

**KNOWLEDGE, ATTITUDE AND PRACTICES OF POSTOPERATIVE
NAUSEA AND VOMITING MANAGEMENT AMONG MEDICAL
PRACTITIONERS IN MUHIMBILI NATIONAL HOSPITAL**

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**Masters of Medicine in Anaesthesiology of Muhimbili University of Health
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By

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**A dissertation Submitted in (Partial) fulfillment of the requirements for the Degree of
Masters of Medicine in Anaesthesiology of Muhimbili University of Health and Allied
Sciences**

October 2021

CERTIFICATION

The undersigned certify that he has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: “*Knowledge, Attitudes and Practices of Postoperative Nausea and Vomiting management among Medical Practitioners at Muhimbili National Hospital, Dar es Salaam, Tanzania*”, 2020 in (Partial) fulfillment of the requirement for the degree of Masters of Medicine in Anaesthesiology of Muhimbili University of Health and Allied Sciences.

Dr. Albert Ulimali

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Date.....

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(Co-supervisor)

Date.....

DECLARATION AND COPYRIGHT

I, **Tumaini Ndibwire**, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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DEDICATIONS

I dedicate the results of this study to my beloved mother, Violet Ndibwire who continually provides her moral, spiritual and emotional support. Thank you!

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LIST OF ABBREVIATIONS

5-HT	5-hydroxytryptamine
AOR	Adjusted Odds Ratio
ASA	American Society of Anesthesiologists
BMC	Bugando Medical Centre
GA	General Anesthesia
IV	Intra-Venous
MNH	Muhimbili National Hospital
MUHAS	Muhimbili University of Health and Allied Sciences
N ₂ O	Nitrous Oxide
NNT	Number Needed to Treat
NSAID	Nonsteroidal anti-inflammatory drugs
PACU	Post Anesthesia Care Unit
PONV	Postoperative Nausea and Vomiting
POV	Postoperative Vomiting
RA	Regional Anesthesia
SPSS	Statistical Package for the Social Sciences
TIVA	Total Intra-Venous Anesthesia
USA	United States of America

ABSTRACT

Background: Postoperative nausea and vomiting (PONV) is an easily overlooked problem in postsurgical patients. The incidence of untreated PONV is reported to range from 30% to 80% worldwide. At MNH the incidence of PONV has been reported to be 17.3% only for elective general surgical cases. PONV in most cases is the cause of severe distress and less satisfaction to patients from surgery and anesthesia. Even though PONV is mostly self-limiting and non-fatal but it could result in significant morbidity.

Aim of the study: This study aimed to assess medical practitioners' knowledge, attitude, and practices on PONV at MNH from February to April 2021.

Methodology: This was a hospital-based cross-sectional study where a questionnaire was given to medical practitioners in anesthesia and surgical departments. The questionnaire aimed to assess the practitioners' knowledge of PONV, their attitude toward PONV, and their practices of PONV management. Each questionnaire was coded and data entry was performed manually into SPSS version 20 for analysis. Descriptive analysis was conducted for demographic data. Binary logistic regression analysis was done to see the independent effect of predictors on the dependent variables. Predictors with statistical significance with $P\text{-value} \leq 0.25$ were modeled by multivariable logistic regression analysis. The measure of association was Odds ratio with 95% confidence interval and a $P\text{-value} \leq 0.05$ was considered statistically significant.

Results: A total of 165 questionnaires were distributed and those returned and properly filled were 151. Generally, practitioners had poor knowledge of PONV where only 38.4% of them had good knowledge. Practitioners from the anesthesia department were more knowledgeable compared to those from general surgery ($P=0.001$). Also the majority of practitioners had a negative attitude toward PONV where only 35.8% of practitioners viewed PONV to be an important problem in their clinical practice. Practitioners from otorhinolaryngology were more likely to have a positive attitude compared to those from general surgery ($P=0.009$), followed by practitioners from the anesthesia department ($P=0.039$). Having a positive attitude did not affect the level of knowledge ($P=0.266$). PONV risk assessment was done by 49.3% of the

respondents. Good knowledge was associated with practice of PONV risk assessment ($P=0.009$). A multimodal approach in managing PONV was applied by 58.9% of practitioners. Practitioners with a positive attitude were more likely to apply a multimodal approach compared to those with a negative attitude ($P=0.042$).

Conclusion: Generally medical practitioners have poor knowledge of PONV, and a negative attitude towards PONV. Having a good knowledge of PONV and a positive attitude toward it leads to better management of PONV patients. Postoperative satisfaction of surgical patients can be improved if practitioners are knowledgeable about PONV and have a positive attitude toward it.

DEFINITION OF TERMS

Nausea- This is an unpleasant sensation referred to the upper gastrointestinal tract and pharynx associated with the conscious awareness of the strong urge to vomit.

Vomiting- This is the forceful expulsion of gastric contents from the mouth and is brought about by coordinated motor changes involving muscles of the respiratory and gastrointestinal systems.

Postoperative Nausea and Vomiting- Is any nausea or vomiting occurring during the first 24-48 hours after surgery in inpatients.

Medical practitioner- Is a doctor professing to practice medicine, surgery, and midwifery and is holding a recognized qualification from an institution of higher learning.

Knowledge- This is the intellectual understanding of medical practitioners about PONV and PONV management.

Attitude- How medical practitioners view PONV. This includes how they view the importance of PONV as a problem and how distressing PONV is to patients.

Practices of PONV- These refer to actions by medical practitioners to prevent and treat PONV.

CHAPTER ONE

1.0 BACKGROUND INFORMATION

1.1 Introduction

Postoperative nausea and vomiting is defined as any nausea, retching, or vomiting which occurs up to 24 to 48 hours post-surgery and anesthesia (1). The incidence of untreated PONV has been ranging from 30% for low-risk patients up to 80% for high-risk patients worldwide (1). In our setting at MNH the incidence of PONV has been reported to be 17.3% for elective general surgical cases and in another setting in Tanzania at BMC is reported to be 41% (2, 3). PONV in most cases is the cause of severe distress and less satisfaction to patients from surgery and anesthesia. PONV could be perceived by patients to be a worse outcome than the pain of surgery itself (4). Even though that PONV is mostly self-limiting and non-fatal but it could result in significant morbidity such as dehydration, electrolyte imbalance, wound dehiscence, esophageal rupture, and fatal airway compromise (4, 5, 6). PONV when untreated is associated with increased length of stay in the PACU and unanticipated longer hospital stay and the associated costs to the patient (7, 8).

Baseline good knowledge, as well as positive attitude toward PONV management by practitioners, is crucial in the optimal management of patients at risk or those with established PONV (9). Also, evidence-based practices on PONV management reduce risks of PONV and associated complications to patients, as well as increasing patient satisfaction and reducing hospital costs from an increased hospital stay (10).

As already mentioned, PONV at MNH is reported to be 17.3% for general surgical cases. Hence this was the reason that warrants for this study to be conducted at MNH. There is limited evidence on the knowledge, attitude, and practices of medical practitioners regarding the management of PONV at MNH hence this remains as a gap.

This study was aimed to assess the attitude of medical practitioners toward PONV, the knowledge that they have about PONV, and their current PONV management practices in Muhimbili National Hospital. Therefore information generated from this study will lead to improvement of management protocols and overall improvement of patients' postoperative experience.

1.2 Risk factors for PONV

There are risk factors that make it more likely for patients to develop PONV, and interventions to manage PONV have been based on these risk factors. These risk factors can be anesthetic-related, surgical-related, or patient-related. Anesthetic-related factors include the type of anesthetic technique, use of volatile anesthetics, use of nitrous oxide, duration of anesthesia, and use of postoperative opioids (11, 12). General anesthesia is associated with more episodes of PONV as compared to regional anesthesia (12). This might be due to the fact that in regional anesthesia there is less use of opioids. Also, total intravenous anesthesia utilizing propofol has less risk of developing PONV (12). The use of volatile anesthetics and nitrous oxide is associated with more episodes of PONV. Duration of anesthesia also plays a role in developing PONV as the longer the patient is under anesthesia the more likely is to develop PONV (12). Hence, baseline risk factors for PONV can be reduced by: avoidance of general anesthesia by use of regional anesthesia when possible, use of propofol for induction and maintenance of anesthesia, avoidance of nitrous oxide and volatile anesthetics, minimization of intraoperative and postoperative opioids and adequate hydration (12).

Not only are anesthesia-related factors are associated with PONV but certain types of surgical procedures have risks for developing PONV. Cholecystectomy, gynecological surgery and laparoscopic surgery have been shown to have higher incidences of PONV (12).

Some patients can be predicted to develop PONV as compared to others. It is well known female patients, those who are non-smokers, or those with a history of PONV or motion sickness are more likely to develop PONV as compared to others (10). Some studies show that blacks are less likely to develop PONV compared to others but have the same risk factors as other races (13). Children over the age of 3 years are also at high risk of developing PONV in

comparison to adults (10). POV is used in children as an outcome factor rather than PONV as it is easier to assess vomiting in children than to assess nausea.

There is a risk scoring system that is currently mostly used by anesthesia providers to predict the likelihood of developing PONV (14). This utilizes female sex, non-smoking status, history of PONV or motion sickness, and use of opioids as independent risk factors (predictors) to develop PONV. Each positive predictor is assigned a score of 1. Using this system if a patient scores 0 (no independent risk factor), 1, 2, 3, or 4 predicts the chance of developing PONV as approximately 10, 20, 40, 60, or 80% respectively.

1.3 Management of PONV

Prevention of PONV is the most important approach during management hence it is important first to recognize patients at risk for PONV. Management of PONV is based on either reducing the baseline risk factors for developing PONV, prophylactic antiemetic drugs, or treatment with antiemetic drugs when nausea and vomiting have already developed (10). There are guidelines and protocols which have been developed at international and national levels which most anesthesia providers use to manage PONV.

Antiemetic drugs used to manage PONV target different receptors involved in the genesis of nausea and emesis which are histamine, muscarinic, opioid, dopamine 2, and serotonin receptors (10). Low-risk patients usually, prophylactic treatment is recommended but this is based on the assessment of risk versus benefits of such treatment. For those patients with moderate risk usually prophylactic treatment can be with 1 to 2 antiemetic drugs and those with a high risk combination of 2 to 3 antiemetic drugs can be used as prophylaxis and these drugs should be selected such that they act on different receptors. It is also important to remember that there is a choice of utilizing TIVA using propofol and minimizing the use of opioids which reduce the risk of developing PONV.

1.4 PROBLEM STATEMENT

Incidence of PONV is reported to range from 30% to 80% worldwide and in our setting at MNH is reported to be 17.3% for general surgical cases (1, 2). From the patients' perspectives,

PONV is very distressing and causes less satisfaction to patients and is often ranked as an outcome that causes worse distress than the pain of surgery itself (4). PONV although is mostly self-limiting but complications associated with it like dehydration, electrolyte imbalance, and rare ones like wound dehiscence, esophageal rupture, and airway compromise could still occur (4, 5).

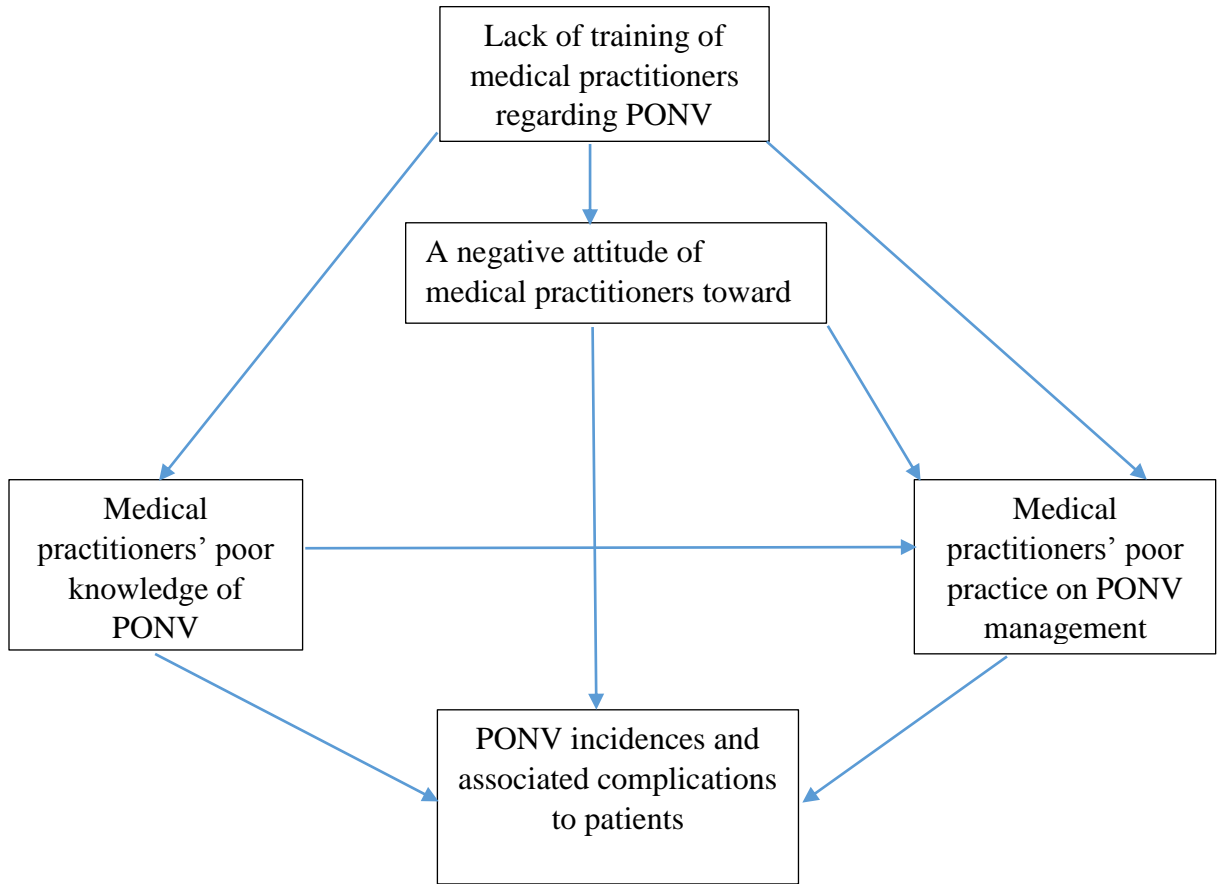
PONV incidences could be reduced if practitioners are aware of the PONV problems and PONV management, and have a positive attitude toward PONV. This leads to better management of patients at risk or those with established PONV (9). Also evidence-based practices by practitioners on PONV management reduce risks of PONV, and associated complications as well as increasing patient satisfaction and reducing hospital costs from an increased hospital stay (10).

There is limited evidence on the knowledge, attitude and practices of medical practitioners regarding the management of PONV at MNH hence this remains as a gap.

This study intended to assess the attitude of medical practitioners toward PONV, the knowledge that they have about PONV, and their current PONV management practices in surgical and anesthesia departments in Muhimbili National Hospital.

1.5 CONCEPTUAL FRAMEWORK

Figure 1



Incidences of PONV are due to medical practitioners' lack of awareness regarding this problem hence lead to negative attitude toward it. This may contribute to poor PONV management practices by practitioners who have been documented to have poor knowledge on PONV and negative attitude toward PONV management.

1.6 RATIONALE

To make sure that patients are satisfied from anesthesia and surgery and to reduce the distress associated with PONV together with morbidity associated with it, PONV needs to be properly addressed by medical practitioners. To achieve this, medical practitioners need to be knowledgeable, with a positive attitude and good practice on the management of PONV. No

study has been done at MNH regarding the knowledge, attitude, and practices of medical practitioners on the management of PONV.

This study intended to explore medical practitioners' knowledge, attitudes, and practice in managing PONV at MNH. The information generated from medical practitioners will be useful in improving management protocols, training medical practitioners, and serve as a guide in improving patients' postoperative experience.

1.7 RESEARCH QUESTION

What are the PONV knowledge, attitudes, and management practices among medical practitioners at MNH?

1.8 OBJECTIVES

1.8.1 BROAD OBJECTIVES

To assess the knowledge and attitude of medical practitioners toward PONV and their current PONV management practices at MNH from February to April 2021.

1.8.2 SPECIFIC OBJECTIVES

1. To determine the level of knowledge of medical practitioners about PONV at MNH from February to April 2021.
2. To determine the attitude of medical practitioners toward PONV at MNH from February to April 2021.
3. To identify the current medical practitioners' practices on management of PONV at MNH from February to April 2021.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Practitioners' knowledge about PONV

Baseline good knowledge about PONV management is crucial in the optimal management of patients at risk or those with established PONV. Hence good PONV management depends on awareness of the problem by the practitioners and therapeutic options available.

A study done by Jiaming L et al in Singapore on PONV knowledge, attitudes, and anti-emetic prescribing practices among surgeons found that there was a considerable lack of PONV knowledge among surgeons. Many of them were not aware that early identification of high-risk patients, intraoperative prophylaxis for high-risk patients, and combination anti-emetic therapy improve PONV management (9).

A survey of Swedish nurse anesthetists on their perceptions of perioperative PONV management showed that the majority of them did not notice PONV a major problem. But most of them performed regular risk assessments for PONV and the assessment and treatment often were based on the ward's routines or their own knowledge and adjusts treatment according to the patient's risk of developing PONV (15).

A multicenter cross-sectional study on knowledge and practice of postoperative nausea, vomiting management, and predictors of knowledge among health professionals in referral hospitals was done in Ethiopia by Yetneberk et al. This showed that half of the health professionals had poor knowledge regarding PONV management (16). Also, those professionals who had training on PONV management were 5.32 more likely to be knowledgeable than those who did not have training (16).

2.2 Practitioners' attitude toward PONV

Patients agree that PONV is an important postoperative problem that needs to be addressed (4, 10). However, the attitudes of practitioners toward the impact of PONV vary in different

places and also depending on their specialty. In fact PONV has been acknowledged by some practitioners as “big-little” problem (4, 10).

A study done by Jiaming L et al in Singapore on PONV knowledge, attitudes, and anti-emetic prescribing practices among surgeons also found that majority of the doctors working in pediatric surgical departments thought that pain was more distressing to patients than vomiting or nausea (9). However, practitioners practicing in surgical subspecialties had a more positive attitude toward PONV than those working in general surgery. These practitioners were 2.63 times more likely to correctly define PONV, identify PONV as an important problem, and rank both nausea and vomiting as more distressing than pain. This was because there is a higher incidence of PONV in surgical subspecialties than in general surgery (9). Also, those practitioners who viewed PONV with a positive attitude were more likely to correctly prescribe a different anti-emetic when patients vomited recurrently (9).

A Comparative Survey of the attitudes, perceptions, and practices of Swiss anesthesiologists and Surgeons regarding PONV done by Oliver et al showed that 78% of surgeons and 90% of anesthesiologists felt that PONV was a problem in their everyday practice. Also, 77% of surgeons felt other specialty have more roles for PONV than their own as compared to 33% of anesthesiologists. Hence this shows that surgeons view PONV less favorably as compared to anesthesiologists (17).

A survey by Kappen et al in Netherland regarding physicians' attitudes towards the use of a prediction rule for PONV showed that those practitioners who use prediction rule perceived PONV to be a more severe complication than those who did not use and they attributed a more favorable benefit-harm ratio to prophylactic anti-emetics. This shows that in the prediction rule risks for PONV are presented which aids a more accurate assessment of a patient with PONV and results in more a positive attitude toward PONV (18).

2.3 Management practices of PONV

Good evidence-based practices on PONV management reduce risks of PONV and associated complications to patients as well as increasing patient satisfaction and reducing hospital costs

from an increased hospital stay. As it has been shown, patients are better managed when PONV is prevented before it occurs (10, 25). This is achieved by identifying patients at risk, reducing baseline risk factors for PONV, and giving PONV antiemetic prophylaxis (10, 25).

Assessment of patients for risk factors of PONV is crucial in guiding PONV prophylaxis. This is because when patients are scored based on risk factors it has been shown to reduce incidences of PONV when therapy is guided based on risk scores for PONV (10, 25). Commonly used, the Apfel score is based on 4 predictors: female sex, history of PONV and/or motion sickness, nonsmoking status, and use of postoperative opioids (26). The incidence of PONV with the presence of 0, 1, 2, 3, and 4 risk factors is approximately 10%, 20%, 40%, 60%, and 80%, respectively (10, 26). Hence patients with 0-1, 2, or 3-plus risk factor are classified into “low,” “medium,” and “high” risk categories respectively. For low- and medium-risk patients, anti-emetic prophylaxis with 1 to 2 agents is recommended. For high-risk patients prophylaxis with 3 or more agents is recommended (25). These agents should be of different classes so that they act on different receptors to prevent PONV.

Basing on the above findings, it is recommended that practitioners should manage PONV first by assessing the patients for risk of PONV, reducing baseline risk factors, and providing PONV prophylaxis. Several studies have been done on PONV management practices by practitioners.

A survey done on Swedish nurse anesthetists showed that almost all of them perform a regular PONV risk assessment of patient (15). However, 41% of them stated to have given anti-emetic prophylaxis to patients with no PONV risk factors (15).

A study was done in USA Texas, on the impact of current antiemetic practice on patient outcome showed that 42% of high-risk patients received either no or only one antiemetic and of these patients 1 in 3 developed emesis and most developed emesis after discharge from PACU. It also showed that patients who were best protected from PONV symptoms are those who received 3 or more antiemetic drugs (19).

A Comparative Survey of the attitudes, perceptions, and practice of Swiss anesthesiologists and Surgeons on PONV done by Oliver et al showed that anesthesiologists prescribed anti-emetic prophylaxis more than surgeons (77% vs. 45%; $p < 0.01$) (17).

For those patients with established nausea or vomiting postoperatively treatment should be aimed at whether the patient has received or has not received PONV prophylaxis. Macario et al did a study in the USA regarding Anesthesiologists' practice patterns for the treatment of PONV in ambulatory PACU. This showed that the majority of anesthesiologists preferred pharmacologic interventions for the treatment of established PONV with 5-HT antagonists being the most common drugs prescribed (20). Also, 26% of anesthesiologists stated they would administer a second dose of 5-HT antagonist if the initial 5-HT antagonist used as a prophylaxis failed (20).

A multicenter cross-sectional study on the knowledge and practices of PONV among health professionals in Ethiopia by Yetneberk et al showed that 28.5% of health professionals give anti-emetic prophylaxis to risk patients (16). The majority of antiemetic prophylaxis was given by anesthetists (90.7%; $p < 0.001$) compared with internists. Also, 19.2% of health professionals did risk assessment and stratification of patients with risk of PONV. Also, in this study it showed that only 7.9% of health professionals had guidelines in their workplace with 18.7% of them stated to have provided anti-emetics based on guidelines. 71.9% of the anesthetists had guidelines in their workplace with 38.2% of them stated to have provided anti-emetics based on the guidelines (16). Also in this study, it was found that 48% of health professionals stated to have applied multimodal approach in managing patients with established PONV (16).

Fluid administration with crystalloid is an inexpensive way of reducing emesis. Goodarsi et al demonstrated that when patients receive a high amount of IV fluids about 30mls/kg lead to less emesis than when given 10mls/kg in strabismus surgery (21). A study done by Chalya et al on the incidence, predictors, and management of PONV in Bugando medical center showed that in patients who reported episodes of PONV only 31.3% were treated with antiemetic

drugs and adequate hydration and majority of patients were just reassured. The antiemetic drugs used included promethazine, metoclopramide, and anti-malarial (3).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study design

This was a prospective hospital-based cross-sectional study which was aimed at providing baseline information about the knowledge, attitudes, and practices of medical practitioners regarding PONV management.

3.2 Study duration

This study was conducted over a period of three months from February to April 2021.

3.3 Study setting

This study was conducted at Muhimbili National Hospital (MNH) in the departments of anesthesia, general surgery, dental surgery, urology, otorhinolaryngology, gynecology, and ophthalmology. MNH is a tertiary referral and teaching hospital, situated in Dar es Salaam. The hospital serves patients referred from other hospitals in Dar es Salaam as well as other regional hospitals around the country. It has a bed capacity of around 1,500 and attending 1,000 to 1,200 outpatients per week and admitting 1,000 to 1,200 inpatients per week (22). MNH has eight directorates of which the directorate of surgery is among them. The Directorate of surgery has bed capacity of 788 beds (22).

3.4 Study population

The study population involved medical practitioners who were residents, registrars and specialists working in the departments of anesthesia, general surgery, dental surgery, urology, otorhinolaryngology, gynecology, and ophthalmology at MNH. This is because these practitioners are responsible for peri-operative care of surgical patients. In addition to this, practitioners in these departments are looked upon as leaders of both surgical and anesthesia teams in daily decision making (23).

3.5 Inclusion criteria

These were all clinically active medical practitioners in the departments of anesthesiology, general surgery, urology, otorhinolaryngology, gynecology, and ophthalmology.

3.6 Exclusion criteria

- Medical practitioners who did not consent to participate in the study.
- All first year residents in the surgical and anesthesia departments.
- Medical practitioners who are not practicing in the surgical & anesthesia departments.
- Medical practitioners who did not practice clinical work for more than 3 years.

3.7 Sample size estimation

Medical practitioners in the departments of anesthesia, general surgery, dental surgery, urology, otorhinolaryngology, gynecology, and ophthalmology to be included as study participants their population was approximately 270 (22).

The sample size was determined using the single population proportion formula assuming the proportion of practitioners who have knowledge of PONV was 50%. Hence the sample size calculated was based on the following formula:-

$$n = \frac{z^2 p (1-p)}{\epsilon^2} \quad \text{or} \quad n = \frac{z^2 p (100-p)}{\epsilon^2}$$

$$P = 50\%$$

$$Z = 1.96 \text{ (assuming 95\% confidence interval)}$$

$$\epsilon = 5 \% \text{ (maximum error allowed)}$$

$$n=384$$

Since the study population was less than 10,000 i.e. total of 270 medical practitioners, correction formula was used as follows:-

$$n_f = \frac{ni}{1 + \left(\frac{ni}{N}\right)}$$

ni= 384

N= 270

Hence nf= 158

By taking additional 5% contingency for non-response rate, 5%*158=7.9

Hence the total sample size was 165.

3.8 Sampling procedure

Study participants were medical practitioners from surgical and anesthesia departments including residents and registrars. These practitioners were recruited into the study after they were identified working in these departments during working hours in both operating theatres and clinics.

There were a total of seven departments included. Simple random sampling technique was applied to get the study participants from each department. The study participants included in the study were proportionate depending on the number of practitioners in each department after obtaining data from human resource management. The proportions of study participants to be included were 13%, 16%, 12%, 9%, 18%, 21%, and 11% in the departments of anesthesia, general surgery, dental surgery, urology, otorhinolaryngology, gynecology, and ophthalmology respectively.

3.9 STUDY VARIABLES

3.9.1 Dependent variables

- Knowledge level of PONV.

- Attitude level toward PONV.
- Practices of PONV management.

3.9.2 Independent variables

Independent variables included demographic data (age, sex, department, position in the department and years of clinical experience).

3.10 Operational definitions

- **Knowledge-** It is the intellectual understanding of medical practitioners about PONV and PONV management. There were 10 questions and respondents were required to answer ‘**true, false or not sure**’. Those who scored equal or more than 60% of knowledge questions were considered to be knowledgeable.
- **Attitude-** How medical practitioners view PONV. This includes how they view the importance of PONV as a problem and how distressing PONV is to patients. There were 6 questions with five-point Likert scale. Practitioners whose scores were equal or above 60% of correctly answered attitudinal questions were considered to have a positive attitude.
- **Practices of PONV management-** These refer to actions by medical practitioners to prevent and treat PONV. These include components of PONV risk assessment, PONV prevention, and treatment up to postoperative time (10).

3.11 DATA COLLECTION

Data collection was done through self-administered questionnaires which were filled by respondents/study participants. These included medical practitioners from both anesthesia and surgical departments. Data collection was done by two trained research assistants supervised by the principal researcher. Questionnaires were distributed to medical practitioners in their respective departments at random times when they were in clinics or theatres. Those who could not be reached at easy digital questionnaires were sent to them through their mobile phones.

3.12 Study tool

A self-administered questionnaire was used of which the knowledge part was adapted from a previous study done in Canada with some modifications (24). The practice part of the questionnaire was designed by the researcher after reviewing an evidence-based practice tool prepared by a multidisciplinary panel of experts on PONV management (10). This was designed to be applicable and fit all professionals in anesthesia and surgical departments. The attitude part was also designed by the researcher after reviewing literature on the previous studies regarding PONV attitude by practitioners (9, 15, 17). Hence this questionnaire examined knowledge of PONV, attitude toward PONV and practices of PONV management.

The first part of the questionnaire covered the demographic information which included: Age, sex, department, position in the department and years of clinical experience including residency.

The second part assessed knowledge about PONV. This part of the questionnaire was adopted from a previous study done in Canada on knowledge of PONV by nurses with some modification (24). It included 10 questions and respondents were required to answer either 'True', 'False' or 'Not sure'.

The third part assessed the attitude of the respondents towards PONV. Five point Likert scale was used to assess attitude (5 = Strongly Agree, 4 = agree, 3 = neutral, 2 = disagree and 1 = strongly disagree) toward PONV.

The final part of the questionnaire covered the practitioners' practices regarding PONV management. This included 7 questions and covered processes during perioperative period up to 24 hours post-surgery and it was designed to fit all the professionals included. Participants were required to choose what they practice from a set of provided answers.

3.13 Validity and Reliability of study tool

The senior anesthesiologist, who was also the supervisor of this study, reviewed the questionnaire to ensure adequate content and any amendment was done before the beginning of the study.

Before the beginning of the study, a pilot study was done on 5% of the intended study participants. These were randomly selected and then were asked to take the questionnaire twice over one week to ensure that the questionnaire had sufficient test-retest reliability with reliability coefficient of 0.73.

3.14 DATA ENTRY AND ANALYSIS

All questionnaires were carefully checked to ensure that they were filled in properly. Each questionnaire was then assigned a serial number and answers were coded and manually entered into SPSS version 20.0 for analysis. Descriptive analysis was used for demographic data. Binary logistic regression analysis was done to see the independent effect of predictors on the dependent variables and predictors with $P\text{-value} \leq 0.25$ were modeled by multivariable logistic regression analysis. The measure of association was Odds ratio with 95% confidence interval and a $P\text{-value} \leq 0.05$ was considered statistically significant. Results were compiled with descriptive statistics and outlined in tables and texts.

3.15 ETHICAL CONSIDERATION

Ethical clearance was sought from the MUHAS ethical review board and permission to do the study was sought from the director of MNH. The purpose and the importance of the study were explained to study participants and written informed consent was provided to each participant. Confidentiality was maintained during the whole period of the study by not writing the participant's name. Participant's involvement in the study was voluntary and

participants who were unwilling to participate in the study and those who wished to quit their participation at any stage were informed to do so without any restriction.

3.16 STUDY LIMITATION AND MITIGATION

Despite that there was guaranteed anonymity, responses to questions about attitudes and practice may reflect what the respondent perceived desire to answer rather than their true opinion. This is because study participants could choose to respond to answers which are not consistent with what they practice. Also the main limitation with cross-sectional studies is that the same populations are not studied over time hence cannot be used to analyze behavior over time as changes in environment or other events may occur. Non-response is also a problem that could have affected this study and could have resulted in a bias of the measures of outcome. This is a particular problem when the characteristics of non-responders differ from responders. Also due to a limited number of studies in this topic some of the findings in this study were not compared to other studies.

Mitigation involved choosing a larger sample size as of medical practitioners. Also inclusion and exclusion criteria were established at the design stage to ensure that those with the outcome were correctly identified. Confidentiality was also ensured at a great extent.

CHAPTER FOUR

RESULTS

Demographics

The questionnaires were distributed to medical practitioners in their respective departments at random times when they were in clinics or theatres in both surgical and anesthesia departments. A total of 165 questionnaires were distributed and those returned and properly filled were 151. The majority of medical practitioners were working in the gynecology department (18.5%) followed by those working in the general surgery department (17.2%) and otorhinolaryngology department (17.2%). Medical practitioners from other surgical and anesthesia departments were 47.7%. The majority of medical practitioners' ages range from 27 to 58 years with median age of 35. Males represented the majority of the study participants which were (78.8%) (Table 1).

Table 1: Demographic characteristics of medical practitioners (N=151)

Variable	Category	Frequency (n)	Percent (%)
Age group (years)	≤ 35	85	56.3
	>35	66	43.7
Median age (years) (Range)		35 (27, 58)	
Sex	Male	119	78.8
	Female	32	21.2
Department	Anesthesiology	21	13.9
	General surgery	26	17.2
	Dental surgery	20	13.2
	Urology	16	10.6
	Otorhinolaryngology	26	17.2
	Gynecology	28	18.5
	Ophthalmology	14	9.3
Position	Specialist	38	25.2
	Resident	88	58.3
	Registrar	25	16.6
Experience (years)	< 5	75	49.7
	5 – 10	51	33.8
	>10	25	16.6

Knowledge of Medical Practitioners about PONV and PONV management

38.4% of the study participants had good knowledge of PONV. Among those in surgical departments, medical practitioners from the gynecology department (46.4%) answered correctly more than 60% of the knowledge questions followed by those from general surgery (42.3%) department. More than half of medical practitioners from the anesthesia department (95.2%) answered more than 60% correctly of the knowledge questions. They were more likely to be knowledgeable compared to those from the general surgery (AOR= 61, 95% CI 6.01-619), followed by those from the gynecology department (AOR= 1.8, 95% CI 0.49-6.5) (Table 2). ‘Adequate IV fluids reduce baseline risk for PONV’ and ‘Surgery greater than 30 minutes increase the risk of PONV’ were the most correctly answered questions, whereas ‘Smokers are less likely to experience PONV’ was the least correctly answered question (Table 3)

Table2: Multivariate analysis of the factors associated with knowledge on PONV among medical practitioners at MNH

Variable	Category	aOR	95% Confidence Interval		P – value
			Lower	Upper	
Age group (years)	>35	0.26	0.061	1.144	0.075
	≤ 35	Ref			
Sex	Male	0.51	0.18	1.442	0.205
	Female	Ref			
Department	Anesthesiology	61	6.01	619	0.001
	Ophthalmology	0.41	0.078	2.17	0.295
	Dental surgery	0.41	0.1	1.66	0.215
	Urology	0.24	0.043	1.4	0.116
	Otorhinolaryngology	0.35	0.084	1.46	0.152
	Gynecology	1.8	0.49	6.58	0.372
	General surgery	Ref			
Experience (years)	5-10	0.79	0.22	1.83	0.727
	>10	4.9	0.72	33.2	0.104
	< 5	Ref			
Position	Specialists	1.5	0.292	8.37	0.601
	Residents	0.63	0.194	2	0.455
	Registrars	Ref			

Key: PONV: Post-operative Nausea and Vomiting, aOR: Adjusted Odds ratio, Ref: Reference category

Table 3: Proportion of medical practitioners who responded correctly to knowledge questions (N=151)

Knowledge questions on PONV	Correct response	Percentage (%)
Women are more likely to suffer from PONV than men	T	55.6
PONV is unpleasant but rarely causes a delay in recovery time after surgery	F	33.1
There is a strong relationship between motion sickness and PONV	T	55
Prolonged pre-operative fasting can result in PONV	T	53
Opioids can affect PONV because they increase gastric motility	F	32.5
Surgery greater than 30 minutes increase the risk of PONV	T	76.8
Hypertension is more likely to cause PONV than hypotension	F	35.8
Adequate IV fluid hydration is an effective strategy for reducing the baseline risk for PONV	T	85.4
Smokers are less likely to experience PONV	T	13.9
Dexamethasone is considered an effective anti-emetic, especially after laparoscopic surgery	T	49

Key: T= True, F= False

Medical Practitioners' attitude towards PONV

There were six questions used to assess the attitudes of medical practitioners toward PONV and PONV management. It was found that 54 (35.8%) of medical practitioners had a positive attitude toward PONV and PONV management. Medical practitioners were firstly asked if PONV was an important problem in their everyday practice. 58 (38.4%) of medical

practitioners agreed that PONV was an important problem in their everyday practice. Regarding the perceived importance of pain and PONV, 5 (3.3%) of medical practitioners disagreed that majority of patients are more worried about pain than PONV. Almost all 148 (98%) of medical practitioners agreed that there was a need for continuous education and training program on PONV. Also 39 (25.8%) of the respondents felt that PONV incidence was not contributed more by other specialties than their own while 71 (47%) felt that all specialties should play equal roles in managing PONV (Table 4).

Medical practitioners from otorhinolaryngology were 5.7 (AOR 5.7, 95% CI 1.55-21.01) times more likely to have a positive attitude followed by those from anesthesia who were 4.6 (AOR 4.6, CI 95% 1.08-20.2) times likely to have a positive attitude compared with those from general surgery. Also it was found that good knowledge was not significantly associated with positive attitude (AOR 1.68 CI 95% 0.67-4.2, P=0.266) (Table 5).

Table 4: Proportion of medical practitioners on their responses to attitudinal questions (N=151)

Variable	Frequency (n)	Percent (%)
PONV is an important problem in your everyday practice		
Agree	58	38.4
Neutral	78	51.7
Disagree	15	9.9
Other specialties play significant role than your own in PONV incidence		
Agree	84	55.7
Neutral	28	18.5
Disagree	39	25.8
Roles of other specialties in managing PONV are more important than your own		
Agree	57	37.8

Neutral	23	15.2
Disagree	71	47
There is a need for continuous education and training program on PONV		
Agree	148	98
Neutral	2	1.3
Disagree	1	0.7
Patients are more worried about pain than PONV		
Agree	142	94.1
Neutral	4	2.6
Disagree	5	3.3
Only treating PONV after symptoms occur is more important than PONV prevention		
Agree	32	21.1
Neutral	10	6.6
Disagree	109	72.3

Table 5: Multivariate analysis of the factors associated with attitude toward PONV among medical practitioners at MNH (N=151)

Variable	Category	aOR	95% Confidence Interval		P – value
			Lower	Upper	
Age group (years)	>35	0.52	0.178	1.54	0.240
	≤ 35	Ref			
Sex	Male	1.66	0.62	4.47	0.308
	Female	Ref			
Department	Anesthesiology	4.67	1.08	20.2	0.039
	Ophthalmology	2.93	0.65	13.1	0.160
	Dental surgery	0.8	0.185	3.5	0.775
	Urology	0.5	0.086	3.0	0.456
	Otorhinolaryngology	5.7	1.55	21.01	0.009
	Gynecology	1.161	0.42	6	0.479
	General surgery	Ref			
Experience (years)	5-10	0.94	0.32	2.7	0.914
	>10	1.03	0.196	5.4	0.971
	< 5	Ref			
Positions	Specialists	3.28	0.64	16.6	0.151
	Residents	1.08	0.31	3.68	0.901
	Registrars	Ref			
Knowledge on PONV	Good	1.68	0.67	4.2	0.266
	Poor	Ref			

Key: PONV: Post-operative Nausea and Vomiting, aOR: Adjusted Odds ratio, Ref: Reference category

Management practices of PONV by medical practitioners

In this study it was found that 19 (12.6%) of medical practitioners stated to have PONV management guidelines in their departments and of those who have the guidelines 18 (94.7)%

stated to have prescribed anti-emetics based on the guideline. 97 (64.2%) of medical practitioners stated to have prescribed anti-emetic prophylaxis based on PONV risk factors though only 74 (49.3%) of the respondents stated to have done PONV risk assessment and stratification of patients scheduled for surgery (Table 6).

Ondansetron was the preferred medication by slightly more than half 77 (51%) of medical practitioners to manage PONV. 89 (58.9%) of the respondents stated to have applied multimodal approach in managing PONV.

Table 6: Statement of practice by medical practitioners on PONV management (N=151)

Practice	Category	Frequency (n)	Percent (%)
Presence of PONV management guideline	Yes	19	12.6
Prescribe anti-emetics basing on PONV guideline	Yes	18	11.9
Prescribe antiemetic prophylaxis basing on PONV risk factors	Yes	97	64.2
PONV risk assessment and stratification of patients scheduled for surgery	Yes	74	49.3
First line anti-emetic drugs used to treat PONV post-operatively	Ondansetron	77	51.0
	Promethazine	33	21.9
	Metoclopramide	23	15.2
	Dexamethasone	18	11.9
Treatment of PONV by an anti-emetic from different class of drug for patients already received prophylaxis		105	69.5
Apply multimodal approach in managing PONV	Yes	89	58.9

The multivariable logistic regression analysis showed that medical practitioners with good knowledge were more likely to do PONV risk assessment and stratification of patients scheduled for surgery as compared to those with poor knowledge (AOR= 3.6, 95% CI 1.38-

9.47, $P=0.009$). Medical practitioners from anesthesia department were more likely to do PONV assessment compared by those from general surgery (AOR= 41, 95% CI 3.9-429). This was followed by medical practitioners from gynecology department who were (AOR= 7.1, 95% CI 0.76-12.1) more likely to do PONV assessment as compared to those from general surgery department.

Regarding the attitude toward PONV, it was found that those medical practitioners with a positive attitude were more likely to apply multimodal approach in managing PONV as compared to those with a negative attitude (AOR= 2.4, 95% CI 1.03-5.74, $P=0.042$). Medical practitioners from anesthesiology department were 5.9 (AOR= 5.9, 95% CI 1.1-31.6, $P=0.037$) times likely to apply multimodal approach as compared to those from the general surgery department. This was followed by those from otorhinolaryngology department who were 4.3 (AOR= 4.3, 95% CI 1.12-16.6, $P=0.034$) times more likely to apply multimodal approach as compared to those from the general surgery department.

CHAPTER FIVE

5.0: DISCUSSION

5.1: Knowledge of PONV by medical practitioners

Baseline good knowledge about PONV management is crucial in the optimal management of patients at risk or those with established PONV. Hence evident practice by medical practitioners regarding PONV management depends on the intellectual understanding of the problem and therapeutic options available.

In this study, it was found that medical practitioners with good knowledge of PONV were 38.4%. These results show that there is generally poor knowledge of PONV among medical practitioners though those from the anesthesia department showed to have higher knowledge of PONV compared to other medical practitioners. Also, a study done by Jiaming L et al in Singapore showed that only 15.3% of the surgeons correctly identified a combination of anti-emetics as the gold standard for PONV management and only slightly more than half (50.6%) were able to identify more than three risk factors for PONV (9). In another study done in Ethiopia by Yetneberk et al showed that half of the health professionals had poor knowledge of PONV management with more than half of anesthetists being more knowledgeable compared to others (16). In both of these studies, the possible reason for the knowledge level on PONV could be due to them having similar professions which reflected their knowledge though those from the anesthesia department being knowledgeable this could be due to them having experience in PONV management and having more training on PONV. Another reason for poor knowledge could be that practitioners are not convinced that PONV is of such clinical importance to be taken seriously.

5.2: Attitude of medical practitioners toward PONV

It has been known that patients agree that PONV is an important post-operative problem that needs to be addressed (4, 10, 25). Few studies have been done regarding the attitude of medical practitioners toward PONV as this can affect their practice on PONV. This study showed that the majority of medical practitioners have a negative attitude toward PONV of which only 35.8% had a positive attitude. Medical practitioners from anesthesiology were

more likely to have a positive attitude compared with others followed by those from the otorhinolaryngology. This was similar to a study done by Jiaming L et al in Singapore in which the majority of surgeons felt that pain was more distressing to patients than nausea or vomiting (9). However, surgeons practicing in surgical subspecialties had a more positive attitude toward PONV than those from the general surgery department which is also the case in this study; practitioners from otorhinolaryngology had a more positive attitude. This could be explained to the fact that even in otorhinolaryngology there is higher incidence of PONV which has led to the majority of practitioners in that department to have a positive attitude.

Regarding the importance of PONV as an important problem in everyday practice in this study it was found that minority of practitioners (38.4%) agreed on PONV to be an important problem. This was different from a study done by Oliver et al in Switzerland in which it was found that 78% of surgeons and 90% of anesthesiologists felt that PONV was an important problem in their everyday practice. This could be attributed to the fact that in our setting there is less reported incidences of PONV as compared to other settings. However, survey done on Swedish nurse anesthetists showed that most did not notice PONV to be a major problem perioperatively, but most of them performed regular risk assessments for PONV and treatment often was based on the ward's routines and adjusted according to the patient's risk of developing PONV (15). This could be explained to the fact that there is a better system of identifying patients with risk of developing PONV and prophylactic treatment initiated early according to risk hence reducing incidences of PONV.

5.3: Management practices of PONV by medical practitioners

As it has been shown, patients are better managed when PONV is prevented before it occurs (10, 25). This is achieved by identifying patients at risk, reducing baseline risk factors for PONV, and giving PONV antiemetic prophylaxis (10, 25). Hence assessment of patients for risk factors of PONV is crucial in guiding PONV prophylaxis. This is because when patients are scored based on risk factors it has been shown to reduce incidences of PONV when therapy is guided based on risk scores for PONV (10, 25). This is achievable if proper

guidelines are in place and are followed by practitioners in managing PONV patients (10, 25, 27).

This study showed that only 12.6 % of medical practitioners have PONV guidelines in their departments, with the majority of anesthesiologists reported to have PONV guidelines in their departments compared to others. This was similar to a study done in Ethiopia by Yetneberk et al to health professionals which showed only 7.9% of them had PONV guidelines in their workplace and 71.9% of anesthesiologists had guidelines in their workplace. This similarity could be attributed to the fact that more anesthesiologists and anesthesiologists tend to have a positive attitude toward PONV than other professionals hence putting more importance on PONV prevention and management.

Also, in this study showed that 49% of medical practitioners do risk assessment and stratification of patients scheduled for surgery. This was different from a study survey done on Swedish nurse anesthetists in which it was found that all of them (100%) performed a regular PONV risk assessment of patients scheduled for surgery (15). This difference could be due to differences in the presence of protocols regarding the management of PONV and compliance to the protocols.

This study showed that 64.2% of medical practitioners stated to have prescribed anti-emetic prophylaxis to patients with risk of PONV with the majority being medical practitioners from the anesthesia department. This was different from a study done by Yetneberk et al on health professionals in Ethiopia in which 28.5% of them provided anti-emetic prophylaxis. Also in that study in Ethiopia majority of anesthesiologists 90.7%; $p < 0.001$ provided anti-emetic prophylaxis compared to other health professionals (16). This difference could be because Yetneberk et al involved different health professionals including midwives, nurses and anesthesiologists. Also, availability of anti-emetics may differ in different settings. In another study done in Switzerland among surgeons and anesthesiologists it was found that anesthesiologists prescribed antiemetic prophylaxis more than surgeons (77% vs. 45%; $p < 0.01$) (17). This was similar to this study and is possibly due to similarity of professionals

being surveyed who could have same capability roles in prescribing anti-emetics and also their professions reflecting their attitude toward PONV.

Ondansetron is the most commonly used and studied 5-HT₃ receptor antagonist and is considered the gold standard in PONV management (28). This study showed that slightly more than half of medical practitioners preferred to prescribe ondansetron as a first line drug to manage patients with established PONV. This was similar to a study done by Macario et al in USA (20). The study showed that the majority of anesthesiologists preferred pharmacologic interventions for treatment of established PONV with 5-HT antagonists being the most common drugs prescribed (20). Also, 26% of anesthesiologists stated they would administer a second dose of 5-HT antagonist if the initial 5-HT antagonist used as prophylaxis failed (30). This similarity could be due to both practitioners in those settings having same profession as well as availability of anti-emetics in those settings. However, a study done by Chalya et al in Bugando medical center showed that the most common antiemetic drugs used were promethazine, metoclopramide and anti-malarial (3). This difference to this study could be attributed to differences in availability and cost of anti-emetic medications in different settings.

58.9% of medical practitioners in this study stated to have applied the multimodal approach in managing PONV patients. This was somehow similar to a study done by Yetneberk et al in Ethiopia where 48% of health professionals stated to have applied multimodal approach in managing PONV patients (16). Also a study done by Chalya et al in Bugando medical center showed that patients who reported episodes of PONV 31.3% were treated with antiemetic drugs and adequate hydration (3). This similarity in multimodal approach could be due to practitioners' experience in managing PONV as well as the concern of dehydration due to vomiting.

CHAPTER SIX

6.0: CONCLUSION AND RECOMMENDATIONS

6.1: CONCLUSION

Postoperative nausea and vomiting (PONV) is a common occurrence among surgical patients in which incidence is more than ten percent. This problem causes distress to patients hence patients become less satisfied with anesthesia and surgery. PONV could be an easily overlooked problem by medical practitioners caring for post-operative patients due to poor knowledge and a negative attitude toward it. Also, it is common for medical practitioners to view PONV as an anesthesiologists' concern rather than a problem where all professionals should deal with it collaboratively.

As it is shown in this study, the majority of medical practitioners have poor knowledge of PONV and a negative attitude towards it. In this study, knowledge was not associated with attitude. But good knowledge was associated with the practice of doing PONV risk assessment by medical practitioners which is important in PONV management. Practitioners with good attitudes were more likely to apply the multimodal approach to patients in managing PONV with a significant number of them being from the anesthesia and otorhinolaryngology. Hence for medical practitioners to provide good care to patients who suffer from PONV they need to have a good knowledge and a positive attitude toward it.

6.2: RECOMMENDATIONS

Basing on the findings of this study, the following recommendations should be considered;

1. More training should be done to medical practitioners regarding PONV and PONV prevention and treatment. This should be incorporated into a post-graduate training program for residents.
2. More studies should be done to obtain exact data concerning the incidence of PONV in all surgical specialties. This should include studies on the clinical and psychological impacts of suffering from nausea and vomiting.

3. There should be a uniform PONV prevention and treatment protocol in all departments involved in the care of surgical patients. This should be detailed in accordance with the patients' risk of developing PONV.
4. Anesthesiologists should be involved in the care of surgical patients together with other professionals not just in theatre but at all points of patient care until the patient is discharged from hospital.

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APPENDIX 1: A QUESTIONNAIRE ON ASSESSMENT OF ATTITUDE, KNOWLEDGE AND MANAGEMENT PRACTICES OF POSTOPERATIVE NAUSEA AND VOMITING AMONG MEDICAL PRACTITIONERS AT MNH

Serial number: _____

PART I: DEMOGRAPHY				
S.No	QUESTIONS	RESPONCES (Tick your responses in the boxes below)		
1	Sex	<input type="checkbox"/> Male	<input type="checkbox"/> Female	
2	Age	_____ years		
3	Department	<input type="checkbox"/> Anaesthesiology <input type="checkbox"/> General surgery <input type="checkbox"/> Dental surgery <input type="checkbox"/> Urology <input type="checkbox"/> Otorhinolaryngology <input type="checkbox"/> Gynecology <input type="checkbox"/> Ophthalmology		
4	Position	<input type="checkbox"/> Specialist	<input type="checkbox"/> Resident	<input type="checkbox"/> Registrar
5	Years in clinical practice in your department (including residency)	<input type="checkbox"/> Less than 5 years	<input type="checkbox"/> 5-10 years	<input type="checkbox"/> More than 10 years
Part-II: Knowledge questions related to PONV				
S.No	Questions (Circle T for True, or F for False or N for Not sure) Note: PONV=Postoperative Nausea & Vomiting	Response options		
		T=True	F=False	N=Not sure
6	Women are more likely to suffer from PONV than men	T	F	N
7	PONV is unpleasant but rarely causes a delay in recovery time after surgery	T	F	N

8	There is a strong relationship between motion sickness and PONV	T	F	N
9	Prolonged pre-operative fasting can result in PONV	T	F	N
10	Opioids can affect PONV because they increase gastric motility	T	F	N
11	Surgery greater than 30 minutes increase the risk of PONV	T	F	N
12	Hypertension is more likely to cause PONV than hypotension	T	F	N
13	Adequate IV fluid hydration is an effective strategy for reducing the baseline risk for PONV	T	F	N
14	Smokers are less likely to experience PONV	T	F	N
15	Dexamethasone is considered an effective anti-emetic, especially after laparoscopic surgery	T	F	N

Part-III: Attitude questions of the respondents towards PONV

S.No	Questions (Tick your responses in the boxes provided)	Response options				
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
16	PONV is an important problem in your everyday practice					
17	Other specialties play the significant role than your own in PONV incidence					
18	The role of the other specialties in managing PONV is more important than your own					
19	There is a need for continuous education and training program					

	on PONV					
20	Majority of patients are more worried about pain than PONV					
21	Only treating PONV after symptoms occur is more important than PONV prevention					

Part IV: Practice questions related to PONV (Tick your responses in the boxes provided)

22. Do you have PONV management guidelines in your department?
- Yes
- No
- Not sure
23. If yes in the above question 22, have you ever prescribed anti-emetics basing on PONV management guideline?
- Yes
- No
24. Have you ever prescribed antiemetic prophylaxis basing on risk factors?
- Yes
- No
25. Do you do PONV risk assessment and stratification of patients scheduled for surgery?
- Yes
- No

26. A 22 year old woman post-surgery under GA. She received no anti-emetic prophylaxis. In the ward within 24 hours post-surgery she reports PONV. What would your initial antiemetic order be?

- Dexamethasone
- Ondansetron
- Promethazine
- Metoclopramide

Other.....

27. A 22 year old woman post-surgery under GA. She received dexamethasone and ondansetron for PONV prophylaxis. In the ward within 24 hours post-surgery she reports PONV. What would your initial antiemetic order be?

- Dexamethasone
- Ondansetron
- Promethazine
- Metoclopramide

Other.....

28. Apart from anti-emetics, do you use other modalities in combination with anti-emetics to treat PONV in the postoperative period?

- Yes
- No

Thank you for your cooperation

APPENDIX 2: CONSENT FORM- ENGLISH VERSION

Introduction

My name is Tumaini Ndibwire, a researcher from Muhimbili University of Health and Allied Sciences. I am asking for your help in participating in a research study titled ‘**Knowledge, attitude and practices of postoperative nausea and vomiting management among medical practitioners in Muhimbili National Hospital**’, by completing a written questionnaire. This study aims to assess medical practitioner’s knowledge about postoperative nausea and vomiting (PONV), their attitude toward PONV and their management practices regarding PONV. This is important study because in the end it will lead to overall patients’ postoperative experience.

Participation in the study

You are kindly requested to participate in this study. If you accept to participate in this study your particulars will be taken and used for the purpose of this research and this will certainly not bother you or cause any discomfort to you. Please complete the questionnaire and it should take approximately 20 minutes to fill out. Do not put your name on the survey. Your answers are completely anonymous (no one will be able to identify this one as yours). You have the right to discontinue participation at any time without penalty, and you have the right to withdraw consent. You have the right to refuse to answer particular questions.

Confidentiality

You are strongly assured of the confidentiality of the information obtained that will only be used for the purpose of this research and anonymity will be highly observed when collecting data and compiling report. To assure you as already clarified above your name will not be required to appear in the questionnaire. Also, I believe the anonymity of the responses will lead to more accurate responses.

Risk to participant

No anticipated risk or harm that may result from participating in this study. Your participation is absolutely voluntary and there is no penalty for refusing to participate. You are free to ask any question and you may stop to participate in this study any time.

Contact Person

If you have any questions about this study, please contact the principal investigator Dr. Tumaini Ndibwire at 0784705541. For further information about your rights as a research subject or if you are not satisfied with the manner in which this study is being conducted, you may contact: the chairman of the university senate research and publications, MUHAS P.O.BOX 65001, Dar es Salaam. Telephone; 2150302-6

Signing of the consent

If you agree to participate in this study please sign in this consent form.

I (initials)..... have read and understood the contents of this form and I have been given satisfactory explanation with all my questions answered. I therefore consent to participate in this study.

Signature of intervieweeDate.....

Signature of interviewerDate

APPENDIX 3: CONSENT FORM- SWAHILI VERSION

Utangulizi

Jina langu ni Tumaini Ndibwire, mtafiti kutoka chuo kikuu cha afya na sayansi shirikishi kutoka Muhimbili. Ninaomba ushiriki wako katika utafiti ninao fanya unaoitwa ‘**Knowledge, attitude and practices of postoperative nausea and vomiting management among medical practitioners in Muhimbili National Hospital**’, kujaza dodoso lililoandikwa.

Ushiriki wako katika tafiti hii

Unaombwa kushiriki katika utafiti huu. Kama utakubali kushiriki taarifa zako zitachukuliwa na kutumika kwa ajili ya utafiti huu tu na hili halitakusumbua wala kukusababishia madhara yoyote. Tafadhali umalize kujaza dodoso na haitachukua zaidi ya dakika 20 kujaza dodoso. Usiweke jina lako kwenye dodoso. Majibu yako kwenye dodoso hayataonwa na mtu yoyote na hakuna atakaejua kuwa ni yako. Una haki ya kuacha kuendelea kushiriki utafiti huu wakati wowote bila adhabu yoyote na pia una haki ya kuondoa kibali cha kushiriki.

Usiri

Unahakikishiwa kuwa taarifa zako zitakazokusanywa zitatumika kwa utafiti huu tu na zitakuwa ni za siri wakati wote kuanzia kukusanya taarifa mpaka kufanya majumuisho wakati wa kuandika ripoti. Na pia jina lako halitatakiwa kutumika katika dodoso, na pia ninaamini kutumika kwa usiri kutafanya majibu yajibiwe kwa usahihi zaidi.

Athari kwa mshiriki

Hakuna athari zozote zitakazo weza kutokea kwa mshiriki. Ushiriki wako hautakuwa wa kulazimishwa hata kidogo na pia hakutakuwa na adhabu yoyote kama ukikataa kushiriki. Uko huru kuuliza swali lolote na pia unaweza kuacha kushiriki wakata wowote.

Mawasiliano

Kama utakuwa na maswali yoyote kuhusu utafiti huu tafadhali wasiliana na mtafiti Dkt. Tumaini Ndibwire kwa simu 0784705541. Kwa taarifa zaidi kuhusu haki zako kama mshiriki

wa tafiti hii au kama haujaridhishwa na jinsi ambavyo utafiti huu unavyofanywa unaweza kuwasiliana na mwenyekiti wa kamati ya tafiti na machapisho ya chuo kwa anuani: S. L. P 65001, MUHAS, Dar es Salaam au kwa simu 2150302-6

Utiaji sahihi wa kibali cha ushiriki

Kama unakubali kushiriki tafadhali tia sahihi yako katika kibali hiki.

Mimi (Herufi tu za mwanzo wa jina na mwisho)..... nimesoma na kuelewa taarifa za hii fomu na nimepatiwa maelezo yanayojitosheleza. Kwahiyo ninakubali kushiriki katika utafiti huu.

Sahihi ya mshiriki Tarehe.....

Sahihi ya mtafitiTarehe