

**ASSESSMENT OF KNOWLEDGE, ATTITUDE AND
PRACTICE REGARDING OXYGEN THERAPY AT
EMERGENCY DEPARTMENT OF HOSPITAL
UNIVERSITI SAINS MALAYSIA**

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LIST OF ABBREVIATIONS

OT	Oxygen therapy
ED	Emergency Department
Hospital USM	Hospital Universiti Sains Malaysia
CME	Continuous medical education
CNE	Continuous nursing education
KAP	Knowledge, Attitude, Practice
SKT	Sasaran Kerja Tahunan (Annual Work Target)
OR	Odds ratio
SpO ₂	Oxygen saturation
SPSS	Statistical Package for Social Sciences
STEMI	ST elevation myocardial infarction
SLR	Single Logistic Regression
MLR	Multiple Logistic Regression
LR	Likelihood ratio
O ₂	Oxygen
CNS	Central nervous system
COPD	Chronic obstructive pulmonary disease
EMS	Emergency medical services
MMC	Malaysian Medical Council
WHO	World Health Organisation

ABSTRACT

Introduction This study aimed to assess the prevalence of knowledge, attitude and practice of oxygen therapy (OT) and identify the associated factors with good knowledge, attitude and practice of oxygen therapy among the healthcare workers in Emergency Department in Hospital Universiti Sains Malaysia. **Method** This cross-sectional study has enrolled the healthcare workers from the emergency department at Hospital USM involving medical officers, house officers, assistant medical officers and staff nurses who had fulfilled the inclusion criteria. All data were tested using the Chi-square test and multiple logistic regression and was analysed using SPSS software version 24. **Result** A total of 160 respondents have completed the questionnaire adapted from Aloushan et. al, 2019 regarding oxygen therapy. Of them, 6.9 % had a good knowledge, 15 % had a positive attitude and 65.6 % had good practice. The mean score of knowledge for OT was 5.44 ± 1.68 (maximum score of 10), the attitude was 24.29 ± 3.07 (maximum score of 35) and practice was 4.11 ± 1.62 (maximum score of 9). Professions, duration of services and availability of OT guidelines were significant associated factors with good KAP scores. **Conclusion** This study showed that there was poor knowledge and negative attitude among the healthcare workers in oxygen administration. However, practice of oxygen therapy was overall good. It is recommended that continuous training on oxygen therapy and availability of hospital guideline on oxygen therapy should be developed. Oxygen administration knowledges and skills should be enhanced in the current daily practice among the healthcare workers.

Keywords: Emergency department, Healthcare workers, Oxygen administration

ABSTRAK

Pengenalan Kajian ini bertujuan untuk menilai tahap pengetahuan, sikap dan amalan kerja terhadap rawatan oksigen dan mengenalpasti faktor-faktor lain yang berkaitan berkenaan tahap pengetahuan, sikap dan amalan kerja yang baik terhadap rawatan oksigen dalam kalangan petugas kesihatan di Jabatan Kecemasan Hospital Universiti Sains Malaysia. **Kaedah** Kajian keratan rentas atau *cross-sectional* yang dijalankan dalam kalangan petugas kesihatan di Jabatan Kecemasan Hospital USM yang melibatkan perubatan, pegawai perubatan siswazah, pembantu pegawai perubatan dan jururawat yang memenuhi kriteria inklusi. Semua data diuji menggunakan ujian Chi-square dan regresi logistik berganda dan dianalisis menggunakan perisian SPSS versi 24. **Keputusan** Seramai 160 responden telah menjawab soal selidik diadaptasi daripada Aloushan et. al, 2019 mengenai terapi oksigen berkaitan rawatan oksigen. Daripada itu, 6.9 % mempunyai pengetahuan yang baik, 15 % mempunyai sikap positif dan 65.6 % mempunyai amalan yang baik. Min skor pengetahuan bagi rawatan oksigen adalah 5.44 ± 1.68 (skor maksimum 10), sikap adalah 24.29 ± 3.07 (skor maksimum 35) dan amalan adalah 4.11 ± 1.62 (skor maksimum 9). Profesion, tempoh perkhidmatan dan ketersediaan garis panduan OT adalah faktor penting yang dikaitkan dengan skor pengetahuan, sikap dan amalan kerja yang baik. **Kesimpulan** Kajian ini menunjukkan bahawa terdapat pengetahuan yang lemah dan sikap negatif dalam kalangan petugas kesihatan berkenaan pengendalian terapi oksigen. Walau bagaimanapun, amalan terapi oksigen secara keseluruhannya adalah baik. Dengan ini, disarankan agar latihan berterusan mengenai terapi oksigen dan garis panduan hospital mengenai terapi oksigen perlu dilaksanakan. Pengetahuan dan kemahiran pengurusan rawatan oksigen harus dipertingkatkan dalam amalan kerja harian dalam kalangan petugas kesihatan kecemasan.

Kata Kunci: Jabatan Kecemasan, Petugas kesihatan, Rawatan oksigen

1. INTRODUCTION

Scheele and Priestly discovered oxygen independently of each other in 1772 and 1774, respectively. It was quickly realized that this gas is not only life-giving but might be poisonous as well. Shortly after its discovery, oxygen was used for medical purposes (Adib-Hajbaghery et al., 2014). Thus, oxygen therapy (OT) delivers oxygen at levels greater than those present in the environment ($> 21\%$) and is commonly prescribed by doctors and paramedics. It is a core element of World Health Organisation (WHO) model of essential medicine and it is a list of safest drugs used in the health care system.

OT is considered a key instrument in resuscitating pre-hospital trauma patients during evaluation and transportation by Emergency Medical Services (EMS) (Adib-Hajbaghery et al., 2014, McMullan et al., 2013). It is also believed to be an essential treatment for a wide range of hospitalized patients in the developed world as it plays a vital role in improving saturation and reducing the effort of breathing. OT has a pivotal role in saving the lives of many patients with heart and lung diseases if used at an appropriate time and in an appropriate amount according to the recently updated guidelines (Hardinge et al., 2015, Organization, 2016).

Oxygen therapy is a common intervention in health care worldwide; yet, despite universal use, it is evident through poor practice that oxygen is often prescribed and administered injudiciously. It is proposed that possibly an influencing culture presides, whereby oxygen is often poorly understood and uncertainty regarding its use exists (Kelly and Maden, 2014). It has an essential role in both acute and chronic conditions of diseases in the prevention or management of hypoxemia. Oxygen should be considered as a drug that is prescribed and administered for specific indications, with a documented target oxygen saturation range and with regular monitoring of the patient's response (Beasley et al., 2015). The optimal amount and method of oxygen delivery varies depending on a patient's underlying medical condition

and whether the condition is acute or chronic. The selection of the best oxygen delivery device and flow rate of oxygen depends on many factors some of which are the patient's age, the therapeutic goals and patient tolerance. Even though OT is one of the most widely used resuscitation methods, it may harm or cause a patient's status to deteriorate if used inappropriately. Pulmonary oxygen toxicity and oxygen-induced hypercapnia are considered as two of the major side effects of OT (Newnam, 2014).

Underuse of oxygen is extremely dangerous as it exposes critically ill patients to the risk of hypoxic organ damage. Overuse of oxygen can also be harmful, especially for patients with chronic obstructive pulmonary disease. (COPD). It was previously believed that high doses of supplemental oxygen were either beneficial or harmless for virtually all other acutely ill patients, but it is now known that hyperoxemia may have harmful physiological consequences and delay the recognition of physiological deterioration (Hale et al., 2008).

Thus, improper oxygen administration may give rise to adverse effects. The classic presentation of a patient with oxygen toxicity can be classified as pulmonary, ocular and central nervous system (CNS) toxicities. The earliest sign of oxygen toxicity is mild irritation of the trachea with deep inspiration, cough with chest tightness, CNS toxicity including seizures and paralysis, ocular such as retinopathy and myopia. Therefore, an early index of suspicion is necessary to detect oxygen toxicity while we are managing patients with oxygen therapy in the emergency department.

A beneficial effect that increases survival rates has been identified for acutely ill patients in oxygen therapy saturations between 94%-98%, however, in patients with elevated risk hypercapnic respiratory failure, lower saturation 88%-92% should be considered (Kane et al., 2013). Thus, the target saturation should be written on the drug chart and should be administered by staff who are trained in oxygen administration. These staff should use appropriate devices and flow rates to achieve the target saturation range (Lemma, 2015).

1.1 Justification of the study

The purpose of this study focused on awareness and procedures related to oxygen administration in care for patients who are needed in the emergency department. Despite their frequent use in daily practice, there are still significant gaps regarding oxygen therapy. Arguments are built to conclude that oxygen awareness encourages good practices in oxygen administration, enhances well-being, and needs treatment. On the other hand, lack of adequate oxygen awareness can affect health practices.

1.2 PROBLEM STATEMENT & STUDY RATIONALE

Patients on oxygen therapy in the emergency department are commonly prescribed by emergency healthcare workers. The justification of oxygen therapy and methods of oxygen delivery is still poor despite daily use. Thus, injudicious oxygen administration may predispose the patient to harmful effects.

Despite few studies have been done in other countries regarding knowledge, attitude and practice regarding oxygen therapy in the emergency department, there is no study done regarding this topic in Malaysia, thus we are inquisitive to know the knowledge, attitude and practice of oxygen therapy among the emergency healthcare workers at the emergency department in Hospital Universiti Sains Malaysia.

The findings of this study can contribute to the improvement of the level of education and practice of oxygen administration and prevent inappropriate oxygen administration.

1.3 RESEARCH QUESTIONS

(a) What is the prevalence of good knowledge on oxygen therapy among the emergency healthcare workers in the emergency department in Hospital University Sains Malaysia?

- (b) What is the prevalence of positive attitude among emergency healthcare workers on oxygen administration to the patients in the emergency department?
- (c) What is the prevalence of good practice on oxygen administration among the emergency healthcare workers in the emergency department?
- (d) What are the associated factors associated with good knowledge, attitude and practice of oxygen therapy among emergency healthcare workers?

NULL HYPOTHESIS

There are no associated factors associated with the knowledge, attitude and practice of oxygen therapy.

1.4 OBJECTIVES

1.4.1 General Objective

- To assess the knowledge, attitude and practice of oxygen therapy among the emergency healthcare workers in the emergency department in Hospital Universiti Sains Malaysia

1.4.2 Specific Objectives

- To determine the prevalence of good knowledge, attitude and practice on oxygen therapy among emergency healthcare workers at the emergency department in Hospital Universiti Sains Malaysia
- To identify associated factors with good knowledge, attitude and practice on oxygen therapy among emergency healthcare workers in the emergency department

1.5 LITERATURE REVIEW

Since the introduction of oxygen as a therapeutic agent 76 years ago, much has been learned regarding the detrimental effects of hypoxemia and the beneficial impact of oxygen therapy. It is projected that there are close to 800,000 patients receiving long-term oxygen therapy (LTOT) in the United States, at a cost of approximately \$1.8 billion annually (Kim et al., 2008).

Patients in cardiac and /or respiratory arrest need to be managed according to Basic and Advanced Life Support guidelines by the attending doctor, nurse or midwife. Patients who are already started on acute oxygen therapy should be monitored carefully and regularly (Lemma, 2015). The concentration of O₂ chosen should be the lowest dose that will correct hypoxemia; 40% O₂ is not known to be clinically toxic even after prolonged administration, but toxicity increases progressively above this value (Snider and Rinaldo, 1980).

Healthcare professionals, especially nurses most often use oxygen therapy empirically without sufficient knowledge of its indications, dosage, side effects and toxicity. Oxygen therapy is a nursing procedure where specific medical orders should be given to minimise side effects to patients (Uwineza Didi, 2017).

A local study done in Riyadh found participants did not possess the knowledge of oxygen therapy. Only 12.4% of total participants were aware that oxygen therapy should be administered for both treating and preventing hypoxia while 69.8% were fully aware of the contraindication of oxygen therapy. This hence postulated the lack of training or teaching was the cause for it. This poor knowledge in using oxygen therapy in those critical situations could deteriorate patients' condition and outcomes (Aloushan et al., 2019).

In another study on omissions and errors in oxygen therapy in Greece revealed that 41% of head nurses believed that oxygen is a gas that improves dyspnoea. The majority of nurses (88.6%) said that there was no protocol for the treatment of oxygen in the department in which

they worked. The results of the study indicate that educational programs, protocols and guidelines are required to ensure the proper use of oxygen (Brokalaki et al., 2004).

Despite its near-universal use in pre-hospital care, few data exist to support the efficacy of prehospital supplemental oxygen in trauma patients. Data were reviewed from 5,090 patients not requiring assisted ventilation who were transported to the trauma centre. Of these, patients who received prehospital supplemental O₂ had higher mortality than those without O₂. This suggests that supplemental oxygen does not improve survival in traumatized patients who are not in respiratory distress (Stockinger and McSwain Jr, 2004).

Furthermore, a study done in New Zealand reported that the number of patients receiving high concentration OT decreased significantly following the implementation of an educational program about pre-hospital oxygen delivery by paramedics to all patients with acute exacerbation of chronic obstructive pulmonary disease between 2005 and 2010 (Pilcher et al., 2015).

In the study conducted in 2006, the knowledge of 53 nurses and 40 doctors that worked in the intensive care unit of the General Hospital in UK and were active in oxygen prescription, was evaluated. 25% of the physicians and 50% of the nurses could not prescribe the right dose and method of oxygen therapy in cardiorespiratory arrest cases. They concluded that doctors and nurses did not have sufficient knowledge and understanding of oxygen therapy (Ganeshan et al., 2006). In a similar study, assessment of the knowledge of oxygen therapy in seven hospitals in a major city of Greece, in 2004 the findings showed that the familiarity level of participants with some aspects of oxygen therapy such as its indications, necessary measurements and monitoring during therapy, and identifying delivery devices were on a moderate level (<80%) (Goharani et al., 2017).

Despite the importance of emergency nurses' oxygen administration decisions, little is known about how these decisions are made. Inconsistent recommendations in the professional

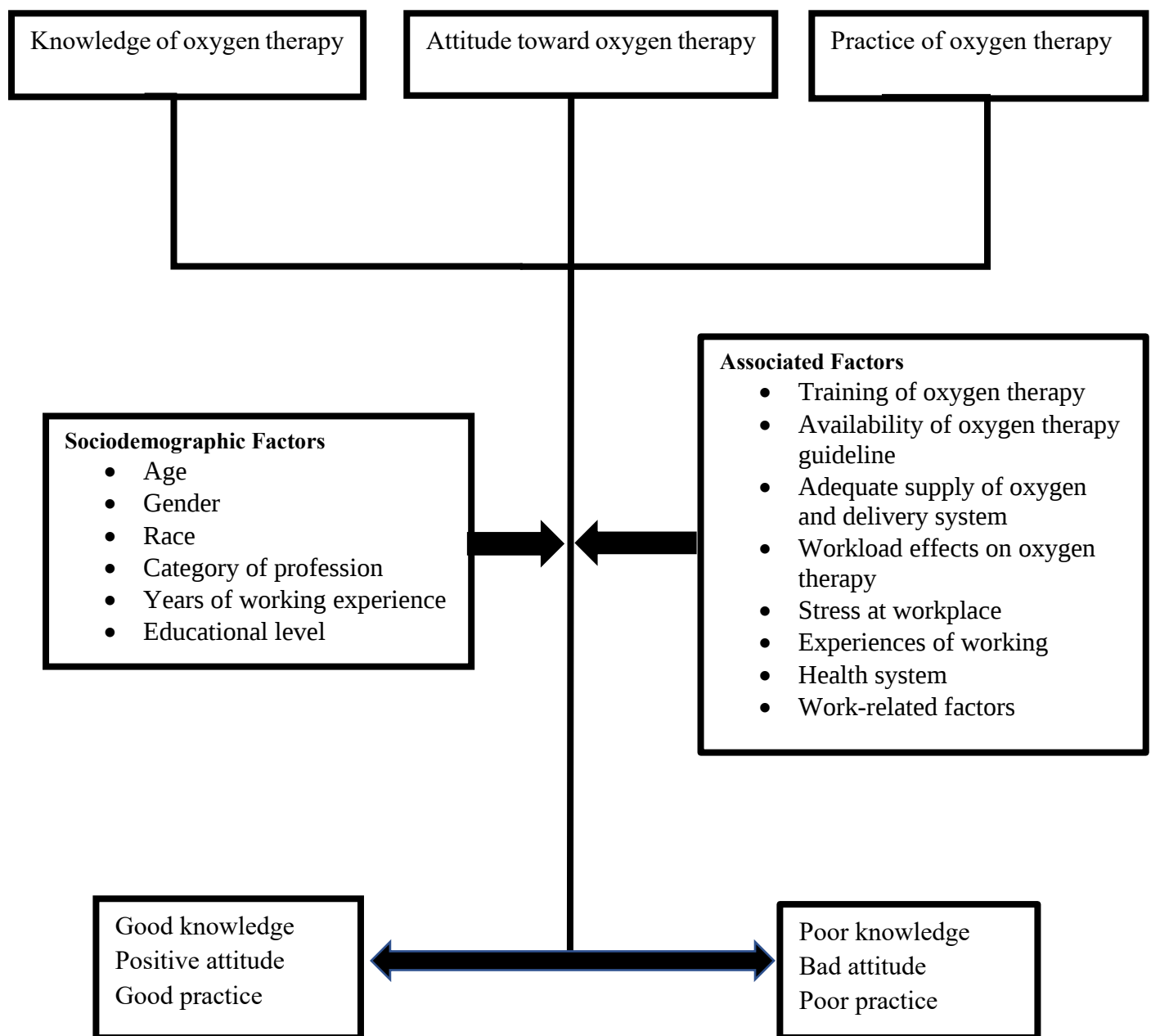
literature regarding supplemental oxygen indications, oxygen delivery devices, and oxygen flow rates result in variability in nurses' oxygen administration decisions (Murphy et al., 2001). A lack of factual knowledge about supplemental oxygen use might be an important explanation for the variability in oxygen administration practices. Emergency nurses' knowledge regarding the use of supplemental oxygen has been shown to improve as a function of education (Considine et al., 2005). However, the acquisition of factual knowledge is not necessarily associated with behavioural change and the relationship between factual knowledge and clinical decisions regarding oxygen administration remains largely unexplored (Patel et al., 2002).

A study was conducted in 2015, in Addis Ababa, Ethiopia showed a clear gap in nurses' knowledge, attitude and practice and mentioned some possible contributing factors. These factors included: lack of oxygen therapy guidelines, inadequate training, heavy workload on ED and inadequate oxygen delivery devices (Lemma, 2015). Another similar study in Riyadh also demonstrates that there is a clear gap of knowledge, attitude and practice among all groups of participants related to oxygen therapy use. The possible associated factors for this gap included shortage of training programs, unavailability of national oxygen therapy guidelines and excessive workload (Aloushan et al., 2019).

Despite having various literature reviews on knowledge, attitude and practice regarding oxygen therapy overseas, no study related to the knowledge, attitude and practice of oxygen therapy has been done in Malaysia, specifically in our setting. This study will identify the depth of knowledge, attitude and practice towards oxygen therapy among emergency healthcare workers in the emergency department, Hospital USM.

CONCEPTUAL FRAMEWORK

This conceptual framework shows the possible factors associated with the daily practice of oxygen therapy among emergency healthcare workers at the emergency department in Hospital Universiti Sains Malaysia, Kelantan. The factors are knowledge on oxygen therapy, the attitude on oxygen therapy, sociodemographic factors (age, gender, race, category of profession, years of working and years of emergency training) and associated factors (average number of patients seen in a day, availability of oxygen guideline, adequate supply of oxygen and delivery system, workload effects, stress, experiences of working, health system and work-related factors).



2. RESEARCH METHODOLOGY

2.1 Study Design

- This is a cross-sectional study.

2.2 Study Period

- The study is going to be performed from 1st June 2020 till 1st May 2021.

2.3 Study Location

- Hospital Universiti Sains Malaysia, Kelantan, Malaysia.

2.4 Study Participants

2.4.1 Reference Population

- All emergency healthcare workers in Kelantan.

2.4.2 Source Population

- Emergency healthcare workers at the emergency department in Hospital Universiti Sains Malaysia, Kelantan.

2.5 Sampling Frame

- Emergency healthcare workers (medical officers, house officers, assistant medical officers and staff nurses) at the emergency department in Hospital Universiti Sains Malaysia, Kelantan who fulfill the inclusion criteria.

2.6 Inclusion Criteria

- Emergency healthcare workers (medical officers, house officers, assistant medical officers and staff nurses) working in the emergency department, Hospital Universiti Sains Malaysia
- Emergency healthcare workers that have been working more than 2 months in the emergency department

2.7 Exclusion Criteria

- Emergency healthcare workers who are not available during the study period (on leave)
- Incomplete or missing data

2.8 Sample size calculation

One proportion formula:

The formula:

$$n = \left(\frac{Z_{\alpha}}{\Delta} \right)^2 * P (1 - P)$$

P = The population proportion from literatures

Δ or d = Precision or detectable deviation. Absolute precision is usually taken between

1% (0.01) – 10% (0.10). Can also be relative precision.

Z_{α} = normal deviates that reflects Type I error; usually taken as 1.96 for $\alpha = 0.05$ (95%CI).

Z: 1.96

Delta: 0.08

We will be considering a 10% dropout of samples in all the factors mentioned

Objective 1

The single proportion sample size was calculated using Sample Size Calculator Version 2.0

OBJECTIVES	P	n	n (including 10% drop out)	REFERENCE
1.(a) Knowledge	0.36	139	155	(Lemma, 2015)
(b) Attitude	0.32	131	146	(Aloushan et al., 2019)
(c) Practice	0.32	131	146	(Uwineza Didi, 2017)

P: The proportion of knowledge, attitude and practice

Objective 2

The associated factors with good knowledge, attitude and practice on oxygen therapy were calculated using a two-proportion comparison.

ASSOCIATED FACTORS	P ₀	P ₁	n	n (including 10% drop out)	Literature review
1. Training on OT	0.19	0.40	62	69	(Aloushan et al., 2019)

2. Availability of OT guideline	0.20	0.43	63	70	(Aloushan et al., 2019)
3. Adequate supply of O ₂ and delivery system	0.12	0.29	88	98	(Uwineza Didi, 2017)
4. Workload effects on OT	0.24	0.46	73	82	(Lemma, 2015)

Abbreviations: OT-oxygen therapy, O₂ - oxygen

P_0 : Proportion of training on OT (Factor) on poor knowledge, attitude and practice (KAP) based on literature

P_1 : Estimated of training on OT (Factor) on good KAP

Conclusion

The highest sample size calculated is 139. Therefore, the sample size taken for this study will be 139. After 10% dropout, the sample size would be 155.

2.9 Sampling Method

Convenience sampling method. All participants that fulfill the inclusion and exclusion criteria will be recruited for the study.

2.10 Method of Data Collection

- Data collection is the systematic process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes.

- Several emergency healthcare workers were obtained from the head of the department of the emergency department. The investigator will personally distribute the questionnaire after continuous medical education (CME) or continuous nursing education (CNE) to the healthcare workers to avoid interference of clinical duties and services.
- All participants in the lecture hall/ tutorial room will be brief regarding the study and those who are not volunteer to participate in the study may inform the investigator and leave the lecture hall. Whereas those who are willing to participate will be brief regarding the study details for about 5 minutes and given the written consent form. No conflict of interest to those who do not volunteer to involve.
- A self- administered questionnaire method will be handed to them if they consented to participate in the study. The investigator will be presence during the questionnaire session in case if there is any query regarding the questionnaire.
- The written consent form and questionnaire will be handled in the English language as all eligible participants have good English proficiency skills as part of their academic requirement and training.
- Participants may answer the questionnaire at the same time.
- The duration of answering the questionnaire will be 30 minutes.
- Briefing or education regarding oxygen therapy and proper oxygen administration will be given after the participants have answered the questionnaire.

2.11 Research Tool

- Data collection will be done using a questionnaire from a validated survey, adapted from Aloushan et. al, 2019 with Cronbach alpha 0.72, on assessment of the knowledge, attitude and practice regarding oxygen therapy at emergency departments in Riyadh in 2017. The questionnaire comprises 38 questions and they are divided into 5 sections, namely demographic, knowledge, attitude, practice (KAP) and associated factors of KAP regarding oxygen therapy.
- There are 38 questions in the questionnaire. The first section includes the demographic data of the respondents i.e gender, age, race, category of profession, total duration of work and years of training in the emergency department.
- The second section consists of 10 questions about knowledge assessment. Each question will contribute to 1 mark, making a total of 10 marks for knowledge assessment. Respondents are considered to have good knowledge if they score $\geq 80\%$. There are 7 questions in the attitude section. A five-point Likert scale (Strongly Agree = 5 / Agree = 4 / Neutral = 3 / Disagree = 2 / Strongly Disagree = 1) is used.
- Section 4 about the practice of oxygen consists of 9 questionnaires. Last section is regarding the associated factors of knowledge, attitude and practice toward oxygen therapy.

2.12 OPERATIONAL DEFINITIONS

2.12.1 Oxygen therapy

- Oxygen therapy is defined as the administration of oxygen at concentrations greater than those found in ambient air” (O'Driscoll et al., 2016)

2.12.2 Emergency healthcare workers

- Staff who are working in the emergency department in general hospital or district hospital

2.12.3 Good knowledge

- Emergency healthcare workers who scored the correct response or answer to knowledge questions above 80% (Uwineza Didi, 2017)

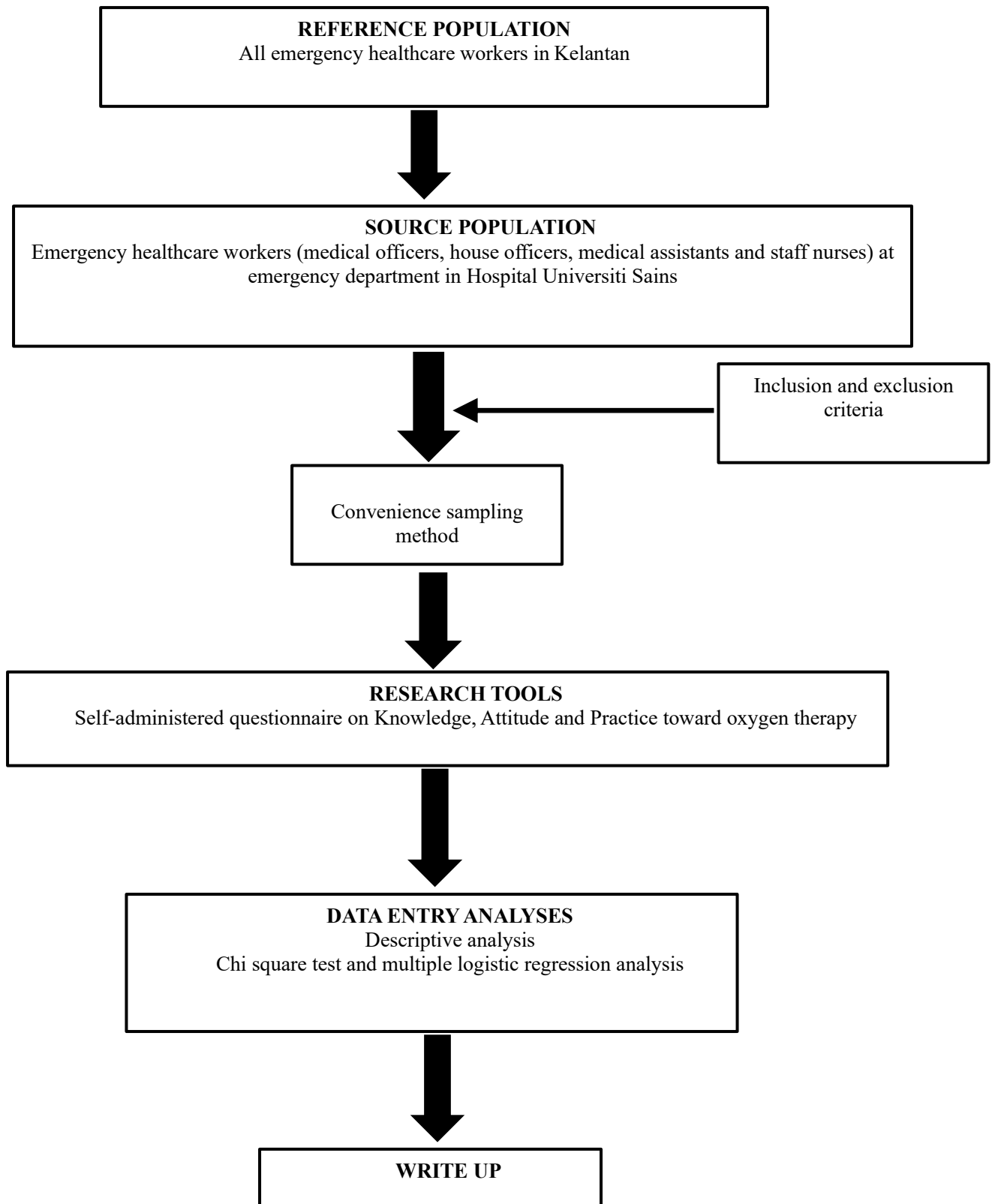
2.12.4 Positive attitude

- Emergency healthcare workers who scored the correct response or answer to attitude questions above 80% (Uwineza Didi, 2017)

2.12.5 Good practice

- Emergency healthcare workers who scored the correct response or answer ≥ 4 points to practice questions (Aloushan et al., 2019)

2.3 STUDY FLOWCHART



2.4 STATISTICAL ANALYSIS & DATA ENTRY

- Data entry and data analysis using SPSS version 24
- Each of the participants' questionnaires will be coded with numbering (eg. 001, 002..) without exposing the names to keep them confidential. This numbering system will facilitate the data entry later.
- The data will be analysed for descriptive statistics with frequency and percentage for categorical data.
- The data will be tested by using the chi-square test and multiple logistic regressions.

2.5 EXPECTED RESULTS

2.5.1 Objective 1(a)

Table 9: Respondents' knowledge toward oxygen therapy

Knowledge	Good knowledge, <i>n</i> (%)	Poor knowledge, <i>n</i> (%)
Oxygen indication		
Oxygen contraindication		
Normal SpO ₂ at rest for adults <70-year-old		
Oxygen therapy is not indicated		
The term used to describe movement of air into and out of the lungs		
The term used to describe passive process in respiratory physiology		
Normal breathing rates in a child >2-year-old		
Can oxygen therapy be harmful?		
Giving oxygen to patients with STEMI and SpO ₂ ≥90% on room air		
Giving oxygen to patients with head injury and normal SpO ₂		

n : number; % :percentage; SpO₂ : oxygen saturation; STEMI : ST-elevation myocardial infarction

2.5.2 Objective 1(b)

Table 10: Respondents' attitude toward oxygen therapy

Attitude	Positive attitude, <i>n</i> (%)	Bad attitude, <i>n</i> (%)
Oxygen is given when ordered by a medical professional, or a registered nurse initiated order in an emergency department		
Oral and nasal hygiene and normal saline drops as necessary should be done when giving OT in children		
Continuous oxygen administration is more beneficial than intermittent OT		
Humidification is the best practice to prevent dryness of mucus membrane of upper respiratory tract		
Persons with severe lung disease need to be maintained at the prescribed SpO ₂ range		
Administration of oxygen to patients is not safe and it is very dangerous		
A person on OT indicates that the patient is at the end stage of life		

OT : oxygen therapy; SpO₂ : oxygen saturation; *n* : number; % : percentage

2.5.3 Objective 1(c)

Table 11: Respondents' practice toward oxygen therapy

Practice	Good practice, <i>n</i> (%)	Bad practice, <i>n</i> (%)
Conditions that do not affect pulse oximetry readings		
The best practice on pulse oximetry		
Benefits of attaching humidification devices		
Effects of water collection in the tubing during oxygen administration		
Strategies to optimize oxygen travel through wet secretions		
Nasal cannula		
Tolerating oxygen mask device		

Using non-rebreathing oxygen mask in trauma patient

Applying petroleum jelly to minimize inflammation of lips and nose

n : number; % : percentage

2.5.4 Objective 2

2.5.4.1 Dependent Variables

Table 12: Associated factors of knowledge, attitude and practice toward oxygen therapy

Associated factors	Response	Frequency	Percentage
Training on OT	Yes		
	No		
Availability of OT guideline	Yes		
	No/ I don't know		
Adequate supply of oxygen and delivery system	Yes		
	No/ I don't know		
Workload effects on OT	Yes		
	No/ Unknown		

Abbreviations

OT: oxygen therapy

2.5.4.2 Independent Variables

Table 13: Demographic characteristics of participants

Variables	Frequency	Percentage
Age		
20-25 years		
26-30 years		
31-35 years		
36-40 years		
41-45 years		
46-50 years		
≥ 51 years		
Gender		
Male		
Female		
Race		
Malay		
Chinese		
Indian		
Others		
Category of profession		
Senior Medical Officers		
Junior Medical Officers		
House Officers		
Staff Nurses		
Assistants Medical Officer		
Duration of work		
≤ 1 year		
2-5 years		
6-9 years		
10-13 years		
≥ 14 years		
Years of training in emergency department		
≤ 1 year		
2-5 years		
6-9 years		
10-13 years		
≥ 14 years		

2.6 GANTT CHART AND MILESTONE

Table 14: GANTT CHART

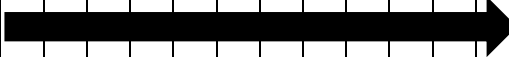
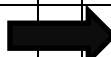
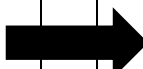
PROJECT ACTIVITIES	TIMELINE																								
	2020								2021								2022								
	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	
Data collection																									
Data entry																									
Data analysis																									
Report writing																									
Project completion/ Draft submission																									
Submission of research papers																									

Table 15: MILESTONE

- Data collection: 1st June 2020 till 31st May 2021
- Data entry: 31st August 2021
- Data analysis: 31st October 2021
- Report writing: 31st December 2021
- Project completion and draft submission: 28th February 2022
- Research paper submission: 31st November 2022

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