done on KAP to the nurses and midwives in all hospital departments on oxygen administration, and there is no guideline for oxygen administration. That is why the researcher took interest in assessing knowledge and practice about oxygen administration among nurses and midwives at Masaka District Hospital where the researcher is working. The reason why the researcher is interested in all hospital departments not in specialized departments like in intensive care unit (ICU) is that, oxygen in ICU is given under controlled conditions and usually on mechanical ventilation.

1.3. PROBLEM STATEMENT

There are observed significant gaps on the oxygen administration from different studies: for example oxygen concentration that is supposed to be given to different patients of different pathologies, flow rate and oxygen delivery device to be used. This has a very serious impact on

the patient care outcome including; oxygen toxicity affecting lung tissue, very little oxygen to emergency patients and affecting other tissues mainly brain tissues; (Brill & Wedzicha, 2014). Globally, the data from Europe revealed that, there are various risks if the oxygen is given inappropriately, due to the poor knowledge of nurses regarding oxygen administration (Mahmoud et al., 2016). In addition, poor knowledge was observed where 58%, 20%, 10% and 12% nurses administered the oxygen according to the doctor's order, partial pressure of oxygen, guidelines and patient condition respectively, the some in the united states of America on Chronic Obstructive Pulmonary Diseases (COPD) showed that, the prescribed oxygen was not given as prescribed and it was the same as in Portugal which shows the poor practice of the nurses and midwives on the oxygen administration to those patients. For example, 93% oxygen was given as prescribed, 12% given completely prescribed oxygen and 23% patients were not getting prescribed oxygen (Brill & Wedzicha, 2014).

In Saudi Arabia, the study done showed poor knowledge and practice of nurses on the oxygen administration at accident and emergency department. The main factors which were associated with poor KAP were workload, shortage of training programs and unavailability of national oxygen therapy guidelines including lack of local guidelines (Aloushan, 2017 P 6). In Australia, the study done reviewed the gaps on following the guideline for oxygen administration, administration of oxygen according to prescription, measurements of pulse oximetry and to the patients with respiratory distress the arterial blood gases were not taken as it has to be in the guideline, 87%, 91%,91% and 68 % respectively (Cousins et al., 2016).

In Africa, the data from a study done in Ethiopia showed that, there are clear gaps on KAP of nurses' and midwives' on oxygen administration, and this was done to the patients of accident and emergency department, where the poor knowledge was about 63%, negative attitude 46.7% and poor practice was 56.6% (Lemma, 2015).

In east African countries, there is no observed study done and at the national level in Rwanda, there is only one unpublished study done on KAP on oxygen administration among nurses in critical care department, this has motivated the researcher to work on it.

Here in Rwanda, the researcher observed that, there is also anecdotal evidence that there are no guidelines and protocols available in accessed district hospitals. Oxygen as a drug has to follow the processes as other drugs, and furthermore, the researcher observed that, oxygen

administration is not given appropriately according to patient's pathology, oxygen delivery device to be used and to adjust the flow rate according to patient response. This motivated the researcher to conduct this study on assessment of KAP on the oxygen administration among nurses and midwives at Masaka District Hospital.

1.4. AIM OF THE STUDY

This study was aimed to assess KAP on oxygen administration among nurses and midwives at Masaka District Hospital.

1.5. OBJECTIVES OF THE STUDY

1.5.1. GENERAL OBJECTIVE

The general objective of this study was to assess KAP on oxygen administration among nurses and midwives at Masaka district Hospital

1.5.2. SPECIFIC OBJECTIVES

The specific objectives of this study are;

1. Determine nurses' and midwives' level of knowledge on the oxygen administration at Masaka District Hospital.
2. Assess nurses' and midwives' practice on the oxygen administration at Masaka District Hospital.
3. Assess nurses' and midwives' attitude on the oxygen administration at Masaka District Hospital
4. Assess association between demographic characteristics and KP on the oxygen administration among nurses and midwives at Masaka District Hospital.

1.6. RESEARCH QUESTIONS

The following are the questions of this study:

1. What is the level of knowledge of nurses and midwives on oxygen administration at Masaka District Hospital?

2. What is the practice of nurses and midwives on oxygen administration at Masaka District Hospital?
3. What is the attitude of nurses and midwives on oxygen administration at Masaka District Hospital?
4. What are the demographic variables associated with KP on oxygen administration at Masaka District Hospital?

1.7. SIGNIFICANCE OF THE STUDY

To identify the gaps on the oxygen administration in order to inform guidelines or protocols that may be developed following the study. Clinically this study may inform the safety of patients in relation to oxygen administration by reducing adverse events related to this procedure. It can also assist in curriculum changes towards administration of the oxygen and safety of patients.

1.8. DEFINITION OF KEY TERMS

- 1. ASSESS:** This is the mean used to find the level of KAP of midwives and nurses on oxygen administration.
- 2. KNOWLEDGE:** This means the information received from education or experience of nurses and midwives on oxygen administration as shown by their knowledge grade which are measured as adequate knowledge, moderately adequate knowledge and inadequate where by adequate knowledge, moderate knowledge and inadequate knowledge; > 75% score, 50-75% score and < 50% score respectively (Wang et al., 2015).
- 3. PRACTICE:** This means the work of applying the specific actions in the oxygen administration whereby it can be measured by used check list and the following terms are used; good practice, fair practice and poor practice with their scores 81%–100%, 51%–80%, and 50% or less respectively (Maheshwari, M, & Ramnani, 2014).
- 4. ATTITUDE:** This is the way of responding to something which can be positive or negative towards to ideas, situations, object and person. These can be seen as above 75% and below 75% as positive and negative attitude respectively (Maheshwari et al., 2014).
- 5. OXYGEN ADMINISTRATION:** This is the action of giving oxygen which is a gas that is used as a medication in case of needed to the patient according to the known condition, and it is given as medical support issue.

6. NURSING STAFF: This means the registered nurses with Rwanda Nursing and Midwifery Council who is allocated in nursing field by helping the patients according to their needs.

7. MIDWIVES: This means the registered midwives with Rwanda Nursing and Midwifery Council who is allocated in the field of doing all pregnancy mothers' work and their babies in the accordance of their needs.

1.9. STURSTURAL ORGANIZATION OF THE STUDY

This section is made up of the following;

Introduction of the study, the problem statement, background of the study, objectives which made by the general and specific objectives of the study, aim of the study, significance of the study, research questions, the definition of key terms and the conclusion of chapter one. Literature review which is made up of; introduction, empirical literature, theoretical review, conceptual frame-work and research gaps identified; all of those are for chapter two. Methodology section which has following issues; Introduction, research approach research design, population of the study, research setting, sample size, sampling strategy, sampling, data collection, data collection procedure, data collection instruments, data management, data analysis, limitation and challenges, ethical considerations, data dissemination and conclusion for chapter three. Results section which is made up of; introduction, demographic issues of all participants of the study, presentation of all findings according to the objectives of the study, discussion and in addition to that, conclusion which has the following parts; introduction, conclusion and recommendations.

1.10. CONCLUSION

Oxygen administration is a medical concept which means to give oxygen. The oxygen is considered a medication. Literature on the administration of oxygen by nurses and midwives was presented above by different researchers. They reviewed poor knowledge and practice seen in all developed and developing countries. Both developed and developing countries come up with many gaps like lack of training, unavailability of oxygen delivery devices, lack of oxygen guidelines and protocols. In addition, there are still few studies regarding oxygen administration globally and in Africa we have only two studies done in the same country. The chapter has also adds the following as needed in the study; the purpose of the study, research questions, research

objectives, definition of key terms and significance of the study. The next section presents in depth the literature review of this study (Brill & Wedzicha, 2014; Lemma, 2015:1).

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

The main purpose of reviewing the literature in this study is to assess the Nurses' KAP on oxygen administration at Masaka District Hospital from different gaps that have been identified (Aveyard H, 2010, p.4). The information was obtained from several sources which includes; journals, text books, reports, and databases for literature like CINAHL, PubMed, Medline, and Google Scholar. The age of literature in this study is ten years. This chapter comprises of theoretical, empirical literature, conceptual frame-work and conclusion.

In this study the Literature review has the various functions, it can help the researcher to understand the clear original of the study where it come from and where it is now. Therefore, it has another important thing of utilizing the new ideas from different studies done, and in addition, at the end of the study, the researcher can propose the steps needed for further studies according to the research findings (Wang et al., 2015).

2.2. THEORETICAL LITERATURE

Oxygen as symbolized by O₂ is a gas that is found in atmosphere, it is considered as the fifth element and it is attached to all forms of life where it is very crucial needed to all living organisms. The following, ancient Greeks and Chinese conformed that, in the atmosphere there is a very important substance that is useful for life, that substance is oxygen. The theory of Leonardo da Vinci in 1500 AC lamented that, all living things uses that chemical element for their sustainability. In addition, the theory of Robert Boyle in 1600 proposed that, fire and respiratory actions uses that oxygen which is found in atmosphere (Mahmoud et al., 2016).

The chemical element of oxygen was first revealed by Priestley Joseph in 1774, the Lavoisier gave its name that is called to day and he supposed that it is needed for all acids and he gave its name as oxygen and in other wards the originator of acids. This element also has another important function in medicine of both acute and chronic diseases. In those conditions, it is very highly needed together in respiratory physiology in case of low level of oxygen in the body it is indicated to be given said by Antoine L. Hence (Singh et al., 2011; Eastwood et al., 2012).

While giving oxygen, consideration of oxygen delivery device to be used is very needed and has to be kept in mind, this means, the device used from the oxygen source to the patients and to consider the fraction of inspired oxygen (FiO_2) with its appropriate flow rate. The oxygen delivery devices are the following; simple face mask with reservoir bag which has the capacity of giving FiO_2 of 60% to 100% with a flow rate of 10 to 15L/min, simple face mask and nasal cannula see in table 2.1. if oxygen is given at high concentration of fractions of inspired oxygen, it can lead to damage of the lungs which will cause other systemic problems (Lemma, 2015).

Table 2.1: The estimated inspired oxygen concentration with oxygen delivery devices

Estimated inspired oxygen concentration			
Nasal cannula		Simple face mask	
Flow rate (L/min)	Estimated FiO_2 (%)	Flow rate (L/min)	Estimated FiO_2 (%)
1	24%	5	30%
2	28%	6	35%
3	32%	7	40%
4	36%	8	45%
5	40%	9	50%
6	44%	10	55%
Key: FiO_2 = fraction of inspired oxygen.			

Oxygen which is considered, its administration is known as supplemental oxygen which is given as essential means to different patients with different medical conditions. Therefore, it has to be given with prescription done by the doctor, but in case of emergency situations, it can be given and the prescription comes after (Lemma, 2015).

The prescription made of oxygen administration it has to have the following; the time of starting the oxygen, the desired oxygen saturation to be achieved, the oxygen delivery device that is going to be used and the oxygen flow rate according to patient's status. The prescription of oxygen should also be signed and dated and documented in the patients' file and it has to be administered by authorized health personnel (Aguilar et al., 2015, UHSM University Hospital of South Manchester NHS Foundation Trust, 2014; Duprez et al., 2014)

According to Alberta Health Services, (2016), the oxygen as it is referred as medical intervention, is to treat and prevent hypoxia and it is indicated in Hypoxemia, to decrease work of breathing, to the post-operative situation in the specific time frame, oxygen flow rate and it also decreases myocardial work. In addition while giving oxygen the best goal is to achieve the arterial blood tension and not cause oxygen toxicity by achieving in between 92% to 98%, and to COPD patients is 88% to 92% saturation respectively (Cousins, Wark, & McDonald, 2016).

While literature maintains that oxygen has to be given administered mainly at a concentration that is greater than that found in the atmosphere (Duprez et al., 2014), some authors argue that oxygen must be given meticulously, especially in patients with COPD whose hypoxaemic drive may be threatened by high concentrations of oxygen (Kinney, et al, 1998). This assertion also plays a role in children with congenital heart problems who have a compensatory patent ductus arteriosus because of the danger of closure of this opening from high the concentration of oxygen. Therefore, patients who are suffering from or suspected to be hypoxic, they must be given oxygen cautiously. Hence there is a need for evidence based and context driven guidelines and or protocols on the oxygen administration. All health care providers are encouraged to give oxygen according to protocols and guidelines of Basic Life support in case of respiratory and cardiac arrest (Duprez et al., 2014).

The partial pressure of oxygen saturation can be changed with age, where increase in age can change its normal value for young people is 94-98% but it can be reduced by age, in case of low partial pressure of oxygen it will cause hypoxemia which is low level of oxygen in the blood.

Thus hypoxemia will cause the damage of hypoxic tissue if the partial pressure of oxygen is below 90% (Duprez et al., 2014).

In giving oxygen, it is measured by measuring the hemoglobin saturation within the blood, this done by the use of spectrophotometry. This has different types like Hemoximetry and oximetry, all are used in medical practices. The arterial blood gases are also analyzed to estimate the arterial blood ox hemoglobin. Therefore, pulse oximetry is recorded as SPO₂, and in addition, the oxygen has to be given with fixing the target oxygen saturation that is desired to be achieved according to the clinical presentation of the patient, and it has to be given with prescription but in case of emergency it can be administered and prescription comes after (Aguiar et al., 2015).

Oxygen as a drug can cause various risks if it is given inappropriately like cerebral damage, cardiac arrhythmias, tissue damage, renal damage and vision damage mainly in neonates and infant period (from 28 days of life to 1 year) and finally the loss of their life (Lemma, 2015).

Oxygen administration can also administered to patients with chronic obstruction pulmonary diseases (COPD), conditions, in these cases; it is called the oxygen given as long term Oxygen therapy (LTOT). In other cases where it is given in specialization services like in neonatal intensive care unit (NICU) and pediatric intensive care unit (PICU) it is given under some stated precautions (UHSM University Hospital of South Manchester NHS Foundation Trust, 2014; Uronis, McCrory, Samsa, Currow, & Abernethy, 2011).

During oxygen administration, there are some laboratory investigations that are recommended to be taken regularly which are follows; Arterial blood gases (ABG), Chest x-ray, hemoglobin and hematocrit, not only blood samples, the following vital signs have to be checked; heart rate (HR), respiratory rate (RR) and blood pressure (BP) (Duprez et al., 2014).

2.4. EMPRICAL LITERATURE

Globally, the data from Europe revealed that, there are various risks if the oxygen is given inappropriately like cerebral damage, tissue damage, cardiac arrhythmias and renal damage, due to the poor knowledge of nurses regarding oxygen administration (Mahmoud et al., 2016). In addition, poor knowledge was observed where 58%, 20%, 10% and 12% nurses administered the

oxygen according to the doctor's order, partial pressure of oxygen, guidelines and patient condition respectively.

The study done in United States of America on Chronic Obstructive Pulmonary Diseases (COPD) showed that, the prescribed oxygen was not given as prescribed and it was the same as in Portugal which shows the poor practice of the nurses and midwives on the oxygen administration to those patients. The researcher reported that, 93% oxygen was given as prescribed, 12% given completely prescribed oxygen and 23% patients were not getting prescribed oxygen (Brill & Wedzicha, 2014).

The study done in Saudi Arabia showed poor KAP of nurses on the oxygen administration at accident and emergency department. The main factors which were associated with poor KAP were workload, shortage of training programs and unavailability of national oxygen therapy guidelines, including lack of local guidelines (Aloushan, 2017 P 6).

The study done in Australia reviewed the gaps on following the guideline for oxygen administration, the administration of oxygen according to prescription, measurements of pulse oximetry and to the patients with respiratory distress the arterial blood gases were not taken as it has to be in the guideline, 87%, 91%, 91% and 68 % respectively (Cousins et al., 2016).

In Africa, the data from a study done in Ethiopia showed that, there are clear observed gaps on KAP of midwives and nurses on oxygen administration to the patients of accident and emergency department, where the poor knowledge was about 63% and poor practice was 56.6%. The study further revealed that the associated factors are lack of oxygen therapy training and oxygen administration guidelines (Lemma, 2015).

Another study done also in Ethiopia revealed that, there is a clear gap KAP of the nurses who were working at accident and emergency departments in public institutions on the oxygen administration. The issues revealed in this particular study were: inadequate supplies of oxygen delivery devices, inadequate supervision and work load in addition to lack of guidelines and lack of proper oxygen administration training from the previous study. This means that, there is need

for training, intensive supervision, guidelines development and availability of all oxygen delivery devices as well (Ameen, 2017:1).

In east African countries, there is no observed study done and on the national level in Rwanda, there is only one unpublished study done on KAP on the oxygen administration among nurses in the critical care department, this has motivated the researcher to work on it.

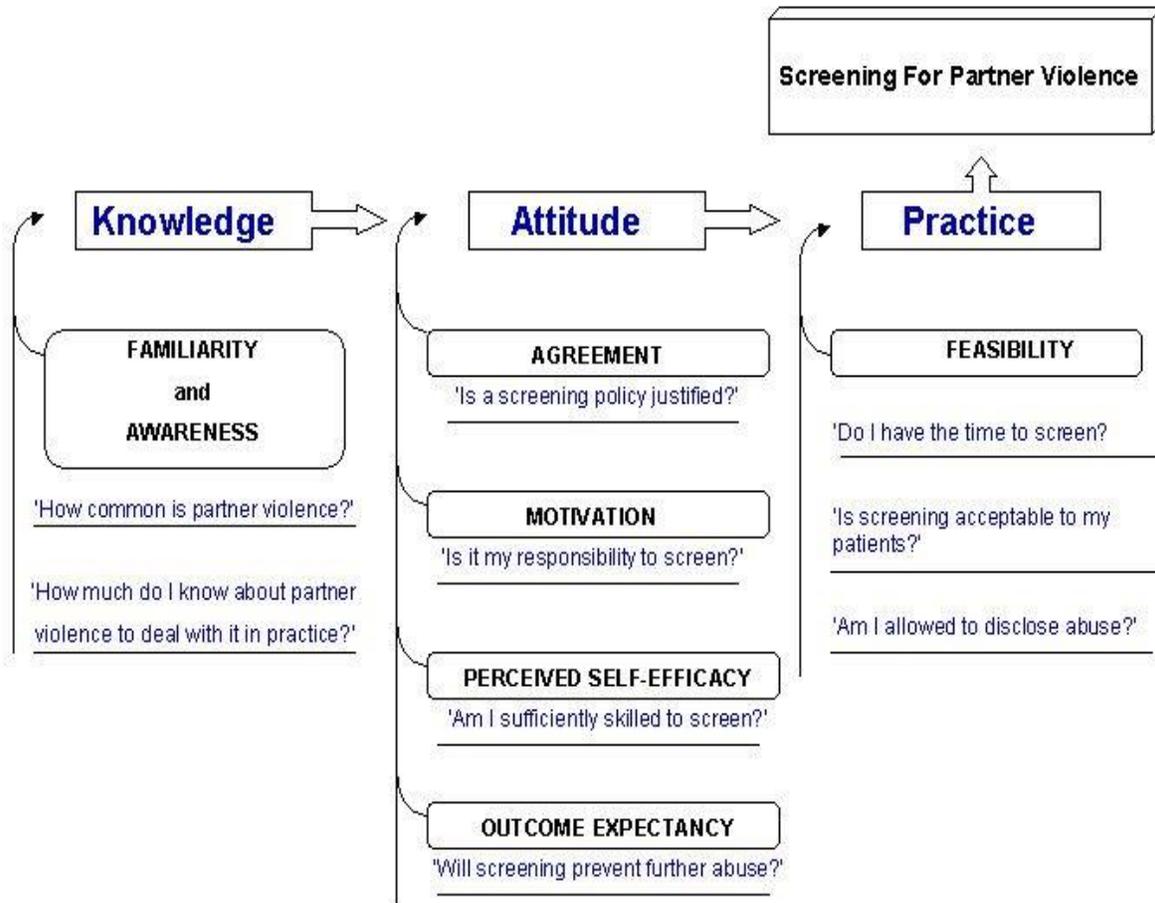
2.4. CRITICAL REVIEW AND RESEARCH GAPS IDENTIFIED

Critical review and identified gaps of this study are; the global studies done in developed countries were all predominately in the accident and emergency departments not talking about other departments like medical ward, pediatrics and others. Furthermore, in regionally and locally, there is no studies found on the oxygen administration and the one done was not published. Therefore this study is justified to occur in a district hospital where most patients are received for stabilization and transfer. How much, how oxygen is given can make a difference in the stabilization and the safe transfer of the patient to the higher level of care.

2.5. CONCEPTUAL FRAME-WORK

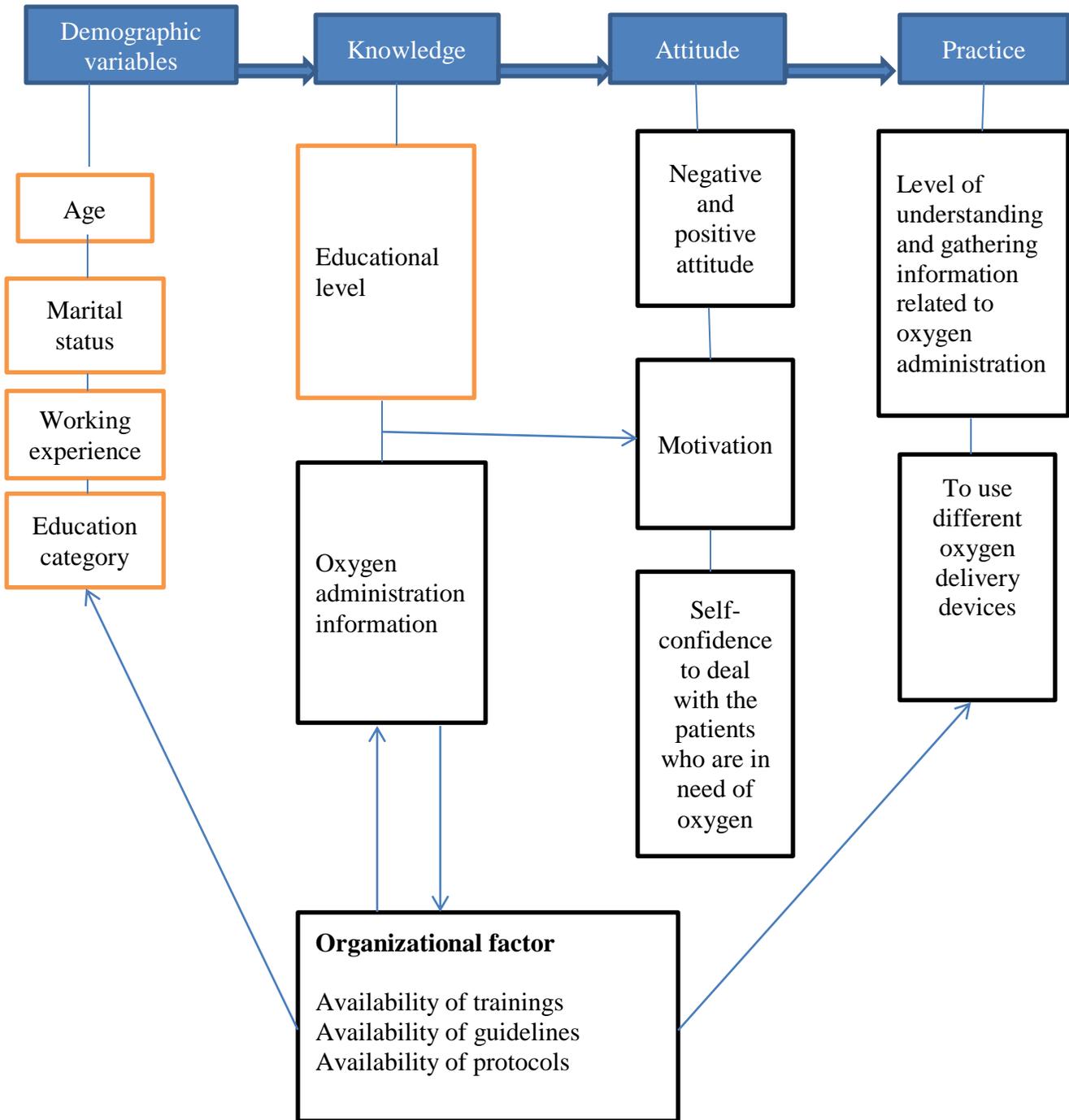
The researcher was in sighted and to choose and to adapt the conceptual framework from Roelens et al (Roelens et al.,2006, P. 4) where Roelens et al, used a similar conceptual framework to assess KAP survey among obstetrician-gynecologists on intimate partner violence in Flanders, Belgium. This explained more and proposed the guidelines and from knowledge, attitude and practice. Therefore, the researcher used a similar conceptual-frame work to assess KAP of nurses and midwives to whole population in different wards.

Figure 2.1 Knowledge, attitudes, and practice survey among obstetrician-gynaecologists on intimate partner violence in Flanders, Belgium



Source: Adapted from Roelens, Verstaelen, Egmond and Temmerman (2006:4)

Figure 2.2: Conceptual frame-work on Knowledge, attitude and practice of nurses toward oxygen administration at Masaka District Hospital of Kigali



From the diagram above, it shows how the oxygen administration can be affected by knowledge; attitude, practice and the demographic variables can also have its implications. This means that all of them with their corresponding variables can affect oxygen administration positively or negatively depending on the level of knowledge, positive attitude or negative and practice skills. See figure 2.2 above.

2.5. CONCLUSION:

The above literature review here was tried to discover more on the assessment of nurse's and midwives' KAP on oxygen administration at Masaka District Hospital. In this section, Oxygen which is considered as drug and it has to be administered in different medical cases. The prescription is highly needed before its administration but, this can be changed where it can be without prescription and prescription come after, this can be only applied in case of emergency situation.

The purpose of oxygen administration is to increase the life expectancy in the patient living with COPD where it is considered as home care and to improve quality of life. All in all, the oxygen delivery devices, follow of guidelines can be put in account for better management of better patient's outcome patients according to patients' clinical condition.

CHAPTER 3: METHODOLOGY

3.1. INTRODUCTION

This section was to describe the methodology of this study, which has the following components; research approach, study design, data collection methods, study setting, population and sampling strategy, ethical considerations, sample size of the study, instrumentation, validity and reliability, data dissemination, data analysis, inclusion and exclusion criteria, ethical considerations, data management, limitations and challenges of the study.

3.2. Study approach

This study used quantitative approach, descriptive research; statistical analysis, chi-square was used to test association between demographic variables and KAP.

3.3. Study design

The cross-sectional design was used in this study. This is the type of research design that explains the data from the population at specific time in relation to the point of the study as this study was done at that specified time (Grimes and Schulz, Lancet 2002. p: 57–61).

3.4. Study setting

The study was conducted at One District Hospital which is found in Kigali City, Rwanda country, Kicukiro district. Masaka district hospital is one of district hospitals of Kigali city which is located in Kicukiro district, Masaka sector, Cyimo cell, Kabeza village. It is a 157 bedded hospital which are operational. It serves 10 health centers with total population of 39 595 within the catchment area (Rwanda Health Management and Information system (HMIS), 2016). It is bordered by Muyumbu sector of Rwamagana district, Kanombe sector of Kicukiro district and Rusororo sector of Gasabo district. This hospital has different health professional made by specialist doctors, general medical doctors, paramedical staffs, on the side of nurses and midwives, it has nurses and mid wives with secondary school certificate, advanced diploma and Bachelor's degree.

3.5. STUDY POPULATION

The population was all employed nurses and midwives who were working in the institution cited above. This district hospital was having sixty eight nurses and seventeen midwives which is equal to 85 as whole population (HR record, March, 2019).

3.5.1. Inclusion criteria

This study was including all nurses and midwives working at Masaka District Hospital who were willing to be the participants of the study.

3.5.2. Exclusion criteria

This study excluded workers who are not nurses and midwives as their profession, who were not working in that institution and nurses and midwives who were in annual, maternity and sick leave during the study period, and addition, those who did not consent not willing to participate.

3.7. SAMPLE SIZE AND SAMPLING STRATEGY

3.7.1. Sample size

In this study, the researcher used all nurses and midwives which was convenient sampling method that was used. The Slovin's formula was used in calculation of sample size which was named as $n = N / (1+Ne^2)$, where n is sample size, N is total population and e is margin of error. It was consider the confidence interval of 95% and maximum variability of 5% with P=0.005. Therefore all nurses and midwives at the time of data collection that concerted to participate in the study accept the ones who dropped out or refused and others who were on leave. The total target population was 85 nurses and midwives at Masaka District Hospital as the selected district hospital in Kigali. The population was given from human resource management officer March, 2019.

The formula: $n = n / 1 + n (e)^2 = 85 / 1 + 85(0.05)^2 = 70$

3.7.2. Sampling strategy

A convenient type of sampling method was used. All targeted employed nurses and midwives that were available at the time of data collection were all considered as participants of the study.

3.8. Instruments for data collection

In this study, the researcher used a structured questionnaire developed with the help of the supervisor. The whole questionnaire was having four sections which are: Social demographic data which was named as section A and it has six items; nurses and midwives knowledge on oxygen administration which was named as section B and it has twenty items; nurses and midwives attitude on oxygen administration, which was named as section C and it has eleven items; nurses and midwives practice on oxygen administration, which was named as section D which was in the form of checklist and has thirteen items, refer to appendixes 4. The items on attitude were chosen based on the fact that they represent common knowledge but most nurses do not practice this probably because of attitude. Hence a Likert scale was used for attitude assessment.

3.9. RELIABILITY AND VALIDITY OF THE TOOL

3.9.1. Reliability of the tool

The content of the tool was developed by researcher with the help of the Supervisor and it was formulated to local context. A pre-test was done involving 5 nurses and midwives, who were excluded from the study to test the tool. The purpose of this pre-test study was to check whether the tool was well designed in a way that would allow participants to understand it and to estimate the time required for participants to fill in the questionnaire. The tool was also tested for internal consistency through Cronbach's alpha for reliability which was 0.82.

3.9.2. Validity of the tool

A content validity is presented hereunder as Table 3.1 to establish if all objectives and or questions are addressed in the tool.

Table: 3.1. Content validity

Objectives	Questions in tool
1) Identify factors associated with KAP on oxygen administration among nurses and midwives in Masaka District Hospital.	Section A: Personal identification (demographic variables) associated with KAP of oxygen administration
2) Determine nurses' and midwives' knowledge on oxygen administration in Masaka District Hospital.	Section B: Questions on knowledge of nurses and midwives on oxygen administration
3) Assess nurses' and midwives' attitude on oxygen administration in Masaka District Hospital.	Section C: Questions on attitude of nurses and midwives on oxygen administration
4) Assess nurses' and midwives' practice on oxygen administration in Masaka District Hospital.	Section D: Checklist on practice of nurse and midwives on oxygen administration

3.10. Data collection

After receiving the authorization letters, one from Ethics Committee of research or IRB in UR/CMHS and the permission letter from the ethics committee of the study area, the researcher went to the site to explain the study objectives, purpose of the study and the process of data collection. In addition, the participants were made aware of their rights to refuse to participate and to terminate participation at any stage of the study without sanction. Potential risks and their mitigation were discussed. However, in this study the risks were minimal in the form of potential disruption of ward routine activities. Hence the researcher let the participants take the questionnaires to complete them at leisure. After explaining and securing informed consent, the participants were given questionnaires, and they were to respond to the questionnaire privately. A sealed box was left in unit managers' offices to deposit the completed questionnaires. These boxes were checked every week over a month of data collection with reminders when necessary.

3.11. Data analysis

Data were checked to see if they are all complete for and their consistency every day, after data collection they were entered into SPSS version 21. First, descriptive statistics and Chi-square

was computed for the study variables. Nurses and midwives knowledge and practice were independent variables and Oxygen administration was dependent variable. The independent variables were binary and dependent variables were nominal. This study was considered both level of confidence of 95% and margin error of 5% and the outcome of interest at $p \leq 0.005$ were considered as positive significant factor effect.

3.12. Ethical consideration

Permission was got from the ethics committee of the College of medicine and health sciences, University of Rwanda. Refer to appendixes 1. After getting ethical approval, written permission was got from study area. Refer to appendixes 2. The participants were given explanation with respect to the study and they were allowed to participate or to refuse. Those who accepted to participate in the study, after getting their written informed consent were given the questionnaires to complete. Refer to appendixes 3.

The confidentiality of participants was respected by using anonymity and keeping the records under lock and key during data collection and thereafter. Signature was used on consent forms instead of participants' names for anonymity. Then participants were assured that the findings were not going to harm them as they were not identified in any form in the data records.

3.13. Data management.

All data collected from the participants were kept in the computer with password to keep electronic information. Hard copies were kept in the cupboard that has key; it was locked and taken by researcher only. All data were controlled every day to make sure that there is no error. During data entry and data manipulation, the researcher keep in mind that they are checked regularly, all records both soft and hard were kept locked for five years and then after will be discard

3.14. Data dissemination

After this research, all findings will be disseminated as follows; presentation of findings in college of medicine and health sciences and the final thesis will be submitted to the library for the future use of other students, researchers and academic community. And in addition, the research results will also be presented to the study area where I got the data, dissemination of

data will be also done through publication of my paper and conference presentations locally and internationally if funds allow.

3.15. Limitations and challenges of the study

The limitations of this study were as follows; to fill the questionnaire and to observe nurses and midwives by the use of check list, this was very hard activity to have new case patient who is going to start getting oxygen. Another limitation, this study was conducted in one health facility which is situated in an urban area; therefore it will not be possible to generalize the results to the whole population of the country.

3.16. Conclusion

The convenient sampling method was used in this study; this was used for giving chance to all nurses and midwives who are present at that time of data collection. Only one study area was used. Therefore the clear questionnaire during data collection and check list on practice part. The data were maintained so that we cannot loss any data and they were manipulated and analyzed collect to prevent biases. All in all, the ethical considerations were highly take account in this study where the researcher has all approvals both from school and authorization letter from the institution where the researcher was conducted and the pat during all steps by respecting ethics committee approval, written authorization from the study area and participants' confidentiality was respected .

CHAPTER 4: RESULTS

4.1. INTRODUCTION

In this part, data were analyzed with the purpose of answering of all questions that were asked in chapter 1 section 1.6 in research questions. The analysis was done in several steps, not starting from answering the asked questions directly. Descriptive statistical values such as; mean standard deviations (SD) and median that have been used for continuous variables and distribution frequencies. In testing the relationship between nurses' and midwives' KP on the oxygen administration with demographic variables, Chi-square was used or inferential statistics.

4.1. PRESENTATION OF DATA

Data was presented according to demographic data, Knowledge of participants, knowledge scores, attitude of participants, attitude score, practice of participants, practice scores and association between demographic variable and KAP. Tables are presented to illustrate the respective sections of data as listed.

4.1.1. Demographic Data

As per Table 4.1 below, 56.8% respondents were female, 68.6% were married, 60.0% of all respondents were aged 30-39 years, 68.6% were holding advanced diploma, 54.3% were having working experience of 5-10 years and 45.7% working experience in their current departments of 2-3 years.

Table: 4. 1. Demographic variables (N=70)

Variable	Frequency	Percentage frequency
Gender		
Male	29	41.4%
Female	41	58.6%
Age		
20-29 years	18	25.7%
30-39 years	42	60.0%
40-49 years	9	12.9%
50-59 years	1	1.4%
Marital status		
Single	22	31.4%
Married	48	68.6%
Level of education		
Diploma nurse(A1)	48	68.6%
Diploma(A1)	9	12.9%
Bachelor's Degree nurse(A0)	10	14.3%
Bachelor's Degree midwife(A0)	1	1.4%
Working experience		
<5 years	23	32.9%
5-10 years	38	54.3%
11-15 Ears	6	8.6%
11-16 >20 years	1	1.4%
Working experience in your current experience		
< 6 Months	10	14.3%
7 Months-1 year	16	22.9%
2-3 years	32	45.7%
4-5 Years	5	7.1%
4-6 >5 years	7	10%

4.1.2. Nurses and midwives knowledge on oxygen administration

Table: 4.2 below, shows that only six out of 20 questions were answered correctly at more than 50%; for example: which statement is true regarding pulse oximetry? The following equipment is routinely required for oxygen therapy except, which of the following devices is recommended for oxygen delivery in children; indication of giving oxygen; on administration of oxygen, it is important to monitor also the signs of improvement. Among the statement below, which one will indicate if the patient is improving well? Which of the following cases makes the reliability of Oxygen oximeter questionable? These questions were answered by the participants as per the following frequencies and percentages 60/70(85.7%), 39/70(55.7%), 38/70(54.3%), 44/70(62.9%), 44/70(62.9%) and 36/70(51.4%) respectively.

Table: 4. 2. Nurses and midwives knowledge on oxygen administration (N=70)

Variable	Frequency	Percentage
1. Oxygen therapy is a medication therefore it is important to		
Incorrect	40	57.1%
Correct	30	42.9%
2. In administering oxygen, it is important to prioritize		
Incorrect	39	55.7%
Correct	31	44.3%
3. Which statement is true regarding pulse Oximetry?		
Incorrect	10	14.3
Correct	60	85.7
4. Which of the following is a major muscle of respiration?		
Incorrect	40	57.1%
Correct	30	42.9%
5. Among the statement below, which one is indicating low partial pressure of oxygen?		
Incorrect	58	82.9%
Correct	12	17.1%
6. Oxygen deficiency can be detected by the following except:		
Incorrect	60	85.7%
Correct	10	14.3%

7. Indiscriminate administration of O₂ is discouraged due to		
Incorrect	36	51.4%
Correct	34	48.6%
8. The following equipment is routinely required for oxygen therapy except:		
Incorrect	31	44.3%
Correct	39	55.7%
9. Which of the following devices is recommended for oxygen delivery in children?		
Incorrect	32	45.7%
Correct	38	54.3%
10. Which of the following are indications of giving oxygen?		
Incorrect	26	37.1%
Correct	44	62.9%
11. An adult patient arrives in your unit and doctor prescribes 4 liters per minute of Oxygen per face mask. What percentage of oxygen will you be giving?		
Incorrect	67	95.7%
Correct	3	4.3%
12. Adult patient arrives in your ward with chronic obstructive pulmonary disease (COPD) and oxygen is prescribed with stipulation of the amount. You decide to use a face mask for administration. Using a mask, what percentage of oxygen will you administrator this patient?		
Incorrect	67	95.7
Correct	3	4.3
13. Reports in your ward and you are requested to give oxygen per cannula. The doctor prescribes 2 Liters per minute of		

oxygen flow. How much oxygen will you document that it has been given?

Incorrect	58	82.9%
Correct	12	17.1%

14. A patient changes condition in your ward and the doctor prescribes 100% oxygen. What oxygen device will you use?

Incorrect	50	71.4%
Correct	20	28.6%

15. The following are complications of oxygen except:

Incorrect	51	72.9%
Correct	19	27.1%

16. On administration of oxygen, it is important to monitor also the signs of improvement. Among the statement below, which one will indicate if the patient is improving well?

Incorrect	26	37.1%
Correct	44	62.9%

17. Which of the following cases make the reliability of Oxygen oximeter is questionable?

Incorrect	34	48.6%
Correct	36	51.4%

18. A patient changes condition in ward and the doctor is in theatre. The nurse or midwife gives oxygen. This nurse is justified to give oxygen.

Incorrect	52	74.3%
Correct	18	25.7%

19. The passive process in respiration physiology is;

Incorrect	41	58.6%
Correct	29	41.4%

20. Which of the following oxygen delivery devices is able to give oxygen concentration reaching to 100%?

Incorrect	55	78.6%
Correct	15	21.4%

Knowledge score on oxygen administration (N=70)

Table: 4.3 below, demonstrates that the participants' knowledge regarding oxygen administration was found to be poor; Mean=7.5286 which is equivalent to 37.643% (Wang et al., 2015). The scores were categorized using inadequate knowledge (below 50%), moderate knowledge (between 60 and 80%) and adequate knowledge (above 80%).

Table: 4. 3. Knowledge score on oxygen administration (N=70)

Knowledge score out of 20	Frequency (%)	Knowledge percentage (%)	Level of knowledge	Measurement of central tendency
2	1(1.4%)	1.4%		Mean=7.5286
4	3(4.3%)	4.3%		Median=7.0000
5	6(8.6%)	8.6%		Mode=7.00
6	12(17.1%)	17.1%	Inadequate knowledge	SD=2.24397
7	19(27.1%)	27.1%		Variance=5.035
8	10(14.3%)	14.3%		Range=13
9	6(8.6%)	8.6%		Minimum=2
10	7(10%)	10%		Maximum=15
11	2(2.9%)	2.9%		
12	2(2.9%)	2.9%	Moderate knowledge	
13	1(1.4%)	1.4%		
15	1(1.4%)	1.4%	Adequate knowledge	

Participants' attitude on oxygen administration (N=70)

As per table: 4.4 below, the majority of the statements were answered according to the respondent's views or attitude on a Likert scale. The majority of participants strongly agree on the care of the patient on oxygen therapy, for example, administration without a prescription in

an emergency with prescription after the case (75.7%) hygiene of all materials before administration (77.1%) and observation of oxygen saturation during administration (71.4%). Least agreement is on oxygen saturation range of COPD patient's maintenance (51.4%).

Table: 4. 4. Participants' attitude on oxygen administration (N=70)

Variable	Frequency	Percentage
1. Oxygen as a drug can be only administered when the prescription made by the medical doctor.		
Strongly agree	22	31.4%
Agree	23	32.9%
Disagree	16	22.9%
Strongly disagree	9	12.9%
2. Oxygen as a drug can be administered by nurse or midwife, then prescription comes after in case of emergency situation.		
Disagree	4	5.7%
Agree	13	18.6%
Strongly agree	53	75.7%
3. Before giving oxygen, the hygiene of all materials needed and patient has to be highly checked.		
Strongly disagree	3	4.3%
Agree	13	18.6%
Strongly agree	54	77.1%
4. While giving oxygen, mouth and nostril care is highly needed.		
Strongly disagree	2	2.9%
Disagree	3	4.3%
Agree	20	28.6%
Strongly agree	45	64.3%

5. When patient is treated by oxygen, observation of oxygen saturation is recommended.		
Strongly disagree	2	2.9%
Agree	18	25.7%
Strongly agree	50	71.4%
6. If oxygen is given without humidification it will cause dryness of mucosa membrane.		
Strongly disagree	2	2.9%
Disagree	6	8.6%
Agree	17	24.3%
Strongly agree	45	64.3%
7. Patients with COPD and other lung diseases, the oxygen saturation range has to be maintained.		
Strongly disagree	2	2.9%
Disagree	3	4.3%
Agree	29	41.4%
Strongly agree	36	51.4%
8. Oxygen as a drug, it has very serious effects to the patients when it is given unsafely as others pharmaceutical products.		
Strongly disagree	1	1.4%
Disagree	4	5.7%
Agree	26	37.1%
Strongly agree	39	55.7%
9. To be on oxygen therapy indicates the last stage of life.		
Strongly disagree	3	4.3%
Disagree	5	7.1%
Agree	19	27.1%
Strongly agree	43	61.4%

10. Knowing the different oxygen delivery devices and how they differ is an important thing before initiation of oxygen therapy.

Agree	26	37.1%
Strongly agree	44	62.9%

11. The targeted oxygen saturation is very important to adjust accordingly.

Strongly disagree	3	4.3%
Disagree	3	4.3%
Agree	22	31.4%
Strongly agree	42	60.0%

Attitude score on oxygen administration

Attitude scores were computed using Chi-square test and categorized into positive and negative attitude. The overall mean =37.7 which is equivalent to 85.6%, was obtained thus it means that the nurses and midwives attitude on oxygen administration was found to be positive (Maheshwari et al., 2014). See Table 4.5 below.

Table: 4. 5. Attitude score on oxygen administration (N=70)

Attitude score out of 44	Frequency (%)	Attitude percentage (%)	Level of attitude	Measurement of central tendency
25	2(2.9%)	2.9%	Negative attitude	Mean=37.7
26	1(1.4%)	1.4%		Median=38.0
28	1(1.4%)	1.4%		Mode=36.0
32	2(2.9%)	2.9%	Positive attitude	SD=3.98
33	2(2.9%)	2.9%		Variance=15.8
34	1(1.4%)	1.4%		Range=19
35	1(1.4%)	1.4%		Minimum=25
36	11(15.7%)	15.7%		Maximum=44
37	8(11.4%)	11.4%		
38	11(15.7%)	15.7%		
39	8(11.4%)	11.4%		
40	7(10.0%)	10.0%		
41	3(4.3%)	4.3%		
42	6(8.6%)	8.6%		
43	5(7.1%)	7.1%		
44	1(1.4%)	1.4%		

Nurses and midwives Practice on oxygen administration

As per Table: 4.6. Below the participants’ practice regarding oxygen administration is presented, where the observations were only on 29 respondents who were willing to participate in this study. A few points were found to have high competence frequencies by participants during observation, such as; Connects tubing to wall oxygen or cylinder, Opens oxygen gauge on cylinder or wall oxygen and Opens the accurate oxygen flow for the device used at 20/29(69.0%), 22/29(75.9%) and 18/29(62.1%) respectively.

Table: 4. 6. Nurses' and Midwives' Practice on oxygen administration (N=29)

Variable	Frequency	Percentage frequency
1. Gives the indication for oxygen therapy		
Non competent	18	62.1%
Moderate competent	9	31.0%
High competent	2	6.9%
2. Indicates the complications of oxygen therapy to expect		
Non competent	28	96.6%
High competent	1	3.4%
3. Indicates the devices that can be used for oxygen administration	25	86.2%
Non competent	1	3.4%
Moderate competent	3	10.3%
High competent		
4. Relates the oxygen devices and oxygen flow rates		
Non competent	25	86.2%
Moderate competent	1	3.4%
High competent	3	10.3%
5. Checks the doctor's prescription		
Non competent	5	17.2%
Moderate competent	14	48.3%
High competent	10	34.5%
6. Establishes baseline SpO₂ to be able to determine progress		
Non competent	15	51.7%
Moderate competent	9	31.0%
High competent	5	17.2%
7. Checks availability of O₂ in the cylinder (if applicable)		
Non competent	15	51.7%
Moderate competent	8	27.6%

High competent	6	20.7%
8. Checks functional status of equipment		
Non competent	15	51.7%
Moderate competent	8	27.6%
High competent	6	20.7%
9. Assembles all the necessary equipment as per unit protocol		
Non competent	11	37.9%
Moderate competent	8	27.6%
High competent	10	34.5%
10. Explains the procedure and purpose to the patient and/or family		
Non competent	26	89.7%
Moderate competent	3	10.3%
11. Chooses the correct device for the prescribed amount of oxygen and size of the patient		
Non competent	21	72.4%
Moderate competent	7	24.1%
High competent	1	3.4%
12. Chooses the right device for the age or size of the patient		
Non competent	25	86.2%
Moderate competent	3	10.3%
High competent	1	3.4%
13. Washes hands		
Non competent	7	24.1%
Moderate competent	10	34.5%
High competent	12	41.4%
14. Dons surgical gloves according to unit protocol		
Non competent	2	6.9%
Moderate competent	13	44.8%
High competent	14	48.3%

15. Connects tubing to wall oxygen or cylinder		
Non competent	1	3.4%
Moderate competent	8	27.6%
High competent	20	69.0%
16. Opens oxygen gauge on cylinder or wall oxygen		
Non competent	1	3.4%
Moderate competent	6	20.7%
High competent	22	75.9%
17. Tests if O₂ running through the tube		
Non competent	4	13.8%
Moderate competent	14	48.3%
High competent	11	37.9%
18. Connects prescribed O₂ device appropriately		
Non competent	3	10.3%
Moderate competent	13	44.8%
High competent	13	44.8%
19. Applies device on patient appropriately for the chosen device		
Non competent	3	10.3%
Moderate competent	15	51.7%
High competent	11	37.9%
20. Opens the accurate oxygen flow for the device used		
Non competent	1	3.4%
Moderate competent	10	34.5%
High competent	18	62.1%
21. Monitors the correct parameters for oxygen administration, e.g. SpO₂, Respiratory rate, Patient color, GCS.		
Non competent	27	93.1%

Moderate competent	2	6.9%
22. Records monitoring at the appropriate interval according to unit protocol		
Non competent	25	86.2%
Moderate competent	3	10.3%
High competent	1	3.4%
23. Reports any abnormality found in observation		
Non competent	26	89.7%
Moderate competent	3	10.3%

Practice score on oxygen administration

Table: 4.7 below, demonstrates the overall mean which is equal to 17.5 which is equivalent to 32.59% denoting poor practice (Maheshwari, M, & Ramnani, 2014).

Tables: 4. 8, 4.9. and 4.10 below demonstrate that; the level of education and working experience in current department with knowledge were significantly associated ($p=0.008$) and ($p=0.018$) respectively. Marital status and working experience with attitude were significantly associated on oxygen administration ($p=0.033$), ($p=0.002$) respectively. Level of education of participants on oxygen administration was significantly associated with practice ($p=0.015$).

Table: 4. 7. Demographic variables associated with knowledge (N=70)

Demographic variable	X² -Value	P-Value
Gender and knowledge	11.438	0.407
Age and knowledge	28.886	0.072
Marital status and knowledge	9.685	0.559
Level of education and knowledge	69.769	0.008
Working experience and knowledge	65.801	0.018
Working experience in the current department and knowledge	44.670	0.444

Table: 4. 8. Demographic variables associated with attitude (N=70)

Demographic variable	X² -Value	P-Value
Gender and attitude	23.670	0.071
Age and attitude	35.418	0.846
Marital status and attitude	26.525	0.033
Level of education and attitude	62.199	0.398
Working experience and attitude	97.651	0.002
Working experience in the current department and attitude	64.786	0.313

Table: 4. 9. Demographic variables associated with practice (N=29)

Demographic variable	X² -Value	P-Value
Gender and practice	20.045	0.129
Age and practice	57.134	0.060
Marital status and practice	11.273	0.664
Level of education and practice	81.248	0.015
Working experience and practice	29.648	0.380
Working experience in the current department and practice	63.309	0.234

Table: 4. 10. Practice score on oxygen administration (N=29)

Attitude score out of 46	Frequency (%)	Attitude percentage (%)	Level of practice	Measurement of central tendency
11	2(6.9)	2.9%	Poor practice	Mean=17.5
13	4(13.8%)	13.8%		Median=16.0
14	5(7.1%)	17.2%%		Mode=14.0
15	3(4.3%)	10.3%%		SD=5.2
16	1(3.4%)	3.4%		Variance=27.0
17	1(3.4%)	3.4%		Range=20.0
18	3(10.3%)	10.3%		Minimum=11.0
19	3(10.3%)	10.3%		Maximum=31.0
20	1(3.4%)	3.4%		
21	1(3.4%)	3.4%		
23	1(3.4%)	3.4%	Fair practice	
24	1(3.4%)	3.4%		
26	1(3.4%)	3.4%		
30	1(3.4%)	3.4%		
31	1(3.4%)	3.4%		

CHAPTER 5: DISCUSSION

5.1. Introduction

This study was intended to assess nurses' and midwives' KAP on oxygen administration at one of the District Hospitals, Kigali. Therefore, this section is going to highlight in detail about the independent variables which were demographic characteristics and dependent variables which were knowledge, attitude and practical skills of nurses and midwives.

The results are presented based on the current literature, objectives and conceptual frame-work of the study and P-value <0.005 was considered to show statistical significance among demographic variables with KAP. And finally, data discussed here are from 70 participants who filled self-administered questionnaires and 29 of them were observed while administering oxygen in different hospital departments.

5.2. Knowledge of nurses and midwives on oxygen administration

From this study, the knowledge of nurses and midwives were found as inadequate knowledge where the knowledge mean was 7.5286 which is equivalent to 37.643% (Wang et al., 2015). The nurses and midwives knowledge was found as inadequate on oxygen administration on to know the percentage of oxygen concentration to be given by use of simple face mask, percentage of oxygen concentration that is supposed to be given to the COPD patient and to know some statements regarding to oxygen oximetry 3/70(4.3%), 3/70(4.3%) and 10/70(14.3%) respectively. In Ethiopia it was found as poor at 67%, where the nurses were mainly depends on oxygen indications and focused on oxygen saturation, this was again seen in Saudi Arabia 12.4% were aware of oxygen therapy and has to be administered in preventing and treatment of hypoxia, 69.8% were the only that knows the contra-indications of oxygen therapy and 72.7% were the only nurses that answered correctly the normal range of oxygen saturation (Aloushan, 2017., P: 6., Lemma, 2015).

5.3. Attitude of nurses and midwives on oxygen administration

From the data above, the attitude of nurses and midwives on oxygen administration was found to be position on the percentage of 85.6% to all participants, in this part, all eleven questions ten of them were answered above 50% to be strongly agree. Thus even if the KP was poor but the

attitude of nurses and midwives was positive, this means that the nurses and midwives have positive behaviors on oxygen as a drug and it can be very simple for them to improve on knowledge and practice.

5.4. Practice of nurses and midwives on oxygen administration

From the above data, poor practice was found at 32.59% mainly on monitoring the patient oxygen saturation parameter according to the unit protocol, report any abnormality found and to indicate the complication of oxygen therapy 25/29(86.2%), 26/29(89.7%) and 28/29(96.6%) respectively. This was also the same in Europe where the nurses' practice was based on doctor's order, partial pressure of oxygen, guidelines and patient condition and the poor knowledge were observed at 58%, 20%, 10% and 12% respectively (Mahmoud et al., 2016).

The prescribed oxygen to be given was found as poor practice among the nurses and midwives where only 10/29(34.5%) were the only ones that checked the doctor's prescription, this was also found in United States of America on Chronic Obstructive Pulmonary Diseases (COPD) which showed that, the prescribed oxygen was not given as prescribed and it was the same as in Portugal which shows poor practice of the nurses and midwives on oxygen administration. For example, among 93% oxygen was given as prescribed, 12% given completely prescribed oxygen and 23% patients were not giving prescribed oxygen (Brill & Wedzicha, 2014).

The poor practice of nurses and midwives again was found in Australia where reviewed the gaps on following the guideline for oxygen administration, administration of oxygen according to prescription, measurements of pulse oximetry and to the patients with respiratory distress, the arterial blood gases were not taken as it had to be in the guideline at rates 87%, 91%, 91% and 68 % respectively, and in addition, the poor practice was seen in Ethiopia as 56.6% (Cousins et al., 2016).., Lemma, 2015).

5.4. The association factors between demographic variables with knowledge and practice on oxygen administration

This study has also found poor knowledge and practice to be 37.643% and 32.59% respectively. The significantly associated factors among demographic characteristics were level of education and working experience. The poor knowledge with demographic variables was associated with level of education and working experience where p-value was 0.008 and 0.018 respectively.

The poor practice with demographic variables the associated factor also again with level of education with p-value of 0.015. This was again found in Saudi Arabia and the associated factors were lack of trainings, unavailability of national guideline, inadequate oxygen delivery equipment and Harvey workload. The associated factors of poor knowledge and practice were also seen in Ethiopia and the possible factors were lack of oxygen administration trainings and lack guidelines (Aloushan, 2017., P: 6., Lemma, 2015).

6.2. CONCLUSION

This study showed that there, is a clear knowledge and practice gaps among nurses and midwives. The possible associated factors were also identified; level of education and working experience can affect the challenges on oxygen administration.

6.3. RECOMMENDATIONS

The results of this study have some implications in nursing education, nursing practice, professional bodies and research.

Nursing practice

There is need of various positive implications towards nursing profession in our country, region and the world. This can contribute to institutionalize and improve oxygen administration to affordable positive attitudes and oxygen administration practices. The nurses and midwives at Masaka District Hospital have also share the results and this can improve the practice.

Nursing education

The curriculum review to address the identified gaps in knowledge and skills on oxygen administration in the training program and would establish regular training courses, workshops and continuous educational programs to uplift the standards in nursing care on oxygen administration of nurses to their working places.

Professional bodies

Professional bodies like Nursing and midwifery council and nursing associations could promote development and transfer of knowledge, improve nursing practices and enhance professional capacities through reviewing some of their objectives and perform professional standards, capacity building, knowledge sharing and knowledge services and become a model organization.

Research

The study was conducted on one site, Masaka District Hospital. Therefore there is need of further research related to oxygen administration that could be conducted in other sites especially in referral hospitals and district hospitals in general considering the fact that this was a small scale study which cannot be generalized outside the participating institution.

6.4. CONCLUSION

Oxygen as a drug can be admitted to the all patients who are in need of it, prescription is recommended to be done as other medications by showing the flow rate, oxygen delivery device and targeted oxygen saturation. The conclusion and different recommendations stated above in different domain are mainly due to the gaps shown from this study done where the knowledge was found as inadequate and poor practice of nurses and midwives on oxygen administration at Masaka District Hospital.

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APPENDICES

APPENDIX: 1. AUTHORIZATION LETTERS



UNIVERSITY OF
RWANDA

COLLEGE OF MEDICINE AND HEALTH SCIENCES

CMHS INSTITUTIONAL REVIEW BOARD (IRB)

Kigali, 14/01/2019
Ref: CMHS/IRB/004/2019

NSABIMANA Ephrem
School of Nursing and Midwifery, CMHS, UR

Dear NSABIMANA Ephrem

RE: ETHICAL CLEARANCE

Reference is made to your application for ethical clearance for the study entitled "*Assessment of Knowledge, Attitude and Practice on Oxygen Administration among Nurses and Midwives at One District Hospital, Kigali Rwanda*"

Having reviewed your protocol and found it satisfying the ethical requirements, your study is hereby granted ethical clearance. The ethical clearance is valid for one year starting from the date it is issued and shall be renewed on request. You will be required to submit the progress report and any major changes made in the proposal during the implementation stage. In addition, at the end, the IRB shall need to be given the final report of your study.

We wish you success in this important study.


Professor Jean Bosco GAHUTU
Chairperson Institutional Review Board,
College of Medicine and Health Sciences, UR



Cc:

- Principal College of Medicine and Health Sciences, UR
- University Director of Research and Postgraduate studies, UR

EMAIL: researchcenter@ur.ac.rw P.O. Box: 3286, Kigali, Rwanda WEBSITE: <http://cmhs.ur.ac.rw/> www.ur.ac.rw

REPUBLIC OF RWANDA

Date : 4/04/2019

REF 417/MSK/DH/2019



KIGALI CITY
DISTRICT KICUKIRO
HOPITAL MASAKA
B.P 3472 KIGALI
E-mail: masaka.hospital@moh.gov.rw

To: Mr.NSABIMANA Ephrem

Re: PERMISSION TO CONDUCT DATA COLLECTION

Dear Sir,

Reference made by decision of Director General of Masaka district hospital on your research proposal entitled "*assessment of knowledge, attitude and practice on oxygen administration among nurses and midwives* " The management of Masaka District Hospital is pleased to inform you that, you have authorization to conduct a study in our hospital.

Sincerely




Dr. Marcel UWIZEYE
Director General Masaka Hospital

APPENDIX: 2. INDIVIDUAL INFORMED CONSENT FORM

I'm **NSABIMANA Ephrem**; I'm a master's student in school of nursing and midwifery, college of medicine and health sciences, University of Rwanda. In order to accomplish my studies, a research thesis must be carried out. I'm carrying out a research thesis on **“assessment of knowledge, attitude and practice on oxygen administration among nurses and midwives at one district hospital Kigali, Rwanda.”** as partial fulfillment of my studies. You have been selected to be asked the questions in this study. We would very much appreciate your participation in this study. We would like to ask you about demographic data, Knowledge on oxygen therapy, Attitude on oxygen therapy and Practice on oxygen therapy.

The results of this study will be used to formulate guidelines proper use of oxygen delivery devices and to know which condition the patient is more at high risk of being in hypoxemia status. Asking you question will usually take about 5 to 10 minutes to complete. The information you provide will be kept strictly confidential and will not be shown to other persons.

Participation in this study is voluntary and you can choose not to answer any question or all of the questions. The study does not involve any obvious risks to you, except we will take a bit of your time as you answer the questionnaire. However, we hope that you will participate in this study since your views are important. At any time you need clarifications over the research study, direct your questions to:

NAME	PHONE NUMBER	SIGNATURE
Mr. NSABIMANA EPHREM	0788703085
Mr. Placide HAVUGITANGA	0788779623
Prof. Busisiwe R Bhengu	+250782333732/+27836615563

Emails: Mr. NSABIMANA Ephrem: nsabephrem@yahoo.com

Mr. HAVUGITANGA Placide: placideh2005@yahoo.fr

Prof. BUSISIWE R Bhengu: bhengub2@ukzn.ac.za/bhengub2@gmail.com

APPENDIX: 3. INFORMED CONSENT FORM

I would like to participate in this study and I have understood all the explanations given by the Interviewer related to this study process. I have been informed that my participation is voluntary and that I terminate my participation at any time of the study. I have also been informed of minimal risks involved in the study.

Signature of Participant Date/...../2019

APPENDIX: 4. QUESTIONNAIRE: ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICE ON OXYGEN ADMINISTRATION AMONG NURSES AND MIDWIVES IN ONE DISTRICT HOSPITAL, KIGALI RWANDA

Instructions:

Choose the correct answer by circling the letter which is corresponding to the correct answer.

Answer all questions according to your personal view.

NB: The confidentiality of your information will be ensured in this research

SECTION A: PERSONAL IDENTIFICATION.

1. Sex

- A. Male
- B. Female

2. Age

- A. 20-29 Years
- B. 30-39 Years
- C. 40-49 Years
- D. 50 -59 Years and Above
- E. ≥ 60 Years and Above

3. Marital Status

- A. Single
- B. Married
- C. Divorced/ Separated
- D. Widow(er)
- E. Cohabitation

4. Level of education

- A. Secondary School Level (A2)
- B. Diploma Nurse (A1)
- C. Diploma Midwife (A1)
- D. Bachelor's Degree Nurse (A0)
- E. Bachelor's Degree Midwife (A0)
- F. Masters in nursing
- G. Masters in midwifery
- H. Other specify.....

4. Working experience

- A. < 5 Year
- B. 5-10 Years
- C. 11- 15 Years
- D. 16-20 Years
- E. ≥ 20 Years and Above

6. Working experience in your current department

- A. < 6 Months
- B. 7 Months -1 Years
- C. 2-3 Years
- D. 4- 5Years
- E. ≥ 5 Years and Above

SECTION B: QUESTIONS ON KNOWLEDGE OF OXYGEN ADMINISTRATION.

INSTRUCTION: CHOICE THE BEST ANSWER

1. Oxygen therapy is a medication therefore it is important to

- A. Know its side effects before administration
- B. Check prescription before administration
- C. Collect equipment for use before you start
- D. Verify if it is within your scope before administration

2. In administering oxygen, it is important to prioritize:

- A. Position of the patient before administration
- B. Patency of the airway before administration and throughout administration
- C. Availability of suction equipment before oxygen administration
- D. Availability of the vital signs monitor to monitor the oxygen administration

3. Which statement is true regarding pulse Oximetry?

- A. Determines Hb count
- B. Determines end-tidal CO₂
- C. Measures respiratory rate
- D. Measures O₂ saturation

4. Which of the following is a major muscle of respiration?

- A. Abdominal muscle
- B. Scalene muscle
- C. Diaphragm
- D. Internal intercostal muscles

5. Among the statement below, which one is indicating low partial pressure of oxygen?

- A. Less than 80mmHg
- B. Less than 80%
- C. Less than 90%
- D. Less than 90mmHg

6. Oxygen deficiency can be detected by the following except:

- A. Dyspnea
- B. Tachypnea
- C. Cyanosis
- D. Restlessness

7. Indiscriminate administration of O₂ is discouraged due to:

- A. Possibility of a compensatory Patent Ductus Arteriosus (PDA)
- B. Dependency of patient with chronic obstructive pulmonary disease (COPD) on low oxygen
- C. The fact that oxygen is a medication and must be prescribed
- D. A and B

8. The following equipment is routinely required for oxygen therapy except:

- A. Oxygen Gauge
- B Oxygen tubing
- C. Suction apparatus
- D. Oxygen Mask

9. Which of the following devices is recommended for oxygen delivery in children?

- A. Oxygen mask
- B. Oxygen cannula
- C. Mechanical ventilation
- D. Non-rebreather mask

10. Which of the following are indications of giving oxygen?

- A. Hypoxia
- B. Head injury
- C. Seizures
- D. All the above

11. An adult patient arrives in your unit and doctor prescribes 4 liters per minute of Oxygen per face mask. What percentage of oxygen will you be giving?

- A. 60%
- B. 40%
- C. 35%
- D. 28%

12. Adult patient arrives in your ward with chronic obstructive pulmonary disease (COPD) and oxygen is prescribed with stipulation of the amount. You decide to use a face mask for administration. Using a mask, what percentage of oxygen will you administer this patient?

- A. 60%
- B. 40%
- C. 35%
- D. 28%

13. A child reports in your ward and you are requested to give oxygen per cannula. The doctor prescribes 2 Liters per minute of oxygen flow. How much oxygen will you document that it has been given?

- A. 21%-25%
- B. 25% - 28%
- C. 28% -32%
- D. 32%-36%

14. A patient changes condition in your ward and the doctor prescribes 100% oxygen. What oxygen device will you use?

- A. Nasal cannula
- B. Face mask
- C. Non-rebreather mask
- D. Venturi mask

15. The following are complications of oxygen except:

- A. Dry mucous membranes
- B. Blindness in babies
- C. Discomfort with skin breakdown on straps
- D. Bronchospasm

16. On administration of oxygen, it is important to monitor also the signs of improvement. Among the statement below, which one will indicate if the patient is improving well?

- A. Reduced respiratory rate
- B. A more comfortable breathing pattern
- C. Improved oxygen saturation
- D. All the above

17. Which of the following the reliability of Oxygen oximeter is questionable cases?

- A. Cold extremity
- B. Vasoconstrictive drugs
- C. Severe anaemia
- D. All the above

18. A patient changes condition in ward and the doctor is in theatre. The nurse or midwife gives oxygen. This nurse is justified to give oxygen.

- A. True
- B. False
- C. True if she reports herself
- D. True if she ensures that a follow-up prescription is made

19. The passive process in respiration physiology is;

- A. Expiration
- B. Inhalation
- C. Inspiration
- D. Nasal flaring

20. Which of the following oxygen delivery devices is able to give oxygen concentration reaching to 100%?

- A. Nasal cannula
- B. Simple face mask
- C. Non- rebreather face mask
- D. Venturie mask

SECTION C: QUESTIONS ON ATTITUDE OF OXYGEN ADMINISTRATION

1. Answer questions from A to K by writing X or √ According to your response.

No	Description	Strongly Agree	Agree	Disagree	Strongly Disagree
A	Oxygen as a drug can be only administered when the prescription made by the medical doctor.				
B	Oxygen as a drug can be administered by nurse or midwife, then prescription comes after in case of emergency situation.				
C	Before giving oxygen, the hygiene of all materials needed and patient has to be highly checked.				
D	While giving oxygen, mouth and nostril care is highly needed.				
E	When patient is treated by oxygen, observation of oxygen saturation is recommended.				
F	If oxygen is given without				

	humidification it will cause dryness of mucosa membrane.				
G	Patients with COPD and other lung diseases, the oxygen saturation range has to be maintained.				
H	Oxygen as a drug, it has very serious effects to the patients when it is given unsafely as others pharmaceutical products.				
I	To be on oxygen therapy indicates the last stage of life.				
J	Knowing the different oxygen delivery devices and how they differ is an important thing before initiation of oxygen therapy.				
K	The targeted oxygen saturation is very important to adjust accordingly.				

THANK YOU VERY MUCH FOR YOUR TIME AND RESPONDING

APPENDIX: 5. CHECK LIST

SECTION D: QUESTIONS ON PRACTICE OF OXYGEN ADMINISTRATION

The participant must be able to demonstrate competence in the preparation for, connecting, monitoring and documenting administration of oxygen.

A. COGNITIVE COMPONENT:	Competent		
	0	1	2
1. Gives the indication for oxygen therapy			
2. Indicates the complications of oxygen therapy to expect			
3. Indicates the devices that can be used for oxygen administration			
4. Relates the oxygen devices and oxygen flow rates			
B.PSYCHOMOTOR COMPONENT			
	Competent		
	0	1	2
B. 1. Assessment:			
1. Checks the doctor’s prescription			
2. Establishes baseline SpO ₂ to be able to determine progress			
3. Checks availability of O ₂ in the cylinder (if applicable)			
4. Checks functional status of equipment			
B.2. Planning:			
1. Assembles all the necessary equipment as per unit protocol			
2. Explains the procedure and purpose to the patient			

and/or family			
3. Chooses the correct device for the prescribed amount of oxygen and size of the patient			
4. Chooses the right device for the age or size of the patient			
B.3. Implementation			
1. Washes hands			
2. Dons surgical gloves according to unit protocol			
3. Connects tubing to wall oxygen or cylinder			
4. Opens oxygen gauge on cylinder or wall oxygen			
5. Tests if O ₂ running through the tube			
6. Connects prescribed O ₂ device appropriately			
7. Applies device on patient appropriately for the chosen device			
8. Opens the accurate oxygen flow for the device used			
9. Monitors the correct parameters for oxygen administration, e.g. SpO ₂ , Respiratory rate, Patient colour, GCS,			
B.4. Documentation and evaluation			
1. Records monitoring at the appropriate interval according to unit protocol			
2. Reports any abnormality found in observation			

Participant score: _____/46 (out of total score)