

**FACTORS INFLUENCING THE CHOICE OF
ANAESTHESIOLOGY AS A SPECIALTY AMONG KENYAN
MEDICAL OFFICERS**

**A DISSERTATION SUBMITTED IN PART FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTERS OF
MEDICINE IN ANAESTHESIA OF THE UNIVERSITY OF NAIROBI**

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DECLARATION

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I hereby declare that this dissertation is my original work and that it has not been submitted to any university for the award of a degree or any other purpose.

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TABLE OF CONTENTS

DECLARATION.....	ii
TABLE OF CONTENTS	iii
ABSTRACT.....	v
LIST OF ABBREVIATIONS.....	vii
DEFINITION OF TERMS.....	viii
1 INTRODUCTION.....	1
1.1 History of Anaesthesiology	1
1.2 The Scope of Anaesthesiologists.....	1
2 LITERATURE REVIEW	4
3 STUDY OBJECTIVES	7
3.1 Main Objective.....	7
3.2 Specific Objectives.....	7
4 STUDY JUSTIFICATION	8
5 STUDY QUESTIONS.....	9
6 RESEARCH METHODOLOGY	9
6.1 Study Design	9
6.2 Study Area.....	9
6.2.1 Geographical map of Kenya.....	10
6.3 Study Population	11
6.4 Sampling Procedure and Sample Size Determination.....	11
6.4.1 Sampling Procedure	11
6.4.2 Sample Size Determination.....	11
6.5 Inclusion Criteria.....	12
6.5.1 Exclusion Criteria.....	12
6.6 Data Collection Tool	122
6.7 Data Collection Procedure	133

6.8	Validity and Reliability of Research Instrument.....	13
6.8.1	Pre-test	13
6.8.2	Validity and Reliability of Research tool.....	133
6.9	Data Management	14
6.10	Ethical Considerations.....	14
7	RESULTS.....	15
7.1	Demographic characteristics.....	15
7.2	Choice of specialty.....	18
7.3	Choice of anaesthesiology.....	22
8	STUDY LIMITATIONS.....	30
9	DISCUSSION	30
10	CONCLUSION.....	31
11	RECOMMENDATIONS.....	31
12	REFERENCES	3132
	APPENDIX I: CONSENT EXPLANATION	35
	APPENDIX II: CONSENT FORM	36
	APPENDIX III: SELF-ADMINISTERED QUESTIONNAIRE.....	37
	APPENDIX IV: UNIVERSITY ATTENDED.....	41
	APPENDIX V: COUNTRY OF MEDICAL SCHOOL.....	42
	APPENDIX VI: COUNTY OF WORK STATION.....	43
	APPENDIX VII: KNH/UON -ERC APPROVAL.....	44
	APPENDIX VIII: DECLARATION OF ORIGINALITY FORM.....	45

ABSTRACT

Background

The scope of anaesthesiologists has expanded tremendously in recent years. Despite its central role in modern healthcare delivery, medical officers have had difficulty in settling for anaesthesiology as a prospective career choice. This has led to a shortage of physician anaesthesiologists in the country. As a result, many anaesthetics are performed by non-physician practitioners.

Objectives

The objectives were to identify the factors influencing the choice of anaesthesiology as a specialty among Kenyan medical officers, to determine factors that attract and those that deter doctors from the specialty and to propose measures that can be taken to make the specialty more attractive among medical officers to reduce the existing shortage.

Methods

This was a cross sectional descriptive study design. Each of the 290 participants was contacted directly via phone call and email and the nature of the study explained. Thereafter the principal investigator or the research assistants personally visited the doctors in their facilities. The nature of the study was explained again and consent sought. After reading and understanding the consent explanation, participants signed the consent form and proceed to filling the self administered questionnaire. On completion, questionnaires were handed back to the principal investigator or research assistants for data analysis.

Results

All 290 completed forms were returned duly filled; 166(57%) of the respondents were males while 124 (43%) were females. The average age of the participants was 27.58 years. Only 13(4.5%) of the participants chose anaesthesiology as their first choice, 16(6.6%) as a second choice and 6(3.1%) as a third choice. The most preferred specialties of choice were surgery 125(44.8%), obstetrics and gynaecology 94(33.7%), paediatrics 73(26.2%) while internal medicine was at 60 (21.5%). The factors that attracted those who selected anaesthesiology as a career choice were; financial and material rewards, length of postgraduate program and flexible working hours. Those that did not select anaesthesiology cited dependence on surgeons, long/inflexible working hours, minimum patient contact and little previous exposure to the specialty as the main deterrents. To improve the experience at undergraduate level, it was suggested to increase the rotation time and to have a more practical teaching approach. In addition, at internship level, it was suggested that a mandatory anaesthesia rotation be introduced to increase exposure to the specialty.

LIST OF ABBREVIATIONS

MPDB	-	Medical Practitioners and Dentists Board.
KSA	-	Kenya Society of Anaesthesiologists
ASA	-	American Society of Anaesthesiologists
KNH	-	Kenyatta National Hospital
U.O.N	-	University of Nairobi
M.O	-	Medical officer
C.O	-	Clinical officer
PACU	-	Post Anaesthesia Care Unit
ICU	-	Intensive Care Unit
KDHS	-	Kenya Demographic and Health Survey
KNH/UON-ERC	-	Kenyatta National Hospital/University of Nairobi- Ethics and Research Committee

DEFINITION OF TERMS

1. **Medical officer intern:** A doctor in internship training, who has attained the degree of Bachelor of Medicine and Bachelor of Surgery (MBChB) or its equivalent, but does not have a full license to practice medicine unsupervised.
2. **Medical officer:** A doctor who has attained the degree of Bachelor of Medicine and Bachelor of Surgery (MBChB) or its equivalent, completed internship and is licensed to practice medicine unsupervised.
3. **Registrar:** A Medical officer pursuing a clinical postgraduate specialty.
4. **Consultant:** A consultant doctor is a senior doctor who practices in one of the medical specialties after completion of a Masters degree and has been recognized by the medical practitioners and dentists board.
5. **Clinical officer anaesthetist:** A clinician with a diploma in clinical medicine and surgery who has attained a Higher National Diploma (HND) in anaesthesia and is licensed to administer anesthesia in Kenya.
6. **Nurse anaesthetist:** Nurse with a diploma from the Kenya Registered Nurse Anaesthetist Program (KRNA) who provides anaesthesia under supervision.
7. **Level 4 hospitals:** Sub county hospitals.
These are hospitals operating in, and managed by the county. They are comprised of the former district hospital, staffed by medical officers, clinical officers and a few consultants. They have the resources to provide comprehensive medical and surgical services.¹
8. **Level 5 hospitals:** County hospitals.
They act as referral hospitals to the sub county hospitals. They also provide specialized care including intensive care. They are staffed by consultants, medical officers and clinical officers. They act as an intermediary between the national central

level and the counties. They oversee the implementation of health policy at the county level, maintain quality standards, and coordinate and control all county health activities.

9. Level 6 hospitals: National referral hospitals.

These are at the apex of the health care system, providing sophisticated diagnostic, therapeutic, and rehabilitative services. Staffed by consultants, registrars, medical officers and clinical officers. The national referral hospitals are Kenyatta National Hospital, Moi Teaching and Referral Hospital, Mathari Mental Hospital and Spinal Hospital.

1 INTRODUCTION

The word anaesthesia is coined from two Greek words: "an" meaning "without" and "aesthesia" meaning "sensation". Anaesthesiology is the practice of medicine dedicated to the relief of pain and total care of the surgical patient before, during and after surgery.

1.1 History of Anaesthesiology

In the light of the limited knowledge of anatomy and physiology in Greco-Roman times, and the fact that anaesthetics as we know them today were only introduced in the 19th century, surgery was a very traumatic experience for patients. However, medicinal plants have for a long time been used as anaesthetics. Most of them had soporific, narcotic or poisonous properties, such as Mandragora, Thorn Apple, Henbane, Hellebore and Poppy. This changed in 1846 when William T. G. Morton, a Boston dentist, successfully used Ether as he removed a tumor from a patient's jaw ². Morton became widely recognized as the founder of anaesthesia as we know it today. Thereafter, scientific and medical interest grew and the use of new, more advanced anaesthetics and the adverse consequences of their use, led physicians to acquire special expertise in anaesthetic administration.

The intravenously-administered anaesthetic induction agent Sodium Pentathal was introduced in 1934 by Dr. John Lundy. It remained the most common anaesthetic induction agent until the introduction of Propofol in 1977. Rubber endotracheal tubes were introduced after World War I, and muscle relaxants in the late 1940s. Those trends led ultimately to the physician anaesthesiologist and the concept of the anaesthesia care team. In 1941, the American Board of Medical Specialties recognized anaesthesia as a new medical specialty, with certification of residency programs and their graduates.

Today anaesthesiology is a core medical specialty world over. According to the American Society of Anaesthesiologists (ASA), there are approximately 40 million anaesthetics administered each year in the United States alone. ³

1.2 The Scope of Anaesthesiologists

In Kenya, anaesthetics are administered by physician anaesthesiologists, clinical officer (C.O) anaesthetists and nurse anaesthetists.

The scope of anaesthesiology has expanded tremendously in recent times. The role of an anaesthesiologist includes preoperative assessment, administration of anaesthesia, and

postoperative care - all aimed at a safe and effective surgery with the best possible patient outcome.

Pre anaesthetic evaluation and treatment in readiness for surgery is one of the key roles played by the anaesthesiologist. Knowledge of the illnesses and the effects on the body of the surgery being performed and anaesthetics to be used, can mean the difference in the quality and outcome of the operation. A careful pre anaesthetic evaluation could detect previously unknown co-morbidities that would require further evaluation before proceeding for the operation, thus preventing poor outcomes of surgeries and even mortalities.

In the operating room, anaesthesiologists are responsible for administering anaesthesia, to relieve pain and for maintaining vital life functions such as heart rate and rhythm, breathing, blood pressure, body temperature, body fluid balance; and control the patient's level of consciousness to make conditions ideal for a safe and successful surgery, with minimal or no harm to the patient. At the end of surgery, they maintain the patient in a comfortable, pain free and stable state during the recovery in the post anaesthesia care unit.

In critical care medicine, anaesthesiologists often lead the clinical team of intensive care units alongside other specialties, providing critical care as they deal with life threatening medical and surgical conditions. During resuscitation, stabilisation and transport of acutely unwell and trauma patients, anaesthesiologists form crucial members of the team that provides airway management, cardiac and pulmonary resuscitation and advanced life support.

An important role of anaesthesiologists is to provide pain therapy. They are responsible for running pain relief clinics, where they deal with acute and chronic pain. They manage post operative pain and also provide patient controlled analgesia. A common example is epidural analgesia and anaesthesia for labour and delivery.

Some anaesthesiologists receive additional training in areas such as cardiac anaesthesia, paediatric anaesthesia, transplant anaesthesia and neuroanaesthesia and can provide specific expertise in those areas.

The scope of an anaesthesiologist also includes the provision of sedation and anaesthesia for patients undergoing various procedures outside the operating theatre e.g. endoscopic procedures, interventional and diagnostic radiology, dental procedures, cardiac catheterisation, radiotherapy and in psychiatric units for patients receiving electroconvulsive therapy (ECT).

Anaesthesiologists are often involved in emergency evacuation of critically ill and injured patients from remote settings to central medical care units. In addition, many anaesthesiologists are active in research, teaching, developing new drugs and equipment to minimize error and increase patient safety and comfort.

Recent estimates in the United Kingdom have shown that anaesthesiologists are involved in the care of about two-thirds of all patients admitted to hospital⁴. This therefore means that each hospital with inpatient facilities should have an anaesthesiologist as part of the clinical team.

In Kenya, the total number of registered physician anaesthesiologists as of June 2014 was 138⁵. Considering a population of more than 44 million Kenyans, this implies that there is only one physician anaesthesiologist for every 318,840 Kenyans. There are also 306 C.O anaesthetists registered with the clinical officer's council. The ratio therefore of physician anaesthesiologists to C.O anaesthetists is 1:3.

The need therefore of anaesthesiology in Kenya cannot be overlooked. What influences or hinders the choice of anaesthesiology as a career is a complexity of factors that needs to be assessed. This study aims to identify the factors determining the choice of anaesthesiology as a career choice among medical officers in Kenya with a view to increase enrolment of doctors to the anaesthesiology specialty.

2 LITERATURE REVIEW

Studies in parts of the developing world show preference of anaesthesiology as a specialty among doctors and medical students is lower than in the developed world.^{6-11.}

A study done in Egypt by Omnia S. El Seifi et al. in 2011 on the ranking of the first career choice of interns and medical students showed only 3.7% chose anaesthesiology as a career choice. The most favoured specialties were obstetrics and gynaecology (18%) and surgery (17%). The most commonly cited reasons were: better career opportunities, family expectations and effective role models in the specialty⁶. Meanwhile in India, Pravin Thorat et al. in a 2007 study on the career choices of medical interns showed 11% preferred anaesthesiology as a career choice citing commitment, good working conditions and social preference as the main reasons. The biggest draw backs were unfriendly working hours and dependence on surgeons. The most preferred specialties were diagnostic imaging and radiology (23%), orthopaedics (18%), internal medicine (17%) and obstetrics and gynaecology (14%)⁷.

T C Onyeka et al. in a 2010 study “Choice of future career amongst medical students in Enugu, Nigeria: Implications for anaesthesiology” showed that, of the 200 students interviewed; only 1% chose anaesthesiology as their first choice and 2% as a second and third choice. The most preferred specialty of choice was surgery (29%), paediatrics and public health (14% each) tied at second place while obstetrics and gynaecology (12%) came in at third place. In the most preferred specialty of second choice, surgery (31%) was first, paediatrics (29%) was second and public health (21%) was third. When asked about their specialty of third choice, public health (27%) came in at first place, internal medicine (23%) took the second place while paediatrics (19%) was third. surgery (12%) was at sixth place and anaesthesia at tenth place. In addition, a short duration of exposure to anaesthesia, insufficient participation in practical anaesthesia and inadequate provision of teaching aids were cited as contributory factors to the problem of limited interest or non-interest in anaesthesiology⁸. A similar study by Eze B I et al. on factors influencing choice of medical specialty of pre-residency medical graduates in south eastern Nigeria, showed only 3.1% of the 316 interviewed, chose anaesthesiology as a speciality of choice. Personal interest in the specialty was the predominant factor that influenced most individuals. Inadequate exposure to anaesthesiology and a brief undergraduate rotation were the main reasons for lack of interest

in selecting it as a preferred medical speciality. The most popular specialties were obstetrics and gynaecology (22.6%), surgery (19.5%), paediatrics (16%), internal medicine(8.4%) and diagnostic imaging and radiology (6.6%). anaesthesiology, psychiatry and dentistry were at the bottom of the list ⁹. In 2011, at the Aga Khan University in Pakistan, Fauzia et al. in a study on anaesthesiology as a career choice in a developing country showed that 8% included anaesthesiology in their first 3 choices and only 1.3% as a first choice. The most commonly cited reason was poor mentorship and ineffective role modelling ¹⁰. In neighbouring Bangladesh, a similar study done in 2009 by S M Moslehuddin Ahmed et al. showed that the popular subspecialty choices were cardiology, obstetrics and gynaecology, internal medicine, paediatrics, cardiac surgery, general surgery, and neurosurgery ¹¹. Meanwhile anaesthesiology, radiology, pathology, microbiology, biochemistry etc, were found to be the less attractive specialties, this was mainly attributed to poor financial rewards and lack of patient recognition.

Anaesthesiology as a specialty seems to be more popular in the developed countries. Weissman et al. in a study published in the Israel Journal of Health Policy Research in 2013 showed that of the 234 medical graduates from Israel interviewed, 28% considered anaesthesiology as their preferred field of specialization ¹². In the United Kingdom, a survey conducted in 2003 by G. Turner et al. about career choices for anaesthesiology: national surveys of graduates of 1974–2002, published in the British Journal of Anaesthesia, showed that the percentage of doctors choosing anaesthesiology, 1 year after qualification, increased from 5 to 12% ¹³. In both the studies, it was found that effective role modelling and a pleasant undergraduate rotational experience were the commonly cited reasons attributed to the improved uptake of anaesthesiology as a preferred career choice.

In North America, a Canadian survey in 1994 by Yang H. et al. on recruitment in anaesthesiology examined why anaesthesiology residents choose the specialty. Four reasons were found to be among the principal reasons for choosing anaesthesiology. They included adequate time off, preference of a hands-on speciality and immediate gratification. Five reasons were found to be among the least popular reasons namely research opportunity, effective role models, good earning potential and pain management skills. It concluded that anaesthesiology recruitment is not related to the duration of undergraduate anaesthesia exposure but is influenced by technical factors such as: hands on specialty, applied basic sciences and life-style factors such as time off and immediate gratification ¹⁴. In the United

States, a similar survey in 2001 by Wass C.T. et al. on the factors responsible for selecting anaesthesiology as a career among doctors also showed that the most frequently cited reasons for selecting anaesthesiology as a career were that it is an engaging hands on specialty, it involves the clinical application of physiology and pharmacology, and that there is adequate time off ¹⁵.

In Kenya, a study at the University of Nairobi, in 2010 by P. Mwachaka et al. titled “Specialty preferences among medical students in a Kenyan university” showed that only 4 (1%) of the 385 students interviewed chose anaesthesiology as a preferred speciality. The specialties of choice were surgery (35%), internal medicine (13.9%), obstetrics and gynaecology (12.9%), public health (6%) and paediatrics (4.6%). The main reasons given for those preferences were:- encouragement by department staff, role models in the specialty, job and financial rewards, prestige of the specialty, lifestyle of practice, ease of raising a family, length of residency training and ease of entry into residency ¹⁶.

3 STUDY OBJECTIVES

3.1 Main Objective

To identify the factors that influence the choice of anaesthesiology as a career choice for medical officers in Kenya.

3.2 Specific Objectives

- To determine factors influencing the field of postgraduate specialty pursued by medical officers in Kenya.
- To identify the factors that attract or deter medical officers from pursuing anaesthesiology as a career choice.
- To propose measures that will attract more doctors to pursue anaesthesiology as a career choice to reduce the existing shortage.

4 STUDY JUSTIFICATION

Anaesthesiology is a unique and important specialty in Medicine. With the rising population, the need to train anaesthesiologists will be pivotal in balancing the surgeon to anaesthesiologist and anaesthesiologist to population ratios in order to meet the rising healthcare demands of Kenya.

There are 4,965 registered medical doctors in Kenya ¹⁷. Among them, there are a total of 874 registered surgeons. The total number of registered physician anaesthesiologists was 138 as of June 2014. The anaesthesiologist to surgeon ratio is 1:6. The shortage is greater due to the uneven distribution as only 28 of the 138 physician anaesthesiologists work in the rural hospitals while the majority practice in the cities of Nairobi, Mombasa and Kisumu.

Considering a population of more than 44 million Kenyans¹⁸, there is one physician anaesthesiologist for every 318,840 Kenyans. There are 306 clinical officer anaesthetists registered with the clinical officer's council. The ratio therefore of Physician anaesthesiologists to C.O anaesthetists is 1:3.

Despite its central role in modern healthcare delivery, medical officers have had difficulty in settling for anaesthesiology as a prospective career choice. As a result, many anaesthetics are performed by non-physician practitioners. Lack of pain clinics and palliative centres in hospitals leads to suboptimal care for patients

It is important to study these factors in order to plan future recruitment strategies to meet the Vision 2030 development programme¹⁹. Healthcare is a key sector under the social pillar of the Vision 2030. During the same period, Kenya expects to meet its Millennium Development Goals (MDGs) by 2015 ²⁰. They include improving level of healthcare in the country by reducing maternal and infant mortalities, combating HIV/AIDS, malaria and other diseases.

The goal of Ministry of Health is to have a physician anaesthesiologist in every level 4 hospital upwards. This can only be achieved by attracting more doctors to the specialty. Such data can also be an important input into the efforts of the healthcare leadership to promote a specialty distribution that matches the population's evolving healthcare needs.

5 STUDY QUESTIONS

1. What are the factors that influence the choice of anaesthesiology as a career among Kenyan medical officers?
2. What measures can be taken to make the specialty more attractive and recruit more medical officers to reduce the existing shortage?

6 RESEARCH METHODOLOGY

6.1 Study Design

This was a cross-sectional descriptive study design carried out in the months of April and May.

6.2 Study Area

This study was conducted among doctors in Kenyan hospitals. Kenya is a country located in East Africa. It lies on the equator with the Indian Ocean to the south-east. She covers 581,309 km² and has a population of about 44 million people ¹⁸. Kenya has a diverse population that includes most major ethnic, racial and linguistic groups found in Africa. There are an estimated 42 different communities, with Bantus and Nilotes constituting the majority of local residents. Cushitic groups also form a small ethnic minority, as do Arabs, Indians and Europeans ²¹, distributed in the 47 semi-autonomous counties drawn from former 8 provinces that had 58 sub-district, 92 district and 6 provincial hospitals. These hospitals are now referred to as national referral hospitals, county hospitals, sub county hospitals, health centers and clinics. Data was collected from private, faith based, national referral hospitals, county and sub county hospitals. Health centers and dispensaries were excluded as these facilities do not serve as internship centers and are run mostly by clinical officers.

6.3 Study Population

The study population comprised of 3918 medical officers including medical officer interns registered and practicing in Kenya.

6.4 Sampling Procedure and Sample Size Determination

6.4.1 Sampling procedure

The sampling frame was Medical Practitioner's and Dentists Board (MPDB) registered medical officers and medical officer interns in Kenya. Participants were stratified according to the 47 counties and level of the hospital they work in (levels 4-6). Thereafter, random samples were proportionately selected using the lottery method where each of the population members was assigned a unique number. The numbers were then thoroughly mixed and a proportionate number was selected per county to be included in the study. This process was repeated for each county. To increase the representativeness of the sample, minimize sampling errors and cater for attrition an additional 10% were included in the sampling procedure.

6.4.2 Sample Size Determination

The sample size was determined by the Cochran (1963:75) formula²² to yield a representative sample as follows:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where

n_0 Is the sample size

Z^2 is the abscissa of the normal curve that cuts off area desired at 95% confidence level (The value for Z is found in statistical tables which contain the area under the normal curve.)

p = estimated proportion of population with desired characteristic

q Is 1-p

e Is the desired level of precision i.e. the statistical significance = 0.05.

Required sample

$$n_0 = \frac{(1.96^2)(.8)(.2)}{.05^2} = 264$$

To increase the representativeness of the sample, minimize sampling errors and increase generalisability of the result and cater for attrition (10%), a sample of 290 doctors was thus used.

$$n \approx 290$$

6.5 Inclusion criteria

- Medical Practitioners and Dentists Board (MPDB) registered medical officers who consented to the study.
- Consenting medical officer interns licensed by MPDB.

6.5.1 Exclusion criteria

- Medical officers and medical officer interns who did not give consent to the study.
- Medical officers already pursuing a postgraduate specialty.

6.6 Data Collection Tool

Data was collected using self administered, structured questionnaires that contain closed and open ended questions. The first section consisted of preliminary categorical data on medical officers' characteristics. The other section consisted of questions on factors that determine the choice of anaesthesiology as a career for medical officers in Kenya. (Appendix III)

Study Period

This study was conducted in the months of April and May 2015.

6.7 Data Collection Procedure

The participants were randomly identified using the lottery process (sampling procedure pg. 11). Contact information of the participants was obtained from the Medical Practitioners and Dentists Board (MPDB) database and directly through colleagues practicing in those hospitals. Data was collected from interns who were in the pre- registration period and registered medical officers.

Each participant was contacted directly via phone call and email and the nature of the study explained. Thereafter the principal investigator or the research assistants personally visited the doctors in their facilities. The nature of the study was explained again and consent sought. After reading and understanding the consent explanation, participants signed the consent form and proceeded to filling the self administered questionnaire. On completion, questionnaires were handed back to the principal investigator or research assistants.

In case of any queries concerning the study, the participants were free to seek clarification by contacting the principal investigator or the supervisors on the contacts provided in the consent form.

6.8 Validity and Reliability of Research Instrument

6.8.1 Pre-test

Pre-testing of study tool was carried out to structure, modify and rectify the study tool questions by clarifying grammar and language used to avoid bias and misinterpretations of the questions. 10% of the sample size (29 respondents) was used. The data collection instrument was also pre-tested for consistency, timing, accuracy and reliability. Pre-test was conducted among medical officers and interns in Kenyatta National Hospital, who were not included in the final study.

6.8.2 Validity and Reliability of Research tools

The content validity was ascertained by performing a pre-test to standardize the data collection tool. The questionnaire was then validated by the university supervisors before data collection. The reliability of the questionnaire was established through a test retest

technique whereby the instrument was administered twice to the same group of participants during the pilot study. There was a time lapse between the first test and the second test. Cronbach's alpha coefficient was used to test reliability of data collected. The alpha (α) score was 0.86, which was considered satisfactory and ascertained reliability.

6.9 Data Management

At the end of data collection, the self administered questionnaires were cross checked for completeness and any missing entries. The quantitative data collected was coded and processed. The qualitative data was then analyzed. It involved reading through the data and developing codes that draw similar connections between categories. Data was analyzed by the use of SPSS (Statistical Package for Social Sciences) version 21 as per the specific research questions using frequencies and percentages. Relationship between the variables was established using Chi-square test of association and logistic linear regression of Probit models, since the responses were categorical. Findings were presented in the form of text, charts, graphs and tables.

6.10 Ethical Considerations

Approval was sought from KNH/UON-ERC (appendix VII). The nature of the study was explained to the participants prior to data collection and the participant's confidentiality guaranteed. No doctor was victimized for declining to participate. There were no cost implications on the participants and they had the freedom to withdraw from the study at any time without victimization.

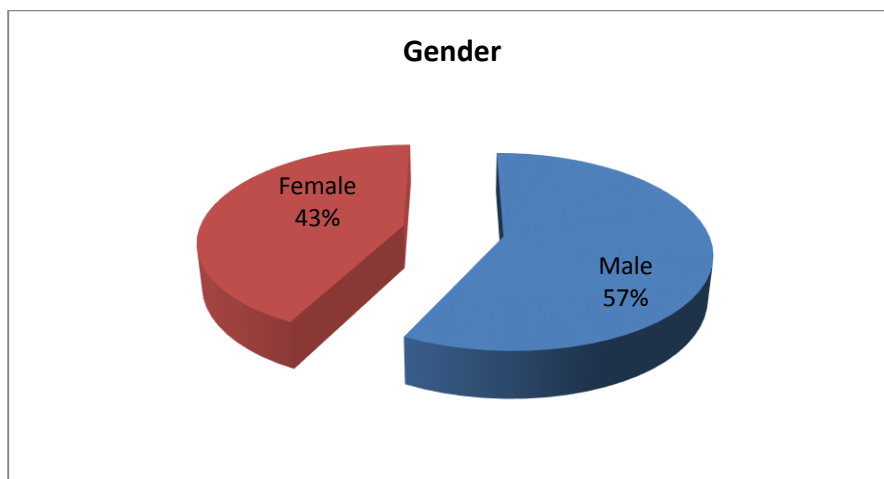
Study findings will be availed to the KNH/UON-ERC, the University of Nairobi library, and the Ministry of Health to facilitate appropriate policy formulation.

7 RESULTS

Two hundred and ninety medical officers meeting the inclusion criteria were enrolled in the study which was conducted in the months of April and May, 2015. The response rate was 100%. Included are findings on the demographic characteristics, factors influencing the field of postgraduate specialty pursued by medical officers in Kenya; factors that attract medical officers to anaesthesiology; factors that deter medical officers from anaesthesiology as a career choice and proposed measures that will improve the anaesthesiology experience at undergraduate and internship levels.

7.1 Demographic characteristics

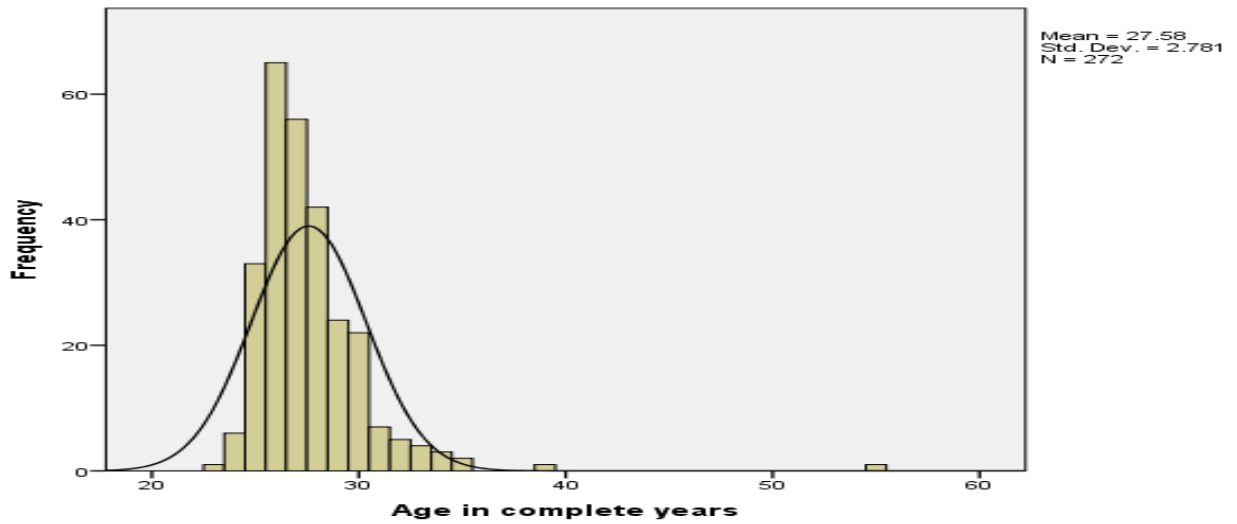
Figure 1: Gender distribution



The sample included 166(57.0%) males and 124(43%) females.

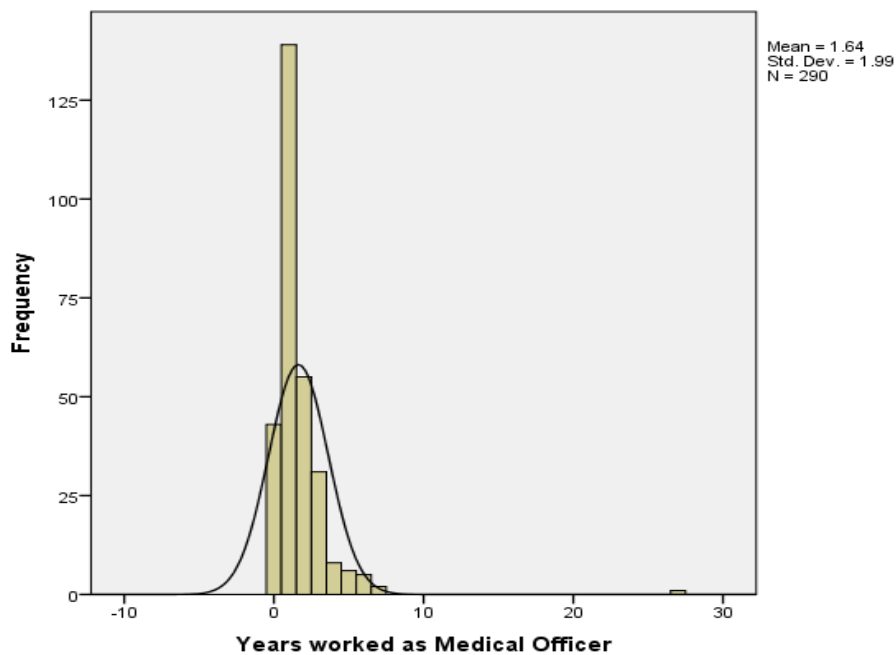
The mean age of the respondents was 27.58(\pm 0.33) years within the range of 23 to 55 years.

Figure 2: Age distribution of respondents



The average number of years worked as a medical officer was 1.64(±0.23) years within the range of 0 and 25years.

Figure 3: Years worked as a Medical Officer



Majority 153(52.6%) attended University of Nairobi, 37(12.7%) attended Kampala International and Moi Universities each, 10(3.4%) attended Kenyatta and Ryazan State Medical Universities each while the rest attended medical schools indicated in Appendix IV.

Most respondents attended medical schools in Kenya 202(69.4%), Uganda 41(14.1%), Russia 23(7.9%) and the rest as indicated in Appendix V.

Counties of work of most respondents included Nairobi 40(13.7%) and Kisumu and Mombasa counties each 16(5.5%). Respondents from other counties are as listed in appendix VI. Most 128(44.0%) respondents were from level 4 hospitals, 88(30.2%) from level 5 hospitals, 43(14.8%) from level 6 hospitals and 32(11.0%) from private/ faith based hospitals.

Table 1: Demographic characteristics

Variable	Categories	Frequency	Percent
Number of years worked as medical officer	<=3	268	92.1
	4-6	19	6.5
	>=7	3	1
	Missing responses	1	0.3
Age in complete years	21-30	249	85.6
	31-40	22	7.6
	51-60	1	0.3
	Missing responses	19	6.5
Colleges/ Universities/ Medical Schools attended	University of Nairobi	153	52.6
	Kampala International	37	12.7
	Kenyatta	10	3.4
	Moi	37	12.7
	Others	50	17.2
	Missing responses	4	1.4
Country of medical school attended	Kenya	202	69.4
	Uganda	41	14.1
	Russia	23	7.9
	Ukraine	9	3.1
	China	5	1.7
	Others	10	3.4
	Missing responses	1	0.3
Gender	Male	167	57.4
	Female	124	42.6
Work station County	Nairobi	40	13.7
	Kisumu	16	5.5
	Mombasa	16	5.5
	Kiambu	13	4.5
	Nakuru	13	4.5
	Machakos	13	4.5
	Murang'a	13	4.5
	Busia	12	4.1
	Uasin Gishu	12	4.1
	Others	143	49.0
Level of hospital	Level 4	128	44
	Level 5	88	30.2

	Level 6	43	14.8
	Private/ Faith based/ Others	32	11

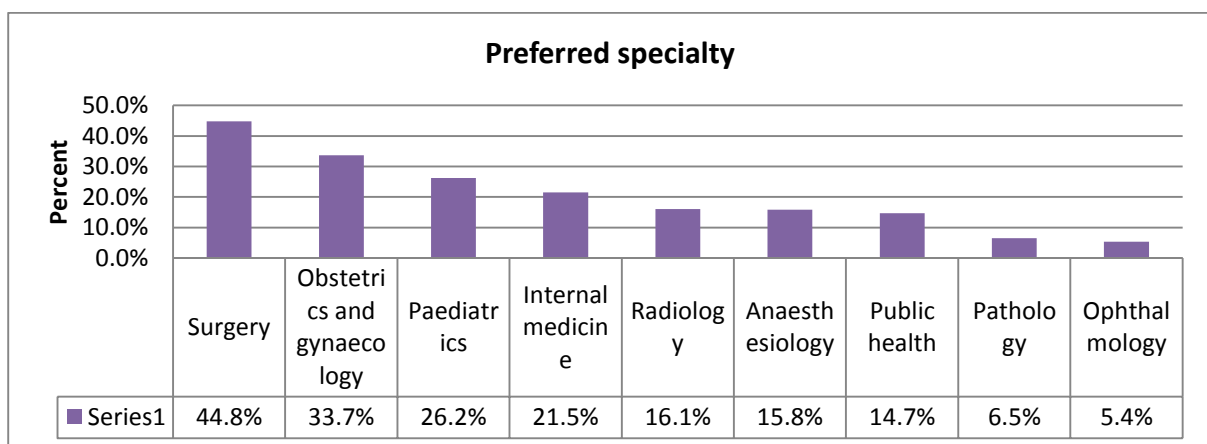
7.2 Choice of Specialty

The most preferred specialities included surgery 125(44.8%), obstetrics and gynaecology 94(33.7%), paediatrics 73(26.2%) and internal medicine at 60(21.5%) among others as indicated in Table 2. The distribution of choice of specialty was significant (p value<0.01) which implied that choices of specialty varied among the respondents.

Table 2: Preferred specialty

Preferred specialty	Count	% (N)
Surgery	125	44.8%
Obstetrics and gynaecology	94	33.7%
Paediatrics	73	26.2%
Internal medicine	60	21.5%
Radiology	45	16.1%
Anaesthesiology	44	15.8%
Public health	41	14.7%
Pathology	18	6.5%
Ophthalmology	15	5.4%

Figure 3: Preferred specialty

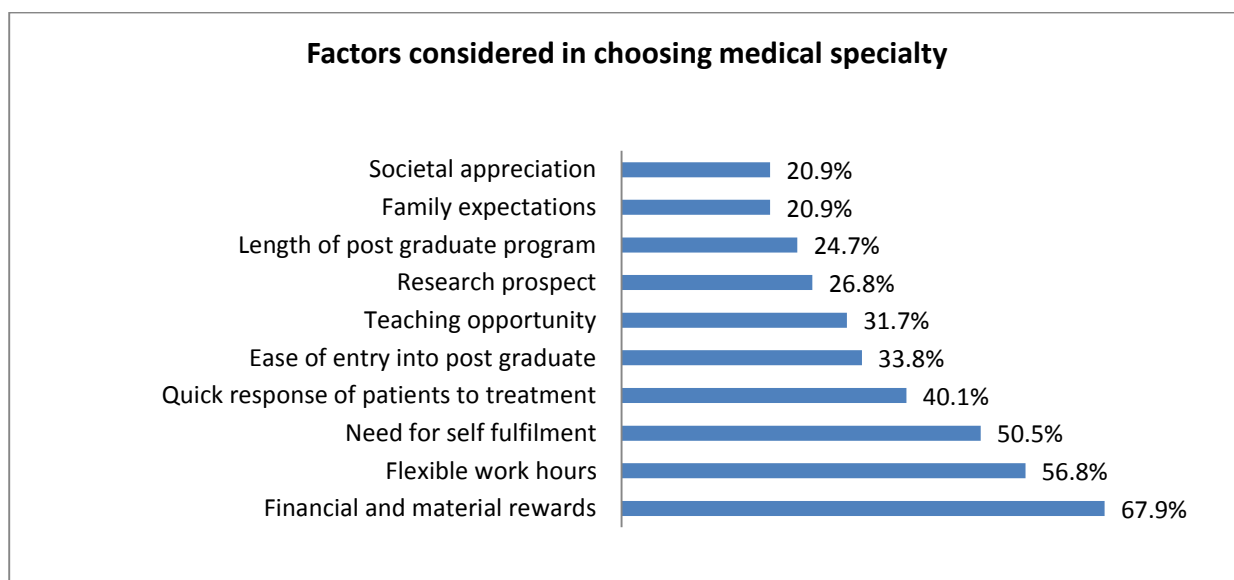


The reasons for preference of the various specialties included financial and material rewards 195(67.9%); flexible work hours 163(56.8%); need for self fulfilment 145(50.5%); and quick response of patients to treatment 115(40.1%) among others as indicated in Table 3. The distribution of factors considered in choosing medical specialty was significant (p value <0.01) which implied that choices of specialty varied among the respondents.

Table 3: Factors considered in choosing medical specialty

Factors considered in choosing medical specialty	Count	% (N)
Financial and material rewards	195	67.9%
Flexible work hours	163	56.8%
Need for self fulfilment	145	50.5%
Quick response of patients to treatment	115	40.1%
Ease of entry into post graduate	97	33.8%
Teaching opportunity	91	31.7%
Research prospect	77	26.8%
Length of post graduate program	71	24.7%
Family expectations	60	20.9%
Societal appreciation	60	20.9%

Figure 4: Factors in choosing specialty



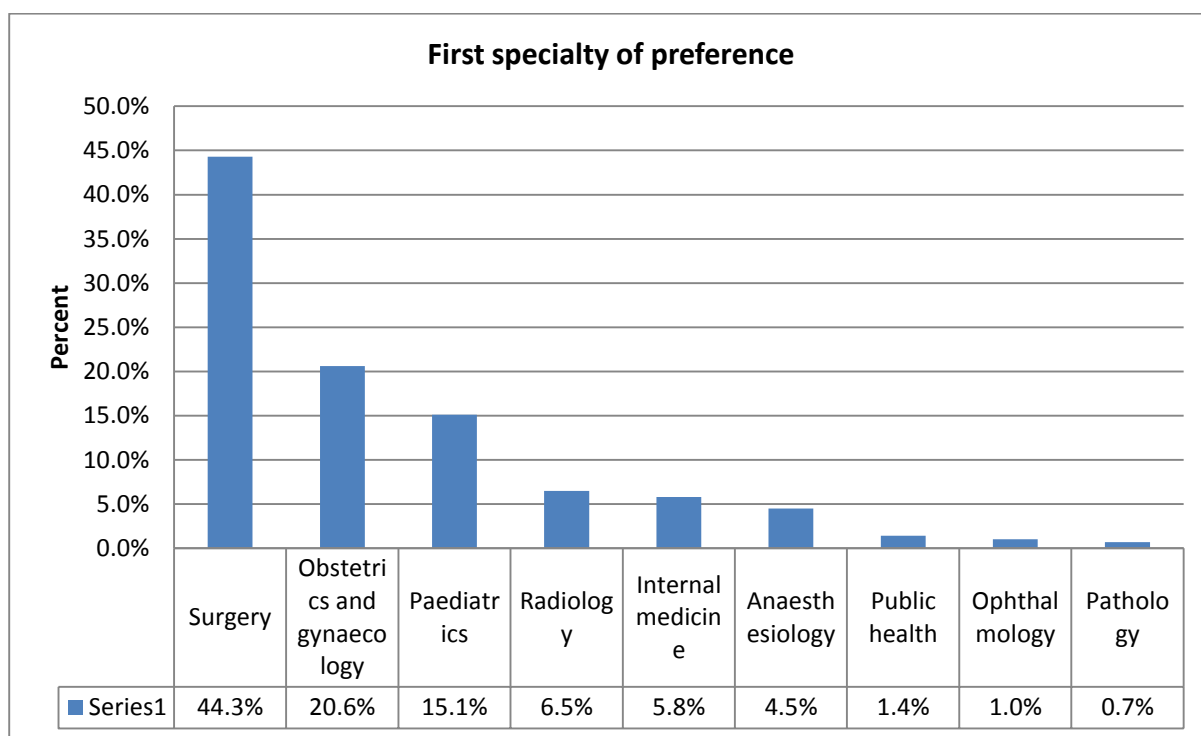
Order of specialty preference was as indicated in Tables 4-6.

Table 4: First specialty of preference

The most popular specialty of first preference was surgery while pathology was the least. Anaesthesia was preferred specialty of 13(4.5%) respondents.

First specialty of preference	Frequency	Percent
Surgery	129	44.3%
Obstetrics and gynaecology	60	20.6%
Paediatrics	44	15.1%
Radiology	19	6.5%
Internal medicine	17	5.8%
Anaesthesiology	13	4.5%
Public health	4	1.4%
Ophthalmology	3	1.0%
Pathology	2	0.7%

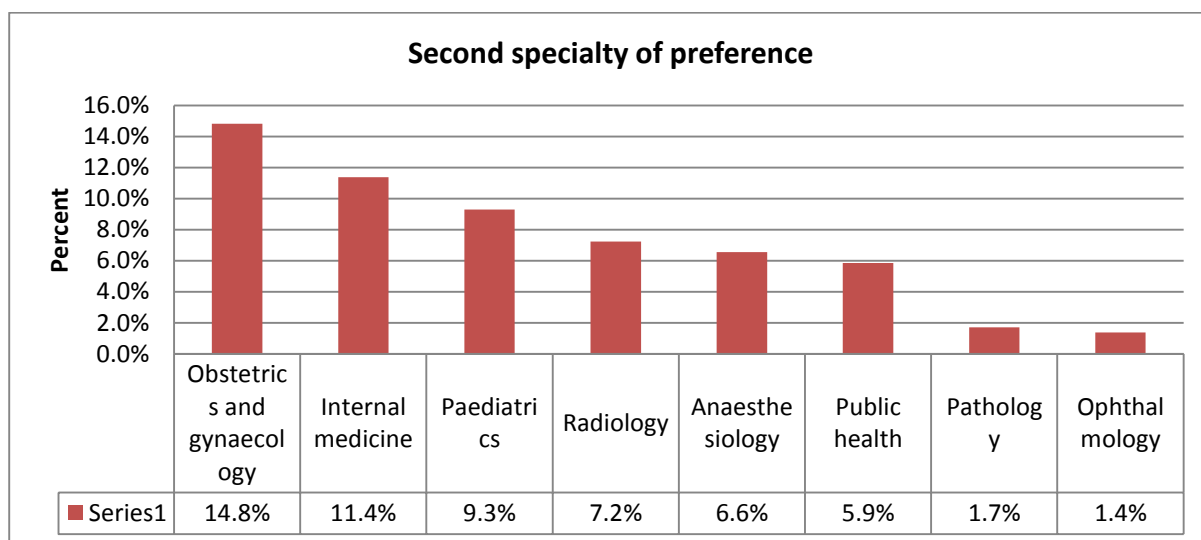
Figure 5: First specialty of preference



The most favoured speciality of second preference among the sampled doctors was obstetrics and gynaecology 43(14.83%) and ophthalmology the least. Anaesthesia was preferred by 16(6.6%) of the respondents.

Table 5: Second specialty of preference

Second specialty of preference	Frequency	Percent
Obstetrics and gynaecology	43	14.83%
Internal medicine	33	11.40%
Paediatrics	27	9.31%
Radiology	21	7.20%
Anaesthesiology	16	6.60%
Public health	14	5.90%
Pathology	5	1.70%
Ophthalmology	4	1.40%

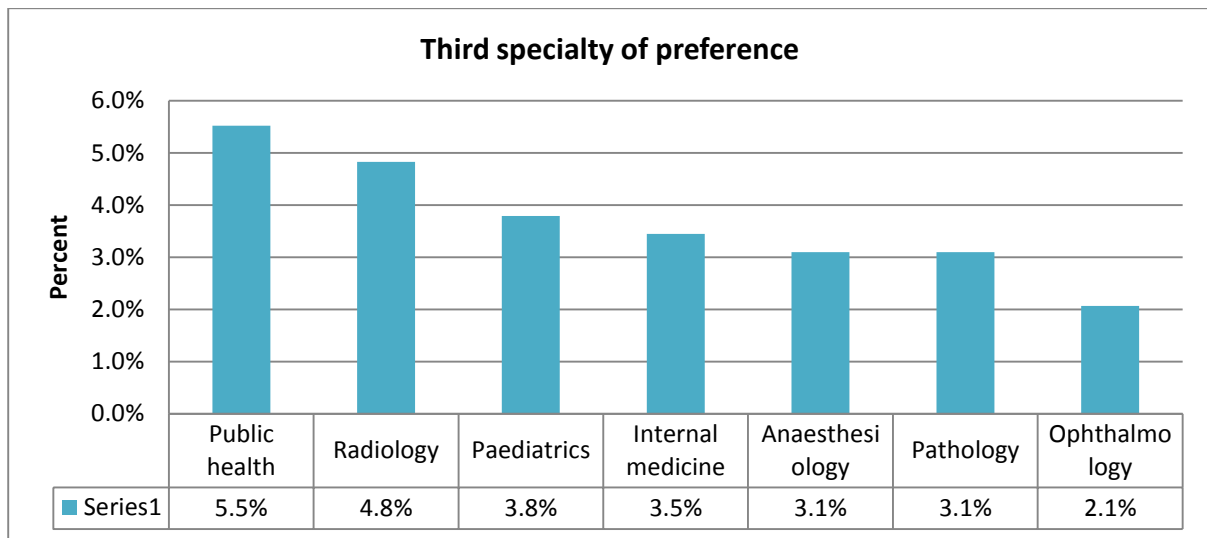
Figure 6: Second specialty of preference

Public health was the most preferred specialty of third preference with ophthalmology being the least favoured. Anaesthesiology was preferred by 6(3.1%) respondents.

Table 6: Third specialty of preference

Third specialty of preference	Frequency	Percent
Public health	16	5.52%
Radiology	12	4.83%
Paediatrics	8	3.80%
Internal medicine	7	3.50%
Anaesthesiology	6	3.10%
Pathology	6	3.10%
Ophthalmology	4	2.10%

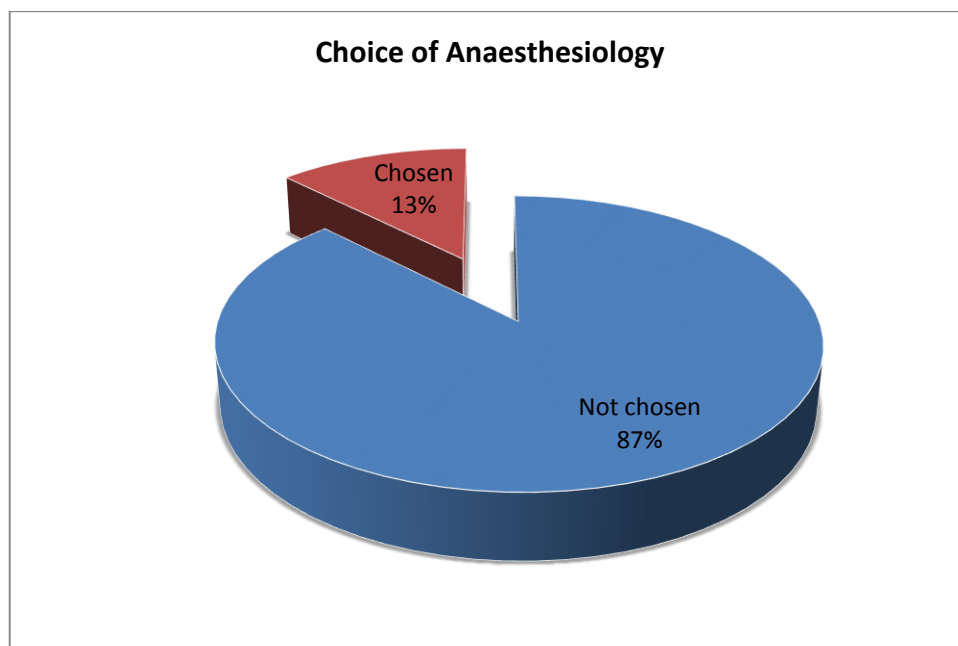
Figure 7: Third specialty of preference



7.3 Choice of anaesthesiology

36(13%) respondents had anaesthesiology as either first, second or third specialty of choice. The choice of anaesthesiology among first three choices was not significant (p value <0.06) which was attributed to low numbers choosing anaesthesiology.

Figure 8: Choice of anaesthesiology



Majority of respondents who anaesthesiology was among first three choices had worked as medical officers for 3 years or less. Having worked for ≤ 3 years increased the odds of choosing anaesthesiology by 11.9%. Majority of the respondents who chose anaesthesiology among their first three choices trained in Kenya. These respondents were aged 21-30 years. The gender distribution of the respondents was similar (male 5.5% and female 5.8% of the total).

Table 7: Demographics of participants who chose anaesthesiology

Variable	Categories	Statistics	Choice of anaesthesiology		P-value		
			Not chosen	Chosen			
Years worked as Medical Officer	<=3	Count	236	32	0.535		
		% of Total	81.4%	11.0%			
	4-6	Count	19	0			
		% of Total	6.6%	0.0%			
	>=7	Count	2	1			
		% of Total	.7%	.3%			
Medical school attended	University of Nairobi	Count	138	15	0.620		
		% of Total	48.1%	5.2%			
	Moi	Count	31	6			
		% of Total	10.8%	2.1%			
	Kenyatta	Count	9	1			
		% of Total	3.1%	.3%			
	Kampala International	Count	34	3			
		% of Total	11.8%	1.0%			
	Others	Count	43	7			
		% of Total	15.0%	2.4%			
	Medical school country	Kenya	Count	179		23	0.487
			% of Total	61.7%		7.9%	
		Uganda	Count	38		3	
			% of Total	13.1%		1.0%	
		Russia	Count	20		3	
% of Total			6.9%	1.0%			
Ukraine		Count	9	0			
		% of Total	3.1%	0.0%			
China		Count	4	1			
		% of Total	1.4%	.3%			
Others	Count	7	3				
	% of Total	2.4%	1.0%				
Gender	Male	Count	151	16	0.327		
		% of Total	51.9%	5.5%			
	Female	Count	107	17			
		% of Total	36.8%	5.8%			
Age in complete years	21-30	Count	221	28	0.838		
		% of Total	81.3%	10.3%			
	31-40	Count	20	2			
		% of Total	7.4%	.7%			
	51-60	Count	1	0			
		% of Total	.4%	0.0%			
Station of work (County)	Nairobi	Count	33	7	0.791		
		% of Total	11.3%	2.4%			
	Kisumu	Count	14	2			
		% of Total	4.8%	.7%			
	Mombasa	Count	15	1			
		% of Total	5.2%	.3%			
	Kiambu	Count	10	3			
		% of Total	3.4%	1.0%			

		% of Total	3.4%	1.0%	
	Nakuru	Count	10	3	
		% of Total	3.4%	1.0%	
	Machakos	Count	9	4	
		% of Total	3.1%	1.4%	
	Murang'a	Count	7	6	
		% of Total	2.4%	2.1%	
	Busia	Count	11	1	
		% of Total	3.8%	0.3%	
	Uasin Gishu	Count	11	1	
		% of Total	3.8%	0.3%	
	Others	Count	138	5	
		% of Total	47.6%	1.7%	
	Private/ Faith based/ Others	Count	12	0	0.425
		% of Total	4.1%	0.0%	
Level of hospital	Level 4	Count	122	15	
		% of Total	41.9%	5.2%	
	Level 5	Count	83	15	
		% of Total	28.5%	5.2%	
	Level 6	Count	38	6	
		% of Total	13.1%	2.1%	

Reasons for choosing anaesthesiology

Majority of the respondents 16(44.6%) cited financial/material rewards as their reason to select anaesthesiology, length of post graduate program was cited by 13(37.2%) and flexible work hours 12(34.7%) and others as shown in table 8.

Table 8: Reasons for choosing anaesthesiology

Reasons for choosing anaesthesiology	Count	%
Financial and material rewards	16	44.6%
Length of post graduate program	13	37.2%
Flexible work hours	12	34.7%
Teaching opportunity	9	24.0%
Need for self fulfilment	7	19.8%
Family expectations	6	18.2%
Research prospect	6	18.2%
Ease of entry into post graduate	5	15.7%
Societal appreciation	3	7.4%
Quick response of patients to treatment	2	5.8%

Figure 9: Reasons for choosing anaesthesiology

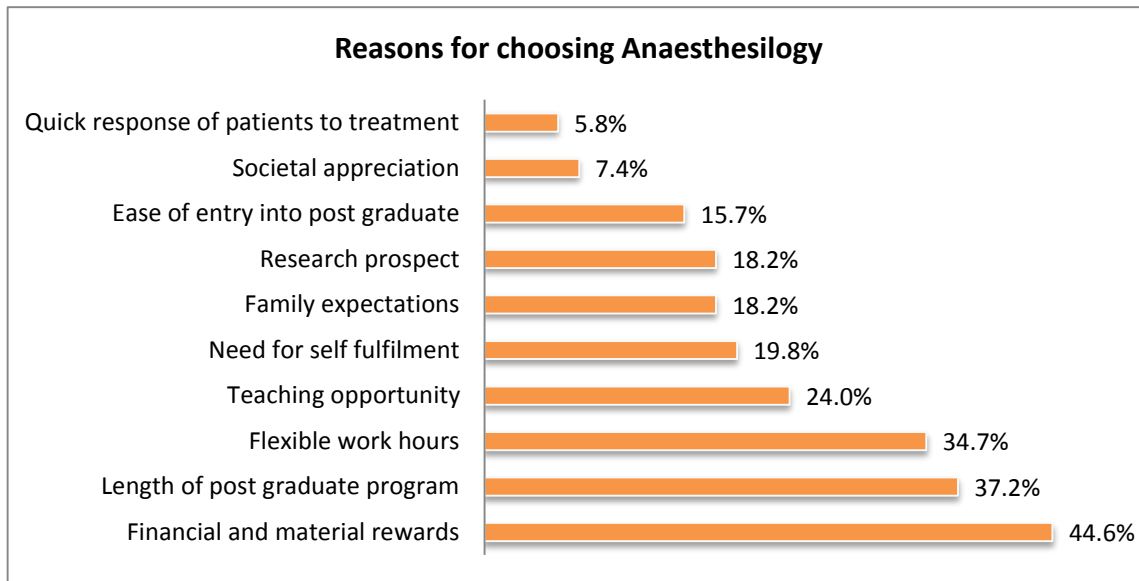
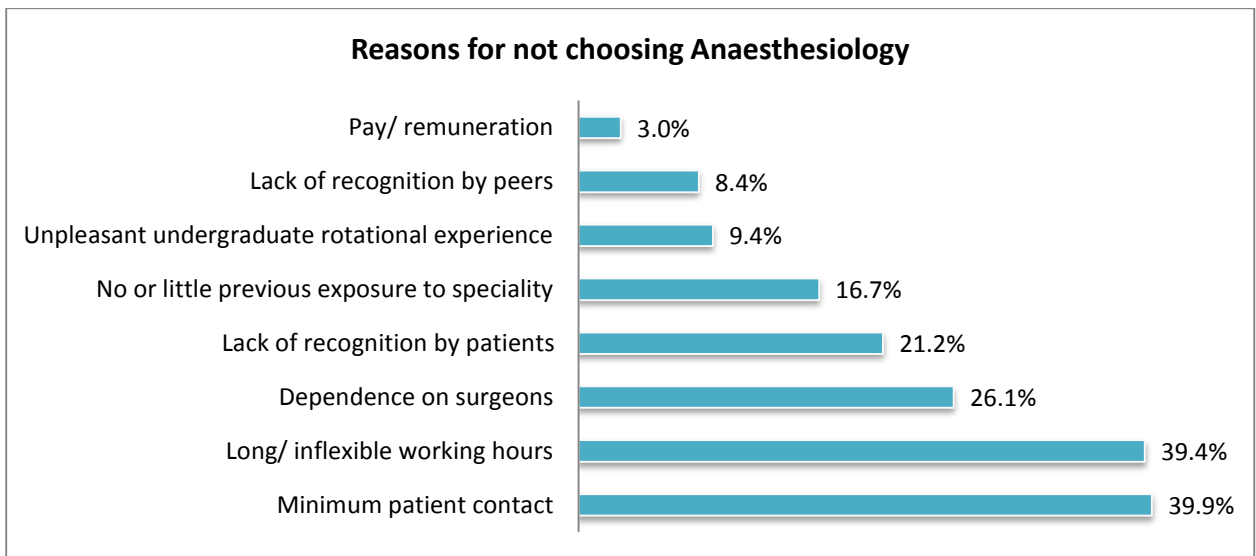


Table 9: Reasons for not choosing anaesthesiology

Respondents cited the following deterrents as the reason they did not choose anaesthesiology:

Reasons for not choosing anaesthesiology	Count	%
Minimum patient contact	81	39.9%
Long/ inflexible working hours	80	39.4%
Dependence on surgeons	53	26.1%
Lack of recognition by patients	43	21.2%
No or little previous exposure to specialty	34	16.7%
Unpleasant undergraduate rotational experience	19	9.4%
Lack of recognition by peers	17	8.4%
Pay/ remuneration	6	3.0%

Figure 10: Reasons for not choosing anaesthesiology



Presence of consultant anaesthesiologist

Out of the 290 respondents, 181(62.2%) reported to have consultant anaesthesiologists in their work stations.

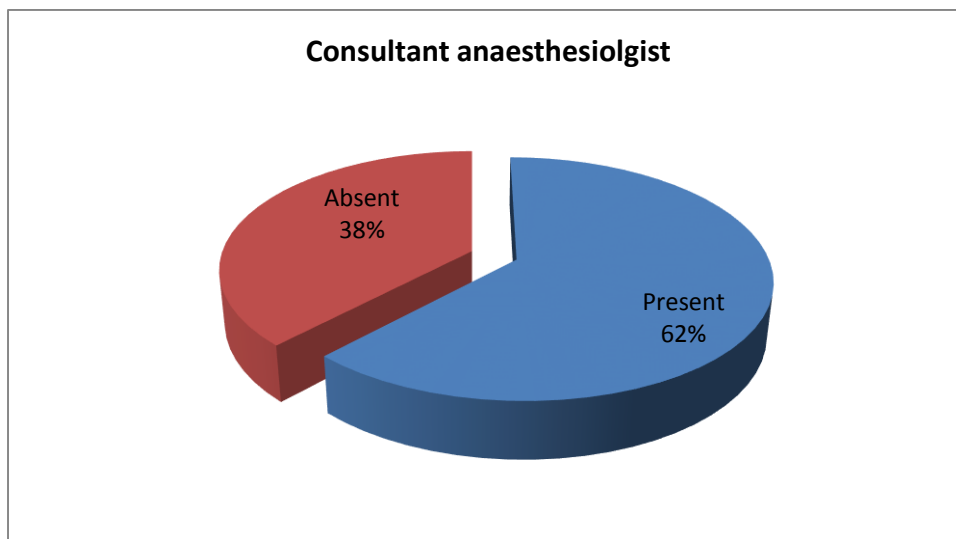
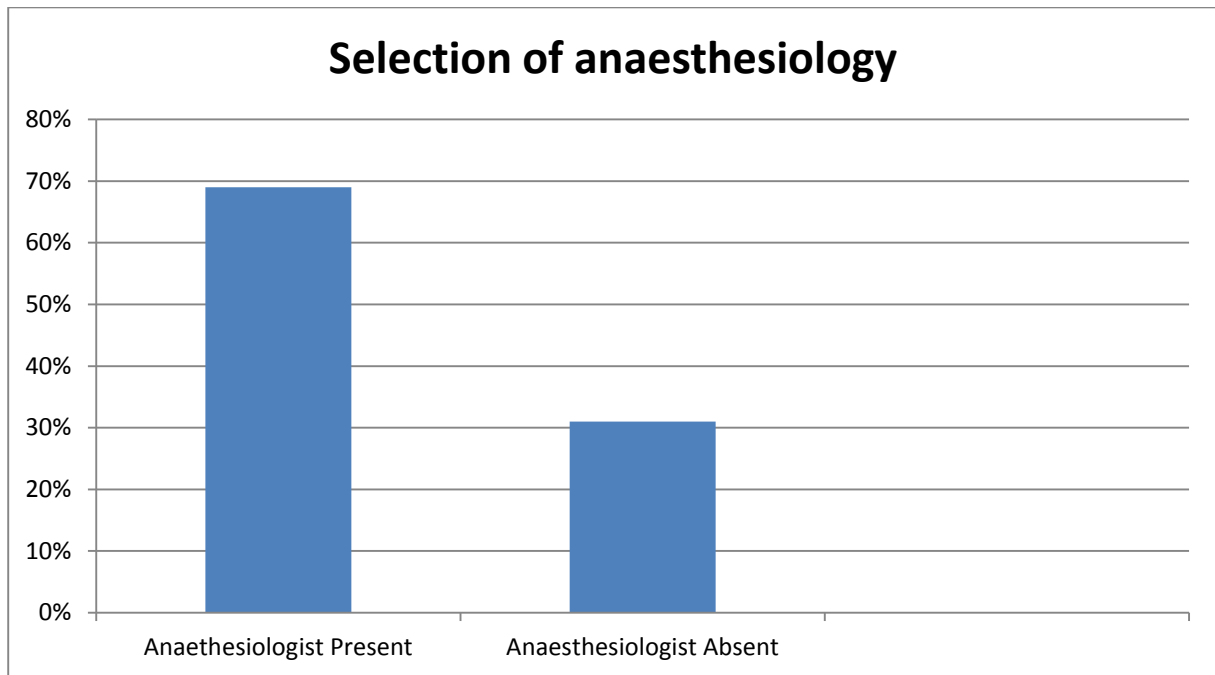


Figure 11: Presence of consultant anaesthesiologist

There was significant (p-value= 0.04) between choice of anaesthesiology and presence of consultant anaesthesiologist. This implied that presence of a consultant anaesthesiologist in work stations increased the probability of choosing anaesthesiology.

Figure 11: Presence of consultant anaesthesiologist



Perception on adequacy of anaesthesiology experience at medical school

Anaesthesiology experience at medical school was considered adequate by only 108(38%) respondents.

Figure 12: Anaesthesiology experience at medical school

Perception on adequacy of anaesthesiology experience at medical school

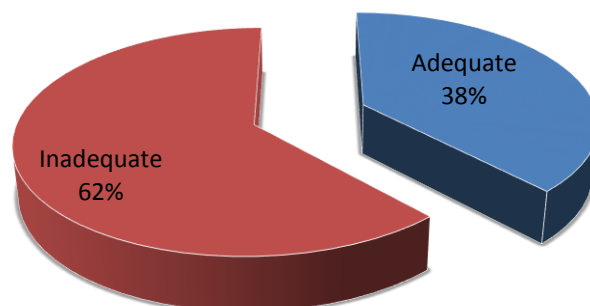
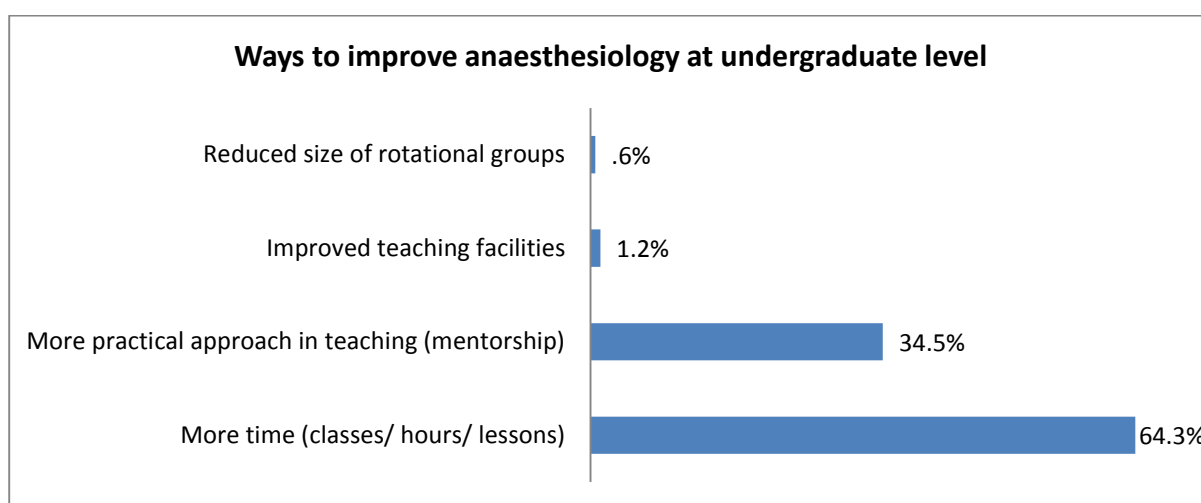


Table 10: Ways to improve anaesthesiology at undergraduate level.

Majority of the respondents felt that there was a need for more time allocated for the rotation, a more practical approach in teaching/ mentorship and improved teaching facilities.

Ways to improve anaesthesiology at undergraduate level	Count	%
More time (classes/ hours/ lessons)	110	64.3%
More practical approach in teaching (mentorship)	59	34.5%
Improved teaching facilities	2	1.2%
Reduced size of rotational groups	1	.6%

Figure 13: Ways to improve anaesthesiology at undergraduate level

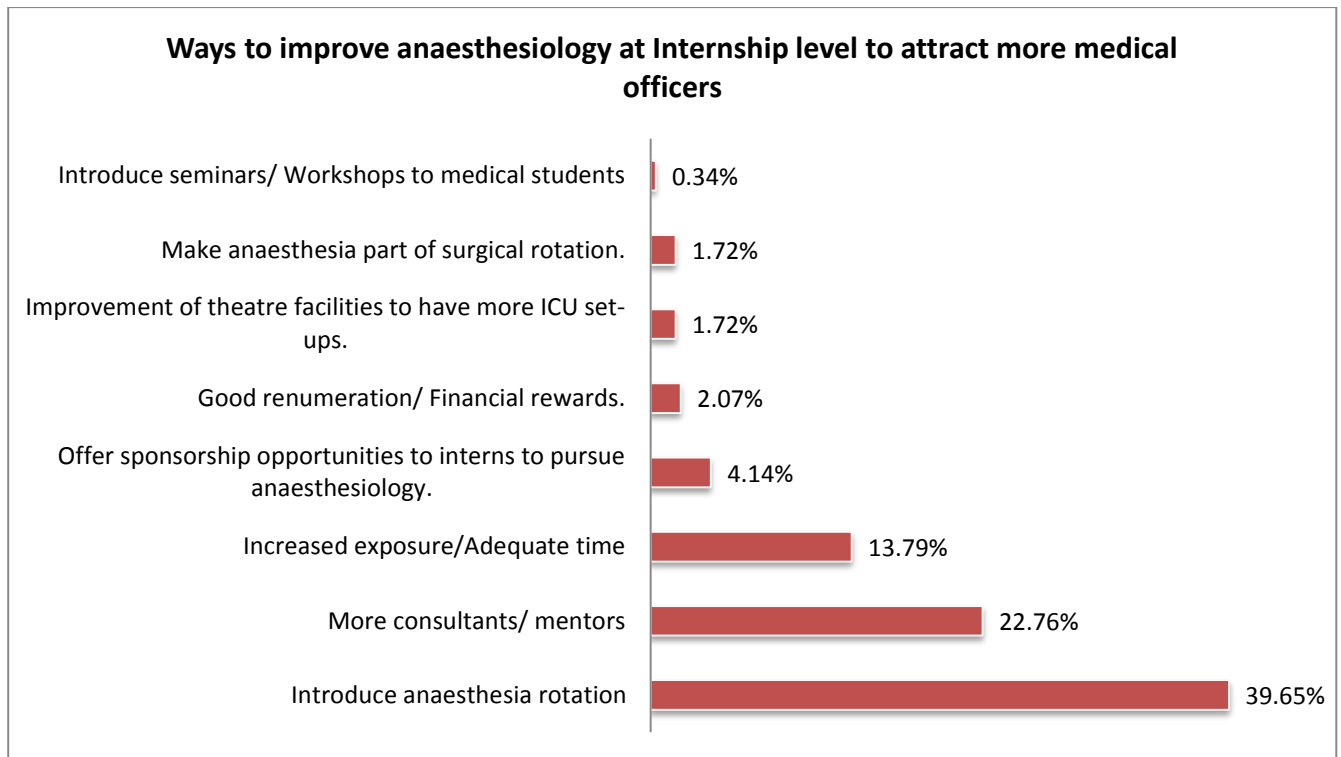


Ways to improve anaesthesiology at internship level

It was suggested that introduction of an anaesthesiology rotation at internship level, more anaesthesia consultants for better mentorship, increased exposure during internship and the need to offer sponsorships to doctors to pursue anaesthesiology would have a positive effect.

Table11: Ways to improve anaesthesiology at internship level.	Frequency	%
Introduce anaesthesiology rotation	115	39.65%
More consultants/ mentors	66	22.76%
Increased exposure/Adequate time	40	13.79%
Offer sponsorship opportunities to interns to pursue anaesthesiology.	12	4.14%
Good remuneration/ Financial rewards.	6	2.07%
Improvement of theatre facilities to have more ICU set-ups.	5	1.72%
Make anaesthesiology part of surgical rotation.	5	1.72%
Introduce seminars/ Workshops to medical students	1	0.34%

Figure 14: Ways to improve anaesthesiology at internship level



8 STUDY LIMITATIONS

1. This study included only medical officers and medical officer interns. It therefore did not represent the views of undergraduate medical students and registrars who were already pursuing their postgraduate degrees.
2. Accessing medical officers in some areas was a challenge hence remote counties were under represented.

9 DISCUSSION

While the scope of anaesthesiology has expanded tremendously in recent times, results of this study indicate that its uptake as a career choice is still low among Medical officers in Kenya. It corroborates the findings from studies done in other developing countries ⁶⁻¹¹. This is in contrast to the significantly better uptake of anaesthesiology as a career choice from studies done in the developed countries ¹²⁻¹⁵.

The gender distribution among respondents who preferred anaesthesiology was equal. The main factors considered when deciding on career choices were; financial rewards, flexible working hours and the need for self fulfilment. Factors that deter medical officers from choosing anaesthesiology were; minimum patient contact/ exposure to the specialty, long/ inflexible working hours, and dependence on surgeons. The spectrum of career choice in this study was biased towards the core clinical specialties. This can be attributed to the clinical exposure in these specialties during undergraduate training and internship. On the other hand the majority (62%) of those interviewed thought that the anaesthesiology experience at undergraduate level was inadequate. While other specialties are attractive to students prior to clinical exposure, studies have shown that doctors rarely choose to enter into anaesthesiology until they have had some clinical experience ²³.

At least 38% of the participants did not have a physician anaesthesiologist in their station of work. This implies that there is a lack of mentors or role models in many internship centres. If these students receive a positive undergraduate experience, by way of an increased length

of rotation and more clinical exposure, their recruitment into anaesthesia will be enhanced. This also underscores the fact that introduction of a mandatory anaesthesiology rotation during internship would help develop interest in the specialty.

10 CONCLUSION

Data in this study highlights that low interest in anaesthesiology is still a problem amongst non specialist doctors. The respondents felt that the duration of exposure to anaesthesia at undergraduate level is inadequate. Lack of anaesthesia as a rotation during internship further aggravates the low interest in the specialty. With few medical officers and interns selecting anaesthesia as a career choice and widening scope of anaesthesiologists to include diagnostic procedures and anaesthesia outside the operating rooms, the shortage of anaesthesiologists will continue. This implies that an increasing number of anaesthetics will be administered by non physician anaesthetists leading to reduced quality and safety. With rising population, the goal of the ministry of health to have a physician anaesthesiologist in every level 4 hospital upwards will require that more doctors be trained as anesthesiologists and thus the factors deterring specialization in anesthesiology need to be addressed.

11 RECOMMENDATIONS

- Increase the length of the anaesthesiology rotation during undergraduate training.
- Introduce a mandatory rotation in anaesthesiology during internship.
- Have resident anaesthesiologists at internship centres.
- Provide more post graduate sponsorships in anaesthesiology as an incentive to recruit medical officers to the specialty.

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APPENDIX I: CONSENT EXPLANATION

My name is Dr. Faizan Mohammed Yaseen. I am a postgraduate student in anaesthesia at the University of Nairobi. I am conducting a study on factors influencing the choice of anaesthesiology as a specialty among Kenyan medical officers.

This study will include medical officers and medical officer interns practicing in Kenya. The aim of this study is to help understand the various factors that influence the choice of anaesthesiology as a career. The results from the study will be used to propose measures that will improve the enrolment to anaesthesiology among medical officers in Kenya.

Participation in the study is voluntary and you have the right to withdraw at any stage without victimization. No cost will be incurred by you during this survey. Confidentiality will be maintained throughout this study. This study has been approved by UON/KNH-ERC (see attached approval letter). For further clarifications you can contact me on the following cell number: 0718422427 or e-mail: dr.faizanmd@gmail.com.

You can contact my supervisors on the following contacts:

Prof. Zipporah Ngumi: 0722218921 or email: zngumi@gmail.com

Dr. Antony Gatheru: 0721654806 or email: gatherua@gmail.com

You can also contact the secretary, UON/KNH-ERC for any queries on (254) 020 2726300-9 Ext 44355 or email: uonknh_erc@uonbi.ac.ke

APPENDIX II: CONSENT FORM

I Dr. _____, have read the consent explanation and hereby give consent to participate in the survey titled **‘Factors influencing the choice of anaesthesiology as a specialty among Kenyan medical officers’**.

I confirm that I have understood the nature of the survey and that all efforts will be made to maintain confidentiality throughout. I also understand my participation in this study is voluntary and that I may choose to withdraw from the study at any time. In case of any questions or concerns during the study period, I understand that I can contact the principal investigator Dr. Faizan Mohammed, the supervisors or the KNH/UON-ERC for necessary clarifications and further information.

I hereby give my consent.

Signature _____

Date _____

APPENDIX III: SELF-ADMINISTERED QUESTIONNAIRE

Serial No. _____

Factors influencing the choice of anaesthesiology as a specialty among Kenyan medical officers

Provide the following information by ticking/ writing where applicable.

SECTION A: Demographic Characteristics

1. Number of complete years worked as a medical officer?.....
2. Name of medical school attended?.....
3. Country of medical school attended?.....
4. Gender
Male []
Female []
5. What is your age in complete years?.....
6. What is your current station of work: Hospital?..... County?.....
7. What level (4-6) is your hospital?
Level 6 []
Level 5 []
Level 4 []
Private / Faith Based/ Other (specify)

SECTION B: Choice of Specialty

8. What factors do you consider important in choosing a medical specialty? (*Tick as many as apply*)

- i. Financial and material rewards []
- ii. Family expectations []
- iii. Flexible work hours []
- iv. Teaching opportunity []
- v. Research prospect []
- vi. Societal appreciation []
- vii. Quick response of patients to treatment []
- viii. Need for self fulfillment []
- ix. Ease of entry into postgraduate program []
- x. Length of postgraduate program []
- xi. Others (specify).....

9. What specialty will you choose?(*You may choose more than one*)

- i. Surgery [] Specify.....
- ii. Obstetrics and Gynaecology []
- iii. Paediatrics []
- iv. Internal Medicine []
- v. Anaesthesiology []
- vi. Radiology []
- vii. Pathology []
- viii. Ophthalmology []
- ix. Public Health []
- x. Others (Specify).....

10. If you chose more than one specialty how would you place them in order of preference?

- i. First
- ii. Second
- iii. Third.....

11. If you chose anaesthesiology, what do you find appealing about it?

- i. Financial and material rewards []
- ii. Family expectations []
- iii. Flexible work hours []
- iv. Undergraduate/ post-medical school mentor/role models []
- v. Teaching opportunity []
- vi. Research prospects []
- vii. Societal appreciation []
- viii. Quick response of patients to treatment []
- ix. Need for self fulfillment []
- x. Ease of entry into postgraduate program []
- xi. Others (specify).....

12. If you did not chose anaesthesiology for the question above, what is your reason?

- i. Minimum patient contact []
- ii. Lack of recognition by patients []
- iii. Lack of recognition by peers []
- iv. Dependence on surgeons []
- v. No or little previous exposure to the specialty []
- vi. Pay/ Remuneration []
- vii. Unpleasant undergraduate rotational experience []
- viii. Others (specify).....

13. Does your current station of work have a consultant anaesthesiologist?

- Yes []
- No []

14. Do you think your anaesthesiology experience at medical school was adequate?

Yes []

No []

15. If your response in Q. 14 above was 'NO', what do you think can be done to improve anaesthesiology experience at **undergraduate level**?

.....
.....

16. What do you think can be done to improve anaesthesiology experience/ training at **internship** to attract more medical officers to the specialty?

.....
.....

Appendix IV: University/ College of Graduation

University/ College	Frequency	Percent
University of Nairobi	153	52.6
Kampala International University	37	12.7
Moi University	37	12.7
Kenyatta University	10	3.4
Ryazan State Medical University	10	3.4
Peoples Friendship University of Russia	5	1.7
Lugansk State Medical University	4	1.4
Makerere University	4	1.4
Nizhny Medical	3	1.0
Kharkov National Medical	2	.7
Khartoum Medical	2	.7
Volgogvard State Medical	2	.7
Zhejiang Medical	2	.7
Egerton University	1	.3
Haccettepe University	1	.3
International Medical & Technological	1	.3
International University of Africa	1	.3
Latin America School of Medicine	1	.3
National Pirogov Memorial Medical	1	.3
Islamabad college of medical Sciences	1	.3
Patrice Lumumba University	1	.3
Saratuk State Medical	1	.3
Science & Technology Medical School	1	.3
South East University	1	.3
University of Witwatersrand	1	.3
V. N. Karazin University	1	.3
Wenzau Medical College	1	.3
Zaparozhye State Medical	1	.3
Nizhny Novgorod State Medical Academy	1	.3
Missing Responses	4	1.4

Appendix V: Country of medical school attended

Country of medical school	Frequency	Percent
Kenya	202	69.4
Uganda	41	14.1
Russia	23	7.9
Ukraine	9	3.1
China	5	1.7
Sudan	3	1.0
Cuba	1	.3
Ethiopia	1	.3
Pakistan	1	.3
South Africa	1	.3
Tanzania	1	.3
Turkey	1	.3
Yemen	1	.3
Missing Responses	1	.3

Appendix VI: County of work station

Station of work (County)	Frequency	Percent
Nairobi	40	13.7
Kisumu	16	5.5
Mombasa	16	5.5
Kiambu	13	4.5
Nakuru	13	4.5
Machakos	13	4.5
Murang'a	12	4.1
Busia	12	4.1
Uasin Gishu	12	4.1
Bungoma	9	3.1
Kakamega	9	3.1
Kisii	8	2.7
Nyamira	8	2.7
Trans Nzoia	7	2.4
Garissa	7	2.4
Nandi	7	2.4
Kitui	7	2.4
Kericho	6	2.1
Isiolo	6	2.1
Embu	5	1.7
Kirinyaga	5	1.7
Wajir	5	1.7
Baringo	4	1.4
Kilifi	4	1.4
Kwale	4	1.4
Samburu	4	1.4
Meru	4	1.4
Tharaka Nithi	4	1.4
Vihiga	4	1.4
Kajiado	3	1.0
Turkana	3	1.0
Nyeri	3	1.0
Bomet	3	1.0
Narok	2	.7
Taita Taveta	2	.7
Laikipia	1	.3
Mandera	1	.3
Homabay	1	.3
Makueni	1	.3

Appendix VII: KNH/UON-ERC approval letter



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COLLEGE OF HEALTH SCIENCES
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KNH/UON-ERC

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KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
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Fax: 725272
Telegrams: MEDSUP, Nairobi

Ref: KNH-ERC/A/149

2nd April, 2015

Dr. Faizan Mchammed Yaseen
Dept. of Anaesthesia
School of Medicine
University of Nairobi

Dear Dr. Faizan

Research Proposal: Factors influencing the Choice of Anaesthesiology as a Specialty Among Kenyan Medical Officers (P726/12/2014)

This is to inform you that the KNH/UoN-Ethics & Research Committee (KNH/UoN-ERC) has reviewed and approved your above proposal. The approval periods are 2nd April 2015 to 1st April 2016.

This approval is subject to compliance with the following requirements:

- Only approved documents (informed consents, study instruments, advertising materials etc) will be used.
- All changes (amendments, deviations, violations etc) are submitted for review and approval by KNH/UoN ERC before implementation.
- Death and life threatening problems and severe adverse events (SAEs) or unexpected adverse events whether related or unrelated to the study must be reported to the KNH/UoN ERC within 72 hours of notification.
- Any changes, anticipated or otherwise that may increase the risks or affect safety or welfare of study participants and others or affect the integrity of the research must be reported to KNH/UoN ERC within 72 hours.
- Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. (*Attach a comprehensive progress report to support the renewal*).
- Clearance for export of biological specimens must be obtained from KNH/UoN-Ethics & Research Committee for each batch of shipment.
- Submission of an *executive summary* report within 90 days upon completion of the study
This information will form part of the data base that will be consulted in future when processing related research studies so as to minimize chances of study duplication and/or plagiarism.

For more details consult the KNH/UoN ERC website www.erc.uonbi.ac.ke

Appendix VIII

UNIVERSITY OF NAIROBI

Declaration of Originality Form

This form must be completed and signed for all works submitted to the University for examination.

Name of Student _____

Registration Number _____

College _____

Faculty/School/Institute _____

Department _____

Course Name _____

Title of the work

DECLARATION

1. I understand what Plagiarism is and I am aware of the University's policy in this regard

2. I declare that this _____ (Thesis, project, essay, assignment, paper, report etc) is my original work and has not been submitted elsewhere for examination, award of a degree or publication. Where other people's work or my own work has been used, this has properly been acknowledged and referenced in accordance with the University of Nairobi's requirements.

3. I have not sought or used the services of any professional agencies to produce this work

4. I have not allowed, and shall not allow anyone to copy my work with the intention of passing it off as his/her own work

5. I understand that any false claim in respect of this work shall result in disciplinary action, in accordance with University Plagiarism Policy.

Signature _____

Date _____