A survey of the perceptions and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts

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University of the Witwatersrand, Johannesburg,

in the partial fulfilment of the requirements for the degree of

Master of Medicine in Anaesthesiology

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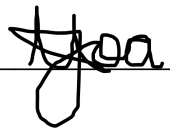
Declaration

I, Pulane Adelice Talane, herewith declare that this research report is my own, unaided work. It is being submitted for the degree of Master of Medicine at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university.



Signed

On this__30th _____day of_____July_____2022

Dedication

This project is dedicated to my late grandmother Sisinyana Moloantoa and late mother Makhang Moloantoa, the only two people who never stopped believing in me until their very last days on earth.

Abstract

Background

William J.G Morton (1816-1868) introduced the world to modern anaesthesia when he successfully anaesthetised a patient using Ether at Massachusetts General Hospital in Boston in October 1846. (1) Since then, advances in pharmacology have resulted in the safer use of anaesthetic drugs and technological advances have improved monitoring of patients under anaesthesia. Anaesthetists around the world are now involved in the fields of critical care, trauma and pain management. (2)This has brought a sense professional *esprit de corps* to the anaesthetic fraternity. Despite this radical growth and development of the speciality, there is still a lack of public knowledge regarding the discipline of anaesthesia, anaesthetists' expertise, or the role played by the anaesthetist in the chain of health care delivery. (3)

Methods

A cross sectional study was carried out between June and September 2021 on Grade 12 learners in four Johannesburg districts. A questionnaire consisting of three sections and 26 questions was handed out at pre-selected schools. The first part of the questionnaire acquired demographic data, the second contained questions pertaining to anaesthetists and anaesthesia as a speciality, and the third part pertained to interest in the field of anaesthesia.

Results

Of the 595 learners that participated in this study, 335 (56.3%) were aware that an anaesthetist administers anaesthesia in the operating room. A considerable number of learners n=344 (57,8%) believed that a nurse monitored and recorded the patient's vital signs during surgery. Only 95 learners (16%) correctly identified all the duties of the anaesthetist outside of the theatre environment. Overall, learners fared poorly, achieving an average score of 14% for the questionnaire. However, there was a statistically significant correlation between being from a high socioeconomic background and awareness that the anaesthetist administers anaesthesia. A high socioeconomic background was defined as having a suburban residence, a household income comprising a salary instead of social grants and care givers that possessed a university degree.

Knowledge regarding the intraoperative duties of the anaesthetist was still poor, regardless of the socioeconomic background of the learner. Previous exposure to anaesthesia did not improve awareness about anaesthesia among the learners.

Conclusion

This study has shown that awareness regarding anaesthesia and anaesthetists is still lacking despite the radical growth in the field. This lack of awareness cannot be ignored; education of the general public should be intensified in order to empower people to ask the right questions as well as make informed decisions about their perioperative care in the future. More than half of the learners in the study (58.5%) believed that good medical education can reduce the burden of health care costs and medicolegal consequences; and 70% of them would request an anaesthetist to provide them with detailed information about their anaesthetic before the start of surgery. Therefore, despite lack of awareness, the majority of the learners displayed interest and willingness to know more about anaesthesia, and grade 12 learners would be a formidable target group to direct anaesthetic education campaigns.

Acknowledgements

Thank you to the following people:

My husband, Talane Talane, for his never ending love and support

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To my aunt, Nonkumbuzo Mdidimba, for taking care of my family while I was focussed on my research report

To my younger brother, Sentle Napo Moloantoa, for his unwavering belief and support and for transporting me to the sites of data collection.

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LIST OF ABBREVIATIONS

DA (SA)	Diploma in Anaesthesia
CMSA	Colleges of Medicine of South Africa
FCA (SA)	Fellowship of the College of Anaesthetists of South Africa
ASA	American Society of Anaesthesiologists
ICU	Intensive Care Unit
CHBAH	Chris Hani Baragwanath Academic Hospital

1. Section 1: Literature Review

1.1. Introduction

Anaesthesia is one of the youngest branches of medicine and the specialty has made multiple developmental strides over time.

William J.G Morton (1816-1868) introduced the world to modern anaesthesia when he successfully anaesthetised a patient using Ether at Massachusetts General Hospital in Boston in October 1846. (1)

Since then, advances in pharmacology have resulted in the safer use of anaesthetic drugs and technological advances have improved monitoring standards of patients under anaesthesia. Anaesthetists around the world are now involved in the fields of critical care, trauma and pain management. (2) This has brought a sense of professional *esprit de corps* to the anaesthetic fraternity.

Despite this radical growth and development of the speciality, there remains a lack of public knowledge regarding anaesthesia as a discipline, anaesthetists' expertise and the role played by the anaesthetist in the chain of health care delivery. (3)

Anaesthetists are generally not at the forefront of patient management, rather, they are perceived as "behind the scenes doctors". The general public did not consider anaesthetists to be doctors in a study done by Uma et al.(4) This corelates with the results from the MORI Social Research Institute's survey done in Great Britain, whose results were published by the Royal College of Anaesthetists in 2000, where 36% of the British public believed anaesthetists were not medically qualified doctors. (5) A study by Swinhoe et al revealed that 35% of the population thought that anaesthetists were not qualified doctors at all. (6) In fact, the anaesthetist is often thought of as a technician or a surgical assistant. (7-9)

Regarding the role of anaesthetists outside of the theatre environment, education appears to be lacking as the public is generally unaware that the anaesthetist's role extends beyond theatre. According to Rolf Sandin, associate professor in the department of Anaesthesia and Critical Care Länssjukhuset in Sweden, the title of the domain, 'Anaesthesia', perpetuates the concept that the scope of discipline is limited to putting patients to sleep in the theatre environment. He suggested that the term, 'acute life support', would be more fitting. (5)

According to a study done in Ghana by Djabletey et al in 2017, this lack of knowledge about anaesthesia persists, despite the surgical advances that have paralleled the advances in anaesthesia. (3)

The literature also demonstrates which variables may influence the knowledge and perceptions of anaesthesia and anaesthetists by the public. These are: level of education, socioeconomic status, previous exposure to anaesthesia and the influence of the media. (5, 10)

1.1 Current training of anaesthetists in South Africa

According to the recommendation drawn up by the South African Society of Anaesthesiologists (SASA) in an article by Joubert et al in 2006, undergraduate medical students need to complete a two-week rotation in the anaesthetic departments of teaching hospitals as part of their academic curriculum. During internship, interns undergo two months of anaesthetic training. Most of this time is used to hone their skills in airway management rather than the practice of anaesthesia itself. (11)

It is evident that the time allocated to anaesthesia as a student and intern is insufficient to acquire a full set of skills to independently administer anaesthesia safely.

For post graduate training, the Colleges of Medicine of South Africa (CMSA) offers a Diploma in Anaesthesia (DA) and the Fellowship of the College of Anaesthetists (FCA) part one and two examinations. South African universities and their associated hospitals jointly facilitate this. A Master of Medicine (Anaesthesia) is completed concurrently at the university the candidate is registered at. Traditionally, an exit examination was also offered by the university, and could be sat instead of the CMSA examination.

To obtain a DA, candidates are required to undergo a six-month training programme at an accredited institution, followed by written and oral examinations. The candidate is expected to have attained the skills to administer sedation, general and regional anaesthesia to healthy American Society of Anaesthesiologists (ASA) classes one and two patients for low risk surgery. (11)

Table 1: The relative outcome of specialist versus non-specialist anaesthetists regarding patient morbidity and mortality.(11)

Type of anaesthetist	**Death rate**	**Place**	**Author**	**Year**
Specialist	1:180000	England and Wales	Lunn (CEPOD)	1987
Specialists/Non-specialist	1:15000	Groote Schuur	Harrison	1990
Non-specialists	1:3000	Harare	McKenzie	1994
Specialist/Non-specialist	3,4:10000	Tygerberg	Coetzee	1999

For FCA training, universities offer a four-year programme. In addition to working in operating theatres, registrars also rotate through intensive care units and pain clinics. Upon completion, registrars are examined on their knowledge and competence to practice as independent specialist anaesthetists. (11)

Table 1 illustrates that further training (i.e. specialisation) translates into improved standards of care and therefore improved patient outcomes, as seen by reduced death rates. (11)

1.2. Public knowledge and perceptions

In 2004, Gurunathan et al found that 89% of the study population in India knew that anaesthetists were medically trained doctors. Forty seven percent of participants thought that the anaesthetist keeps the patient unconscious throughout the operation. Forty two percent were aware that the anaesthetist ensures their well- being during the operation, and 25% were aware that the anaesthetist monitors their vital signs intraoperatively. The fact that anaesthetists work outside the operating theatre, such as in the intensive care unit (ICU), trauma unit and pain clinics, was known by only 5% of the study population. (12)

In the study by Uma et al, 50% of the study population thought that anaesthesia was administered through a single injection and 40% thought the anaesthetist's job was done once the patient was put to sleep. (4)

A 2013 study by Sagun et al in Saudi Arabia revealed that more people (73,6%) were aware that anaesthetists were medically trained doctors in comparison to a 2004 study by Gurunathan, where 73% of the participants knew that an anaesthetist was a medically trained doctor and 60% were aware that anaesthesia is administered by an anaesthetist, however there was little insight into how anaesthesia is administered.(13)

A study by Lee et al in 2014 showed that 25% of the population were unaware that the anaesthetist administers anaesthesia in theatre. With regards to the preoperative responsibilities of the anaesthetist, 86% of the study population thought the surgeon decided if the patient is fit for surgery, while 70% believed that the surgeon also determined the starvation period pre-surgery. Between six percent and 28% knew that the anaesthetist plays a role outside theatre, half of whom believed this was to provide a local anaesthesia service for minor procedures in the outpatient department. (8)

In a study done by Pandya et al in 2016 in India, 26% of the study population had some knowledge of anaesthesia, but thought that anaesthesia was administered by surgeons. (14)

According to Prakash et al in 2018, 12% of the cohort were aware that the anaesthetist induces anaesthesia. Intraoperative monitoring was thought to be the nurses' responsibility by 50% of the population. Thirty four percent thought intraoperative monitoring was conducted by surgeons, with only 8% being aware that monitoring was the role of anaesthetists. (10)

A qualitative study done at Chris Hani Baragwanath Academic Hospital (CHBAH) in 2015 on preoperative patients revealed a limited understanding of the role played by the anaesthetist in the chain of perioperative patient care. Patients were unable to differentiate between an anaesthetist and a nurse and some thought the surgeon performed both the anaesthetic and the surgery. This was likely due to patients' assuming there were two types of doctors: medical and surgical. Postoperatively, patient awareness of anaesthesia did not improve, despite having had preoperative counselling with the anaesthetist. (15)

1.2.1 Effect of Education and Socioeconomic Status

There are varied results regarding how public education and socioeconomic status affects awareness about the discipline of anaesthesia. While a greater level of education correlated with the ability to correctly identify the anaesthetist as a doctor, awareness of the perioperative duties of the anaesthetist was still poor, regardless of level of education and socioeconomic status. Prakash et al showed no correlation between level of education and knowledge of anaesthesia. (10)

Mathur et al conducted a study, in India, in 2009 assessing knowledge of anaesthesia and anaesthetists in the general population. The study population of 300 participants was divided into five groups based on education level. Of note, 100% of the illiterate group, 84% of those that had completed grade 12 and 72% of those that had tertiary education believed that anaesthesia was administered using volatile agents on a piece of cloth in the absence of any form of monitoring. There was a lack of knowledge among medical students as well. (9)

In 2014 Garcia-Marcinkiewitz and colleagues in their study entitled 'Health Literacy and Anaesthesia' in the United States of America found that participants were aware that anaesthetists are trained doctors, however, irrespective of high levels of education and health awareness, the public still had poor knowledge of the actual roles of the anaesthetists. Five hundred participants took part in the study, of which 97% were Caucasian. The study findings were as follows:

- 74% had tertiary education
- 82% had above average health literacy levels
- 86% were aware that an anaesthetist is a qualified doctor specialised in anaesthesia
- 62% were aware that the anaesthetist determines the patient's fitness for surgery
- 96% were aware that the anaesthetist induces anaesthesia and wakes the patient up after the surgical procedure.

In the same study, only 23% of participants were aware that the anaesthetist monitors blood loss intraoperatively and only 13% knew that the anaesthetist is responsible for blood transfusion during the procedure. Twenty percent of participants were aware of the anaesthetist's role in pain clinics while only 17% knew of their role in the ICU. (7)

In contrast to the above study, studies done in Ghana and Hong Kong by Djabletey et al and Irwin et al, respectively, found that there was a positive correlation between increasing education levels and awareness of the anaesthetists' role outside theatre. (16, 17)

Onutu et al in a 2017 Romanian study found that 91% of their study population were aware that administration of anaesthesia, intraoperative vital sign monitoring and stabilisation were performed by the anaesthetist. However, knowledge regarding duties of anaesthetists outside of theatre was poor. Their study population comprised 80.8% that resided in urban areas, and 65% were university graduates.(18)

1.2.2 The effect of previous surgical exposure

The results from a Nigerian survey by Eyelade et al in 2010 revealed that of the 229 participants; 43.2% had previous surgical and anaesthetic experience; but only 35% of this cohort were aware that the anaesthetist administers anaesthesia. While the majority, 90.9%, remembered the surgeon, only 35.4% remembered the anaesthetist. Out of the 130 participants that had no prior anaesthetic history, 48.5% of them did not know who administers anaesthesia. (19)

In a study by Prakash et al in 2017, it was found that previous surgery alone did not guarantee insight into anaesthesia. According to the results of this study, although 45.3% of participants had previous surgical and anaesthetic exposure, only 12% had knowledge about anaesthesia and the anaesthetist. (10)

Kadri et al did a survey of 231 participants in 2014, in India. One hundred and three patients had a prior surgical and anaesthetic history. Sixty two percent were aware of the various modes of anaesthesia, 51.4% knew that an anaesthetist is a medical doctor and 34.9% were aware that the anaesthetist is responsible for the intraoperative well- being of the patient in theatre. (20)

According to a study by Deepa et al, previous anaesthetic history didn't necessarily translate into awareness of the discipline. (2)

Naithani et al, 2007, found that although 34.67% of the population has been previously operated on, only 15.3% knew about anaesthetic related risks. (21)

1.2.3 The role of the media

While mainstream media often depicts the anaesthetist as a masked doctor, either behind a screen or answering the surgeon, who usually assumes the lead role, this cannot necessarily be assumed to translate into poor impressions of the specialty. (5)

Uma et al demonstrated that the media may play a positive role as 17% of the participants in their study knew about the anaesthetic discipline and had gained insight from magazines, newspapers, the internet and television. (4)

Naithani et al also demonstrated that the media does indeed have an educational role, as their participants had acquired knowledge about painless labour facilitated by an anaesthetist from their daily local print media. (21)

Mathu et al found that anaesthesia- related publications were under-represented compared with other medical specialities. (9) Anecdotally, as anaesthetists don't write articles for local newspapers or do interviews for the health related television programmes as frequently as their surgical and medical counterparts may,(10) the role they play in medicine is often not portrayed as extensively by the media.

The media is of undeniable importance when its role as a vehicle for imparting information for public education is considered. This is upheld by the ASA through their sponsorship of the annual media award for the contributions of media houses for their input towards public education about anaesthesia. (22)

1.3. The quest for knowledge

Upon review of the literature, most studies' participants were eager to know more about anaesthesia given the opportunity. (2, 8, 10, 17) Contrary to this, Gurunathan et al found that 22% did not want any information at all.(12) Onutu et al found that 20.5% preferred not to know about anaesthesia while Lee et al found that 26.4% preferred not to be informed. (8, 18)

1.4. Reasons for lack of knowledge

The most common reason for lack of knowledge about anaesthesia was due to the fact that the surgeon meets the patient before the anaesthetist does. This sequence of events leads the patient to view the anaesthetist as the assistant to the surgeon (3).

Anaesthetists interact with patients during the preoperative consultation, which can be in the operating theatre reception in emergency scenarios. Preoperative visits are aimed at ascertaining the patient's physical status and fitness for surgery, and not often as an education opportunity. As a result, patients spend little time with the anaesthetist when they are awake – leading to anaesthetists being referred to as 'unseen doctors'. (2, 18) This can be viewed as a lost opportunity to inform and educate the public, as personal experience and hearsay can play a very powerful role as a vehicle for information dissemination. This is evidenced in the survey by Mittal et al, where, of the 78% of participants that had some form of information about anaesthesia, 61% had personal experience and 17% noted that their information was derived from others. (23)

1.5. Efforts aimed at public education

Ether Day, National Anaesthesia Day and World Anaesthesia Day have been observed on the 16th day of October since the early 20th century, where anaesthesia as a discipline is celebrated. Challenges facing anaesthesia are discussed and an opportunity is taken to educate the public about anaesthetists' roles and responsibilities in patient care. The media, both print and electronic, plays a major role in these addresses. The United Kingdom launched their first National Anaesthesia Day on the 25th of May 2000, while The Australian and New Zealand College of Anaesthetists (ANZCA) launched theirs in 2013. (24)

1.6. Why public education is necessary

In both developing and developed countries, there is an awareness gap about what anaesthesia is and what the role of anaesthetists are. The aim is to enlighten the public with not only the results of this study, but also with pertinent information about anaesthesia as a domain and who anaesthetic doctors are.

It is the responsibility of the anaesthetic fraternity to create awareness about their speciality, to educate the public and reduce the incidence of misconceptions and unnecessary anxiety the public may have regarding anaesthesia. This will enable them to make better informed decisions regarding their anaesthetic and recognise anaesthetists as both physicians and advocates for the unconscious patient.

1.7. Summary

This literature review discusses the lack of awareness that the general population has regarding anaesthesia and anaesthetists, both locally and internationally.

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2. Section 2: Authors' guidelines

Instructions for authors of South African Journal of Anaesthesia and Analgesia.

Author Guidelines

Submitted manuscripts that are not in the correct format and without the required supporting documentation specified in these guidelines will be returned to the author(s) for correction and will delay publication.

AUTHORSHIP

Named authors must consent to publication **by signing a covering letter** which should be submitted as a supplementary file. Authorship should be based on substantial contribution to:

(i) conception, design, analysis and interpretation of data;

(ii) drafting or critical revision for important intellectual content; and

(iii) approval of the version to be published. These conditions must all be met (uniform requirements for manuscripts submitted to biomedical journals; refer to **www.icmje.org**); and

(iv) exact contribution of each author must be stated.

DECLARATION OF CONFLICT OF INTEREST

Authors must declare all sources of support for the research and any association with a product or subject that may constitute a conflict of interest. If there is no conflict of interest to declare please include the following statement: The authors declare no conflict of interest.

FUNDING SOURCE

All sources of funding should be declared. Also define the involvement of study sponsors in the study design, collection, analysis and interpretation of data; the writing of the manuscript; the decision to submit the manuscript for publication. If the study sponsors had no such involvement, this should be stated as follows: No funding source to be declared.

RESEARCH ETHICS COMMITTEE APPROVAL

The submitting author must provide written confirmation of Research Ethics Committee approval for all studies including case reports. The ethics committee as well as the approval number should be included.

STATISTICAL ANALYSIS

Authors are advised to involve medical statisticians at the protocol stage of their research project: to plan sample size, and the selection of appropriate statistical tests for analysis and presentation.

PROTECTION OF PATIENT'S RIGHTS TO PRIVACY

Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives informed written consent for publication. The patient should be shown the manuscript to be published. Refer to **www.icmje.org**.

ETHNIC CLASSIFICATION

The rationale for analysis based on racio-ethnic-cultural categorisation should be indicated.

CATEGORIES OF SUBMISSIONS

Shorter items are more likely to be accepted for publication, owing to space constraints and reader preferences.

Original articles

Original articles on research relevant to anaesthesia and analgesia should not exceed 3 200 words, no more than 30 references, with up to 6 tables or figures. A structured abstract under the following headings, Background, Methods, Results, and Conclusions is a requirement and should not exceed 300 words.

Clinical Review articles

Review articles relevant to anaesthesia and analgesia should not exceed 2 400 words, with a maximum of 20 references and no more than 6 tables or figures. A summary of 300 words or less is required.

Case reports

Case reports should not exceed 1 800 words with no more than 10 references. Figures are limited to 2 figures and may include images or photographs. The case report should have three headings: Summary (not exceeding 100 words), Case report (with no introduction) and Discussion. Case reports will be published online only. The summary and the URL will appear in the printed version.

Scientific Letters

Scientific Letters should not exceed 2 400 words with a maximum of 10 references. Only one table or illustration is permissible. A structured abstract under the following headings, Background, Methods, Results, and Conclusions, is a requirement and should not exceed 250 words.

Letters to the editor

Letters to the editor should be 800 words or less with only one image or table.

MANUSCRIPT PREPARATION

Refer to articles in recent issues for the presentation of headings and subheadings. If in doubt, refer to 'uniform requirements' - **www.icmje.org**. Manuscripts must be provided in **UK English**.

Qualification, affiliation and contact details

This information must be provided for ALL authors and must be submitted as a supplementary file.

Email addresses of all author must be provided.

ORCID number of **ALL** authors must be provided - if authors do not have ORCID, please register at https://orcid.org/

Abbreviations

All abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.

Scientific measurements

Scientific measurements must be expressed in SI units except blood pressure (mmHg) and haemoglobin (g/dl). Litres is denoted with a lowercase 'l' e.g. 'ml' for millilitres). Units should be preceded by a space (except for %), e.g. '40 kg' and '20 cm' but '50%'. Greater/smaller than signs (> and 40 years of age) should also be preceded by a space e.g. > 20 years. No spaces should precede ± and °, i.e. '35±6' and '19°C'.

Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160...

Quotes should be placed in single quotation marks: i.e. The respondent stated: '...' Round **brackets** (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.

General formatting

The manuscript must be in Microsoft Word or RTF document format. Text must be 1,5-spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes, except for Tables). *The manuscript must be free of track changes.*

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Journal references:

1. Jun BC, Song SW, Park CS, Lee DH. The analysis of maxillary sinus aeration according to aging process: volume assessment by 3-dimensional reconstruction by high-resolutional CT scanning. Otolaryngol Head Neck Surg. 2005 Mar;132(3):429-34.
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Internet references: World Health Organization. The World Health Report 2002 - Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization, 2002. http://www.who.int/whr/2002 (accessed 16 January 2010).

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3. Section 3: Draft Article

A survey of the perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts

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Keywords: Awareness, Knowledge, Learners, Anaesthesia

Abstract

Background

William J.G Morton (1816-1868) introduced the world to modern anaesthesia when he successfully anaesthetised a patient using Ether at Massachusetts General Hospital in Boston in October 1846. (1) Since then, advances in pharmacology have resulted in the safer use of anaesthetic drugs and technological advances have improved monitoring of patients under anaesthesia. Anaesthetists all over the world are now involved in the fields of critical care, trauma and pain management. (2) This has, without a doubt, brought a sense professional *esprit de corps* to the anaesthetic fraternity.

Despite this radical growth and development of the speciality, there is still a lack of public knowledge regarding anaesthesia as a discipline, anaesthetists' expertise and the role played by the anaesthetist in the chain of health care delivery. (3)

Methods

A cross sectional study was carried out between June and September 2021 on Grade 12 learners in four Johannesburg districts. A questionnaire consisting of three sections and 26 questions was handed out at schools. The first part of the questionnaire acquired demographic information, the second part contained questions pertaining to anaesthetists and anaesthesia as a speciality, and the third, interest in the field of anaesthesia.

Results

Of the 595 learners that participated in this study, 335 (56.3%) were aware that the anaesthetist administers anaesthesia in the operating room, however, a considerable number of learners n=344 (57,8%) believed that nurses monitored and recorded the patient's vital signs during surgery. Only 95 learners (16%) could correctly identify all the duties of the anaesthetist outside of the theatre environment. Overall, learners fared poorly, achieving an average score of 14% for the questionnaire. However, there was a statistically significant correlation between being from a high socioeconomic background and awareness that the anaesthetist administers anaesthesia. A high socioeconomic background was defined as having a suburban residence, a household income comprising a salary instead of social grants and care givers that possessed a university degree.

Knowledge regarding the intraoperative duties of the anaesthetist was still poor, regardless of the socioeconomic background of the learner.

Previous exposure to anaesthesia did not improve awareness about anaesthesia among the learners.

Conclusion

This study has shown that awareness regarding anaesthesia and anaesthetists is still lacking despite the radical growth in the field. This lack of awareness cannot be ignored; education of the general public should be intensified in order to empower people to ask the right questions as well as make informed decisions about their perioperative anaesthetic care. More than half of learners in this study, 58.5%, believed that good medical education can reduce the burden of health care costs and medicolegal consequences; and 70% of them would request an anaesthetist to provide them with detailed information about their anaesthetic before the start of surgery. Therefore, despite lack of awareness, the majority of the learners displayed interest and willingness to know more about anaesthesia, and grade 12 learners would be a formidable target group to direct anaesthetic education campaigns.

3.1. Introduction

Anaesthesia as a speciality is one of the youngest branches of medicine and has made impressive advances in the medical field. (14) Since the introduction of modern anaesthesia in 1648, there have been vast improvements in drug safety profiles and patient monitoring systems, that have translated into an advancement in surgery as well. Complex surgery can be undertaken safely and in a humane manner due to modern anaesthesia's safety profile. (1, 16) Anaesthetists have transcended the borders of theatre and are now actively involved in hospital resuscitation teams, trauma units, pain clinics, and intensive care units (ICU). (5, 8, 14)

Studies have shown that the general population does not possess an awareness of who anaesthetic doctors are, or about anaesthesia as a discipline. (4, 9) In fact, in some instances, anaesthesia is not perceived as a distinct medical specialty, nor are they aware that anaesthetists are medical doctors. (4) According to Uma et al, this can be attributed to anaesthetists not being in the forefront of patient management. (4)

The public are generally unaware that the anaesthetist's role is not limited to theatre. (12, 13) One reason cited for this is that the surgeon is the first person to contact the patient, (4, 8) followed by the anaesthetist, who then assesses the patient. This results in the anaesthetist being viewed as the surgical assistant. (3)

As an annual awareness initiative, the 16th of October is celebrated as World Anaesthesia Day. This is intended to educate and improve the perception of the public with regards to anaesthesia. However, there have been few marked improvements in the general public's awareness about anaesthesia. (10)

An abundance of readily available and accessible information about anaesthesia is currently available, facilitated by search engines on the internet. Anecdotally, the public can be viewed as health conscious and are always looking for means to improve their health knowledge as well as their physical health. Yet, anaesthesia remains one of the least recognised branches of medicine.

Research done on undergraduate medical students has revealed a disappointing lack of knowledge about anaesthesia among medical students (25) and according to Gqiba et al, in their study of final year South African medical students in 2017, interests in anaesthesia as a speciality is still poor. (25)

Our study assessed the perceptions, and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts.

3.2. Methods

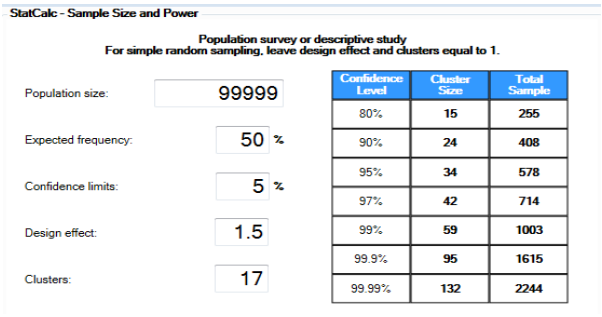
A cross sectional study was carried out between June and September 2021 on Grade 12 learners in four Johannesburg districts.

A two-stage cluster sampling method was used. Cluster sampling is a probability sampling method that is similar to a stratified random sampling method but takes advantage of natural clusters (groups) of population units that have similar characteristics.

The study population was divided into clusters (by schools), and the researcher used the convenience sampling method to collect data from learners.

A list of public schools in four Johannesburg districts was obtained from the Gauteng Department of Education. To define the sample size, the StatCalc® Epi-Infi sample size programme for cluster sample surveys was used, with assistance of the statistician assigned to the study.

When one is using Epi-Info the population size of 99 999 is used by default.


StatCalc - Sample Size and Power

Population survey or descriptive study
For simple random sampling, leave design effect and clusters equal to 1.

Population size: 99999
Expected frequency: 50 %
Confidence limits: 5 %
Design effect: 1.5
Clusters: 17

Confidence Level	Cluster Size	Total Sample
80%	15	255
90%	24	408
95%	34	578
97%	42	714
99%	59	1003
99.9%	95	1615
99.99%	132	2244

Using a 95% confidence interval, the total number of clusters to be used was found to be 17 clusters/schools ($\sqrt{578}$). At the Postgraduate assessors meeting, three more clusters (schools) were added to the total cluster number to allow for sampling of five clusters from each district. The total cluster number was raised to 20. A simple random sampling method was employed in the selection of schools.

The total number of grade 12 learners registered to write Matric exams was 59 033, however 99 999 was used here, to allow for the maximum allowed by the sample size calculator in event there were more candidates that were unaccounted for by the department. This allowed for sampling from more clusters and learners.

Grade 12 learners attending public schools in Johannesburg East, South, West, and North were included.

Learners who did not wish to participate were excluded. Grade 12 learners from private schools were also excluded in order to limit the sample size given the fact that there is only one researcher and limited resources. Further, and anecdotally, the majority of grade 12 learners in this country attend public schools and we felt this would be more representative of the "general population" of learners.

As some learners were below the age of medicolegal consent, learners who were younger than 18 years of age were handed parental assent letters for legal guardians to complete before the learner took part in the study.

Data collection

A questionnaire consisting of 26 questions was handed out at the schools. The questionnaire had three parts: the first collected non- identifying demographic information; the second part consisted of questions related to anaesthesia and anaesthetists and the third addressed interest the learners may or may not have had in learning more about anaesthesia. The information leaflet and questionnaire were issued to the participants at the convenience of the researcher and the participants. The questionnaire was adapted from a similar study conducted in Romania in 2017, (18) with permission from the authors.

Following the introduction of the study, the objectives and aim were explained, followed by distribution of the information letter and the questionnaire.

To ensure accuracy of the responses, the questionnaire was modified so that the questions were easily understandable by a Grade 12 learner, and to facilitate the capture of pertinent information relevant to this study in the South African context. Responses were awarded one point for each correct answer.

Data analysis

To enter and analyse the data, the Statistical Package for Social Sciences (SPSS) software was used. Frequency tables were used to display demographic data.

Frequencies and percentages were used to describe categorical variables; and continuous variables were described using means and standard deviations.

To compare the means, the Students' t-test and analysis of variance (ANOVA) were used.

The confidence interval was set at 95% (p-value <0.05).

Ethical considerations

Ethical clearance for this study was obtained from the Department of Human Ethics of the University of the Witwatersrand (WITS) with clearance certificate number M210238 MED21-01-092. All participants involved signed an informed consent form. Given the age of most pre-university learners, parental assent forms were distributed to learners who were under 18 years of age before they took part in the study.

3.3. Results

3.3.1. Introduction

The study population comprised 595 learners. The majority of the learners were between the ages of 15 and 25 years (95.0%), with only 19 learners (3.2%) aged between 21 – 25 years. Females comprised 63.2% of the study population and black learners made up the majority, 87.1%, of the study population. Only 88 learners (14.8%) had a previous surgical history.

The response rate varied from 30.2% (question ten) to 99.7% (question two). The missing values were reported in the frequencies but were not included in the inferential tests and did not influence the average outcome.

3.3.2 Knowledge regarding anaesthesia and anaesthetists

1. **Awareness about who administers anaesthesia**

More than half the learners, 56.3%, were aware that the anaesthetist administers anaesthesia in the operating room, 25.7% did not know who administers anaesthesia; 10.3% thought it was the role of the surgeon; five percent thought it to be the role of a nurse and one percent thought it was the role of a technician.

2. **Relationship between the surgeon and the anaesthetist during the operation**

It is interesting to note that 25.9% of learners were not aware of the relationship between the surgeon and the anaesthetist in the operating room, while 43.5% believed they worked as team and 11.6% believed the team was led by the surgeon. Only 13.3% of the learners were aware that the surgeon and the anaesthetist have different roles**.**

3. **Measurement of vital signs during surgery**

More than half of the learners, 57.8%, believed that the nurse monitors the patient's vital signs during surgery and only 11.9% of the learners were aware that it is the anaesthetist's duty to

monitor vital signs. Interestingly, 6.7% thought the surgeon monitors the vital signs and 21.8% did not know who monitored the patient's vital signs during surgery.

4. Performance of anesthesia in the operating theatre

Just over half of the learners, 51.1%, were aware that the anaesthetist induces the patient in the operating theatre, while 15.1% believed it was the surgeon's duty and 7.4% believed the nurse induced the patient.

5. Monitoring bleeding and initiating blood transfusion

Intraoperative blood loss monitoring, and blood transfusion were thought to be the responsibility of the anaesthetist by only 7.6% of the learners; whilst 29.9% of learners thought this was a nurses' duty and 29.7% thought it was the responsibility of the surgeon. Most learners, 30.9%, did not know whose responsibility it was.

6. Intraoperative patient resuscitation

Regarding the responsibility of resuscitation during a cardiac arrest, 23.9% of the learners thought the nurse resuscitates the patient, while a significant 37.0% admitted to not knowing whose responsibility it was, and 10% believed it was the anaesthetist's duty. Interestingly, 27.1% thought it was the duty of the surgeon.

7. Patient safety in the recovery room postoperatively

Importantly, 49.9% of the learners believed that the safety of the patient in recovery room immediately after the operation was ensured by the nurse and 23.4% did not know whose responsibility patient safety in the post anaesthesia care unit fell under. Only 10.3% of the

learners believed it was the anaesthetists' responsibility to ensure the patients' safety in the recovery area, and 15.1% thought it was the role of the surgeon.

8. Post operative monitoring within the first 24 hours after the operation

Only 5.4% of learners were aware that the anaesthetist is involved in the post operative monitoring of the patient within the first 24 hours of surgery, while 71.6% of the learners thought it was the nurse's responsibility and 5.7% thought it to be the role of the surgeon.

9. Pain management within the first 24 hours after the operation

Regarding pain management, 12.8% of learners were aware this role is fulfilled by anaesthetists, with more than half of the learners, 57.0%, believing that the nurse manages postoperative pain and 10.6% thought the surgeon is responsible for pain management.

10. The anesthetist's role in the hospital.

Only 16% of the learners could correctly identify all the duties of the anaesthetist outside of the theatre environment i.e. duties in the intensive care unit (ICU), pain clinics, and hospital resuscitation teams, while 49.9% were only aware of the theatre duties of the anaesthetists. The rest of the learners could only identify one area of duty that anaesthetists are involved in.

The mean score for section B was 14.74% (SD= 13.09%). On average, the learners scored 14% for the questionnaire and mostly received 0 – 30%.

3.3.3 Factors associated with knowledge of anesthesia and anesthetists

**Please note: the first column/bar of all figures represents the learners that did not answer the question*

1. Socioeconomic Factors

1.1 Place of residence

Of the 595 learners, 56.6% lived in townships, 32.6% in suburban areas and 8.2% in informal settlements.

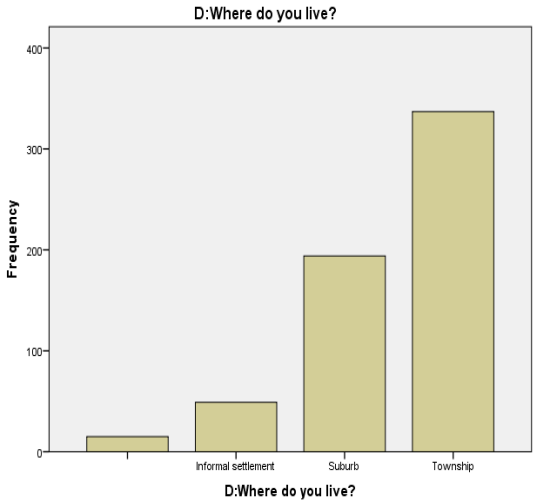


Figure 1: Place of residence

There was a statistically significant correlation between a learner living in a suburban area and

- awareness that the anaesthetist provides anaesthesia (x^2= 65.8; P <0.001).
- awareness that the anaesthetist and the surgeon play different roles in theatre (x^2= 54.8; P <0.001).
- awareness that it is the anaesthetist's duty to monitor the patient intraoperatively (x^2 = 18.9; P <0.001).
- awareness about postoperative pain management being the duty of the anaesthetist (x^2= 8.9; P<0.03).

1.2 Household income

Of the 595 learners, 48.2% had caregivers that were employed and earned wages/salaries, 28.2% of care givers depended on social grants and 19.7% made use of a salary and a social grant.

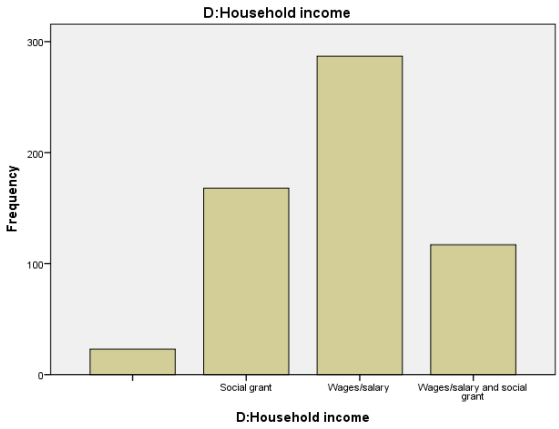


Figure 2: Household source of income

There was a statistically significant correlation between having care givers that earned salaries independent of social grants and

- awareness that the anesthetists provide anesthesia (x^2= 46.9; P <0.001).
- awareness that the surgeon and anaesthetist play different roles in theatre (x^2= 26.4; P<0.033).

- awareness that the anaesthetist is still responsible for the patient over the first 24 hours of the postoperative period (x^2 = 29.8; P <0.001)
- awareness that the anaesthetist is responsible for management of the patient's postoperative pain (x^2 = 21.1; P <0.04).
- Awareness of whose role it is to monitor the patient's vital signs intraoperatively (x^2=28.9; P<0.004)

1.3 Highest level of education of caregiver

Regarding level of education of the caregivers, 59.2% had an education that terminated at Grade 12, 20.2% had a university degree, 7.4% had only completed primary school education and 8.6% held college certificates.

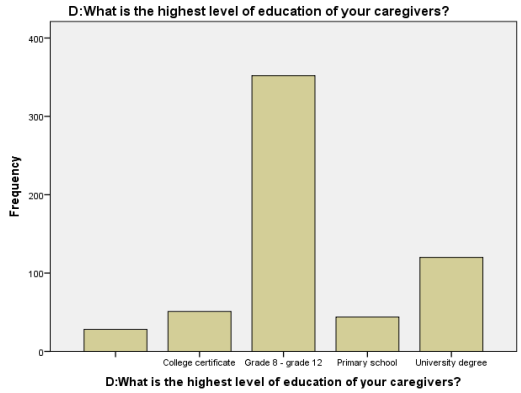


Figure 3: Highest level of education of caregiver

There was a statistically significant correlation between having caregivers with university degrees and

- awareness that the anaesthetist provides anaesthesia (x^2 = 31.1; P <0.001).
- awareness that the surgeon and anaesthetists play different roles in theatre (x^2 =48.3; P <0.001).
- awareness that the anaesthetist monitors vital signs in the intraoperative period (x^2 = 30.3; P <0.016).
- awareness that the anaesthetist monitors vital signs in the intraoperative period (x^2 = 30.3; P <0.016).
- awareness that the anaesthetist is still responsible for the patient 24 hours after the surgery (x^2 = 49.4; P <0.001).

2. Role of previous surgery

Of the 595 learners, only 14.8% had undergone previous surgery, with 87.4% having had no prior surgical experience.

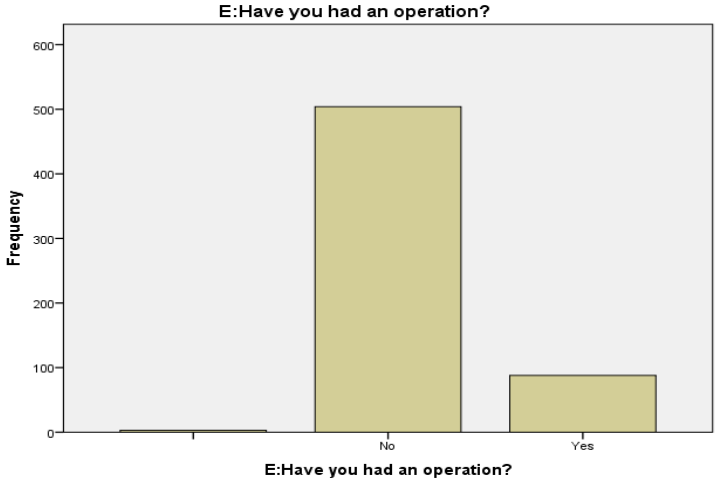


Figure 4: History of previous surgery

There was no statistically significant correlation between learners that had undergone a previous surgical operation and

- awareness that the anaesthetist administers anaesthesia (x^2=3.31; P <0.19)
- awareness about the relationship between the surgeon and the anaesthetist (x^2= 7.159; P <0.710).
- awareness of the anaesthetists' responsibility to monitor blood loss and transfuse blood (x^2=5.16; P <0.773).
- awareness of the role of the anaesthetist during a resuscitation (x^2= 1.09; P= <0,58).
- awareness about the role of the role of the anaesthetist in the post anaesthetic care unit / recovery room (x^2= 2.3; P <0.31).
- awareness of all the roles of the anaesthetists in the hospital (x^2= 2.7; P< 0.251).
- awareness of who oversees the patients' wellbeing during the first 24 hours (x^2= 3.34; P< 1.88).

There was, however, a statistically significant correlation between learners that had previous surgery and awareness about the anaesthetists' intraoperative duty to monitor the patients' vital signs (x^2= 11.5; P < 0.003) as well as awareness that the anaesthetist is responsible for pain management during the first 24 hours after surgery (x^2= 6.8; P= 0.032).

3.3.4 Data describing interest in Anaesthesia

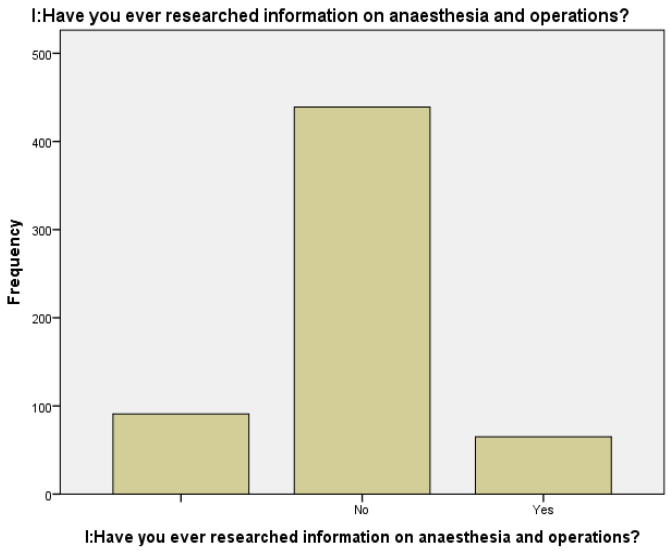


Figure 5: Previous learner directed research about anaesthesia

The majority of learners (73%) had not researched anaesthesia and anaesthetics, and, of the learners that had done research before, 10.9% did so by using the internet and 1.7% had heard about anaesthesia from family members.

When the learners were asked what means were thought to be useful for updating the public about anaesthesia and anaesthetists, the television and the internet were the most favoured by 23.2% and 27.6% of the participants respectively, and 19% wanted it to be part of the school curriculum.

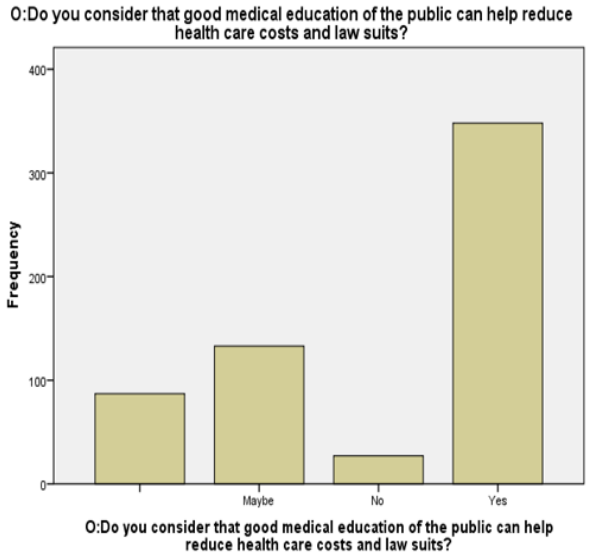


Figure 6: Impact of public medical education on healthcare costs

Most of the learners (58.5%) believed that good public medical education can help reduce health care costs and medicolegal problems faced by anaesthetists, and the majority (70%) of the learners wanted an anaesthetist to provide them with detailed information about anaesthesia if they were to undergo surgery.

3.7 Discussion

This study investigated the perceptions and knowledge of anaesthesia and anaesthetists possessed by grade 12 learners in four Johannesburg districts. The results showed that, on the whole, knowledge in this regard is lacking, and where knowledge was present, it was superficial at best.

Regarding the intraoperative duty of anaesthetists, only 11.9% of the learners were aware that the anaesthetist monitors the patient throughout surgery, a result found to be in line with the study done by Gurunathan et al in 2004, (12) where only 25% of the study population were aware that vital signs were monitored by the anaesthetist.

Intraoperative monitoring of blood loss and blood transfusion was thought to be the duty of the anaesthetist by only 7.6% of the learners, results echoed by the study by Sagun et al in Saudi Arabia (13) where only 4.8% of the study population were aware that blood transfusion is the responsibility of the anaesthetist.

Only 10% of the study population was aware that the anaesthetist is responsible for the resuscitation of the patient during surgery, while 37% of the learners thought this was the nurses' duty and 27.1% thought the surgeon is responsible for intraoperative resuscitation. This is in contrast to the study done by Onutu et al, (18) where 46.2% of the study population viewed resuscitation as a combined effort of the surgeon and anaesthetist.

In our study, only 10.3% of the learners believed that safety of the patient in the recovery unit is ensured by the anaesthetist, in contrast to a study done by Swinhoe et al, (6) where 55% of the study population believed the same.

Just over half of the learners in our study, 57%, believed that nurses are in charge of the patient's postoperative pain management within the first 24 hours of surgery. This may be attributed to the perception that nurses look after the patients in the wards and administer medication.

In our study, learners' knowledge about the roles of anaesthetists outside of the theatre environment was lacking. Only 16% of learners could correctly identify all the other duties of the anaesthetists in the hospital, such as, pain clinics, ICU management and intubation /resuscitation of patients in the wards and emergency rooms. This result is in keeping with a study done by Umar B.R et al. (8)

There was a statistically significant correlation between coming from a high socioeconomic background and awareness about the duty of the anaesthetist being administration of anaesthesia ($p < 0.05$).

However, there was no statistically significant correlation between socioeconomic background and the intraoperative duties of anaesthetists including monitoring of vital signs, administration of blood products and intraoperative patient resuscitation.

There was also no statistically significant relationship between socioeconomic background and awareness about the post- operative duties of the anaesthetist or the duties of anaesthetist outside of theatre.

In our study, a history of previous surgery and anaesthetic exposure did not increase awareness about anaesthesia and anaesthetists, this was in agreement with studies by Prasad et al (26) and Prakash et al, (10) where their study populations who had had anaesthesia still had poor understanding and knowledge about the discipline.

It was reassuring to note that learners displayed the desire to learn more about anaesthesia as a discipline. Better public education in the long term was listed as one of the recommendations that would help reduce the rate of litigations by S. Pepper et.al. (27) The onus is on the anaesthetic fraternity to create awareness about our speciality.

3.8 Study Limitations

We could not extrapolate data from this study to represent the knowledge of all of Johannesburg's Grade 12 learners as private schools have been excluded from the study.

Similarly, we could not extrapolate the data to represent the views of all Grade 12 learners in the rest of South Africa as there may be provincial differences.

The questionnaire for this study was extrapolated from a similar study internationally that sampled the general population, and the literature review is therefore based on the general population as well, and not pre-university learners only, as there was no literature available to this effect. We have extrapolated our results to therefore reflect a portion of the general population, of which pre university learners form a part of.

The researcher relied on the honesty of the learners in completing the questionnaire.

3.9 Conclusion

This study has shown that awareness regarding anaesthesia and anaesthetists is still lacking despite the radical growth in the field. This lack of awareness cannot be ignored; education of the general public should be intensified in order to empower people to ask the right questions as well as make informed decisions about their perioperative anaesthetic care. More than half of learners in this study, 58.5%, believed that good medical education can reduce the burden of health care costs and medicolegal consequences; and 70% of them would request an anaesthetist to provide them with detailed information about their anaesthetic before the start of surgery. Therefore, despite lack of awareness, most of the learners displayed interest and willingness to know more about anaesthesia, and grade 12 learners would be a formidable target group to direct anaesthetic education campaigns. A future study with greater resource capacity could also target private school learners to determine if the results would be echoed by this study.

3.10 Acknowledgements

The author would like to acknowledge the University of Witwatersrand (WITS) in affording her the opportunity to conduct this study, the Gauteng Department of Education for granting the author permission to visit the schools, the schools themselves and all the learners that took part in the study.

3.11 Questionnaire

A survey of the perceptions and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts.

Section A: Demographics

Age

☐ 15 - 20 years old

☐ 21 – 25 years old

Sex

☐ Female

☐ Male

Race

☐ Black

☐ White

☐ Indian

☐ Asian

☐ Coloured

Where do you live?

☐ Suburb

☐ Township

☐ Informal Settlement

Please describe your house

Who are your primary caregivers?

☐ Both parents

☐ Single parent

☐ Legal guardian

What is the highest level of education of your caregivers?

☐ Primary school

☐ Grade 8 – grade 12

☐ College certificate

☐ University degree

Household income

☐ Social grant

☐ Wages/salary

☐ Wages/salary and social grant

Have you been admitted to hospital before?

☐ Yes

☐ No

Have you had an operation?

☐ Yes

☐ No

Section B: Awareness

Who is responsible for performing anaesthesia in the operating room?

☐ The surgeon

☐ The technician

☐ The anaesthetist

☐ The nurse

☐ I don’t know

What is the relationship between the surgeon and the anaesthetist during the operation?

☐ The team is led by the surgeon

☐ The team is led by the anaesthetist

☐ Each plays a different role

☐ They work as a team during the operation

☐ I don’t know

Who measures and monitors the patient’s vital signs (blood pressure, heart rate, oxygen saturation and temperature) during surgery?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who performs anaesthesia during an operation?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who watches for bleeding and who gives a blood transfusion?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who resuscitates the patient during the operation?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who watches over the patient within the first 24 hours after surgery?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who provides treatment for pain that occurs within the first 24 hours of surgery?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who ensures patient safety in the recovery room immediately after the operation?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

What is the anaesthetist’s role in the hospital?

☐ Performing anaesthesia in the operating room

☐ Treatment of medical and surgical emergencies

☐ Caring for patients in ICU

☐ Performing local anaesthesia in the theatre

☐ Resuscitation of patients anywhere in the hospital

☐ Pain therapy in the pain clinic

☐ All the above

☐ None of the above

Section C: Interest

Have you ever researched information on anaesthesia and operations?

☐ Yes

☐ No

If yes: Where did you obtain this information?

☐ Previous exposure

☐ The internet

☐ Television

☐ Radio

☐ Magazines/newspapers/brochures

☐ Family and friends

If no: What means do you think are useful for updating he public awareness on the role and activity of the anaesthetist?

☐ The internet

☐ The TV

☐ Radio

☐ Magazines/newspapers/ brochures

☐ School

Do you think the education and attitude of the anaesthetist contributes to the medical education of the public??

☐ Yes

☐ No

☐ Maybe

Do you consider that good medical education of the public can help reduce health care costs and lawsuits?

☐ Yes

☐ No

☐ Maybe

Would you like the doctor who has specialised in anaesthesia to provide you with information about the anaesthetic before your operation?

☐ Yes, detailed information

☐ Yes, but not detailed information

☐ No

☐ I don’t know

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3. Section 4: Proposal

A survey of the perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts

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3.1 Introduction

Anaesthesia as a speciality is one of the youngest branches of medicine and has made impressive advances in the medical field. (14) Since the introduction of modern anaesthesia in 1648, improvements in drug safety profiles and patient monitoring systems have not only advanced anaesthesia but have also allowed for revolutionary breakthroughs in surgery as well. Complex surgery can be undertaken safely and in a humane manner due to modern anaesthesia's safety profile. (1, 16) Anaesthetists have transcended the borders of theatre and are now actively involved in hospital resuscitation teams, trauma units, pain clinics, and intensive care units (ICU). (5, 8, 14)

Uma et al (4) and Mathur et al (9), showed in their respective studies that the general population did not possess an awareness of anaesthetic doctors or of anaesthesia as a discipline. In fact, in some instances, the general population does not perceive anaesthesia to be a separate medical field, nor are they aware that anaesthetists are medical doctors. (4) According to Uma et al, this can be attributed to the anaesthetists not being in the forefront of patient management. (4)

Regarding the role of anaesthetists outside of the theatre environment, public education seems to fall short as people are generally not aware that the anaesthetist's role is not limited to theatre. (12, 13) Some of the reasons cited for the lack of knowledge are that the surgeon is the first person to make contact with the patient (4, 8). The surgeon's chosen anaesthetist then assesses the patient. This sequence of events leads the patient to view the anaesthetist as the assistant to the surgeon. (3)

Most often, anaesthetists are in contact with the patient for the first time during the preoperative visit. Preoperative visits are aimed at ascertaining the patient's physical status and fitness for surgery and are not often used as an opportunity to educate the patient about the field or profession. Patients next encounter their anaesthetist before induction of anaesthesia, and then again in the recovery room. As a result, patients spend little time with the anaesthetist when they are awake leading to anaesthetists being referred to as 'unseen doctors'. (2, 18)

As an annual awareness initiative, the 16th of October is celebrated as World Anaesthesia Day.

This is intended to educate and improve the perception of the general public with regards to anaesthesia. However, this initiative has failed to make any marked improvements in the general public regarding awareness about anaesthesia. (10)

In 2020, there is an abundance of readily available information, most of which lies in the virtual domain of the internet. Search engines readily bring up a plethora of information for any medical subject that is searched for. We are also in an era where people are health conscious, and are always looking for means to improve their health knowledge as well as their physical health. Yet, anaesthesia remains one of the least recognised branches of medicine.

This is a problem that affects both the developing and the developed world, and both literate and illiterate people to varying degrees. (3, 13, 17) What is most interesting is the fact that people with previous anaesthetic experience also do not have good insight into the domain, education about their field of work during the preoperative visits. (10, 19)

In addition to the lack of awareness regarding anaesthesia and anaesthetists, there is a global shortage of anaesthetists. In 2006, it was reported that the ratio of anaesthetists to the general population in South Africa was less than 1:50 000. (11) This has invariably lead to anaesthetics in rural areas being performed by non-specialist anaesthetists, as specialist anaesthetists tend to be concentrated in urban areas because of their close proximity to academic training facilities, (11, 28) greater patient loads, and potentially greater economic benefits.

Between 2015 and 2016 the World Federation of Societies for Anaesthesiologists conducted a Global Anaesthesia Workforce Survey.(29) The results of the survey showed an ongoing shortage of anaesthetists globally. Out of the 153 countries that participated, 77 countries reported a specialist anaesthetist density of less than 5 per 100 000 population with even lower densities reported in African and South East Asian regions.(29)

Research done on undergraduate medical students has revealed a disappointing lack of knowledge about anaesthesia among medical students (25) and according to Gqiba et al, in their study of final year South African medical students in 2017, interests in anaesthesia as a speciality is still poor. (25)

The lack of interest in anaesthesia as a speciality may be as a result of the notion that anaesthesia is a “behind the scenes” speciality, that anaesthesia is boring, stressful or frightening. (25, 30, 31)

A qualitative study done at Chris Hani Baragwanath Academic Hospital (CHBAH) in 2015 on preoperative patients revealed a limited scope of knowledge when it came to the role played by the anaesthetist in the chain of patient care. Furthermore patients found themselves unable to differentiate between an anaesthetist and a nurse and some thought the surgeon performed

both the anaesthetic and the surgery. (15) This was found to be due to patients' view of the existence of only medical and surgical doctors. (15) What is striking is that even in the postoperative period, patient awareness of anaesthesia did not improve and they did not recall who their anaesthetist was even though they had undergone preoperative counselling with the anaesthetist. (15) CHBAH mostly services Soweto and its drainage areas and patients are mostly those of low socioeconomic status and tend to have lower levels of education. This study did not assess the knowledge and perceptions of members of the public into anaesthesia and anaesthetists.

3.2 Problem statement

There is a paucity of data examining patients' knowledge of anaesthesia and anaesthetists. Data available from local studies reflects surgical patients' perceptions and not that of the general public.

3.3 Aim

The aim of this study is to describe the knowledge and perceptions of anaesthesia and anaesthetists among Grade 12 learners in four districts in Johannesburg.

3.4 Objectives

The primary of objectives of this study are to:

- Describe the knowledge Grade 12 learners have regarding anaesthesia and anaesthetists.
- Describe the perceived role of the anaesthetist in the perioperative period, i.e. before, during, and after surgery.
- Describe the perceived role of the anaesthetist outside of the operating theatre environment.

The secondary objective of this study is to:

4. Determine factors associated with knowledge of anaesthesia and anaesthetists.

4.1 Research Assumptions

The following definitions will be used in the study.

Anaesthetist: a qualified doctor working in the Department of Anaesthesia including interns, medical officers, registrars and consultants.

Awareness: The knowledge Grade 12 learners have regarding anaesthesia and anaesthetists.

Postoperative acute pain: Acute pain that is experienced immediately after surgery - up to 7 days (32)

Socioeconomic status: the position of an individual or group on the socioeconomic scale, which is determined by a combination of social and economic factors such as income, extent and type of education, type and prestige of occupation, place of residence, and—in some societies or parts of society—ethnic origin or religious background. (33)

Low Socioeconomic background: Learners living in informal settlements and underdeveloped townships attending previously disadvantaged schools (Quintile 1 – 3 schools), coming from families with caregivers that possess comparatively lower levels of education (less than Grade 12) and fewer financial resources.

Mid-high Socioeconomic background: Learners living in developed townships and suburbs attending more advantaged schools, where school fees tend to be paid (Quintile 4 – 5 schools). These learners come from families with higher levels of education (college certificates/degrees) and with more financial resources.

Quintile system: System of classifying schools with regards to the socioeconomic backgrounds of the community they service and the amount of funding and support the school receives from the government. Quintiles 1 – 3 are non-fee-paying schools receiving governmental funding with 1 and 3 servicing the poor communities. Quintiles 4 and 5 are fee-paying schools and service mid to high socioeconomic communities. Quintiles 4 and 5 receive little to no funding from the government.

Informal settlement: An unplanned settlement on land which has not been surveyed or proclaimed as residential, consisting mainly of informal dwellings. (34)

Township: Townships are underdeveloped residential areas, usually (but not only) urban, residential areas that during Apartheid were reserved for non-whites (Africans, Coloureds and

Indians) who lived near or worked in areas that were designated ‘white only’ (under the Black Communities Development Act (Section 33). (35)

4.2 Demarcation of the study field

The survey will be carried out on grade 12 learners in four Johannesburg districts – Johannesburg South, Johannesburg West, Johannesburg North, and Johannesburg East. The study will be focused on Public schools.

The number of learners in each district are as follows:

- Johannesburg East has 16 426 learners
- Johannesburg South has 14 419 learners
- Johannesburg West has 10 906 learners
- Johannesburg North has 17 282 learners

Five schools from each district were randomly sampled using a random number generator as follows:

Johannesburg East:

School	**Quintile**	**Contacts**
• Alexandra Secondary School	Q 2	26 2nd Ave. Alexandra Ext. 52 011 443 2713
• Eqinisweni Secondary School	Q 2	5320 Masakhane str. Ivory Park Midrand 011 053 8967
• Maphutha Secondary School	Q 4	1406 Virginia Mlobeli str. Mayibuye Township 010 223 7106
• Athlone Secondary School	Q 5	Girls: 73 Fredrick str. Observatory 011 616 4150
• Bryanston Secondary School	Q 5	7 Tramor rd. Bryanston 011 706 6010

Johannesburg South

School	Quintile	Contacts
• Sakhisizwe Secondary School	Q 1	2358 Grace str. Grasmere Banana Park 011 850 0193
• Thusa Sechaba Secondary School	Q 2	1196 Thwala str. Poortjie 011 850 6657
• Kibler Park Secondary School	Q 5	833 Gordon rd. Kibler Park 011 943 6107
• Lenasia South Secondary School	Q 5	34 Cnr. Ivory and Sheffield rd. Kiasha Park Ext. 5 011 855 1503
• Glenvista Secondary School	Q 5	1 The Broads, Mulberton 011 432 3177

Johannesburg West

School	**Quintile**	**Contacts**
• Kgatelopele Secondary School	Q 1	1062 Cnr Niger Botswana str. Bramfischer Roodepoort 082 893 6243
• Thulane Secondary School	Q 2	25334 Block 5 Doornkop Roodepoort 010 442 3332
• Siyabusa Secondary School	Q 2	19 Rietvallei Slovoville Roodepoort 082 600 7459
• George Khoza High School	Q 4	2331 Mashao Drive Dobsonville Soweto 011 988 1757
• Allen Glen High School	Q 5	1028 Landhuis str. Roodeport 011 575 4971

Johannesburg North

School	Quintile	Contacts
• Blue Eagle High School	Q 1	1291 Tanzania str. Cosmocity, Randburg 011 875 2247
• Sunrise Secondary School	Q 1	1071 Cnr. Humbulani str. West 2 ext. 5 Diepsloot 011 464 5052
• Bona Comprehensive School	Q 3	6603 Matlala str. Soweto, Orlando 011 935 2641
• Westbury Secondary School	Q 4	1 Dowling Ave. Westbury 011 477 5548
• Roosevelt High School	Q 5	1 Thibult str. Roosevelt Park Ext. 5 Emmarentia 011 782 4937

4.3 Ethical considerations

Approval to conduct the study will be obtained from the Human Research Ethics Committee (Medical) and the Graduate Studies Committee of the University of the Witwatersrand (Wits). Consent will be requested from parents for learners that are under 18 years of (Appendix G) age in accordance with the Nationa Health Act 61 of 2003. (36) Consent will also be requested from the learners themselves (Appendix H)

4.3.1 **Consent**

The Department of Education will first be approached for consent to conduct the study (Appendix C). Upon receipt of the consent, schools will be approached (Appendix D). A detailed explanation of the study will be given to the school Headmaster/Headmistress and the Grade 12 learners will be invited to take part (Appendix E). An information letter will be given to the learners and completion of the questionnaire will imply consent from the learners (Appendix F)

4.3.2 Anonymity and confidentiality

During data collection, no identifying information will be acquired. Each study questionnaire will be assigned an identifying number and only the researcher and her supervisors will have access to the raw data. A separate list of participants will be kept by the researcher.

The study will be conducted according to the Declaration of Helsinki (37) and the South African Guidelines for Good Clinical Practice. (38) Data will be stored securely for six years after the completion of the study. Data storage will be in electronic format, in a password protected database.

4.4 Data collection

4.4.1 Research design

The study will be a prospective, contextual, descriptive study of Grade 12 learners' knowledge and perceptions about anaesthesia and anaesthetists in Johannesburg.

Prospective: A prospective study is one where a specific population is followed over time to observe an outcome. (39) The data is collected at the time the study takes place.

Contextual: A simple analysis that helps us to assess text in context of its historical and cultural settings. A contextual study is one that targets a specific population group, which in this study, are Grade 12 learners in four Johannesburg districts.

Descriptive: A quantitative analysis of data providing a simple summary about a sample and measures. According to Brink et al (39) a descriptive study describes a phenomenon by obtaining information from a representative sample of a population, without the intention of discovering a causal link, and in doing so, problems with current practice are identifiable(39). This study is a descriptive, cross-sectional study of Grade 12 learners in the four Johannesburg districts. The variables will not be manipulated by the researcher.

4.4.2 Study population

The study was conducted on Grade 12 learners in Public Schools in Johannesburg East, South, West and North.

4.4.3 Study sample

- Sample method

In this survey, a two-stage cluster sampling method will be used. Cluster sampling is a probability sampling method that is similar to a stratified random sampling method but takes advantage of natural clusters (groups) of population units that have similar characteristics. (40)

The study population will be divided into clusters (by schools), and the researcher will use the convenience sampling method to collect data from learners.

- Sample size

A list of public schools in four Johannesburg districts was obtained from the Gauteng Department of Education (Appendix G).

To define the sample size, the StatCalc® sample size programme (41) for cluster sample surveys was used, with assistance of the statistician assigned to the survey.

Using a 95% confidence interval, the total number of clusters to be used was found to be 17 clusters/schools (√578). 3 more clusters (schools) were added to the total cluster number to allow for sampling of 5 clusters from each district. The total cluster number was raised to 20. A simple random sampling method was employed in the selection of schools.

- Inclusion criteria

Grade 12 learners attending public schools in Johannesburg East, South, West and North.

- Exclusion criteria

Schools and learners who do not wish to participate will be excluded from the survey.

Grade 12 learners from private schools will be excluded.

4.4.4 Data collection

The questionnaire was acquired from a similar survey conducted in Romania in 2017 with permission of the authors (Appendix A). The questionnaire has three parts: the first part collects non identifying demographic information; the second part consists of questions related to anaesthesia and anaesthetists and the third part addresses interest the learners may or may not have in learning more about anaesthesia. The information leaflet and questionnaire will be issued to the participants at the convenience of the researcher and the participants (Appendix E and B).

Following the introduction of the study, the objectives and aim of the study will be explained followed by issuing of the questionnaire and information letter. The data to be extracted includes the answers to all questions posed in the questionnaire.

To ensure accuracy of the responses, the questionnaire was modified so that the questions are easily understood by a Grade 12 learner, and to facilitate the capture of pertinent information relevant to this study in the South African context.

4.4.5 Data analysis

Data will be transferred from the questionnaire to a Microsoft Excel® spreadsheet. Data will then be exported to Stata® version 14 statistical software for analysis. Categorical data will be presented as frequencies and percentages. Data describing the knowledge and perceptions of the Grade 12 learners regarding anaesthesia and anaesthetists will be presented either as a mean (+- standard deviation) if normally distributed, or median (+-interquartile range) if not normally distributed.

Continuous variables will be compared using analysis of variance (ANOVA). The Kruskal Wallis' test will be used if the continuous variable is not normally distributed.

The association between categorical variables will be evaluated using the Pearson's Chi Square test. Fischer's Exact Test will be used if the value in any cell is less than five.

A 95% confidence interval will be used. The statistically significant level will be set at a p-value of <0.05.

4.5 Significance of the study

As evidenced by the literature, public knowledge and perceptions of anaesthesia and anaesthetists is poor worldwide. (3, 5, 8, 9)

In both developing and developed countries, there is an awareness gap about what anaesthesia is and what the role of anaesthetists are.

As medical professionals, we find ourselves working in an increasingly litigious society that is perpetuated by an ever-increasing shortage of anaesthetists as already established by the World Federation of Societies of Anaesthesiologists. (29)

Enlightened Grade 12 students will ideally take this information back to their respective families and communities and this will boost public awareness about the field of anaesthesia. The aim is to enlighten the public with not only the results of the study but also with pertinent information about anaesthesia as a domain and who anaesthetic doctors are.

It is the responsibility of the anaesthetic fraternity to create awareness about the speciality, to educate the public and eradicate misconceptions and anxiety the public may have regarding anaesthesia. This will enable them to make informed decisions regarding their anaesthetic and recognise anaesthetists as both physicians and advocates for the unconscious patient.

The results from this study will be presented to the Gauteng Department of Education, and public schools in Johannesburg to drive a focus on anaesthesia at career orientation events.

4.6 Validity and reliability of the study

Validity: the extent to which a concept is accurately measured in a quantitative study. (42)

Reliability: the extent to which a research instrument consistently has the same results if it is used in the same situation on repeated occasions. (42)

Validity and reliability will be ensured in the following way:

- The adapted use of a pre-published questionnaire
- The use of an appropriate study design
- The presence of the researcher during collection of data to clarify any misconceptions
- The consultation of a biostatistician with regards sample size calculation and data analysis.

4.7 Potential limitations of the study

We cannot extrapolate data from this study to represent the knowledge of all of Johannesburg's Grade 12 learners as private schools have been excluded from the study. Similarly, we cannot extrapolate the data to represent the views of all Grade 12 learners in the rest of South Africa as there may be provincial differences.

Data will have to be collected at the convenience of the schools and their learners, which may not always coincide with the availability of the researcher.

The researcher relies on the honesty of the learners in completing the questionnaire.

4.8 Project Outline

Activity	Sept 2020	Oct 2020	Nov 2020	Dec 2020	Jan 2021	Feb 2021	Mar 2021	Apr 2021	May 2021	June 2021
Protocol Preparation										
Literature										

Review										
Protocol Submission										
Postgraduate Approval										
Ethics Approval										
Data Collection										
Data Analysis										
Draft Article										
Submission										

4.9 Financial plan

Item	Price per page (Rand)	Number of pages	Copies	Total (Rand)
Proposal	1.50	18	1	27. 00
Questionnaires	1.50	6	578	5 202
Postgraduate form	1.50	1	6	9.00
Completed Report	1.50	100	4	600. 00
Binding		100		150. 00
Grand Total				2 520. 00

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5. Section 5: Appendices

Appendix A– Consent for use of previously published questionnaire

29 March 2020 11:44 Adela Hilda Onutu <adela_hilda@yahoo.com>

To: pulanemoloantoa@yahoo.com <pulanemoloantoa@yahoo.com>

Hello, feel free to use it.

Just put the reference.

Best regards,

Adela

29 March 2020 11:24 Pulane Moloantoa <pulanemoloantoa@yahoo.com>

To: adela_hilda@yahoo.om

Dear Dr Adela

I am Dr Adelice Talane from South Africa. I am an anaesthetic registrar and as part of my speciality training, I am required to do a small research study.

I'm doing a quantitative study of perception of anaesthesia and anaesthetists among the general South African population.

As I was doing my literature review, I came across the study that you did in your country about the knowledge of the general public about anaesthesia.

I would like to enquire if I can use your questionnaire for my study as my study is similar to yours, and what would the requirements be?

Kindest Regards

Dr. Adelice Talane

Appendix B– Questionnaire

A survey of the perceptions and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts.

Section A: Demographics

Age

☐ 15 - 20 years old

☐ 21 – 25 years old

Sex

☐ Female

☐ Male

Race

☐ Black

☐ White

☐ Indian

☐ Asian

☐ Coloured

Where do you live?

☐ Suburb

☐ Township

☐ Informal Settlement

Please describe your house

Who are your primary caregivers?

☐ Both parents

☐ Single parent

☐ Legal guardian

What is the highest level of education of your caregivers?

☐ Primary school

☐ Grade 8 – grade 12

☐ College certificate

☐ University degree

Household income

☐ Social grant

☐ Wages/salary

☐ Wages/salary and social grant

Have you been admitted to hospital before?

☐ Yes

☐ No

Have you had an operation?

☐ Yes

☐ No

Section B: Awareness

Who is responsible for performing anaesthesia in the operating room?

☐ The surgeon

☐ The technician

☐ The anaesthetist

☐ The nurse

☐ I don’t know

What is the relationship between the surgeon and the anaesthetist during the operation?

☐ The team is led by the surgeon

☐ The team is led by the anaesthetist

☐ Each plays a different role

☐ They work as a team during the operation

☐ I don’t know

Who measures and monitors the patient’s vital signs (blood pressure, heart rate, oxygen saturation and temperature) during surgery?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who performs anaesthesia during an operation?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who watches for bleeding and who gives a blood transfusion?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who resuscitates the patient during the operation?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who watches over the patient within the first 24 hours after surgery?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who provides treatment for pain that occurs within the first 24 hours of surgery?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

Who ensures patient safety in the recovery room immediately after the operation?

☐ The surgeon

☐ The anaesthetist

☐ The nurse

☐ I don’t know

What is the anaesthetist’s role in the hospital?

☐ Performing anaesthesia in the operating room

☐ Treatment of medical and surgical emergencies

☐ Caring for patients in ICU

☐ Performing local anaesthesia in the theatre

☐ Resuscitation of patients anywhere in the hospital

☐ Pain therapy in the pain clinic

☐ All the above

☐ None of the above

Section C: Interest

Have you ever researched information on anaesthesia and operations?

☐ Yes

☐ No

If yes: Where did you obtain this information?

☐ Previous exposure

☐ The internet

☐ Television

☐ Radio

☐ Magazines/newspapers/brochures

☐ Family and friends

If no: What means do you think are useful for updating he public awareness on the role and activity of the anaesthetist?

☐ The internet

☐ The TV

☐ Radio

☐ Magazines/newspapers/ brochures

☐ School

Do you think the education and attitude of the anaesthetist contributes to the medical education of the public??

☐ Yes

☐ No

☐ Maybe

Do you consider that good medical education of the public can help reduce health care costs and lawsuits?

☐ Yes

☐ No

☐ Maybe

Would you like the doctor who has specialised in anaesthesia to provide you with information about the anaesthetic before your operation?

☐ Yes, detailed information

☐ Yes, but not detailed information

☐ No

☐ I don’t know

Appendix C – Letter of request to Gauteng Department of Education

03 September 2020

Dear Mr. Mukatuni

My name is Dr. Pulane Talane. I work at Chris Hani Academic Hospital Anaesthetic Department. I am currently doing my Master of Medicine (MMED) with the University of the Witwatersrand. I am requesting permission to do a study on Grade 12 learners in four Johannesburg districts entitled "The perceptions and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts".

I have completed the form I received from the department as discussed in our previous communications. I have also attached my protocol. The questionnaire and the permission letters are attached to my protocol as appendices.

I humbly request that the department send me an acknowledgement letter upon receiving the application forms and the attached protocol that can be attached to my protocol for submission to the university's post-graduate panel.

Regards

Dr. Pulane Talane

Appendix D –Research Approval from Gauteng Department of Education

GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	10 September 2020
Validity of Research Approval:	04 February 2020 – 30 September 2020 2019/606
Name of Researcher:	Talane PA
Address of Researcher:	10 Goshawck Crescent
	Parklands Estate
	Parkrand, Boksburg
Telephone Number:	072 827 4192
Email address:	Pulanemoloantoa@yahoo.com
Research Topic:	A survey of the perceptions and knowledge of anaesthetics and anaesthetists possessed by Grade 12 learners in two Johannesburg districts
Type of qualification	Masters of Medicine
Number and type of schools:	17 Secondary Schools
District/s/HO	Johannesburg East, Johannesburg South

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

10/09/2020

The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted:

1. *Letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.*

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

2. *The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.*
3. ***Because of COVID 19 pandemic researchers can ONLY collect data online, telephonically or may make arrangements for Zoom with the school Principal. Requests for such arrangements should be submitted to the GDE Education Research and Knowledge Management directorate. The approval letter will then indicate the type of arrangements that have been made with the school.***
4. ***The Researchers are advised to make arrangements with the schools via Fax, email or telephonically with the Principal.***
5. *A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.*
6. *A letter / document that outline the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.*
7. *The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.*
8. *Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.*
9. *Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.*
10. *Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.*
11. *It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.*
12. *The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.*
13. *The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.*
14. *On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.*
15. *The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.*
16. *Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.*

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards

.....

Mr Gumani Mukatuni
Acting CES: Education Research and Knowledge Management

DATE: 10/09/2020

Office of the Director: Education Research and Knowledge Management
7th Floor, 17 Simmonds Street, Johannesburg, 2001
Tel: (011) 355 0488
Email: Faith.Tshabalala@gauteng.gov.za
Website: www.education.gpg.gov.za

Appendix E – Letter to the Principals and School Governing body

06 September 2020

Dear Sir/Madam

My name is Dr. Pulane Talane, and I am enrolled at the University of the Witwatersrand. I'm currently busy with my Master of Medicine (MMED) titled "The survey of perception and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts". I am currently fully employed at the Chris Hani Baragwanath Academic Hospital (CHBAH) in the Department of Anaesthesia. I humbly request include your Grade 12 learners in my survey. South Africa and the rest of the world currently has a dire shortage of anaesthetists and results from a survey such as this will not only help drive recruitment strategies in the near future but will help build awareness in the communities about anaesthesia as discipline.

Your assistance will be highly appreciated.

Regards

Dr. Pulane A. Talane

Appendix F – Study information document

STUDY INFORMATION DOCUMENT

Study title: A survey of the perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts.

Introduction:

Dear learner

My name is Pulane Talane and I am currently a registrar in the Wits Department of Anaesthesia. I am doing a research on "The perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts". Research is a process used in seeking new knowledge. In this study we want to learn the awareness that Grade 12 learners regarding anaesthesia as a discipline and the nature of the anaesthetist's work. Such as study has never been done in South Africa and it will also act as an opportunity to educate if knowledge is found to be lacking.

Invitation to Participate:

We are asking / inviting you to take part in a research study (or asking for your permission to include your child in a research study).

What is involved in the study:

1. A survey will be done in a form of a questionnaire.

2. It will be distributed in the grade 12 class in a hard copy form.

3. The questionnaire is designed in a form of a multiple choice and the whole questionnaire should take 5 minutes to complete.

Risks of being involved in the study:

There are no risks involved for the participants.

Benefits of being in the study:

The results of this study will help identify knowledge gaps and assist anaesthetists on how to better educate the public about anaesthesia. The Participant will be given pertinent information on the study while involved in the project and after the results are available.

Participation is voluntary

Participation is voluntary and refusal to participate will not result in any penalty. Participation is strictly anonymous, and you are not required to reveal your personal information.

Confidentiality:

Participation is strictly anonymous, and you are not required to reveal your personal information. All data collected in the course of the study will be securely retained for two (2) years, if a scientific publication arises from the study and six (6) years, if there is no publication. Thereafter it will be destroyed accordingly.

Contact details:

Pulane Talane, Principal Investigator, telephone no. 072 827 4192, or by e-mail at Pulanemoloantoa@yahoo.com

Anisah Mamoojee, Supervisor, on telephone no. 082 767 6747, or by e-mail at anisahmamoojee@gmail.com

Nthatheni Madima, Supervisor, on telephone no. 082 371 6257, or by e-mail at Nthatheni@icloud.com

Outputs:

This study will be presented at the Congresses and Published on Medical Jounals and will be available to the participants on request.

Contact details of HREC administrator and chair

This study has been approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand, Johannesburg ("Committee"). A principal function of this Committee is to safeguard the rights and dignity of all human subjects who agree to participate in a research project and the integrity of the research.

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Dr Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Thank you for reading this Study Information Sheet.

Date: June 2021

Appendix G – Parents' Consent form

PARTICIPANT ASSENT SHEET FOR MINORS*

Study tittle: A survey of the perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts

1. I have been given a Participant Information Sheet for Minors, which explains what this study is about;
2. The study was explained to me and I understand what will happen if I take part;
3. I was given time to ask any questions I wanted to and was happy with the answers I was given;
4. I understand that I will not benefit from the study, should I agree to take part. I also understand that I will not be paid to take part in the study; taking part will not cost me anything either;
5. I have been given a range of contact details, repeated below, should I require further information at a later stage, or have any cause for concern over anything which is done to me during the study; and
6. I understand that even if I agree to take part in the study, I can change my mind later and stop being a part of the study
7. My parent(s) or guardian(s) know that I have been invited to take part in the study. They agree that I may do so, but the decision to take part is also mine.

Contact details:

Pulane Talane, Principal Investigator, telephone no. 072 827 4192, or by e-mail at Pulanemoloantoa@yahoo.com

Anisah Mamoojee, Supervisor, on telephone no. 082 767 6747, or by e-mail at anisahmamoojee@gmail.com

Nthatheni Madima, Supervisor, on telephone no. 082 371 6257, or by e-mail at Nthatheni@icloud.com

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Dr Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Name of Participant: _____

Date: _____

Place: _____

Signature or mark _____

Name of Parent or Guardian: _____

Date: _____

Place: _____

Signature or mark _____

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____

* Defined as being persons under the age of 18

Appendix H – Participant Consent form

PARTICIPANT CONSENT SHEET

Study tittle: A survey of the perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts

1. I have been given a Participant Information Sheet which explains the nature and processes involved in this study, which is attached hereto;
2. I was given time to read it, or had it read to me, in the language I best understand;
3. I was given time to ask any questions I wanted to and found any answers given to me to be reasonable and satisfactory;
4. I believe I fully understand why the study is being conducted and what the intended outcomes will be;
5. I understand that there will be no immediate benefit to me, should I agree to participate, nor will I receive any payment; conversely, participation will not cost me anything but my time;
6. I understand that, even if I initially consent to take part in the study, I may subsequently withdraw at any time and would not be required to give any reasons; if that happened, any data collected about me for the purposes of the study would immediately be destroyed, unless I give consent for it to be retained
7. I have been given a range of contact details, listed below. If I require further information or become concerned about any aspect of this study I am free to speak to any of these contacts.

Contact details:

Pulane Talane, Principal Investigator, telephone no. 072 827 4192, or by e-mail at Pulanemoloantoa@yahoo.com

Anisah Mamoojee, Supervisor, on telephone no. 082 767 6747, or by e-mail at anisahmamoojee@gmail.com

Nthatheni Madima, Supervisor, on telephone no. 082 371 6257, or by e-mail at Nthatheni@icloud.com

If you have any concern over the way the study is being conducted, please contact the Chairperson of this Committee who is Dr Clement Penny, who may be contacted on telephone number 011 717 2301, or by e-mail on Clement.Penny@wits.ac.za. The telephone numbers for the Committee secretariat are 011 717 2700/1234 and the e-mail addresses are Zanele.Ndlovu@wits.ac.za and Rhulani.Mukansi@wits.ac.za

Name of Participant: _____

Date: _____

Place: _____

Signature or mark _____

Witnessed by:

Name of Witness: _____

Signature: _____

Date: _____

Appendix I – List of schools

District Name	District Code	Gauteng Reference Number	Emis Number	Institution Name	Level	Type of Institution	Relation with State	Sector	Circuit No	Cluster No	Quintile
JOHANNESBURG EAST	JE	152009	700152009	ALEXANDRA SECONDARY SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	2	3	2
JOHANNESBURG EAST	JE	150011	700150011	ALLANRIDGE SECONDARY SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	3	2	2
JOHANNESBURG EAST	JE	130104	700130104	ATHLONE BOYS' HIGH SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	1	2	5
JOHANNESBURG EAST	JE	130112	700130112	ATHLONE GIRLS' HIGH SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	2	1	5
JOHANNESBURG EAST	JE	130153	700130153	BARNATO PARK HIGH SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	1	3	5
JOHANNESBURG EAST	JE	150201	700150201	BRYANSTON HIGH SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	3	1	5
JOHANNESBURG EAST	JE	400530	700400530	DAVID MAKHUBO SECONDARY SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	3	3	2
JOHANNESBURG EAST	JE	400540	700400540	DENVER SECONDARY SCHOOL	Secondary School	ORDINARY EDUCATION	PUBLIC	PUBLIC	1	1	5

JOHANNESBURG EAST JE 400205 700400205 DRAKE KOKA PRIMARY SCHOOL Primary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 2

JOHANNESBURG EAST JE 400533 700400533 DULCIE SEPTEMBER PRIMARY SCHOOL Primary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 2

JOHANNESBURG EAST JE 152090 700152090 EAST BANK HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG EAST JE 260760 700260760 EQINISWENI SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 2

JOHANNESBURG EAST JE 130484 700130484 HIGHLANDS NORTH BOYS HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 5

JOHANNESBURG EAST JE 150656 700150656 HYDE PARK HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 5

JOHANNESBURG EAST JE 400009 700400009 IVORY PARK SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 2

JOHANNESBURG EAST JE 400402 700400402 J.B. MATABANE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 1

JOHANNESBURG EAST JE 130633 700130633 JEPPE HIGH SCHOOL FOR BOYS Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 5

JOHANNESBURG EAST JE 130641 700130641 JEPPE HIGH SCHOOL FOR GIRLS Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 5

JOHANNESBURG EAST JE 130302 700130302 JULES HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 5

JOHANNESBURG EAST JE 400347 700400347 KAALFONTEIN SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 2

JOHANNESBURG EAST JE 130070 700130070 KENSINGTON SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 5

JOHANNESBURG EAST JE 130765 700130765 KING EDWARD VII SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 5

JOHANNESBURG EAST JE 152207 700152207 KWABHEKILANGA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 4

JOHANNESBURG EAST JE 130864 700130864 MALVERN HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 4

JOHANNESBURG EAST JE 400150 700400150 MAPHUTHA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 4

JOHANNESBURG EAST JE 150987 700150987 MIDRAND HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG EAST JE 152264 700152264 MINERVA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 2

JOHANNESBURG EAST JE 400362 700400362 NOORDWYK SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG EAST JE 151050 700151050 NORTHVIEW HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 5

JOHANNESBURG EAST JE 131128 700131128 PARKTOWN BOYS' HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 5

JOHANNESBURG EAST JE 400128 700400128 PONELOPELE ORACLE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 3

JOHANNESBURG EAST JE 131326 700131326 QUEENS HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 5

JOHANNESBURG EAST JE 152314 700152314 REALO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 2

JOHANNESBURG EAST JE 151498 700151498 SANDOWN HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG EAST JE 131441 700131441 SANDRINGHAM HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 5

JOHANNESBURG EAST JE 132985 700132985 ST ENDA'S SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 5

JOHANNESBURG EAST JE 400115 700400115 TSOSOLOSO YA AFRICA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 3

JOHANNESBURG EAST JE 261420 700261420 UMQHELE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 2

JOHANNESBURG EAST JE 151910 700151910 WAVERLEY GIRLS' HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 5

JOHANNESBURG EAST JE 151928 700151928 WENDYWOOD HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG NORTH JN 400391 700400391 BLUE EAGLE HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 1

JOHANNESBURG NORTH JN 131961 700131961 BONA COMPREHENSIVE SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 3

JOHANNESBURG NORTH JN 140426 700140426 BOPASENATLA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 3

JOHANNESBURG NORTH JN 140038 700140038 CHRIS J BOTHA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG NORTH JN 140053 700140053 CORONATIONVILLE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 4

JOHANNESBURG NORTH JN 400180 700400180 COSMO CITY SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 1

JOHANNESBURG NORTH JN 140434 700140434 DIEPDALE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 3

JOHANNESBURG NORTH JN 400424 700400424 DIEPSLOOT SECONDARY SCHOOL NO. 2 Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 1

JOHANNESBURG NORTH JN 400149 700400149 DIEPSLOOT WEST SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 1

JOHANNESBURG NORTH JN 121301 700121301 EMSHUKANTAMBO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 3

JOHANNESBURG NORTH JN 400585 700400585 FAR NORTH SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 1

JOHANNESBURG NORTH JN 150441 700150441 FERNDALE HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 5

JOHANNESBURG NORTH JN 140517 700140517 FIDELITAS COMPREHENSIVE S. Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 3

JOHANNESBURG NORTH JN 140525 700140525 FONS LUMINIS SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 4

JOHANNESBURG NORTH JN 150466 700150466 FOURWAYS HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 5

JOHANNESBURG NORTH JN 130427 700130427 GREENSIDE HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG NORTH JN 130559 700130559 HOËR TEGNIESE SKOOL LANGLAAGTE Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 5

JOHANNESBURG NORTH JN 150623 700150623 HOËRSKOOL LINDEN Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG NORTH JN 150631 700150631 HOËRSKOOL RANDBURG Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 1 5

JOHANNESBURG NORTH JN 140186 700140186 HOËRSKOOL VORENTOE Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 5

JOHANNESBURG NORTH JN 152181 700152181 ITIRELE-ZENZELE COMPREHENSIVE SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 1

JOHANNESBURG NORTH JN 130062 700130062 JOHANNESBURG SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 5

JOHANNESBURG NORTH JN 152223 700152223 KWENA MOLAPO COMPREHENSIVE FARM SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 2

JOHANNESBURG NORTH JN 132449 700132449 LOFENTSE GIRLS HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 3

JOHANNESBURG NORTH JN 140756 700140756 MADIBANE COMPREHENSIVE SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 2

JOHANNESBURG NORTH JN 121608 700121608 MUSI COMPREHENSIVE Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 5

JOHANNESBURG NORTH JN 140848 700140848 NAMEDI SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 2

JOHANNESBURG NORTH JN 140087 700140087 NOORDGESIG SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 4

JOHANNESBURG NORTH JN 400663 700400663 NORTH RIDING SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 5

JOHANNESBURG NORTH JN 140285 700140285 NORTHCLIFF HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 1 5

JOHANNESBURG NORTH JN 132670 700132670 ORLANDO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 3

JOHANNESBURG NORTH JN 131136 700131136 PARKTOWN GIRLS' HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG NORTH JN 121715 700121715 PROGRESS COMPREHENSIVE SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 4

JOHANNESBURG NORTH JN 140095 700140095 R W FICK SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG NORTH JN 151241 700151241 RAND PARK HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 5

JOHANNESBURG NORTH JN 140111 700140111 RIVERLEA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 3

JOHANNESBURG NORTH JN 131367 700131367 ROOSEVELT HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG NORTH JN 132902 700132902 SELELEKELA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 3

JOHANNESBURG NORTH JN 400210 700400210 SGODIPHOLA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 1

JOHANNESBURG NORTH JN 152363 700152363 ST ANSGAR'S COMBINED SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 1

JOHANNESBURG NORTH JN 400517 700400517 SUNRISE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 1

JOHANNESBURG NORTH JN 121798 700121798 THABA-JABULA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 3

JOHANNESBURG NORTH JN 140137 700140137 WESTBURY SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 4

JOHANNESBURG SOUTH JS 330696 700330696 AHA-THUTO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 2

JOHANNESBURG SOUTH JS 110072 700110072 AZARA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG SOUTH JS 110015 700110015 DALEVIEW SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 2

JOHANNESBURG SOUTH JS 120568 700120568 DIVERSITY HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 5

JOHANNESBURG SOUTH JS 110023 700110023 ENNERDALE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 5

JOHANNESBURG SOUTH JS 400394 700400394 FINE TOWN SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 1

JOHANNESBURG SOUTH JS 111500 700111500 FRED NORMAN SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 5

JOHANNESBURG SOUTH JS 110403 700110403 GLENVISTA HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 5

JOHANNESBURG SOUTH JS 331611 700331611 JABULILE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 2

JOHANNESBURG SOUTH JS 400584 700400584 KIBLER PARK SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 5

JOHANNESBURG SOUTH JS 400429 700400429 LAWLEY SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 1

JOHANNESBURG SOUTH JS 110213 700110213 LENASIA SOUTH SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 5

JOHANNESBURG SOUTH JS 330969 700330969 LESHATA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 2

JOHANNESBURG SOUTH JS 111658 700111658 MOSES MAREN MISSION TECHNICAL SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 2

JOHANNESBURG SOUTH JS 331950 700331950 MPHETHI MAHLATSI SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 2

JOHANNESBURG SOUTH JS 111815 700111815 OAKDALE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 5

JOHANNESBURG SOUTH JS 400521 700400521 ORANGE FARM SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 3

JOHANNESBURG SOUTH JS 400235 700400235 QALABOTJHA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 1

JOHANNESBURG SOUTH JS 331181 700331181 QOQA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

JOHANNESBURG SOUTH JS 131334 700131334 RAND MEISIESKOOL-GIRLS' SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 4

JOHANNESBURG SOUTH JS 331215 700331215 RAPHELA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

JOHANNESBURG SOUTH JS 331546 700331546 SAKHISIZWE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 1

JOHANNESBURG SOUTH JS 110197 700110197 SOUTHVIEW HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG SOUTH JS 331405 700331405 THAMSANQA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 2

JOHANNESBURG SOUTH JS 121137 700121137 THE HILL HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 5

JOHANNESBURG SOUTH JS 331645 700331645 THETHA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 1

JOHANNESBURG SOUTH JS 321554 700321554 THUSA-SETJHABA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 5

JOHANNESBURG SOUTH JS 400522 700400522 TSHEPO YA RONA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 2

JOHANNESBURG SOUTH JS 331504 700331504 VULANINDLELA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 2

JOHANNESBURG SOUTH JS 110767 700110767 WILLOWMEAD SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 4

JOHANNESBURG WEST JW 252189 700252189 ALLEN GLEN HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 5

JOHANNESBURG WEST JW 131862 700131862 ANCHOR COMPREHENSIVE Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2

1 1

JOHANNESBURG WEST JW 132167 700132167 EMADWALENI SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 3

JOHANNESBURG WEST JW 250142 700250142 FLORIDA PARK HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 5

JOHANNESBURG WEST JW 251405 700251405 FORTE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 4

JOHANNESBURG WEST JW 251413 700251413 GEORGE KHOSA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 4

JOHANNESBURG WEST JW 250217 700250217 HOËRSKOOL DIE ADELAAR Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 1 5

JOHANNESBURG WEST JW 250225 700250225 HOËRSKOOL DIE BURGER Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 5

JOHANNESBURG WEST JW 250233 700250233 HOËRSKOOL FLORIDA Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 2 5

JOHANNESBURG WEST JW 250274 700250274 HOËRSKOOL ROODEPOORT Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 1 5

JOHANNESBURG WEST JW 400221 700400221 IKUSASALETHU SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 1

JOHANNESBURG WEST JW 140624 700140624 KELOKITSO COMPREHENSIVE SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 4

JOHANNESBURG WEST JW 400241 700400241 KGATELOPELE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 3 1

JOHANNESBURG WEST JW 140665 700140665 KWA-MAHLOBO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 3

JOHANNESBURG WEST JW 140681 700140681 LAMULA JUBILEE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 3

JOHANNESBURG WEST JW 140715 700140715 LETSIBOGO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 3 4

JOHANNESBURG WEST JW 400791 700400791 LUFHERENG SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

JOHANNESBURG WEST JW 140780 700140780 MATSELISO SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 2 3

JOHANNESBURG WEST JW 140806 700140806 MEADOWLANDS SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 1 3

JOHANNESBURG WEST JW 140814 700140814 MOKGOME SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 3

JOHANNESBURG WEST JW 132688 700132688 ORLANDO WEST SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 3

JOHANNESBURG WEST JW 132704 700132704 PHEFENI SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 2 1 3

JOHANNESBURG WEST JW 251777 700251777 PJ SIMELANE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 4

JOHANNESBURG WEST JW 250951 700250951 PRINCESS HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 1 5

JOHANNESBURG WEST JW 400220 700400220 RAYMOND MHLABA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

JOHANNESBURG WEST JW 251850 700251850 SEBETSA-O-THOLEMOPUTSO Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 2 2

JOHANNESBURG WEST JW 400240 700400240 SIYABONGA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 3 1

JOHANNESBURG WEST JW 251272 700251272 SIYABUSA SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

JOHANNESBURG WEST JW 400218 700400218 THULANI SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

JOHANNESBURG WEST JW 141002 700141002 THUTOLORE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 3 2 3

JOHANNESBURG WEST JW 251173 700251173 WEST RIDGE HIGH SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 4 3 5

JOHANNESBURG WEST JW 400238 700400238 WISEMAN CELE SECONDARY SCHOOL Secondary School ORDINARY EDUCATION PUBLIC PUBLIC 1 1 2

6. Section 6: Annexures

Annexure 1: Ethics Approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Dr Pulane Talane

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M210238 MED21-01-092

NAME: (Principal Investigator)	Dr Pulane Talane
DEPARTMENT:	Anaesthesiology Four Johannesburg District Secondary Schools
PROJECT TITLE:	A survey of the perceptions, and knowledge, of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts
DATE CONSIDERED:	26/02/2021
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr Anisah Mamoojee and Dr Nthatheni Madima
APPROVED BY:	Dr C Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	09/06/2021

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 301, Third floor, Faculty of Health Sciences, Phillip Tobias Building, 29 Princess of Wales Terrace, Parktown, 2193, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed February and will therefore be due in the month of February each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature _____ Date _____

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Annexure 2: Graduate studies approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

10 February 2021
Person No: 2422654
PAG

Dr PA Talane
20 Goshawak Crescent
Parklands Estate
Parklands
1459
South Africa

Dear Dr Pulane Talane

Master of Medicine in Anaesthesia: Approval of Title

We have pleasure in advising that your proposal entitled *A survey of the perceptions and knowledge of anaesthesia and anaesthetists possessed by Grade 12 learners in four Johannesburg districts.* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

Annexure 3: Turnitin

mmed article final turnitin-2.docx

Submission date: 25-Apr-2022 06:36PM (UTC+0200)

Submission ID: 1819941509

File name: mmed_article_final_turnitin.docx (147.07K)

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Chetty, S, E Baalbergen, AI Bhigjee, P Kamerman, J Ouma, R Raath, M Raff, and S Salduker. "Clinical practice guidelines for management of neuropathic pain: expert panel recommendations for South Africa", South African Family Practice, 2013. Publication	<1%