

**THE INCIDENCE OF POST OPERATIVE COMPLICATIONS IN THE FIRST 24
HOURS AMONG PATIENTS UNDERGOING DAYCARE SURGERY AT
KENYATTA NATIONAL HOSPITAL.**

BY

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REQUIREMENT FOR THE DEGREE OF MASTER OF MEDICINE IN
ANAESTHESIA OF THE UNIVERSITY OF NAIROBI.**

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DECLARATION

I declare that this dissertation is my original work and has not been submitted for a degree award in this or any other university. All resources contained here have been acknowledged.


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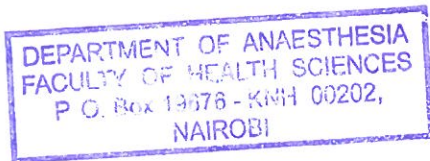
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DEDICATION

I dedicate this thesis to my family for their support throughout the whole study process.

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My pursuit of a master's degree and this thesis in particular is the result of a challenging journey, upon which many people have contributed and given their help and support.

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OPERATIONAL DEFINITIONS

- **Recovery**-a process that begins from the end of intraoperative care until a patient return to their pre-operative physiological state. Divided into immediate, early and late recovery phases after surgery.
- **Ambulatory Surgery**-Also known as Day care surgery. Patient needs some degree of specialized post-operative nursing care but discharged on the same day of procedure.
- **Incidence**-Occurrence of new cases of disease or injury in a population over a specified period of time.

LIST OF ABBREVIATIONS

ASA	American Society of Anesthesiologists
EUA	Examination Under Anesthesia
IUCD	Intra Uterine Contraception Device
BMI	Body Mass Index
KNH	Kenyatta National Hospital
PACU	Post Anesthesia Care Unit
PADSS	Post Anesthesia Discharge Scoring System.
UON	University of Nairobi
VAS	Visual Analogue Scale
UK	United Kingdom
USA	United States of America
HR	Heart Rate
SPO2	Oxygen Saturation.
BP	Blood Pressure
ASU	Ambulatory Surgical Unit
PE	Pulmonary Embolism
MI	Myocardial Infarction.
SD	Standard Deviation
POST	Post-operative Sore throat
POUR	Post-operative Urinary retention.

ABSTRACT

Back ground.

Day care surgery and anesthesia rates have risen worldwide over the years in both developing and developed countries. This is made possible because of emergence of newer surgical, anesthetic and analgesic techniques and expanded scientific research in this field. Recovery and quality of care following day care surgery are key factors in its success, with delayed recovery due to various post-operative complications resulting in increased cost, reduced efficiency and unplanned admissions therefore having an overall negative impact on quality of care.

Objective

To determine the incidence of post-operative complications among patients undergoing day-care surgery at KNH within 24 hours.

Study methodology.

Consecutive sampling was carried out until a total of one hundred and twenty-four patients was achieved. The participants were recruited at the daycare surgical units after meeting the inclusion criteria. The patients were then followed throughout the intra-operative period and at Post Anesthesia Care Unit. Vital signs, post-operative complications, pain scores and time to achieve a standardized discharge criteria were recorded in PACU. Follow up information was obtained via telephone interviews 24 hours after discharge from the day care surgery unit.

Results

The Incidence of post-operative complications was 60% among 69 women and 47 adult men undergoing daycare operations at KNH. The commonest experienced complication was pain (49.1%) followed by nausea and vomiting (22.4%), with major associated factors identified as opioid use and type of anesthesia for pain and opioid use, mode of anesthesia and gender for PONV. Other adverse symptoms identified include bleeding, postoperative sore-throat, lightheadedness, bloating and urinary retention. The average length of stay in PACU was 50 minutes with 95% of patients having been discharged within 2 hours of surgery. There was a 0.9% incidence of unplanned admission with no return to hospital after discharge recorded.

Conclusion:

The result of this study confirm that a significant number of patients still experience pain and post discharge nausea and vomiting despite great improvements in management of the same.

Therefore, Preoperative identification of associated risk factors for various complications among patients undergoing day care surgery is paramount in order to improve patient's care.

CHAPTER ONE

1.0 INTRODUCTION

Day care surgery is the admission of a patient for therapeutic or diagnostic procedure on a planned non-resident basis and who nonetheless requires facilities for recovery.

Recent advances in anesthesia and surgical methods have resulted in great increase of this specialty throughout the world (10). It is a concept that is well established in developed countries but developing countries like India and Africa are yet to catch up. Worldwide, many procedures are being performed as Day surgery with more complex surgeries being involved in the scope. (10,15).

At KNH, some of the day care procedures performed include: Cataract surgery, Upper and lower Gastro-intestinal endoscopy, Gynecological surgeries like EUAs, Dilatation and curettage, MacDonald's stitch, removal of IUCD and many dental procedures.

Day care surgery is deemed safe, with shorter duration of surgery, presumably less cost and fewer complications (2,10,31). However, potential complications are associated with any surgical procedure, however minor (2,6,8,15,31). These complications can be related to either surgery or anesthesia and therefore appropriate patient selection is paramount.

The commonest complications recorded in literature include nausea and vomiting, sore throat, discomfort, incision site pain and hemorrhage (2,5,6,9,12,18,22)

The recovery process after day-care surgery is a continued process. It may take from hours to several days' post-operation and patients are not considered well recovered until they return to their pre-operative physiological state. However, at discharge, they should be home ready; thus, clinically stable and able to rest at home under the care of a responsible adult (2,31).

Consequently, reducing the time spent in the day-care surgical unit by quick and safe patient discharge is known to reduce overall cost of care including labor expense. Delay in discharge reduces the effectiveness of a day care setting (31). However, premature discharge may increase re-admission rates, postoperative complications and at times have legal implications thus, patient discharge should be done without compromising on quality of patient care by ensuring a smooth transition to the home environment.

1.1 Study justification

Literature review suggests that that post-operative adverse symptoms especially pain and nausea remains a challenge worldwide. The overall prevalence of pain reported in literature is 17-40% and 30-40% for PONV in general surgical patients with an even higher rate in high risk patient groups. Occurrence of other symptoms has also been mentioned (4,6). Currently, there is a diverse number of procedures being done on day care basis (10,21) hence the need to ensure recovery is faster and safe. There is a paucity of data however regarding the spread of this specialty in the developing world. This study is carried out to find the incidence of postoperative complications that influence the recovery process of patients following day-care surgery at Kenyatta National Hospital.

According to KNH audit 2012, some of the findings established that the hospital lacked sufficient space for all patients it admits, having a bed capacity of 1410 whereas inpatients were 1876,

translating to a 133% bed capacity. Eighty percent (80%) of the long waiting time by patients is caused by lack of theatre allocation arising from a high number of surgical cases, which are kept waiting in the ward. It was for this reason that KNH set out to build an outpatient surgery center since 2015. Establishment of a dedicated day care center will reduce the patients waiting time while admitted in the ward. It was also found that the hospital lacked established important documented operational standards and guidelines essential for efficient delivery of services such as policies and guidelines on admission and discharge of patients (35).

It is well known that reduction in length of stay in hospital reduces costs to both patient and hospital and also enhances labor efficiency. It is therefore paramount to ensure timely and safe discharge while avoiding unnecessary admissions preoperatively. Many studies have determined the factors that delay discharge but there is no definition of appropriate length of stay in PACU after anesthesia.

The purpose of this study is to provide insight into the safety and time spent to perform day care operations at Kenyatta national hospital. It may also guide on formulating any study guidelines concerning day-care surgery and discharge process. The outcome variables of this study will serve as an index of quality to provide comparison between ambulatory surgery unit in KNH and other institutions as well as improve quality of care.

CHAPTER TWO

2.0 REVIEW OF LITERATURE

Day-care surgery may require administration of general, regional or local anesthesia. The advancements in anesthesia techniques and availability of newer drugs have contributed largely to progress of daycare surgery. However, provision of day care anesthesia is a challenging task, the main challenges being logistics and organization of day care set up to make it function efficiently, effectively and safely, problems that are more pronounced in resource poor settings. The first attempt of daycare surgery is attributed to Dr. Nicoll, a Glasgow Hospital surgeon who reported a series of more than 9000 patients undergoing daycare surgery and anesthesia (1,10,31)

The day care procedure hospital was first introduced in 1962, whereas an exclusively ambulatory surgery hospital was first created in 1969. The formal development of day-care surgery came with establishment of Society for Ambulatory anesthesia in 1984 along with starting of postgraduate sub-specialty training program. (1,31)

In daycare surgery units, patients receive treatment that is focused to their needs, while allowing them to recover in a familiar environment, which is especially advantageous at extremes of age (10,15)

Scheduling is easier due to less chances of cancellation of surgery as a result of non-availability of inpatient beds. It is also less costly compared to inpatient care as hospitalization time is reduced, night and weekend staffing is also not required with an average unit cost reduction being up to 70% (23,31).

In developing countries which harbor more than 20% of disease burden, it's difficult to gauge the progress of day-care surgery due to non-uniform reporting of data. India is approximated to have about 6% of the world's hospital beds but only 10-25% of surgeries are performed on day care basis (31). There is therefore a greater opportunity for expansion of this specialty in this countries in order to ensure cost effectiveness coupled with faster and safer patient turnover.

2.1 Recovery of patients following daycare surgery

Recovery is an ongoing process that starts from the end of surgery to when a patient goes back to their usual physiological state (11). The success of day-care surgery depends partly on safe and timely discharge afterwards. It should be uncommon for patients to return to hospital for admission or need emergency care as a result of premature discharge. Post operatively, patients are usually monitored for adverse symptoms such as bleeding, nausea, pain and cardio-pulmonary function. The rapidity of recuperation depends on factors like type of surgery, conduct of anesthesia and patient's factors like presence of pre-existing co-morbidities (2,5,6,11)

2.1.1 Choice of anesthesia

Anesthesia is one of the most important factors in influencing discharge time in association with patient characteristics and surgery type (6,11). No specific method is superior since all anesthetics can be used. However, its beneficial to choose an anesthetic that has a consistent

onset and offset time, permitting changes in levels of drug effect and that has minimum side effects. The idea is to choose an anesthetic plan that will provide optimum peri-operative conditions ensuring rapid recovery and discharge on the same day. Ideal conditions entail a calm patient, smooth induction, adequate pain control and depth of anesthesia plus muscle relaxation if necessary. There should also be awareness of cost of care which includes but is not limited to cost of anesthetic techniques.

Shagufta Choudhary, M.M Beggani and Dheeraj mulchandani of Bombay hospital studied 8000 patients operated at their day care Centre. Fifty-one percent (51%) were operated under sedation, 44.1% under local anesthesia, 2.2% under general anesthesia and 2% under regional anesthesia. Patients in the local anesthesia group recovered faster, viewed as being pain free in the post-operative period due to the action of local anesthesia, could take their food earlier and were home ready faster as compared to general anesthesia group. Incidence of postoperative complications was also least with patients who received sedation plus local anesthesia as compared to other groups (10).

Susan kerubo Omundi of University of Nairobi studied the difference in recovery profile between general anesthesia and spinal anesthesia patients undergoing day care gynecological procedures. She found out that patients undergoing surgery under spinal anesthesia took much longer to be discharged compared to general anesthesia group brought about by time to ambulation. The pain scores, nausea scores and unplanned admissions were comparable in the two groups (21).

2.1.2 Recovery profile and length of stay in PACU.

This is the most important aspect during postoperative period as the discharge of patients from hospital following day care surgery is decided after evaluating recovery characteristics. Major issues before discharge such as bradycardia, hypotension, hemorrhage, post Dural puncture headache, pain, nausea and vomiting, urinary retention and shivering can possibly defeat the goals of ambulatory anesthesia. (6,9,11).

Chung F et al prospectively studied 500 patients who underwent different day care surgical procedures to find out recovery pattern and home-readiness after surgery. He scored the subjects using the PADSS every 30 minutes after surgery until a score of >9. He then telephoned each patient after 24 hours to identify post-operative symptoms. Eighty-two percent (82%) and 95% of patients were discharged two and three hours respectively post operation. Persistent symptoms occurred in 4.4% of patients. There was a variation in recovery among different surgical procedures and anesthesia techniques. (2)

The incidence of 24-hour post-operative symptoms was higher in the group that experienced post-operative symptoms in PACU. He also noted that most patients achieved a satisfactory home readiness criterion on or before two hours' post-surgery.

Amory tin S et al in his study of Recovery pattern and home readiness following day care gastro-intestinal endoscopy found out that majority of the patients satisfied the PADSS score within 2hrs. No patient had persistent symptoms. (12)

2.2 Frequency of post-operative complications.

The most commonly cited advantage of ambulatory surgery is the advancement in quality of care since it allows same day discharge of clinically stable patients. Post-operative complications even though mostly minor may jeopardize this gain (5,8,9,22). The commonest adverse symptoms experienced by patients include pain at incision site, nausea and vomiting, confusion, hemorrhage, acute urinary retention, paralytic ileus and post-operative fever (11). These adverse symptoms may lead to prolonged length of stay in PACU and reduction of patient's satisfaction hence need to be managed promptly.

2.2.1 Occurrence of pain.

Pain is one of the commonest symptoms experienced after surgery. It is presumed that untreated acute pain can lead to chronic pain with no organic cause to explain the pain (7,9,22). Many studies show that persistent pain also increases the rate postoperative nausea, delirium and prolonged post anesthesia care unit(PACU) stay. Poor pain control can delay resumption of normal daily activities. (5,8,31).

Dr G mwaka, S Thikra and V mung'ayi studied the prevalence of postoperative pain in the first forty-eight hours after daycare surgery at Aga khan hospital in Nairobi. They sampled 150 patients and found 58% as the prevalence of postoperative pain within 30 minutes of surgery, 55.3% after 24 hours and 34.7% after 48 hours (22). Moderate and severe pain was experienced in 13% of patients after 24 hours and 11% after two days.

Thirteen observational prospective studies done by Chung et al, Rawal, Beauregard, Mackintosh, Pavlin, McGrath, Mattila, Gramke, Ismael and Rosen et al (2,5,7,22) examined the frequency of post-operative pain after daycare surgery. The number of patients studied were between 76-5000. Assessment of pain using validated scores was the primary outcome. One study evaluated pain in the immediate post-operative period, five looked at pain in the 1st 24 hours, two in 48 hours, one at 48 hours and beyond and in another study the time of pain assessment was not clear.

Moderate to severe pain was experienced in 25-40% of participants and severe pain in 5-20%. Most patients experienced pain while at home. Ninety-five percent of patients had incisional pain at 24 hours with sixty-four percent still having the pain one week after surgery.

These findings were comparable with a study by Wut et al which found pain as the commonest symptom occurring in 45% of 7675 patients undergoing day care surgery (36).

Two large Swedish surveys found out that in patients undergoing daycare laparoscopic surgery, 65% of his patients experienced moderate pain whereas 25% had severe pain. Only 60% of patients undergoing gynecological procedures had adequate pain control. Cataract surgery patients experienced significant pain post operatively (10).

2.2.2 Occurrence of post-operative nausea and vomiting

PONV is one of the distressing postoperative discomforts experienced after surgery. It has an incidence of about 30-40% among patients undergoing general anesthesia with an even higher rate in high risk patient groups (16,19). Seven prospective observational studies were

done by Chung, Rawal, Sinclair, pavlin, mattilla and Parra-Sanchez et al on occurrence of post-operative nausea and vomiting after day care surgery. They involved between 175-17638 subjects. The researchers aggregated the study findings which showed occurrence of PONV as 17%(range 10-55%) of 5500 participants over a 24hour period (10).

Majority of patients reported nausea and vomiting in the immediate post-operative period, but some experienced PONV after discharge (10).

2.2.3 Unplanned hospital admissions and return to hospital visits

Rates of unplanned admissions are often used as a measure of quality of daycare surgery, because it negates the basic goal of preventing hospitalization and same day discharge. Although medical advancements have made day care surgery a safe option, there are documented and potentially preventable complications that result in unanticipated hospital visits after surgery.

Greenburg et al, Junger et all, shirakami et ablacoe et al and mailla et all did prospective studies on prevalence of unplanned hospital admissions. The rate was between 2-10%(27,28,29). Another study done at gateway surgical center in London by FA Zulfiquer and K Pattanayak found the rate to be 10.3% (10) compared to other studies that ranged from 38-75%(11,14). Most unplanned admissions were due to surgical reasons (43%). Twenty-five percent (25%) of the admissions were due to anesthesia related reasons, with a range of between 25-28% in comparison to other studies (11-13). The rate of unplanned admissions was 0.28%-5.9% (10,28,29,31,34).

A study by Tasce et al of Yale university found an overall rate of 3.8% unplanned admissions;0.3% occurring within same day of surgery while 3.6% within 30 days (15).

2.2.4 Urinary retention

Post-operative urinary retention is the inability to void after surgery despite having a full bladder. In literature, its cited to be between 5-70%. Although regarded as a minor complication, it can be a source of distress to patients especially the elderly. (30,32).

Two prospective studies done by Pavlin et al on bladder function and voiding after day care surgery reported an incidence of urinary retention as 0.5% with high risk patient groups having an even higher rate of 5% (those undergoing urological, hernia, anorectal or surgery under spinal/epidural anesthesia (30,32). These studies involved an average of 329. Similar findings were found by S Stallard et al. (33). A study by Tamella et al found about 3.8% of general surgical patients develop post-operative urinary retention (34).

2.2.4 Other post-operative symptoms

In literature, mention is made of other post-operative symptoms including drowsiness, dizziness, headache, asthenia, myalgia and sore throat. Wu et al 2000 analyzed the results of different studies and found out the incidence of postoperative symptoms following day care surgery was drowsiness (42%), dizziness (18%), headache (17%), asthenia (21%), myalgia (31%) and sore throat (37%) (9,23,31).

2.3 Predictive risk factors for developing post-operative pain, Nausea and Vomiting.

Chung F et al studied Risk factors for post- operative pain in PACU. Five percent (5.3%) of patients experienced severe to moderate pain, depending on type of surgery and anesthesia, gender (more in females) and age. (2)

Apfel et al in their study about risk factors for development of PONV found out that nausea and vomiting was experienced by 30-50% of patients. Female gender, prior history of nausea and vomiting postoperative, non-smokers and use of opioids were major contributing factors. Patients with high BMI were also noted to have a higher (19)

The study by Mattila et al found out general anesthesia, young age, duration of surgery and female sex as the greatest predictors. (37).

Gan et al in his study to identify risks of nausea and vomiting after surgery found that it was more in patients who had undergone general anesthesia and also in many females. (38).

2.4 Use of Discharge criteria

Discharging a patient undergoing day care surgery is a major step in the pathway of care, as it must be achieved without compromising the quality of care. Efficient day surgery processes are facilitated by protocol driven nurse led discharge. Therefore, using an objective assessment for fair and safe discharge is essential. One of such assessment is using a Post-Anesthesia Discharge Scoring System(PADSS).

This score was developed by Chung et and he used it to safely discharge patients. (3) The earlier version of the PADS system required the patient to take oral fluids and pass urine before discharge. These two requirements were removed after studies established that the two factors may delay discharge and can be eliminated without evidence of adverse effects. This resulted in the modified PADS system with 5 parameters; vital signs, pain, post-operative nausea and vomiting, bleeding and ambulation. Every parameter is given a score of 0-2 and patient who scores 9 or more is ready for discharge.

Vital signs 2=within 20% of preoperative value 1=20-40% preoperative value 0=40% of preoperative value
Ambulation 2=steady gait/no dizziness 1=with assistance 0=none/dizziness
Nausea and Vomiting 2=minimal 1=moderate 0=severe

Pain 2=minimal 1=moderate 0=severe
Surgical bleeding 2=minimal 1=moderate 0=severe

Figure 1: The modified Post-Anesthesia Discharge Scoring System

Piergaspare Palumbo and Maria Antonietta Pacile tested the effectiveness of the Post Anesthesia Discharge Scoring System(PADSS) among two thousand four hundred patients by recording the rate of post-operative adverse symptoms and readmissions to hospital. They came to conclude PADSS to be a safe and efficient system for discharging patients. (3,4,39).

Lucio Trevisani et all investigated whether the post anesthesia discharge scoring criteria was as safe as clinical criteria for discharge decision and allow early discharge. They studied 220 patients undergoing colonoscopy. They concluded that the PADS score is just as safe as the clinical criteria and allows earlier patient discharge after colonoscopy done and general anesthesia. (40).

The Aldrete scoring system can be used in deciding whether a patient has recovered enough to be transferred to phase 2 recovery where a PADSS can be instituted to assess home readiness. In its original form, the Aldrete score assigned a score of 0,1 and 2 to every parameter in the system. The maximum score is 10 and once a patient attains a score of nine or more then the discharge assessment can begin. (4,18,20).

With the widespread use of pulse oximetry, a Modified Aldrete scoring system was introduced. It uses 5 parameters: activity, respiration, circulation, consciousness and oxygen saturation. A score of 9 indicates readiness of discharge.

Modified Aldrete score
• Consciousness
2= Fully awake 1= Arousable 0=not responding
• Mobility
2= Able to move four extremities on command
1= Able to move two extremities on command
0= No movement of any extremities on command
• Breathing
2= Breathes deeply 1= Dyspnea 0= Apnea
• Circulation
2= Systemic BP 20% of pre-anesthetic value
1= Systemic BP 20-40 % pre-anesthetic value
0= Systemic BP >50 % pre-anesthetic value

• Color
2= Normal 1= Pale, jaundiced 0= Cyanotic
• O2 saturation
2= >90% on room air
1= Needs supplemental oxygen to achieve saturations >90%
0= Oxygen saturations<90% despite oxygen supplementation

Figure 2

2.5 Research Question

What is the incidence of post-operative complications that may affect recovery following day care surgery for the first 24 hours?

2.6 Main Objective

To determine the incidence of post-operative complications among patients undergoing day-care surgery at KNH.

2.7 Specific objectives

- 1.To find out the incidence of post-operative complications within 24hours after discharge.
- 2.To find out risk factors associated with postoperative complications
- 3.To determine the average length of stay in PACU following daycare surgery.

2.8 Conceptual/Theoretical Frame work.

Day care surgery services are increasing worldwide due to advancement in newer and safer anesthetic and surgical techniques. The procedures performed are also becoming diverse in both type and complexity as they span from the range of biopsies done under local anesthesia to intra-abdominal laparoscopic procedures performed in offices, free standing ambulatory centers and ambulatory units in hospitals. Very few if any ambulatory procedures are emergent and in comparison to inpatient care, ambulatory patients are generally in stable clinical state. They are however still subject to most of the postoperative complications as patients undergoing inpatient surgery albeit at lower frequency. The only adverse events that may be unique to ambulatory surgery are those that arise out of the circumstance of discharging a post-operative patient to an environment lacking skilled nursing care.

From literature, it's evident that post-operative recovery in day care surgery is dependent on many factors such as type of surgery, conduct of anesthesia, patients clinical condition and comorbidities together with behavioral and demographic characteristic which influence occurrence of adverse postoperative symptoms. Several investigations on the subject of recovery have however accorded modern ambulatory surgery an impressive safety record. However, post-operative complications ranging from life threatening ones such as myocardial infarction, pulmonary embolism, stroke to pain, PONV, urinary retention, hemorrhage,

confusion and many others still occur leading to delay in discharge, unanticipated admission and return to hospital.

Limited data exists regarding recovery of patients post day care surgery in our setting with one study investigating only occurrence of pain in a tertiary hospital in Nairobi. The prevalence among 150 patients was 58% within thirty minutes of surgery and 55% after twenty-four hours.

By examining patients aged 18-65 years undergoing daycare surgery under different modes of anesthesia, we will identify the frequency with which postoperative complications occur and predict what factors influence their occurrence. This will aid in developing best clinical framework in handling day care surgery patients.

Figure 3 Schematic

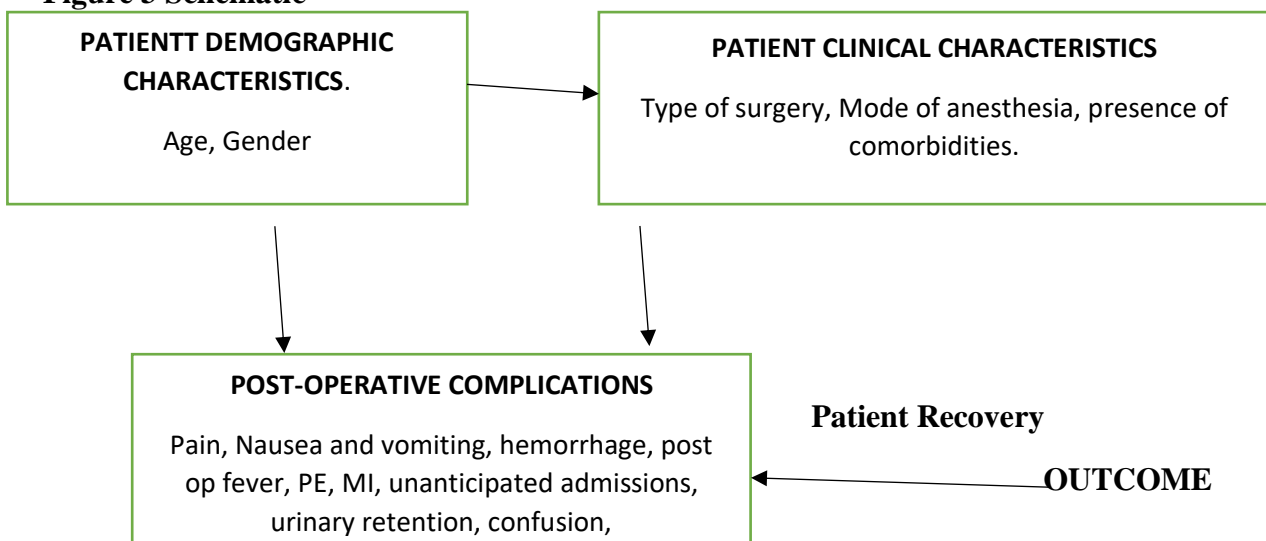


Figure 3: Conceptual framework highlighting the relationship between demographic and clinical characteristics of patients scheduled for daycare surgery and postoperative complications.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Research Design:

A prospective observational cohort study.

3.2 Study site:

The study was conducted at the Kenyatta National Hospital daycare centers, an approximately two thousand bed capacity referral and teaching hospital for the University of Nairobi. It has twenty-one theatres performing both inpatient and daycare surgeries. The daycare procedures performed include gynecological, dental and general surgical procedures.

3.3 Target population:

All adult patients who were scheduled for day care surgery at Kenyatta National Hospital. They included patients undergoing gynecological, general surgery and dental procedures. All the patients were of sound mind and gave the consent willingly. Every patient recruited had a mobile phone.

3.4 Sampling method

Stratified Random Sampling. It involves dividing the entire population into homogenous groups called strata, in this case dental, gynecological and general surgery patients. Random samples of consenting patients were selected from each stratum. An overall population sample size was taken in a number proportional to the strata's size when compared to the population.

3.5 Sample size determination.

The sample size was obtained from 3 different study sites; the gynecological day surgery center, day care general surgery and dental unit with an estimated target population of approximately 180 patients.

In the month of January, February and March 2020, between 50 and 70 patients were seen cumulatively in these units. About seven, three and five-day care patients were served per week including gynecology, dental and general surgical patients respectively. The data collection was conducted between August and November 2021, both months inclusive with a target population of approximately 180 patients.

Sample size was obtained using Yamane's Formula.

$$N = n / (1 - n \cdot e^2)$$

$$n = \text{sample size (x)}$$

$$N = \text{Population size (180)}$$

$$e = \text{Precision Level (5\%)}$$

$$= 124 \text{ patients.}$$

The sample size for each stratum was calculated using the proportionate stratified random sampling formula:

$$n_h = (N_h / N) * n$$

n_h =Sample size for h^{th} stratum

N_h =Population size for h^{th} stratum

N =size of entire population.

n =size of entire sample

=25 from dental clinic,58 from gynecology theatre and 41 from general Surgery.

3.6 Eligibility

3.6.1 Inclusion criteria

- 1) All consenting adult patients undergoing daycare surgery.
- 2) ASA I, II and III
- 3) Patients able to understand and follow instructions.
- 4) Patients with a cell phone.

Exclusion Criteria

- 1) Patients who decline to be enrolled in the study.
- 2) Patients unable to use visual analogue scales
- 3) Patients under 18 years
- 4) Patients with mental or psychological problems, with whom communication would be difficult.

3.7 Study Procedure

3.7.1 Recruitment and Data collection.

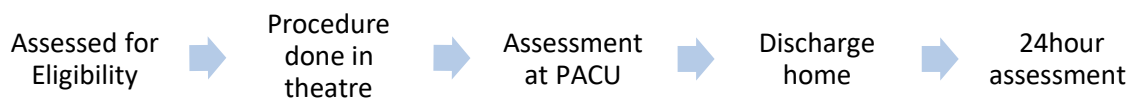
Data was collected using a questionnaire by a trained research assistant and the principal investigator. Patients were assessed upon arrival to theatre reception for eligibility. The purpose of the study was explained to them and consent obtained. Pre-operative assessment was done by obtaining demographic data, approximate weight, diagnosis, surgical procedure to be done and ASA class. In the operation room, administration of anesthesia was left at the discretion of the attending anesthetist. Upon completion of surgery and reversal, the patients taken to PACU were assessed by ALDRETE score every 5 minutes until a score of >9 was achieved.

Thereafter the PADSS was used, scoring the patient every 15 minutes until they attained scores of >9.

Time taken to attain a PADSS of nine and above was recorded. Post-operative symptoms experienced in PACU was noted.

Follow up via telephone 24hrs post discharge was done to determine the well-being of the patients by administering a standard interview.

Participant Flow Chart



3.7.2 Data collection instruments

Data was collected using a standard questionnaire (Appendix I) together with validated discharge criteria protocols (ALDRETE and PADSS) (Figure 1 and 2) A research assistant was trained on the procedure of data collection.

Details recorded include demographic data, diagnosis, ASA class, weight, surgical procedure, anesthesia technique, duration of operation, PACU assessment findings every fifteen minutes and time of discharge. The Visual Analogue Scale for postoperative nausea and vomiting and visual analogue scale for pain were used to assess PONV and pain respectively. Nausea was defined as awareness of tendency to vomit whereas vomiting was forceful expulsion of gastric contents through the mouth.

3.7.3 Data management and Analysis

Data entered and cleaned in Microsoft Excel were analyzed using SPSS (version 21). Demographic and clinical characteristics of patients are presented as frequencies and percentages for categorical data and as means with standard deviations for continuous data. The incidence of post-operative complications was calculated as a proportion of those patients who develop adverse symptoms over the total sample size and presented as a percentage.

The risk factors associated with development of these adverse symptoms were assessed with the use of Chi-square tests and those found to be significant were subjected to multivariate analysis with the use of logistic regression. Odds ratio as well as 95% confidence intervals were calculated and reported where appropriate. All statistical tests are considered significant where the p-value<0.05

3.7.4 Ethical considerations

Permission to carry out the study was sought from the Kenyatta National Hospital administration and KNH-UON Ethics and research committee. Informed consent was

obtained from each participant. No penalty was given for the patients who declined to give consent and neither were incentives given to those who gave consent to take part in the study. Patients were closely and actively monitored for any complications and any adverse effects managed as per protocols. All information obtained from the patient was treated with confidentiality. No additional costs were incurred by the patient for participating in the study. Precaution to prevent the transmission and spread of SARS-COVID 19 disease was done by proper washing and sanitization of hands between patients and procedures and wearing of proper personal protective equipment at all times. All patients scheduled for day care surgery had negative COVID 19 results before recruitment.

3.7.5 Quality assurance Measures

Sampling Bias

Consenting Study participants admitted for day care surgery were randomly selected hence they all stood an equal chance of being included in the study.

Measurement Bias

The questionnaire was simple and clear. The research assistant was trained on how to appropriately fill the questionnaire. The questionnaire was also pretested on a few patients prior to collection of the research data herein.

Information Bias

This was minimized by strict adherence to inclusion and exclusion criteria.

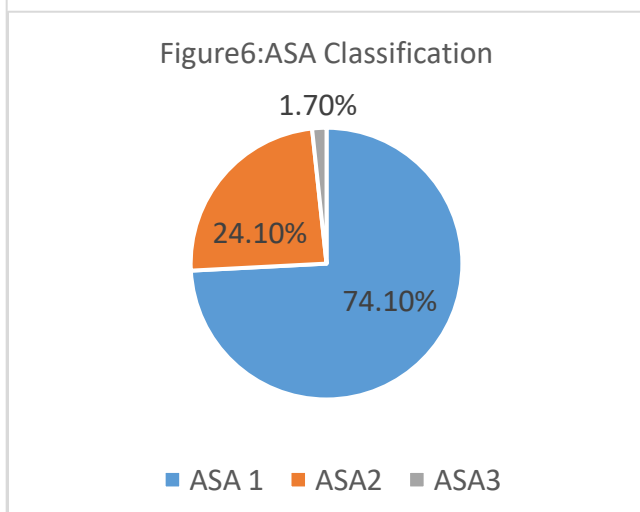
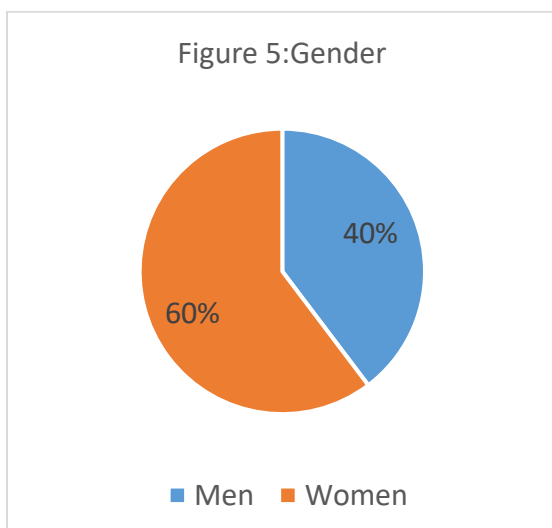
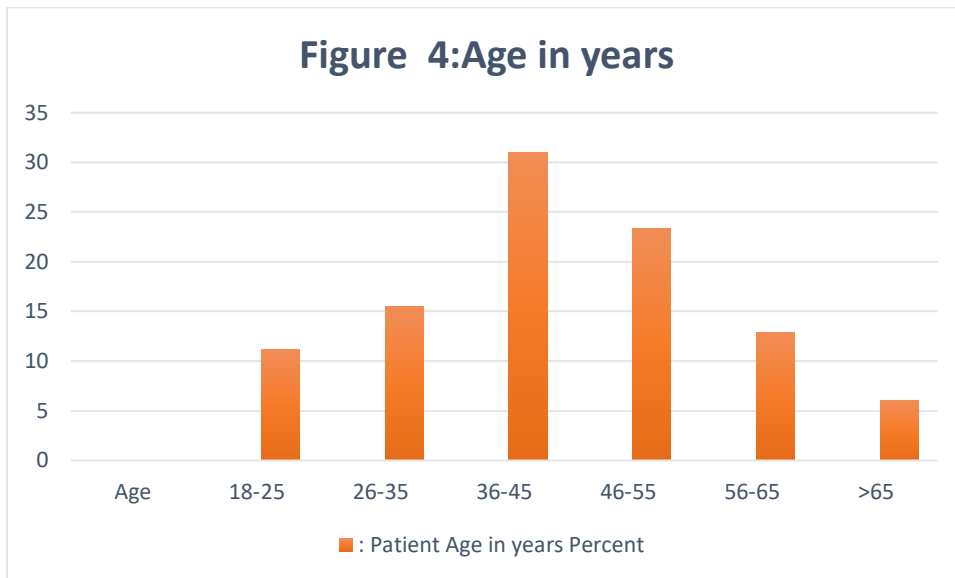
Recall Bias

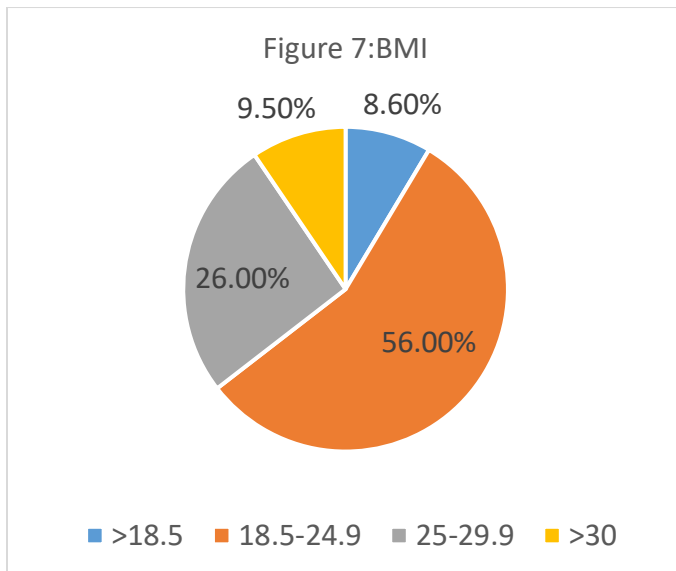
Information was recorded in real time.

4.0 RESULTS

(a) Participant characteristics

A total of 124 patients were recruited for this study. Eight among them were lost to complete follow up. Data were analyzed for the remaining 116 patients. Among them were seventy (70) women and forty-six (46) men consecutively sampled from gynecological, general and dental surgery. The patient characteristics are summarized in figure 4,5 and 6 below.



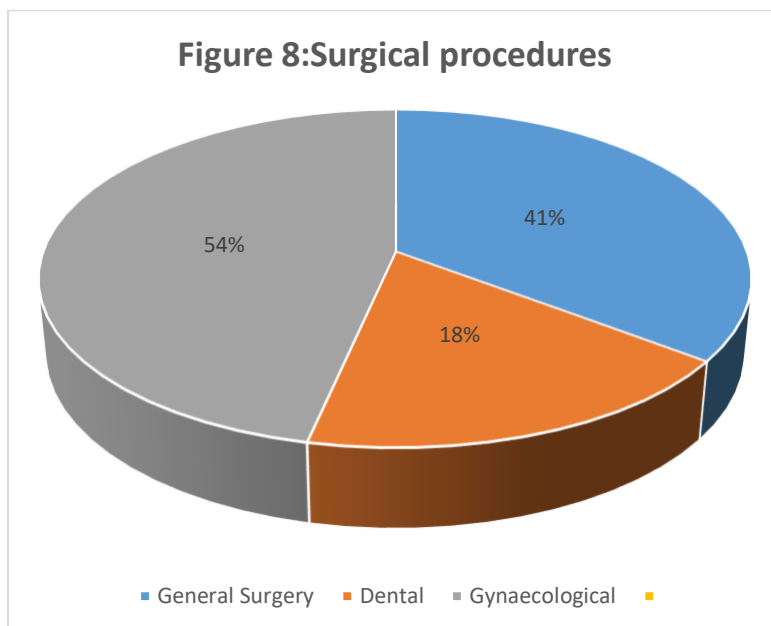


The age of patients ranged between 18-68 years with Majority (31%) being between 36-45 years.

Fifty-six percent of patients had a normal BMI Of 18.5-24.9 with most having been classified as ASA class I (74.1%)

(b) Distribution of procedures

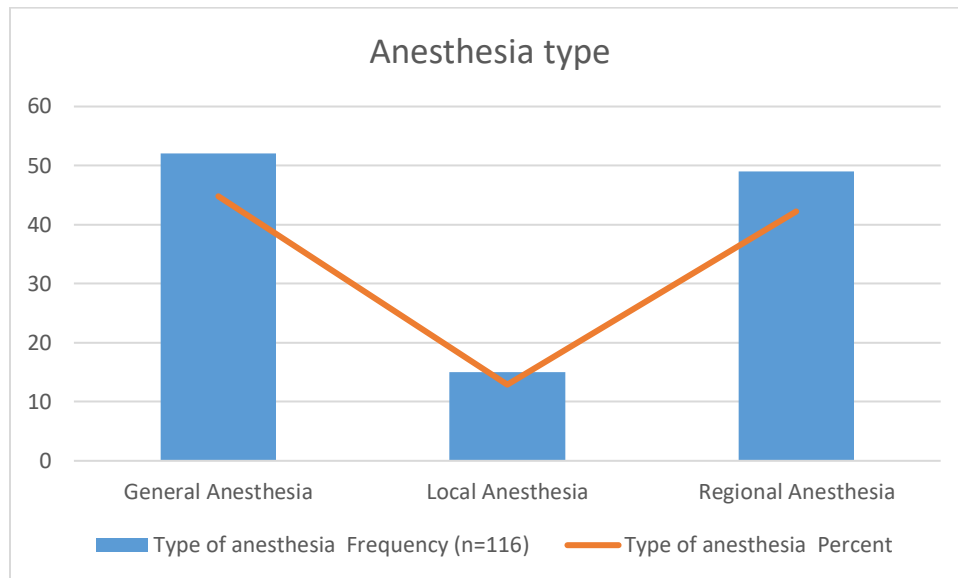
Forty-six percent (46%) of sampled patients underwent gynecological procedures, thirty-five percent (35%) general surgery and eighteen percent (18%) had dental procedures. The procedures done included EUA and biopsy, marsupialization, colonoscopy, endoscopy, teeth extractions and excisions of cysts.



(c) Mode of Anesthesia

Patients had their procedures done under general, regional or local anesthesia. 49% of patients underwent regional anesthesia, 38% general anesthesia and 13% under local anesthesia. 42% received bupivacaine whereas 12% lignocaine as local anesthesia. Of the patients who underwent general anesthesia, 68% were intubated with a standard endotracheal tube, 19% had a supraglottic device whereas 15% were only mask ventilated.

Figure 9



(d) Duration of surgery

The median time of surgery was 45 minutes. 72% of the surgeries took less than 1 hour whereas 28% took between 1-2 hours.

Table 1: Duration of surgery

	Frequency (n=116)	Percent
Less than 1 hour	84	72.4
1 - 2 hours	32	27.6

(e) Duration of anesthesia

Anesthesia was complete within an hour of operation for 73% of patients, with median time being 50 minutes. Only 4% of surgeries took more than 2 hours.

Table 2

	Frequency (n=116)	Percent
Less than 1 hour	73	62.9

1 -2 hours	38	32.8
>2 hours	5	4.3

(f) Use of opioids and other non-opioid analgesic drugs

Majority of patients totaling to 87% received fentanyl 100mcg intra-operatively. 80% were given fentanyl alone, 8.6% together with morphine, 2% and 9% received pethidine and tramadol respectively. 11% of patients didn't receive any opioid. 86% were given either paracetamol alone or combined with other analgesics. 50% of patients were given dexketoprofen as shown in the table below:

Table 3

Analgesic	Frequency (n=116)	Percent
None	13	11.2
Morphine only	2	1.7
Fentanyl only	80	69.0
Morphine and Fentanyl	10	8.6
Fentanyl and Pethidine	2	1.7
Fentanyl and Tramadol	9	7.8
Dexketoprofen	50	43.1
Paracetamol	86	74.1

(g) Anesthetic drugs used

Only 9.5% of patients received full general anesthesia with muscle paralysis which was achieved with atracurium. The other anesthetic drugs given together with anti-emetics are summarized in table 4 and 5 below.

Table 4

Anesthetic drug	Frequency	Percent of patients (n=116)
Ketamine	2	1.7%
Ketofol	6	5.2%
Propofol	44	37.9%
Midazolam	24	20.7%
Isoflurane	16	13.8%
Isoflurane + Nitrous	32	27.6%
Sevoflurane	1	0.9%

Sevoflurane + Nitrous	3	2.6%
Atracurium	11	9.5%
Suxamethoniun	4	3.4%
Nitrous oxide	1	0.9%

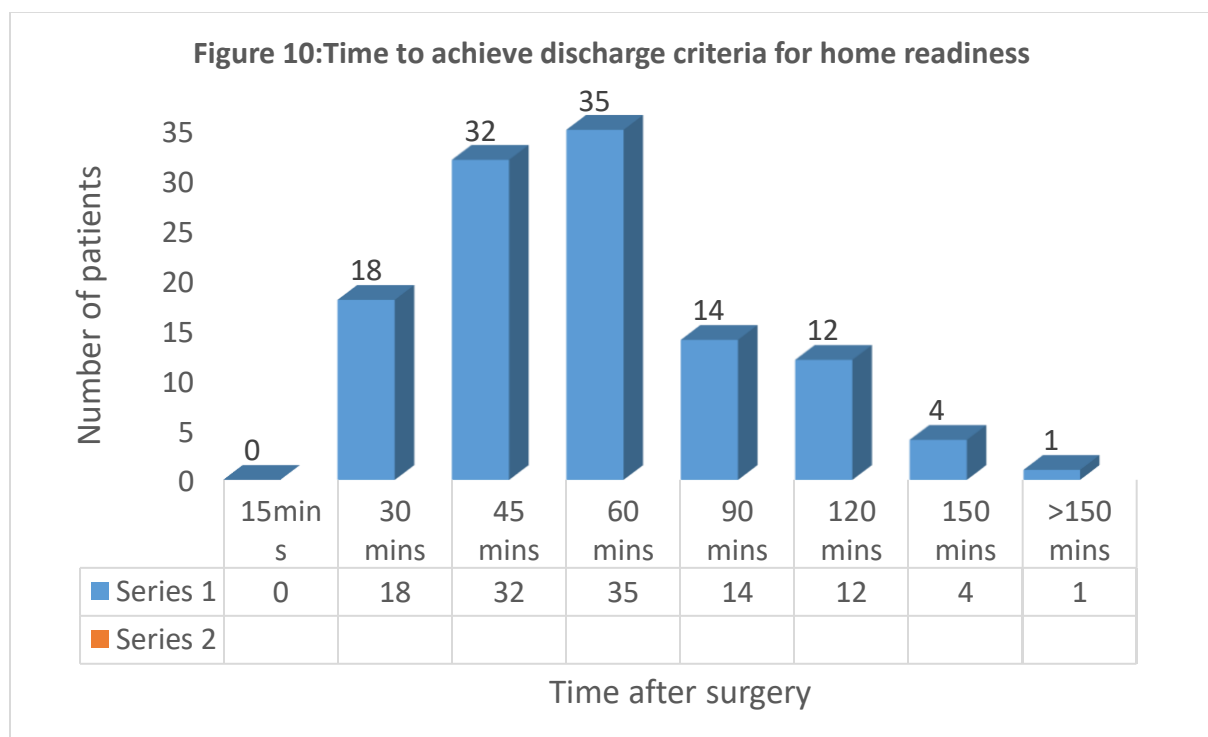
Table 5

Anti-emetic	Frequency (n=116)	Percent
Metoclopramide	25	21.6
Ondansetron	59	50.9
Metoclopramide + Dexamethasone	7	6.0
Ondansetron +Dexamethasone	11	9.5

(h) Time to achieve a standardized discharge criterion

More than half of the patients satisfied the PADS score within one hour after surgery. The fastest patients to recover and meet the discharge criteria were those who underwent surgery under LA, followed by general anesthesia. Patients who received regional anesthesia especially Spinal anesthesia as compared to saddle block took some time for them to regain motor control.

The five parameters used to derive the PADS score are vitals signs, ambulation, nausea, pain and surgical bleeding. Only ambulation took a significant longer time to be achieved among patients who underwent regional anesthesia. Figure 10 summarises the the number of patients who satisfied the PADS score at every 15 minute interval in PACU.



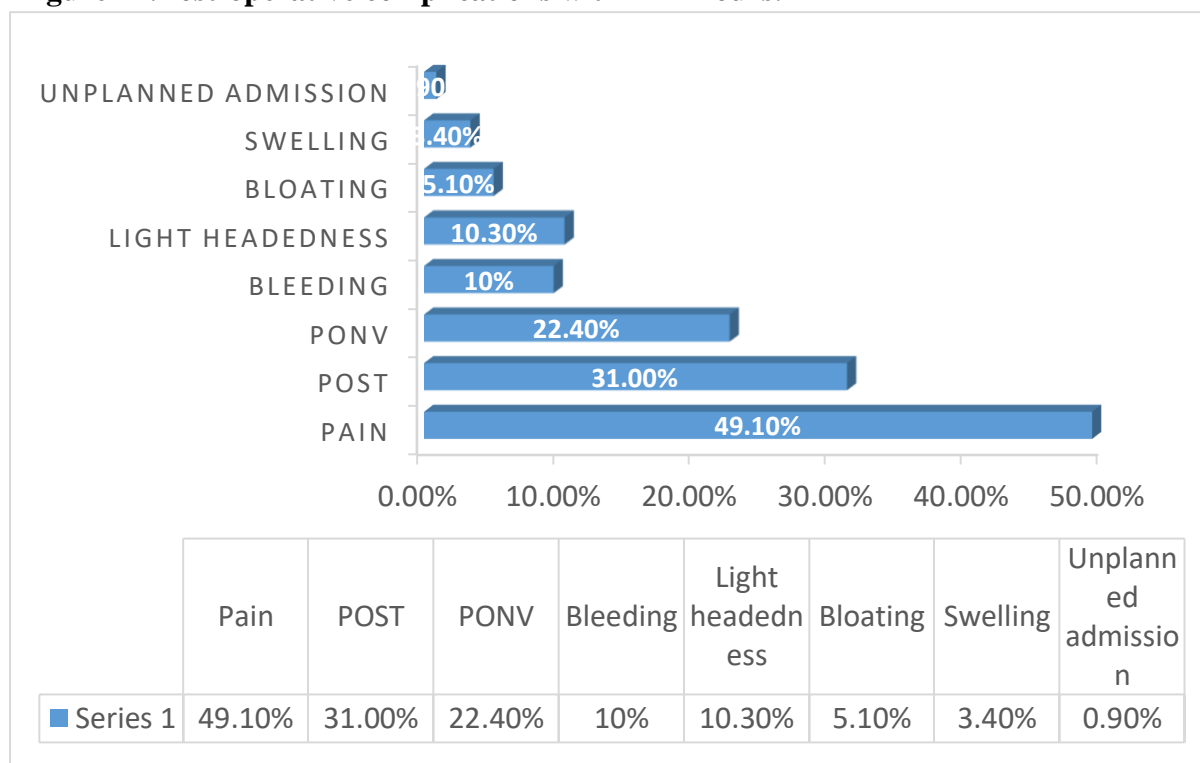
(I) Incidence of post-operative complication

The overall incidence of post-operative complications was 60%. 49.1% of patients complained of pain at surgical site, 9.5% had bleeding, 22.4% nausea and vomiting, 10.3%, light headedness, 5.1% abdominal bloating and constipation, 1% urinary retention and 0.9% unplanned admission. No patient came back to the hospital after discharge within 24 hours of surgery. The symptoms experienced in PACU and at home are summarized in FIGURE 11 and table 6 below respectively:

Table 6: Post-operative adverse symptoms observed in PACU

	Frequency (n=)	Percent
Bleeding	5	4.31
Pain	15	12.9
Hypertension/Hypotension	5	4.31
Sore-throat or Hoarseness	2	1.7
Nausea	6	5.1
Dizziness	4	3.45
Unsteady gait	3	2.6

Figure 11: Post-operative complications within 24 hours.



(j) Perioperative factors associated with post-operative adverse symptoms

Occurrence of post-operative pain was compared to age, gender, type of anesthesia and duration of surgery. There was a significant association of pain and type of anesthesia, type of surgery and use of opioids. There was no relationship of pain and duration of surgery or gender.

PONV was associated with use of opioids and type of anesthesia with no relationship with gender. Use of anti-emetics also affected the experience of pain as shown in the tables below. Bleeding occurred mostly in patients who had undergone gynecological procedures hence affected by type of surgery.

Table 10a: factors associated with pain

Age	Pain		OR (95% CI)	p-value
	Yes, n (%)	No, n (%)		
18-25	6 (10.5)	7 (11.9)	2.1 (0.3 – 15.4)	0.448
26-35	10 (17.5)	8 (13.6)	3.1 (0.5 – 20.6)	0.236
36-45	17 (29.8)	19 (32.2)	2.2 (0.4 – 13.1)	0.371
46-55	16 (28.1)	11 (18.6)	3.6 (0.6 – 22.2)	0.162
56-65	6 (10.5)	9 (15.3)	1.7 (0.2 – 11.6)	0.605
>65	2 (3.5)	5 (8.5)	Reference	
Gender				
Male	24 (42.1)	22 (37.3)	1.2 (0.6 – 2.6)	0.596
Female	33 (57.9)	37 (62.7)	Reference	
Type of Anesthesia				
General Anesthesia	27 (47.4)	25 (42.4)	0.9 (0.4 – 1.9)	0.024
Local Anesthesia	3 (5.3)	12 (20.3)	0.2 (0.1 – 0.8)	0.742
Regional Anesthesia	27 (47.4)	22 (37.3)	Reference	
Surgical procedure				
General surgery	25 (43.9)	16 (27.1)	1.6 (0.7 – 3.6)	0.045
Dental	5 (8.8)	16 (27.1)	0.3 (0.1 – 0.9)	0.802
Gynecological	27 (47.4)	27 (45.8)	Reference	
Use of opioids				
No	54 (94.7)	48 (81.4)	4.1 (1.1 – 15.7)	0.037
Yes	3 (5.3)	11 (18.6)	Reference	

Table 10b: factors associated with nausea and vomiting

Age	Nausea and vomiting		OR (95% CI)	p-value
	Yes, n (%)	No, n (%)		
18-25	7 (26.9)	6 (6.7)	1.6 (0.2 – 9.9)	0.640
26-35	5 (19.2)	13 (14.4)	0.5 (0.1 – 3.2)	0.472
36-45	7 (26.9)	29 (32.2)	0.3 (0.1 – 1.8)	0.322
46-55	2 (7.7)	25 (27.8)	0.1 (0.01 – 0.9)	0.035

56-65	2 (7.7)	13 (14.4)	0.2 (0.03 – 1.7)	0.141
>65	3 (11.5)	4 (4.4)	Reference	
Gender				
Male	6 (23.1)	40 (44.4)	0.4 (0.1 – 1.0)	0.055
Female	20 (76.9)	50 (55.6)	Reference	
Type of Anesthesia				
General Anesthesia	6 (23.1)	46 (51.1)	0.3 (0.1 – 0.8)	0.013
Local Anesthesia	4 (15.4)	11 (12.2)	0.8 (0.2 – 2.7)	0.662
Regional Anesthesia	16 (61.5)	33 (36.7)	Reference	
Duration of surgery				
Less than 1 hour	19 (73.1)	65 (72.2)	1.0 (0.4 – 2.8)	0.932
1 - 2 hours	7 (26.9)	25 (27.8)	Reference	
Use of opioids				
Yes	23 (88.5)	79 (87.8)	1.1 (0.3 – 4.2)	0.035
No	3 (11.5)	11 (12.2)	Reference	

Use of anti-emetics	Yes,N(%)	No,N(%)	OR(95%CI)
Ondansetron	4(35.8)	21(43.2)	3.6(6.04-14.49)
Ondansetron+ dexamethasone	3(5.7)	22(54.7)	Reference
Metoclopramide	17(23.2)	8(54.6)	2.3(3.97-25.92)
Metoclopramide +dexamethasone	3(19.2)	22(30.4)	Reference
Metoclopramide	17(36.6)	8(12.3)	2.1(0.3-16.7)
Ondansetron	4(23.7)	21(34.6)	Reference
Metoclopramide	17(26.7)	8(34.7)	0.9(0.3-0.9)
Placebo	8(23.5)	17(29.8)	Reference

Table 10c: factors for Bleeding

Surgical procedure	Bleeding		OR (95% CI)	p-value
	Yes, n (%)	No, n (%)		
Gynecological	3 (27.3)	38 (36.2)	0.5 (0.1 – 2.2)	0.045
Dental	1 (9.1)	20 (19.0)	0.3 (0.04 – 2.9)	0.322
General surgery	7 (63.6)	47 (44.8)	Reference	

Duration of surgery				
Less than 1 hour	8 (72.7)	76 (72.4)	1.0 (0.3 – 4.1)	0.980
1 - 2 hours	3 (27.3)	29 (27.6)	Reference	

Table 10d factors for lightheadedness

Type of anesthesia	Lightheadedness		OR (95% CI)	p-value
	Yes, n (%)	No, n (%)		
General Anesthesia	6 (50.0)	46 (44.2)	0.9 (0.3 – 3.1)	0.913
Local Anesthesia	0 (0.0)	15 (14.4)	-	
Regional Anesthesia	6 (50.0)	43 (41.3)	Reference	

CHAPTER FIVE

5.0 Discussion

Day care surgery, as it is now commonly practiced not only involves simple, short surgical procedures on healthy patients but also lengthier procedures on geriatric and debilitated patients. This prospective study identified the incidence of adverse post-operative complications within 24 hours of surgery, risk factors associated with these complications and the average length of stay in PACU after day care surgery.

Among the 124 patients recruited, data were analyzed for 116 patients. Eight patients were lost to follow-up as they couldn't be found on phone.

There were 60% female and 40 % male patients. Majority of patients (74%) were ASA 1. 21% of patients experienced significant post-operative symptoms in the recovery room immediately after surgery while 60% reported having one or more of the symptoms at home. These symptoms included pain, nausea, bleeding, delayed ambulation, sore-throat and dizziness.

A study by Chung F et al (2) found an incidence of post-operative symptoms among 4.5 % of patients in PACU and 58% after discharge. The proportion of patients who experienced various complications at home was similar to our study but different compared to symptoms in PACU. The commonest symptom experienced both in PACU and at home in our study was incisional pain at 21% and 49% respectively followed by nausea. A similar study by Chung F et al had an incidence of 45% after discharge which was almost similar to findings in our study.

There was a significant statistical relationship between Pain and type of surgery, mode of anesthesia and opioid use. Gilbert Mwaka and Mung'ayi in their study (22) found an incidence of pain at 20.7% in PACU which was similar to our findings among patients in PACU but different from the incidence at home. However, they found a higher incidence of pain after discharge (58%). Experience of pain was related to type of surgery and anesthesia. In our study, opioid use and type of anesthesia had a strong association with those patients who experienced severe pain having not received any opioid or were given fentanyl alone. Those patients who underwent regional anesthesia had no pain in PACU, with very few reporting pain after discharge. There was no significant association between pain and duration of surgery, age or gender. These findings were similar to Mwaka's study (22).

5% of patients had PONV in PACU whereas those who reported experience within 24hrs post discharge were a proportion of 22.4%. A study by Apfel et al (19) found an incidence of 17% which was almost similar, with gender, prior history of PONV, opioid use, BMI and non-smokers singled out as significant risk factors.

PONV in our study was associated with the use of opioid, gender and type of anesthesia. Patients who had received intraoperative opioids had a twofold risk of developing PONV than those who had not. Many patients who had undergone general anesthesia experienced PONV both in PACU and at home.

Davenport et al reported an incidence of 21%(25), Steward et al 15% (16) whereas Fahy and Marshal et al (4) had a fairly low incidence of 2.9% compared to our study.

88% of the patients received an anti-emetic. Of these only 22.4% experienced nausea or vomiting at home, with approximately 70% having been given metoclopramide or no prophylaxis. All the patients that experienced Nausea in PACU had received two opioids. There was no difference of risk in developing nausea between those who received ondansetron combined with dexamethasone or ondansetron alone. In this study, metoclopramide with or without dexamethasone or no prophylaxis had the same risk.

Thus, ondansetron alone was enough to prevent PONV, and better than metoclopramide with or without dexamethasone. Metoclopramide did not seem to have any effect on PONV. In a study by Polati E et al (41), Ondansetron 4mg was more effective than metoclopramide 10 mg and placebo in preventing PONV.

Golembiewski et al (25) showed a paradoxical increase in rate of nausea in all the three prophylactic anti-emetics used, that is ondansetron, metoclopramide and dexamethasone. However, Tugsan et al (36) showed that dexamethasone 8mg significantly reduced PONV and was effective as Ondansetron 4mg and metoclopramide 10mg.

4 % of patients had some bleeding that was controlled in PACU before discharge. 3.4 % reported some degree of bleeding while at home that however didn't warrant coming back to hospital. This was related to type of surgery as was mostly observed among gynecological patients. A study by Tayler et al (11) found an incidence of 4% whereas Chung F et al⁴ reported 1.9%, with type and duration of surgery being significant determinants

The Incidence of post-operative sore throat was 31% after discharge which was associated with duration and type of surgery. Some patients who underwent spinal anesthesia and those whom their airway was managed by a supra-glottic device reported POST. This was an unexpected finding. Though there is limited literature that might explain this, it is possible that it was due to a multiplicity of causes such as the use of airways, premedication with drugs that diminish airway secretions, the use of mildly irritating anesthetic agents and unduly with-holding of post anesthetic fluids.

This incidence was similar to that reported by Davenport et al (10) but lower than the 14% reported by Ahlgen et al (36). Both studies related POST to type of surgery and duration.

There were other minor complications that were of significant importance. One patient was admitted after surgery due to heavy bleeding post operation. None of our patients returned to hospital after discharge. Compared to FA Zulfiquer and K Pattanayak study, (36) Out of 2592 patients studied, 10.3% were readmitted due to several reasons that were either surgical (43%), anesthetic (25%), medical (12%), PONV (11%) or POUR (7%).

Some patients also experienced bloating (1%), urinary retention (5%) and light headedness (10.3%). A study by Chung F et al (4) recorded similar proportion for light headedness (10%).

Pavlin et al (30,32) in his two studies on bladder function and voiding after day care surgery found a prevalence of 0.5% in low risk and 5% in high risk patients among 329 patients. High risk patients are those that had undergone spinal anesthesia or urological and gynecological surgeries.

Tamella et al (34) showed that roughly 3.8% of general surgical patients develop post-operative urinary retention.

In our study, most of the patients who experienced difficulty in voiding were gynecological patients who had undergone regional anesthesia, a finding that was not clinically significant.

Time to achieve standardized discharge criteria

73% of patients had achieved a satisfactory discharge criteria (PADDS) by 1-hour post-surgery. 16%, 43%, 73%, 85%, 95% and 99% at 30 minutes, 45 minutes, one hour, one and a half hours, two hours and two and a half hours respectively.

Post-operative symptoms in PACU prolonged length of stay in PACU.

In Chung F et al study (2), 82% of patients were discharged within 2 hours and 95% within 3 hours. Post-operative persistent symptoms occurred in 4.4% of patients. Time to home-readiness was 2.5 times longer and incidence of 24hr post-op symptoms 2-8 times higher in the group that had persisted symptoms in PACU.

There was no correlation between experience of symptoms in PACU and at home for our study.

Somchai Amory tin MD et al (12) found out that the number of patients who satisfied the PADSS criteria was 81.6%,97.9% and 100% at 30,60 and 90 minutes respectively with no patient experiencing adverse symptoms post discharge.

CONCLUSION

The overall safety record of modern ambulatory anesthesia is impressive. However, this does not negate the need to recognize and treat the various complications that arise after day care surgery (1).

Incidence of post-operative complications was 60% among 69 women and 47 adult men undergoing daycare operations at KNH.

Commonest experienced complications were pain (49.1%), nausea and vomiting (22.4%).

There was a significant association between pain and type of surgery, type of anesthesia and use of opioids. No association between pain, gender and age. Gender, mode of anesthesia, being female, use of opioids and duration of surgery were singled out as risk factors for nausea and vomiting.

All the patients who reported to have urinary retention had undergone regional anesthesia. Bleeding was mostly experienced by patients who had undergone gynecological procedures.

73% of the patients were ready to be discharged by one hour of completing surgical procedure with the average time in PACU being 50 minutes.

Incidence of POST was surprisingly high (31%) despite many patients having not been intubated.

RECOMMENDATIONS

Day care surgery can safely be done under any mode of anesthesia. Consistent use of standardized discharge criteria can ensure prompt safe discharge of patients into their home environment.

Follow up of patients for much longer(>24hours) is necessary to detect incidence and severity of complications as a quality assurance measure.

More studies are required to compare different types of anesthesia, different drugs and to look at individual complications in detail and to find out the factors that delay discharge from the DSU after achieving home readiness criteria. We should also develop Protocol based management for pain, nausea and vomiting for daycare surgical patients.

STUDY STRENGTH

Our Subjects were homogenous (adult and elective) which provides representative results.

LIMITATIONS

The limitations of this study included the fact that the type of surgeries performed at KNH day care units are of minor and intermediate complexity. Not all surgical disciplines perform day care surgeries. We were not able to complete follow up for four patients after discharge. Two of them had their phones off, whereas the other two did not answer the call. Our survey

also covered a relatively small sample size compared to other studies. Data collection tools also relied on patient reporting and have significant interpatient variability

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Appendix I(a)

PARTICIPANT INFORMATION AND CONSENT FORM. (ENGLISH VERSION)

Title: A study on post-operative complications among patients undergoing day-care surgery at Kenyatta National Hospital.

Principal investigator: Lydia Undisa Chahilu, a post graduate student, University of Nairobi.

Study site -Kenyatta National Hospital day care surgical centers.

Introduction.

I would like to tell you about a study being conducted by the above listed researcher. The purpose of this consent form is to give you the information you will need to help you decide whether or not to be a participant in the study. Feel free to ask any questions about the purpose of the research, what happens if you participate in the study, the possible risks and benefits, your rights as a volunteer, and anything else about the research or this form that is not clear. When we have answered all your questions to your satisfaction, you may decide to be in the study or not. This process is called 'informed consent'. Once you understand and agree to be in the study, I will request you to sign your name on this form. You should understand the general principles which apply to all participants in a medical research: i) Your decision to participate is entirely voluntary ii) You may withdraw from the study at any time without necessarily giving a reason for your withdrawal iii) Refusal to participate in the research will not affect the services you are entitled to in this health facility or other facilities.

May I continue? **YES / NO**

This study has been approval by The Kenyatta National Hospital-University of Nairobi Ethics and Research committee.

Purpose of Study.

The researcher listed above or her research assistant will be interviewing patients undergoing day care surgery at KNH. The purpose of the study is to find out the incidence of post-operative complications experienced by patients after day care surgery. Participants in the study will be asked questions about their experience of unpleasant symptoms post-operatively. There will be approximately one hundred and fifty participants randomly chosen. Am asking for your consent to consider participating in the study. This will help improve quality of care given to patients in this hospital.

Participation

Participation is voluntary and you are free to withdraw from the study at any point. If you agree to participate, you will be interviewed by a trained interviewer in a private area where you feel comfortable answering questions. The interview will last approximately five minutes before operation and you will still be assessed post operatively for the period you will be in hospital. We will ask questions about your personal details and health condition including any relevant medical history before procedure. After undergoing your operation, you will be asked questions about any unwanted symptoms experienced such as pain, nausea, vomiting, sore throat and bleeding. Your vital signs will also be monitored closely. You will then be discharged after we ascertain that you are fit to go home. We will also ask for your telephone contact for follow up after discharge. If you agree to provide your contact information, it will be used only by people working for this study and will never be shared with others. There will be no extra cost incurred to you other than the usual hospital cost of care. Similarly, there will be no financial benefits for participation and the whole process shall not alter or delay your planned treatment. The information you give will help us improve quality of care.

Risks of participation

This being an observational study, your planned treatment will not be affected.

Confidentiality

All the information obtained shall be held with utmost confidentiality. We shall use a serial number to identify you in a password protected computer data base and will keep all our paper records in a locked file cabinet.

Sharing of results

The results obtained from this study shall only be shared with other experts through formal platforms.

Consent form**Patient's section.**

I.....of or I
.....next of kin
to.....of.....

Have read/been read to the information on this consent form concerning the study about incidence of post-operative complications after day care surgery at Kenyatta National Hospital. I have been explained to and understood everything that pertains the study and my questions fully addressed. I have not been coerced or enticed to participate and am voluntarily agreeing to participate. I also understand that I have a right to withdraw from the study at any point without any influence in my treatment. I understand that all efforts will be made to keep information regarding my personal identity confidential.

By signing this consent, I have not given up on the legal rights that I have as a participant in the research study.

Participants signature/Thump stamp..... Date.....

Researcher's section

I, the undersigned, have fully explained the relevant details of this research study to the participant/next of kin to the participant named above and addressed all their concerns. I believe that the participant has understood and has willingly and freely given his/her consent.

Researcher's name.....Date..... Sign.....

Appendix I(b) (SWAHILI VERSION)

FOMU YA MAKUBALIANO YA KUJIUNGA NA UTAFITI

Fomu hii ya utafiti ni ya wagonjwa ambao wanahudumiwa katika hospitali kuu ya Kenyatta na wamealikwa kujiunga na utafiti.

A STUDY ON INCIDENCE OF POST-OPERATIVE COMPLICATIONS AMONG PATIENTS UNDERGOING DAY-CARE SURGERY AT KENYATTA NATIONAL HOSPITAL.

Jina langu ni Lydia Chahilu, mwanafunzi katika chuo kikuu cha Nairobi, sehemu ya anaesthesia na ninafanya utafiti wa kuchunguza mambo yanayoadhiri wagonjwa kupona na kupewa ruhusa baada ya kufanyiwa upasuaji.

Nia ya utafiti

Utafiti huu ni wa kuchunguza jinsi wagonjwa wanaofanyiwa upasuaji na kwenda nyumbani wanavyoadhirika baada ya upasuaji na mambo gani yanayofanya kutoruhusiwa nyumbani wakati ufaao.

Kujumuishwa kwako

Kushiriki katika utafiti huu ni kwa hiari yako,mtafiti mkuu atakueleza na utatakiwa kutia sahihi kama kubalio la kushiriki.

Siri

Majina yako hayatatumika katika utafiti na usiri mkubwa utatumika .

Madhara au manufaa ya kushiriki katika utafiti.

Kushiriki katika utafiti huu hautakuwa na manufaa yoyote kwako binafsi ila utatusaidia kuimarisha matibabu ya wagonjwa hapo baadaye.Hakuna malipo utakayo lipa zaidi ya malipo ya hospitali au pesa utakayopewa kushiriki.Matibabu yako hayataadhirika kwa njia yeyote kwa sababu ya kushiriki.

Uhuru wa kujiondoa

Uko na ruhusa ya kujiondoa kwa utafiti wakati wowote na matibabu yako hayataadhirika kwa njia yoyote kwa shauri hii.

Idhini ya utafiti

Utafiti huu umeidhinishwa na KNH/UON Ethics and Research committee.Baada ya utafiti,habari hii itachapishwa katika kitabu kinachowekwa kwa maktabaa ya chuo kikuu cha Nairobi.

Ikiwa utakubali kushiriki tafadhali tia sahihi au kidole gumba kwenye fomu ya makubaliano ya kushiriki ambayo utapewa hivi punde.

Nambari yangu ya simu ni:0713267300

FOMU YA IDHINI

Mimi.....kutoka.....au mimi ni jamaa wa karibu wa.....kutoka nimekubali kushiriki katika utafiti huu wa:

A STUDY ON INCIDENCE OF POST-OPERATIVE COMPLICATIONS THAT AFFECT DISCHARGE AND RECOVERY OF PATIENTS UNDERGOING DAY-CARE SURGERY AT KENYATTA NATIONAL HOSPITAL.

Ninaelewa ya kwamba uchunguzi utafanyika bila madhara yoyote kwangu au jamaa wangu. Nina uhuru wa kujiondoa kwa utafiti huu wakati wowote.

PADSS at 15minutes.....@30 minutes.....@45
minutes.....@1hour.....

Time of discharge=

24-hour post discharge assessment questionnaire

- Date and time of post-operative call.....
- Any problems since discharge? a). Yes b) No
- Have you experienced any significant bleeding? a) Yes b) No
- Did you experience pain at any site? a) Yes b) No
- Any nausea and vomiting?.....
- Any headache, fainting or light headedness?.....
- Any generalized discomfort or weakness?.....
- Any other complains.....
.....
- Medications taken since discharge?.....
.....
- Did you have any reasons to come back to the hospital?..... If Yes, state reasons
why?.....
- Any additional comments?.....
.....

THE VISUAL ANALOGUE SCALE

Ambulation 2=steady gait/no dizziness 1=with assistance 0=none/dizziness
Nausea and Vomiting 2=minimal 1=moderate 0=severe
Pain 2=minimal 1=moderate 0=severe
Surgical bleeding 2=minimal 1=moderate 0=severe

Figure 1: The modified Post-Anesthesia Discharge Scoring System.

APPENDIX III: BUDGET

3.8 STUDY BUDGET

RESEARCH ASSISTANT	50,000
STATISTICIAN	30,000
STATIONARY	5,000
PRINTING & BINDING	10,000
ETHIC & RESEARCH COMMITTEE FEE	2,000
MICELLANEOUS	5,000
AIRTIME	2000
TOTAL	104,000