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A self assessment study of procedural skills in medical officers at District Hospitals in Region B Gauteng Province South Africa

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A SELF ASSESSMENT STUDY OF PROCEDURAL SKILLS IN MEDICAL OFFICERS AT DISTRICT HOSPITALS IN REGION B GAUTENG PROVINCE SOUTH AFRICA

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A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg in partial fulfilment of the requirements for the degree

Master of Family Medicine

Johannesburg, 2011

DECLARATION

I, Neetha Joe Erumeda hereby declare that this thesis 'A self assessment study of procedural skills in medical officers at district hospitals in Region B Gauteng Province, South Africa' is my own work.

It is being submitted as partial fulfilment for the Master of Family Medicine Degree in the University of the Witwatersrand, Johannesburg. It has not been submitted before for another degree or examination at this or any other university



Neetha Joe Erumeda

21th day of September 2011

This research is dedicated to my family, my husband Dr Joe George Erumeda, my daughters Elina, Roana, my baby son George and my parents for their great support, cooperation, tolerance and prayers

And above all our Lord

ABSTRACT

Background

The role of district hospital doctors in South Africa includes providing effective and efficient primary health care and referral of patients to more specialist care when needed. The doctors who work in these district hospitals have varying levels of clinical and procedural skills. Much research has been done on this topic in rural areas of South Africa; however there is insufficient information on the skills of doctors in urban district hospitals. The aim of this study was therefore to conduct a self-assessment study of procedural skills of medical officers in three district hospitals in Region B, Gauteng Province, which is mostly an urban area. It is hoped that the results of this study can be used to influence the development of appropriate training programs which will capacitate Medical officers to function effectively within the district hospitals.

Methodology

The study was a descriptive cross sectional study of all the doctors in all the three district hospitals in the region during the period of October 2009-November 2009 using a self-administered questionnaire. Doctors assessed themselves on 71 procedures considered to be required at district hospital level.

Results

The results show that there was varying level of self-reported competence in procedural skills among doctors, ranging from some procedures being performed independently to some performed with support, and to some where there was even unfamiliarity with certain procedures. There was some association between perceived overall competence in procedural skills with factors such as age, gender and years of experience, but no association with place of under graduate study, discipline and Family Medicine training. There was statistically significant association between age and overall anaesthetic competence *(p=0.03)*, gender and overall competence in surgery *(p=0.03)*, orthopaedics *(p=0.02)*, urology *(p=0.005)*, years of experience and overall competence in dermatology skills *(p=0.02)*. Junior doctors reported higher competence in anaesthesia, whilst male doctors reported higher competence in surgical,

orthopaedic and urology procedures. The organizational and management structure of the hospital where the doctors are currently working was also identified as a significant factor which affected the overall reported competence.

Conclusion

The study demonstrates that there are varying level of self-reported competence in procedural skills amongst doctors in urban district hospitals. This research study identifies the need for training in the procedural skills that the doctors have identified themselves as not competent to perform. Greater clarity regarding skills required of doctors in district hospitals is needed.

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ABBREVIATIONS

DHS	District Health System
PHC	Primary Health Care
CHC	Community Health Centre
WHO	World Health Organization
IMCI	Integrated Management of Childhood Illnesses
O&G	Obstetrics and Gynaecology
HIV	Human immunodeficiency virus
AIDS	Acquired Immunodeficiency Syndrome
POP	Plaster of Paris
I&D	Incision and Drainage
CMO	Chief Medical Officer
FaMEC	Family Medicine Consortium
ENT	Ear Nose Throat
IUCD	Intrauterine contraceptive device
OPD	Outpatient Department
ATLS	Advanced Trauma Life Support

CHAPTER 1: INTRODUCTION

South Africa's public health care system comprises of clinics, district hospitals, regional hospitals and tertiary hospitals offering varying levels of care. However, more often than not, both regional and tertiary hospitals share the burden of primary health care due to self-referral of patients or due to lack of clinical and procedural skills of doctors.

The document 'A Policy for the Development of a District Health System (DHS) for South Africa' was released in December 1995 and has since been used to guide the implementation of the District Health System in South Africa.[1]The South African government has decided on strengthening the District Health System through a comprehensive primary health care approach. Important components of the District Health System include the district hospitals, primary health care (PHC) clinics and community health centres (CHC). The district hospitals serve both as the support services for the primary health care clinics and the community health centres and as the gateway to specialized care. The World Health Organization (WHO) emphasizes the importance of close co-operation between district hospitals and PHC services, this being one of the key factors in the effective functioning of a district hospital.[2,3]

According to the World Health Organization's functional definition, district hospitals should provide diagnostic, treatment, care, counselling and rehabilitation services. The district hospital should offer the following clinical disciplines at generalist level: Family Medicine and Primary Health Care, Rehabilitation, Medicine, Surgery, Obstetrics, Paediatrics, Psychiatry, Eye care and Geriatrics.[4]Medical doctors in district hospitals should be able to diagnose, manage and/or refer patients appropriately to the next appropriate level of care. A district hospital should provide in-hospital care, operative procedures and effective patient education programmes. The modern approach is to look at broad health programmes such as Women's and Reproductive Health, Safe Motherhood Initiative, Integrated Management of Childhood Illnesses (IMCI), Mental Health Services and the like through an integrated approach.

According to the District Hospital Service Package for South Africa[4], the competence of medical doctors in district hospitals is presumed to be aligned to the expected services to be delivered based on the need of the catchment population being served. The district hospital practitioner needs clinical skills, surgical skills, community health skills, management skills as well as the ability to train other health workers and ensure quality improvement.[5]

An assumption has thus been made in this study that medical officers currently working in district hospitals in South Africa have varying levels of clinical and procedural skills. Also the medical officers come from many different educational backgrounds and from many different countries. The levels of competence of doctors are dependent on the exposure they have had during their undergraduate training or previous and current working experiences. Therefore uniformity in the level of competence of procedural skills among medical officers is often lacking. A medical officer may be more skilled in doing a particular procedure and not another. The types of procedures done in each of these hospitals depends not only on the level of competence of these doctors but also on the infrastructure available at the facility in terms of instruments, theatre facilities and other resources, and to a certain extent even on the management systems which are in place.

It is anticipated that the new Family Medicine registrar training programme introduced in 2008 will in the future help to standardize the levels of competence in clinical and procedural skills amongst medical officers in the District Health Service. However at present, the current competence of medical officers in district hospitals still depends on prior clinical training and work experiences. It is presumed that district hospital doctors should be able to independently perform the defined set of skills as in the District Hospital Service Package[4]as well as be able to teach some of these skills to junior doctors and registrars where indicated. Doctors from district hospitals are currently trained for short periods in regional or tertiary hospitals by specialists in the necessary clinical procedures where competence is lacking. Not all of the district hospital doctors will need training in all the procedures as some may have had the benefit of previous work experiences and others may already be practicing these procedures. Thus an assessment of the current level of competence in procedural skills among medical officers working in district

hospitals is essential to identify the skills gap of what is expected from them as medical officers in district hospitals and what they know at present.

Family Physicians who are trained in the previous part-time Masters in Family Medicine did not participate in formal practical clinical training during the program; this has resulted in a challenge in that these Family Physicians are now expected to provide the formal practical clinical training to the registrars in the new Masters in Medicine in Family Medicine program. These Family Physicians are also involved in teaching clinical skills to the junior and senior medical officers when needed in these hospitals.

Those district hospital doctors working in the rural areas of South Africa, far from tertiary centres, are likely to have better procedural skills than those working in urban areas where referral is not a major issue. In the District Hospital Service Package[4] for South Africa the procedural skills list is a comprehensive list, taking into account that there are certain hospitals that would not be able to access easy referral. The doctors working at these rural hospitals need to know more compared to the doctors working at urban centres where these hospitals are closer to their referral hospitals. The scope of practice of medical officers according to the District Health Service Package[4]includes procedural skills in Emergency Medicine, Internal Medicine, Paediatrics, Anaesthesia, Surgery, Obstetrics and Gynaecology(O&G), and Orthopaedics. The quality of procedural skills acquired is also of concern, the doctor thrown in at the deep end in a peripheral hospital may get to do many appendicectomies, but the question is if the doctor is approaching it in the right way. A self-reported procedural skills audit may not pick this up, but may at least provide a baseline assessment of any skills gap.

The hospitals where the current research was conducted are the only three district hospitals in Region B which is situated in the urban and peri-urban areas of Gauteng, further referred to in this study as Hospitals A, B and C. All these hospitals had fulltime, part-time and sessional doctors working in these facilities. These hospitals are situated less than 50 kilometres from their regional referral hospitals. Hospital A has a bed capacity of 128 patients; Hospital B has 144 beds whereas Hospital C has a bed capacity of 272 patients. Only one hospital (Hospital B) had Family Medicine registrars working there daily while at Hospital A and C there were no formal

registrar rotations. All these three hospitals had outpatient departments (OPD), casualty, HIV clinics, maternity wards, male and female medical and surgical wards, paediatric wards and theatre facilities. Hospital C had a psychiatric ward in the facility which was not present in the other hospitals. Two of the hospitals (Hospitals B and C) were also conducting procedures such as appendicectomy, tonsillectomy and dental procedures in their theatres. Hospital A currently refers such cases to the next higher level.

CHAPTER 2: LITERATURE REVIEW

Most studies on procedural skills of doctors have primarily focused on district hospitals in rural areas, not only in South Africa, but also in other countries. These studies have looked at competencies in certain groups of skills and not in others. There is therefore insufficient literature on the procedural skills of doctors in urban and peri-urban areas, as well as in the previously excluded groups of skills.

In South Africa one of the earliest studies done in 1999 on procedural skills was by Reid et al[6] who in their descriptive study using quantitative and qualitative methods demonstrated the spectrum of procedures performed by general medical officers in South African rural hospitals. The study was done in fifteen rural hospitals in KwaZulu-Natal and four hospitals in the then Northern province. The study was done using record reviews of theatre patients. Anaesthetic usage patterns revealed that ketamine was the most common anaesthesia used both in KwaZulu-Natal and Northern Province in all district hospitals followed by spinal anaesthetics in KwaZulu-Natal and general anaesthetics being administered in the Northern Province. Qualitative results revealed two scenarios in the rural hospital situation: one where doctors felt that they were coping and learning from the work under the supervision of peers or senior colleagues, and the other where they felt stressed by being alone and having to deal with emergencies, especially when short-staffed. Accessibility of referral centres, availability of specialists, fear of contravening the law and perceived hostility towards foreign qualified doctors by the patients were found among the reasons why patients were referred to bigger centres and to the specialists.[6]

Another study was conducted in 2001 by De Villiers and De Villiers to identify the professional skills of medical officers delivering services in district hospitals in rural Western Cape. The study was completed using both qualitative and quantitative methods. The quantitative component was done by a questionnaire which was developed to explore competency ratings of the knowledge and skills necessary to perform district hospital services in the following areas: emergency and trauma, in-patient function, general outpatient services, outreach support to primary health care (PHC), hospital management and public health. The study was done in 27

district hospitals with a study sample of 147 medical officers. The data was statistically analysed and associations between the variables of medical officer category, gender, years of experience (1-5 years, 5-10 years, >10years), and knowledge and skills areas were determined. The study showed that the perceived competency ratings in emergency and trauma, inpatient and outpatient services were higher in the older and more experienced part-time practitioners than their junior counter parts who were the fulltime medical officers and community service doctors except in HIV/AIDS care.[7]Assessments were conducted on the ability of doctors' to independently perform or not certain sets of skills such as caesarean sections, sterilization, appendicectomy, tracheotomy, spinal and general anaesthesia and closed reduction of fractures. This was to determine competencies in the emergency and trauma, inpatient and outpatient services in these hospitals. The limitation of the study was that it only looked at a certain group of skills. Further exploration of the perceived gaps showed that the knowledge of individuals varied considerably according to their education, training and previous working experiences and the circumstances of a particular district hospital. The study also illustrates the role that the discipline of Family Medicine should play in education and training for rural practice, including the need for postgraduate programmes for training in district hospital services.[7]

A comparison of above two studies demonstrated that the procedures done commonly varied between the different hospitals in different provinces of South Africa. The study done by Reid et al[6] shows that the commonest operative procedures done in KwaZulu-Natal and Northern province district hospitals are in general surgery, obstetrics and gynaecology, orthopaedics followed by diagnostic procedures. The commonest among general surgical procedures includes I&D, circumcision, debridement of wounds, excision of lumps, laparotomy, skin graft, removal of foreign body, major and minor suturing and hernia repair in decreasing order. Among the obstetrics and gynaecology procedures caesarean sections, evacuation of uterus, tubal ligation, hysterectomy and ectopic pregnancy are the common procedures conducted. On the other hand the study done by De Villiers et al[5]shows that the commonly done procedures are in obstetrics and gynaecology, general surgery, dental procedures, orthopaedics, ENT and ophthalmology disciplines in decreasing order. The theatre records in district hospitals in Western Cape also show dental procedures, sterilization, caesarean sections, excision of bumps and lumps, tonsillectomy, evacuation of uterus, I&D and closed reduction of fractures as commonly done

operations in decreasing order. The De Villiers study indicated that general anaesthesia was the common anaesthetic method used in the district hospitals in Western Cape; while Reid et al showed that both general anaesthesia and spinal anaesthesia were commonly used in KwaZulu-Natal and the then Northern Province. These findings are reinforced in Mash's Handbook of Family Medicine which states that rural doctors are usually competent in procedural skills within obstetrics and gynaecology including labour ward procedures and caesarean sections; surgery; anaesthesia including spinal, ketamine, and general anaesthesia; paediatrics including neonatal resuscitation and intraosseous infusions; orthopaedic procedures including application of Plaster of Paris (POP) and closed reduction of fractures; and psychiatry.[8]

Caesarean sections were found to be commonly performed in district hospitals in KwaZulu-Natal, the then Northern Province, Nigeria and rural hospitals in Canada.[6 ,9, 10]According to the Saving mothers: Confidential Enquiry into Maternal Deaths in South Africa, during 2005-2007 there was 477210 caesarean sections performed in the country, resulting in a caesarean section rate of 18.4%, however the institutional Maternal Mortality Ratio for caesarean sections was high at 198.2/100000 live births. There was an increase in number of maternal deaths in district and regional hospitals over the period of 2005-2007 compared to the previous years. Generally the lack of surgical skills in caesarean section and anaesthesia was identified as contributory factors to increased maternal deaths especially in level one hospitals.[11]

In a collaborative paper published in 2006, Mash et al have proposed a set of essential clinical and procedural skills for the training of family physicians in South Africa.[12] This has been used as a guide for curriculum planning, as a way of monitoring skills development and for assessment purposes in Family Medicine registrars. The Departments of Family Medicine in different Universities in South Africa have reached consensus on all the essential clinical and procedural skills needed for the new full time registrar programme in Family Medicine. This skills list can also be used as a guide for all the doctors currently working in the district hospital setting since there is no clarity among the list indicated in the District Health Service Package about the level of competency needed for the procedures that should be done at these levels. In this study all the skills were classified into four broad categories, viz. independently competent and able to teach; independently competent; competent under supervision; and elective skill.

This study has also aligned the expected procedural skills to that of the District Hospital Service Package and the majority of these skills were identified as skills that doctors should be able to perform independently in a district hospital setting.[12]

Other similar studies were done in Canada by Wetmore et al[13] and in the United States of America by Nothnagle et al[14]to define and standardize the set of procedural skills needed for family medicine residency training. This was due to the fact that there was no clarity on the core set of procedural skills needed for family medicine residents at the time of graduation in these countries. In the US study the main objective was to reach consensus among the procedures that Family Medicine residents should be competent in at the end of graduation. A 'set of core procedures' was then developed and the required level of competence needed for each of these procedures was defined for family medicine residents on graduation. An additional list of procedures that required more focused training for independent competence was also identified together with a further set of procedures that needed an extra year of training above the usual three years of training. In the study conducted in Canada using the Delphi technique, consensus was reached about the 'core set of procedural skills' which all doctors should be able to perform in rural, urban and small town settings in Canada. The 'enhanced list of procedures' are sets of skills that they should be practicing in atleast two of the three settings if needed. The list is similar to the procedures mentioned in this study and one can compare it to procedural lists used to meet the training requirements in other countries. For example lumbar puncture is identified among the core procedures list in family medicine training in both Canada and US however procedures like basic antenatal ultrasound is identified among the core list in United States but not in the Canadian core list. Again the placement of chest tube is identified among the additional procedures list both in Canada and US but this is among the core procedures list in a South African setting. All these lists of procedures developed emphasize the fact that a definite skill list should be developed for generalists for each setting depending on the health needs and service demands of different settings. In South Africa, currently a similar process is required in determining the same for urban and rural settings. It is anticipated that this may eventually influence a refined District Health Service Package for South Africa.

It is also internationally recognized that a range of skills required to be performed by generalist in rural practice is much wider than that expected of any individual practitioner in an urban context.[15,16] These doctors should be competent in doing anaesthetic, obstetric and surgical procedures especially when working in rural hospitals of Australia. Regular updating and maintaining of skills are essential to maintain quality care of patients in these settings.[16]

Ina recent study in Canada in 2006, Goertzen compared the self-reported competence of procedural skills of family medicine graduates and registrars in training in both rural and urban universities.[17] The results showed that there were statistically significant differences between the rural and the urban groups of doctors, with rural doctors reporting higher levels of competence than their urban counterparts. The study also reemphasized the fact that the development of competence is related to actual experience in performing the procedure. This research study also has highlighted that male doctors reported higher competence and experience in doing surgical, emergency, orthopaedic and obstetrics and gynaecology procedures than female doctors both in rural and urban groups.[17]

A retrospective study in Australia by Worley, Strasser and Prideaux in 2004 among twenty-nine students, six from rural primary care, eight from the remote secondary hospital, and 15 from the urban tertiary teaching hospital looked at the experience and perceived competence of students to manage 78 common procedural skills and 62 common conditions. According to this study it was shown that medical students who worked in a primary care setting gained more experience in doing procedural skills and therefore reported a higher level of competence in performing them compared to those students who worked in regional and tertiary hospitals where they gained less experience and hence reported lower level of competence in doing these procedures. The data also demonstrated that there was a positive correlation between the experience and the self-reported competence which was greater for procedural skills than competence in managing common conditions.[18]

A study conducted in Australia by Barnsley et al among first year post graduate students compared their self-rated confidence and experience in performing a set of routine clinical skills to a formally observed competence of these skills later. The main aim was to determine whether

the level of self-reported confidence matched observed competence for a number of clinical skills. The study was conducted in an urban hospital in Sydney, Australia in first year postgraduate students in various clinical disciplines. A self-assessment questionnaire was developed which covered cognitive and procedural skills areas in two components. The first component was looking at the number of times that a doctor had performed a particular skill and the second component was designed to measure a doctor's self-reported confidence in performing that particular skill. The findings in the Barnsley et al study showed that there was no correlation among the self-reported confidence and the actual observed competence for a set of procedures among the junior medical doctors.[19]

When the competence of procedural skills depends on the actual experience on that procedure it is also important to maintain the same level of competence for that specific procedure. A study done in New Zealand by Patel et al among the junior medical officers showed that even if doctors are trained on specific procedures by short courses, the level of competence was decreasing on re-evaluation after five months on procedures like lumbar puncture, intercostal drain insertion and pleural aspiration except on urethral catheterization which was a procedure doctors were practicing even after the short course training.[20]If doctors do not perform a specific procedure they tend to lose this skill at a later stage. So it is not only important to have the ability to perform a procedure but also important that these procedures are regularly practiced and skills maintained by regular training or short courses for those skills which are not commonly done in these hospitals.

Medical Officers in district hospitals in South Africa are also responsible for the supervision and training of junior doctors such as medical interns and community service doctors. The level of competence in clinical and procedural skills of the senior doctors in these district hospitals is therefore critical as they are expected to teach junior doctors these skills in the right way. A significant number of district hospitals in South Africa have a large proportion of foreign qualified doctors as senior medical officers; these doctors do not have same background and cultural norms of their junior South African colleagues and also do not see the support of their South African junior colleagues as their responsibility.[21] Hence an assessment of the procedural

skills level of these foreign qualified doctors who are trained in Universities outside South Africa is also quite relevant.

Internationally, studies have shown that there are different levels of competence in procedural skills among doctors practicing in different settings. The critical question for Family Medicine training in South Africa is whether or not to develop separate lists of skills for doctors practicing in rural and urban district hospitals instead of the exhaustive list required in the District Health Service Package. Most studies conducted in South Africa have all looked at procedural skills and competencies of doctors working in district hospitals in the rural areas of South Africa. There are not many studies looking into the procedural skills needed for doctors in urban and peri-urban district hospital settings. It is therefore anticipated that this study, set in an urban area, in one the most populated provinces of South Africa, will add to the local knowledge base in this regard.

CHAPTER 3: METHODOLOGY

3.1Aim

To do a self-assessment study of the level of competence in procedural skills of medical officers in district hospitals in Region B of Gauteng province.

3.2 Objectives

To determine Medical officers' self-reported level of competence in procedural skills in district hospitals of Region B of Gauteng Province.

To determine if factors such as age, gender, years of work experience, postgraduate family medicine training and place of undergraduate study, influence the Medical officers' self-reported level of competence in procedural skills.

3.3 Purpose of the Study

To make recommendations for training of doctors and Family Medicine registrars working in the district hospitals as well as to make comparisons with rural district hospitals so as to make recommendations regarding relevant training

3.4 Study Design

A cross-sectional descriptive study using a self-assessment questionnaire.

3.5 Site of study

Three district hospitals in Region B, Gauteng Province. One of the hospitals, District Hospital A, had an integrated structure where all doctors were expected to be competent in all 'disciplines', and therefore were expected to rotate in all wards. In the other two hospitals, viz. District Hospital B and C, services were separated into departments according to the various disciplines and doctors here could choose to work in only one discipline.

3.6 Study population

All the doctors working in the three district hospitals of Region B in Gauteng province were invited to participate in the study. Each district hospital had an average of 15-25 doctors including the full time, part time and sessional doctors. The study population was 70 doctors.

No sampling was done. All the doctors working in the three district hospitals were invited to participate in the study.

3.7 Recruitment of participants

A letter introducing the researcher and the study was sent to each of the district hospitals addressed to the Chief Medical Officer (CMO) or the senior doctor in charge. A request to meet with the doctors in the facility was made and on the appointed date the researcher visited the facility, met with all the doctors to explain the study, obtained their consent for participation in the study and requested them to complete the questionnaires. Questionnaires was distributed in unsealed envelopes, and returned to the researcher in the envelope. Participants were instructed to seal the envelope to ensure confidentiality of information provided. The number of participants who responded was 84% (n=70)

3.8 Data Collection

Data was collected by distributing a structured self-assessment questionnaire to the participants. The questionnaire was developed and aligned to the service delivery package at a district hospital[4]as well as the procedural skills list developed in South Africa, which is a guide for updating or maintaining skills as a competent Family Physician. The latter list was drawn by the Family Medicine Consortium in South Africa (FaMEC) which has used this list in the Family Medicine training programme and curriculum throughout South Africa (as provided by Department of Family Medicine, University of Witwatersrand, 2002). The procedural list includes the absolute necessary procedures and possible add on procedures in each of the different clinical areas. Some of the possible add on procedures are also included in the skills list because in the researcher's personal experience, these are absolutely necessary at a district hospital. For example, caesarean section and spinal anaesthesia are possible add on procedures in the list, however they have been added to the absolutely necessary skills list by the researcher. The skills list used in this research was also compared to the procedural and clinical skills list developed by the different University Departments of Family Medicine as described by Mash et al[13]as the skills to be acquired by the Family Medicine registrars on the new M Med programme.

The questionnaire also included other general information about participants such as age, gender, years of experience after graduation, place of undergraduate training and the country of basic training. Other questions were also included about the postgraduate training in family medicine among the doctors.

The questionnaires were self-administered by the participants of the study. On the initial meeting with the doctors in the three hospitals the questionnaires were distributed, less than half of the doctors were available on the first day of visit to each facility. Some of the questionnaires were filled and returned to the researcher in the sealed envelopes on the same day. The concerns and queries of the doctors were addressed at the meeting to ensure more clarity. The questionnaires for the remaining doctors were left with the relevant Chief Medical Officer's secretary who assisted in distributing and collecting the questionnaires. The researcher also made repeated attempts personally to meet these doctors who were absent on the initial visit in these facilities. It

took 6 to 8 weeks for the collection of the questionnaires. This in fact helped to improve the response rate and also to alleviate any fears, concerns and confidentiality issues. In the researcher's experience the doctors were willing to fill in the questionnaires however constant follow up was needed in getting back the completed questionnaires in time.

A response rate of 80% was decided by the researcher to be an acceptable rate: the actual response rate among the participants was 84%.

3.9 Pilot Study

A pilot study was initially conducted in district hospital A among five doctors working in the hospital. There were no changes to the questionnaire and general research design required so the results were then incorporated in the main study. The main study was conducted immediately after the pilot. Consequently, it was assumed that there was no opportunity for participants of the pilot to influence the responses of those in the main study.

The pilot study helped to test if the questionnaire was effective in evaluating competencies of procedural skills at district hospital level. Initially the idea was to get the completed questionnaire on the same day it was distributed. However the pilot study helped the researcher to understand that since it was a lengthy questionnaire more time would be required to complete the questionnaire properly. The time frame to return the questionnaire almost took two weeks during the pilot. Therefore when the actual research was started it helped to identify these logistical issues in terms of time taken by individuals to complete the questionnaire and queries regarding the format or terms used in the questionnaire.

3.10 Statistical Analysis

Data collected was entered into Epi Info Version 3.5.1 and analyzed using the same software. Descriptive statistics were used for continuous variables. The frequencies and mean were determined for continuous variables using Epi Info software. The results were then imported into

an MS Excel spread sheet and overall levels of competence in each group of procedural skills for all doctors were assessed. The results were then again imported to Stata software. Associations between the overall competence in procedural skills and variables such as age, gender, years of experience, place of undergraduate study, family medicine training and other factors were determined using chi square tests and Fischer's exact tests. Statistical significance was determined to be that where the 'p' value was less than 0.05.

3.11 Ethical Considerations

The protocol was approved by the Human Research Ethics Committee (Medical) of the University of Witwatersrand. The ethical clearance number was M070202.

Approval of the Gauteng Department of Health and Social Development to conduct the study was obtained.

Permission to conduct the research was also obtained from the Medical Superintendents of the three individual hospitals separately.

Informed consent was obtained from each of the doctors who participated in the study.

Participation was voluntary. Doctors who participated were assured of their anonymity.

CHAPTER 4: RESULTS

4.1 Demographics and general information

Questionnaires were distributed to doctors in three district hospitals. The three hospitals have 70 doctors employed in total, of which 59 doctors participated in the study and completed the questionnaires. Therefore 84% of the doctors took part in the study. The doctors included all the fulltime doctors who were community service doctors, as well as junior and senior medical officers with varying years of experience. The study also included Chief Medical Officers who were involved mainly in managerial duties along with clinical work. The other doctors who participated were the part time and the sessional doctors.

Table 1: Demographics of study participants

Age (in years)	n	%
25 to 34	16	30.5
35 to 44	21	40.7
45 to 54	15	17.0
55 and above	7	11.9
Gender		
Male	37	63
Female	22	37

Table 1 illustrates the range of ages of the doctors who took part in the study which varied from a minimum age of 25 years to a maximum age of 68 years. The mean age was 41.2 years.41% of doctors were between 35 to 44 years of age. Among the doctors 63% of the doctors who participated in the study were males compared to the 37% of females.

Among the 59 doctors, 30% of doctors had experience between three to five years, 17% of doctors had experience between six to ten years and 48% of doctors had experience of more than ten years.

Table 2: General Characteristics of study participants

Years of experience	(N=59)	%
2years and below	3	5.2
3to 5years	17	29.3
6 to10 years	10	17.2
Above 10years	28	48.3
Missing Data	1	
Discipline (spending most time)	(N=59)	%
Casualty	17	28.8
OPD/General practice/Family Medicine	17	28.8
Medicine	8	13.6
Maternity	8	13.6
Surgery	3	5.1
HIV clinic	3	5.1
Psychiatry	1	1.7
Anaesthesia	1	1.7
ENT	1	1.7
Place of undergraduate training	(N=59)	%
South Africa	29	49
Outside South Africa	30	51
Place of undergraduate training of doctors who trained outside South Africa	(N=30)	%
DRC	18	60
Cuba	3	10
India	2	6.7
Poland	2	6.7
Nigeria	2	6.7
Uganda	1	3.3
Belgium	1	3.3
Bulgaria	1	3.3
Post graduate family medicine training	(N=59)	%
No	49	83.1
Yes	10	17
Current family medicine training	(N=59)	%
No	54	91.5
Yes	5	8.5
Current hospital	(N=59)	%
Hospital A	15	25.4
Hospital B	24	40.7
Hospital C	20	33.9

Of the 59 doctors, 29 (49%) indicated that they completed their undergraduate medical training in South Africa, while 30(51%) were trained outside South Africa. Among the foreign qualified doctors 60% of the doctors were from the Democratic Republic of Congo. Other doctors were from countries such as Cuba, India, Poland and Nigeria.

Among the 59 doctors there were 10 doctors who had completed one of the previous part-time post graduate Family Medicine training programmes and five doctors who were currently doing the new M Med Family Medicine training.

Among the total of 59 doctors, 15 doctors were working in District hospital A, 24 doctors were from District Hospital B and 20 doctors were from District hospital C.

4.2 Competence in procedural skills

The following illustrate the levels of self-reported competence and experience in the listed procedures. This was taken to be the level of procedural skill.

Competence was interpreted to be the self-reported confidence of the doctor in performing a procedure. The results of competence in procedural skills reported by the doctors included the responses**0, 1, 2 and 3.** The response '0'indicated that the doctor was unfamiliar with the procedure, '1' indicated that the doctor was able to explain the procedure to the patient (theoretical knowledge) but not able to perform it. The response '2'indicated that the doctor was able to perform that procedure with support. The doctor who responded '3'was able to perform that procedure independently.

Experience was determined by the number of times the doctor stated that they actually performed the procedure. Among the doctors who were able to perform the procedure independently those who scored '3'were further classified to 3A, 3B, and 3C. This was according to the number of times the doctor did the procedure independently. If the doctor did the procedure <5 times they

were classified as 3A, between 5 to 10 times was 3B, and if the procedure was done by the doctor more than 10 times they belonged to group 3C.

Table 3: Results of competence in procedural skills among doctors in all disciplines

PROCEDURAL SKILLS	total	0	1	2	3	3A	3B	3C
	N=59	(%)	(%)	(%)	(%)			
ANAESTHESIA								
Bier's block	48	27(56.3)	7(14.6)	6(12.5)	8(16.7)	0	0	8
Ring block	55	6(10.9)	2(3.6)	4(7.3)	43(78.2)	4	2	37
Endotracheal intubation	58	2(3.4)	0(0)	6(10.3)	50(86.2)	1	3	44
General anaesthesia	54	12(22.2)	5(9.3)	11(20.4)	26(48.1)	0	1	23
Spinal anaesthesia	57	10(17.5)	4(7.0)	8(14.0)	35(61.4)	0	1	32
Epidural anaesthesia	58	22(38.6)	15(26.3)	12(21.1)	8 (14.0)	0	1	6
DERMATOLOGY								
Cauterization of warts	56	7(12.5)	8(14.3)	5(8.9)	36(64.3)	2	7	27
Skin biopsy	57	5(8.8)	9(15.8)	7(12.3)	36(63.2)	5	6	23
Excision of bumps and lumps	57	1(1.8)	5(8.8)	6(10.5)	45(78.9)	5	4	34
Skin graft	58	13(22.4)	11(19.0)	15(25.9)	19(32.8)	2	3	14
Injection of keloids	58	14(24.1)	9(15.5)	9(15.5)	26(44.8)	5	4	16
ENT								
Removal of foreign body	59	1(1.7)	3(5.1)	4(6.8)	51(86.4)	1	11	37
Ear syringing	59	1(1.7)	2(3.4)	3(5.1)	53(89.8)	4	6	41
Nasal packing	59	1(1.7)	0(0)	3(5.1)	55(93.2)	5	3	44
Indirect laryngoscopy	58	12(20.7)	14(24.1)	17(29.3)	15(25.9)	3	1	9
Cricothyroidotomy	57	18(32)	19(33)	14(25)	6(11)	4	1	1
Tracheostomy	59	15(25.4)	23(39.0)	13(22.0)	8(13.6)	3	0	4
GENERAL SURGERY								
Intercostaldraininsertion	59	1(1.7)	1(1.7)	2(3.4)	55(93.2)	1	2	51
Insertion of nasogastric tube	58	1(1.7)	0(0)	2(3.4)	55(94.8)	2	1	51
Proctoscopy	57	15(26.3)	22(38.6)	6(10.5)	14(24.6)	3	4	6
Circumcision	58	4(6.9)	5(8.6)	8(13.8)	41(70.7)	3	5	33
Venous cut down	59	12(20.3)	14(23.7)	15(25.4)	18(30.5)	5	3	10
Debridement of wounds	57	2(3.5)	3(5.3)	8(14.0)	44(77.2)	4	4	35
Drainage ofperianalhaematoma	58	8(14.0)	11(19.3)	10(15.8)	29(50.9)	5	5	18
Excision of ingrowing toenail	59	8(14)	11(19)	10(17)	30(51)	5	6	18

PROCEDURAL SKILLS	total	0	1	2	3	3A	3B	3C
Aspiration of breast cyst	59	6(10.2)	13(22.0)	9(15.3)	31(52.5)	5	7	18
Excision and incision biopsy	59	6(1.3)	5(8.6)	11(19.0)	36(62.1)	5	2	28
Insertion of central venous line	59	4(6.8)	5(8.5)	15(25.4)	35(59.3)	6	2	25
I& D abscesses	59	2(3.4)	0(0)	1(1.7)	55(94.8)	1	2	48
Appendicectomy	59	9(15.3)	7(11.9)	21(35.6)	22(37.3)	6	2	14
MEDICINE								
Pleural tap	59	1(1.7)	0(0)	1(1.7)	57(96.6)	1	1	52
Pleural biopsy	58	14(24.1)	16(27)	14(24)	14(24)	4	2	7
Lumbar puncture	59	1(1.7)	0(0)	2(3.4)	56(94.9)	1	1	52
Gastric washout	59	4(6.8)	5(8.5)	9(15.3)	41(69.5)	5	3	32
OBSTETRICS AND GYNAECOLOGY								
Evacuation of uterus	59	1(1.7)	4(6.8)	3(5.1)	51(86.4)	2	2	45
Posterior colpopuncture	57	14(24.6)	9(15.8)	10(17.5)	24(42.1)	1	1	21
Insertion of IUCD	59	8(13.6)	16(27.1)	11(18.6)	24(40.7)	1	2	20
Manual removal of placenta	58	1(1.7)	4(6.9)	4(6.9)	49(84.5)	4	8	35
Episiotomy and suturing	59	1(1.7)	1(1.7)	7(11.9)	50(84.7)	6	3	40
Assisted breech delivery	58	4(6.9)	4(6.9)	14(24.1)	36(62.1)	3	7	26
Repair of third degree tear	58	5(8.6)	5(8.6)	12(20.7)	36(62.1)	5	6	24
Tubal ligation	57	7(12.3)	6(10.5)	9(15.8)	35(61.4)	1	3	31
Obstetric ultrasound	58	3(5.2)	10(17.2)	8(13.8)	37(63.8)	3	0	32
Bartholin's abscess	58	1(1.7)	5(8.6)	2(3.4)	50(86.2)	7	7	34
Endometrial biopsy	56	10(17.9)	14(25.0)	10(17.9)	22(39.3)	1	3	18
Papanicolou smear	58	2(3.4)	4(6.9)	2(5.2)	49(84.5)	2	4	42
Normal vaginal delivery	58	0(0)	0(0)	4(6.9)	54(93)	2	2	48
Caesarean section	57	2(3.5)	5(8.8)	8(14.0)	42(73.7)	1	0	40
Laparotomy for ruptured ectopic	58	4(6.9)	7(12.1)	11(19.0)	36(62.1)	3	1	31
ORTHOPAEDICS								
Close reduction of fractures	59	3(5.1)	7(11.9)	7(11.9)	42(71.2)	4	3	34
Reduction of dislocation	59	1(1.7)	3(5.1)	8(13.6)	47(79.7)	4	4	38
Application of POP	59	1(1.7)	1(1.7)	3(5.1)	54(91.5)	1	1	51
Amputation of digits	58	5(8.6)	6(10.3)	14(24.1)	33(56.9)	5	8	22
Paronychia drainage	57	7(12.0)	4(6.9)	13(22.4)	33(58.6)	5	3	24
Intrabursal/articular injections	57	8(14.0)	4(7.0)	13(22.8)	32(56.1)	4	4	24
Immobilization of fractures	59	1(1.7)	1(1.7)	4(6.8)	53(89.8)	3	3	44

PROCEDURAL SKILLS	total	0	1	2	3	3A	3B	3C
Application of traction	58	2(3.4)	7(12.1)	11(19.0)	38(65.5)	3	3	30
OPHTHALMOLOGY								
Removal of foreign body	58	5(8.6)	6(10.3)	3(5.2)	44(75.9)	6	6	30
I&D Meibomian cyst	57	20(35.1)	15(26.3)	8(14.0)	14(24.6)	3	1	9
Tonometry	58	32(55.2)	13(22.4)	9(15.5)	4(6.9)	1	2	1
Repair of lacerated eyelid	58	6(10)	11(19)	7(12)	34(59)	5	4	25
PAEDIATRICS								
Intravenous infusion	56	0(0)	0(0)	0(0)	56(100)	0	0	52
Umbilical vein catheterization	57	6(10.5)	3(5.3)	12(21.1)	36(63.2)	7	6	23
Suprapubic bladder puncture	55	6(10.9)	3(5.5)	4(7.3)	42(76.4)	5	4	32
Intraosseous infusion	56	10(17.9)	7(12.5)	13(23.2)	26(46.4)	5	4	17
Lumbar puncture	57	3(5.3)	0(0)	1(1.8)	53(93.0)	2	5	45
UROLOGY								
Hydrocoele drainage	57	7(12.3)	7(12.3)	12(21.1)	31(54.4)	5	3	23
Vasectomy	58	19(32.8)	22(37.9)	9(15.5)	8(13.8)	1	0	7
Suprapubic catheterization	57	0(0)	5(8.8)	8(14.0)	44(77.2)	4	6	33
Urethral catheterization	58	0(0)	0(0)	3(5.2)	55(94.8)	2	1	50
Reduction of paraphimosis	58	4(6.9)	3(5.2)	7(12.1)	44(75.9)	4	2	37

Among the results shown above the doctors expressed varying level of competence in different procedures among the disciplines. The level of competence varied from some of the procedures which they were able to do independently (with category 3 scores), some procedures which the doctors reported they were able to do with support (category 2 scores), some doctors only had theoretical knowledge about some procedures (category 1 scores) and some of the procedures the doctors reported unfamiliar (category 0 scores).

Among the results shown below the competency measures of different groups of procedural skills are grouped separately. A category 3 score in the questionnaire indicates the competency of doctor to perform that procedure independently.

When interpreting the tables below the following assumptions were taken into consideration. If more than75% of the doctors scored themselves under category 3 those procedures were grouped as procedures which the majority doctors are highly competent. If between 50-75% of the

doctors have scored themselves under category 3 those procedures were grouped as procedures which the majority doctors are competent. Where less than 50% of the doctors had scored themselves under category 3, this was grouped as not competent procedures amongst the doctors.

Tables 4, 5, and 6 (on the following pages) indicate those procedures doctors reported as being highly competent, competent and not competent.

Table 4: Procedural skills in which doctors rated themselves as highly competent (in descending order)

LIST OF PROCEDURAL SKILLS IN WHICH DOCTORS RATED THEMSELVES ***HIGHLY COMPETENT (75% AND ABOVE***)	No of doctors who could perform the procedure independently n=59	% of doctors who could perform the procedure independently
Intravenous infusion (paediatrics)	56	100
Pleural tap	57	96.6
Lumbar Puncture (adult)	56	94.9
I and D abscesses	55	94.8
Insertion of nasogastric tube	55	94.8
Urethral catheterization	55	94.8
Intercostal drain insertion	55	93.2
Nasal packing	55	93.2
Lumbar puncture(paediatrics)	53	93
Normal vaginal delivery	54	93
Application of POP	54	91.5
Ear syringing	53	89.8
Immobilization of fractures	53	89.8
Evacuation of uterus	51	86.4
Removal of foreign body (ENT)	51	86.4
Bartholin's Abscess	50	86.2
Endotracheal intubation	50	86.2
Episiotomy and suturing	50	84.7
Manual removal of placenta	49	84.5
Papanicolou smear	49	84.5
Reduction of dislocation	47	79.7
Excision of bumps and lumps	45	78.9
Ring block	43	78.2
Debridement of wounds	44	77.2
Suprapubic catheterization	44	77.2
Suprapubic bladder puncture	42	76.4
Reduction of paraphimosis	44	75.9
Removal of foreign body eye	44	75.9

Table 5: Procedural skills in which doctors rated themselves as competent (in descending order)

LIST OF PROCEDURAL SKILLS IN WHICH DOCTORS RATED THEMSELVES***COMPETENT (50 TO <75%)***	No of doctors who could perform the procedure independently n=59	% of doctors who could perform the procedure independently
Caesarean section	42	73.7
Close reduction of fractures	42	71.2
Circumcision	41	70.7
Gastric washout	41	69.5
Application of traction	38	65.5
Cauterization of warts	36	64.3
Obstetric ultrasound	37	63.8
Skin biopsy	36	63.2
Umbilical vein catheterization	36	63.2
Assisted breech delivery	36	62.1
Excision and incision biopsy	36	62.1
Laparotomy for ruptured ectopic	36	62.1
Repair of third degree tear	36	62.1
Spinal anaesthesia	35	61.4
Tubal ligation	35	61.4
Insertion of central venous line	39	59.3
Repair of lacerated eyelid	34	59
Paronychia drainage	33	58.6
Amputation of digits	33	56.9
Intrabursal/articular injections	32	56.1
Hydrocoele drainage	31	54.4
Aspiration of breast cyst	31	52.5
Excision of in growing toenail	30	51
Drainage of perianal haematoma	29	50.9

Table 6: Procedural skills in which doctors rated themselves as not competent (in descending order)

LIST OF PROCEDURAL SKILLS IN WHICH DOCTORS RATED THEMSELVES***NOTCOMPETENT (LESS THAN 50%)***	No of doctors who could perform the procedure independently n=59	%of doctors who could perform the procedure independently
General anaesthesia	26	48.1
Intraosseous infusion	26	46.4
Injection of keloids	26	44.8
Posterior colpopuncture	24	42.1
Insertion of IUCD	24	40.7
Endometrial biopsy	22	39.3
Appendicectomy	22	37.3
Skin graft	19	32.8
Venous cut down	18	30.5
Indirect laryngoscopy	15	25.9
Proctoscopy	14	24.6
I and D Meibomian cyst	14	24.6
Pleural biopsy	14	24
Bier's block	8	16.7
Epidural anaesthesia	8	14
Vasectomy	8	13.8
Tracheostomy	8	13.6
Cricothyroidotomy	6	11
Tonometry	4	6.9

Among the anaesthetic procedural skills of doctors as seen in Figure 1, endotracheal intubation and ring block were identified as procedures in which most doctors reported themselves to be highly competent in, while most were just competent in spinal anaesthesia. Epidural anaesthesia, general anaesthesia and Bier's block were perceived as procedures in which the majority of the doctors were not competent.

Figure 2 illustrates the dermatological procedures that the doctors assessed themselves to be highly competent in excision of bumps and lumps, competent in skin biopsy and cauterization of warts but not competent in performing skin grafts and injection of keloids.

When reviewing the ENT procedural skills as seen in Figure 3, the doctors assessed themselves as highly competent in procedures such as ear syringing, removal of foreign body and nasal packing but not competent in performing procedures like indirect laryngoscopy, cricothyroidotomy and tracheostomy.

Amongst the general surgical procedures as shown in Figure 4, the doctors reported themselves to be highly competent in procedures like intercostal drain insertion, insertion of nasogastric tube and I&D abscesses but not competent in procedures like proctoscopy, venous cut down and appendicectomy.

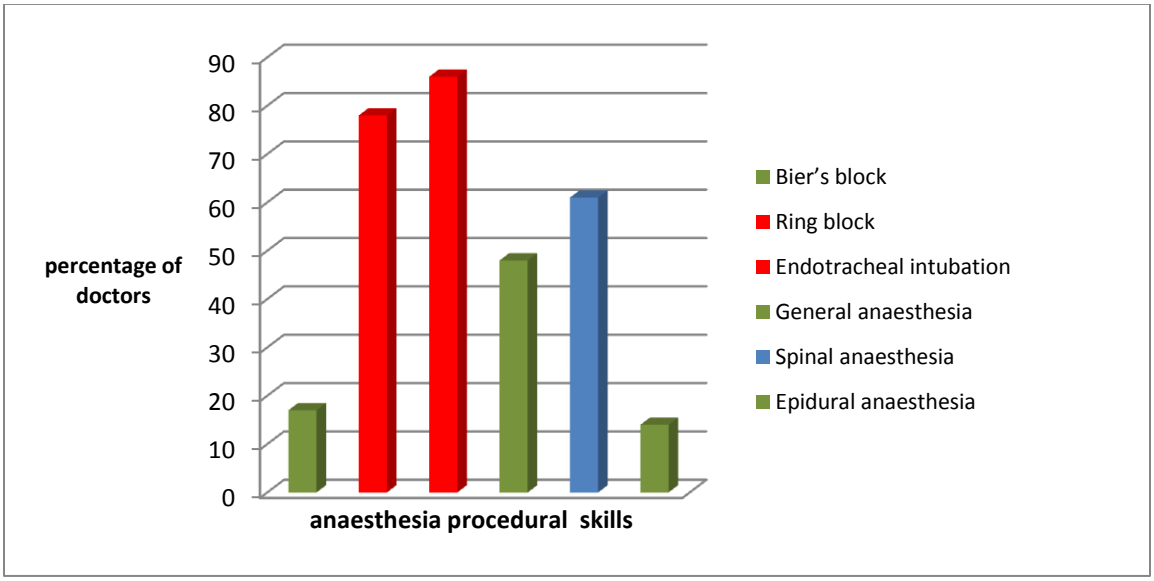

Figure 1: Competency in Anaesthesia procedures among the doctors

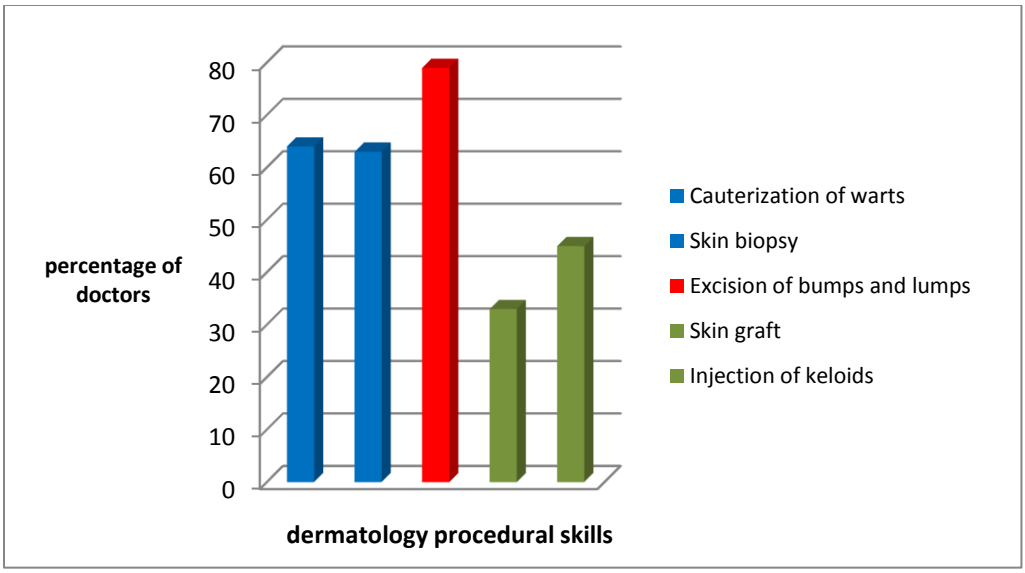

Figure 2: Competency in Dermatology procedures among doctors

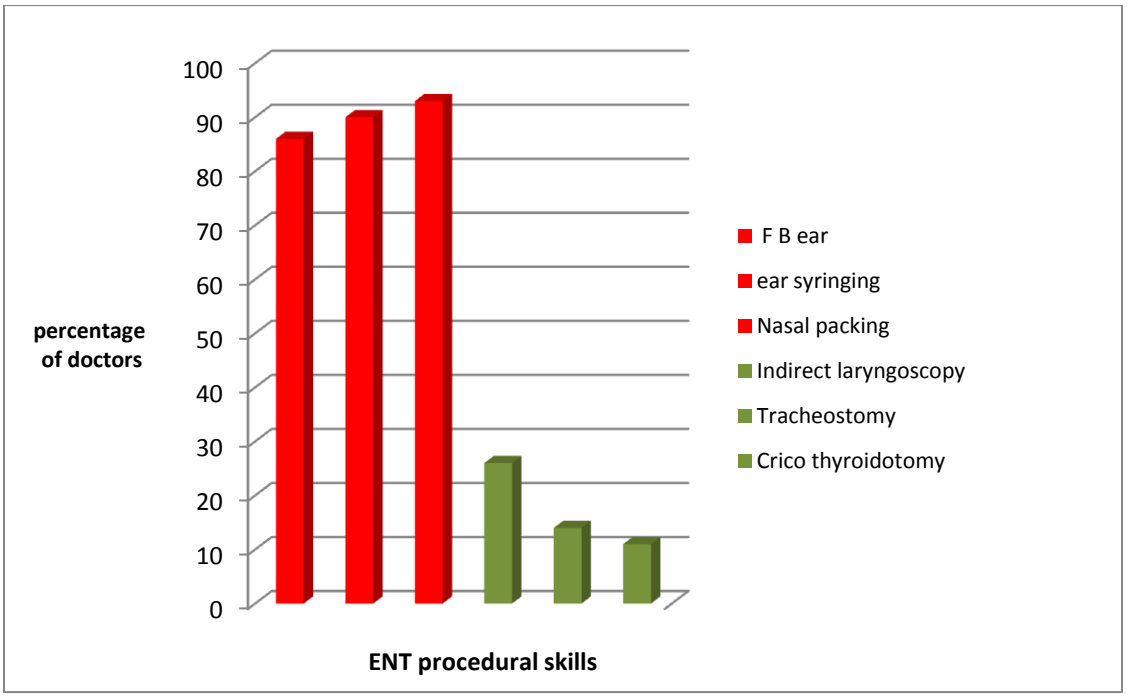

Figure 3: Competency in ENT procedures among doctors

As shown in Figure 5, among the procedural skills within internal medicine doctors reported themselves to be highly competent in performing pleural taps and lumbar punctures but not

competent in performing pleural biopsies. Within the obstetrics and gynaecology procedures as shown in Figure 6, doctors assessed themselves as highly competent in procedures such as evacuation of uterus, manual removal of placenta, papanicolou smears and normal vaginal delivery but not competent in performing procedures such as posterior colpopuncture, insertion of IUCD and endometrial biopsy. Caesarean section was identified as a competent procedure.

Figure 7 illustrates the orthopaedic procedures the doctors reported as being highly competent namely reduction of dislocation, application of POP and immobilization of fractures; and being competent in other procedures as shown above. There was however no orthopaedic procedure in which the doctors reported as not being competent.

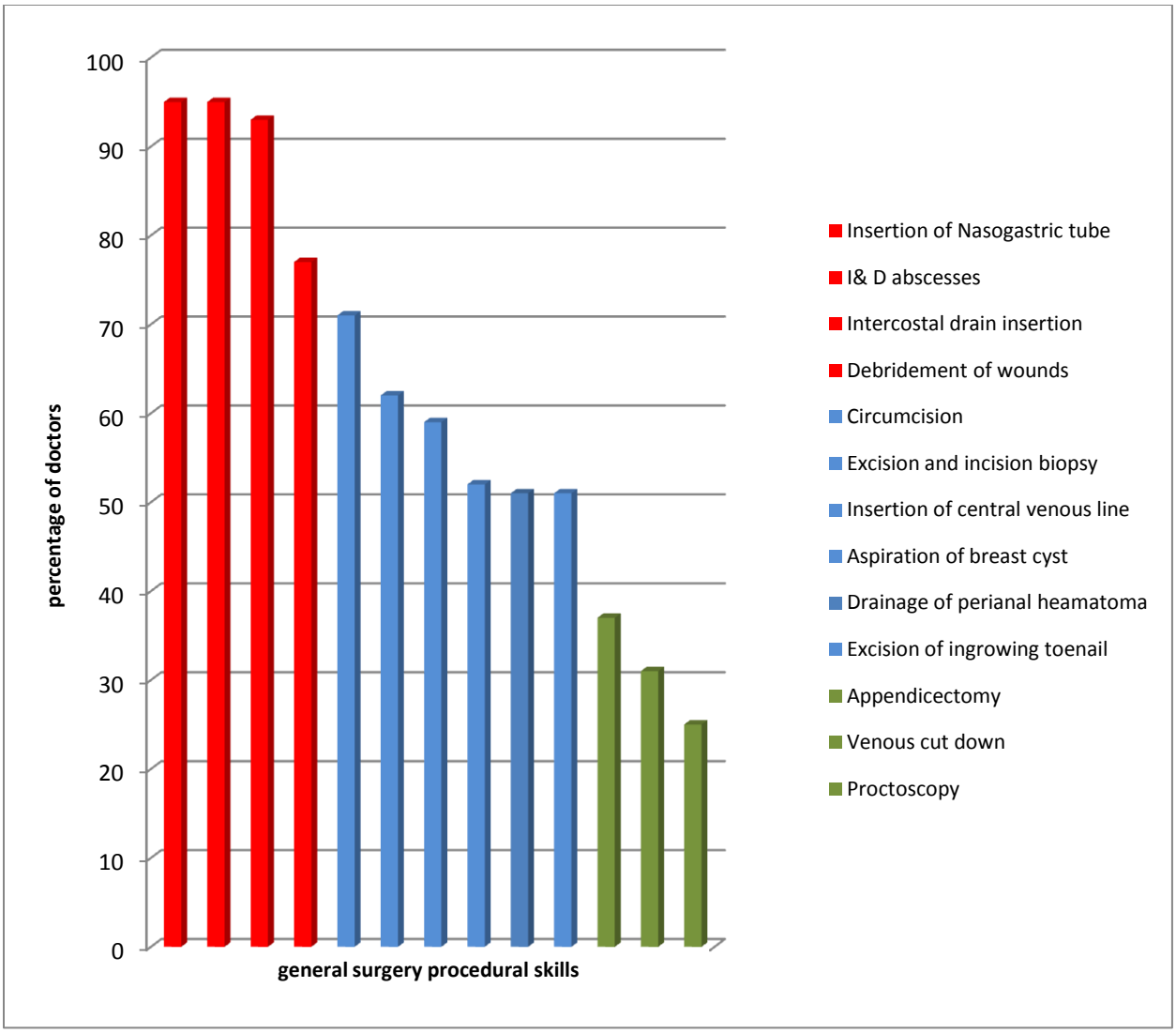

Figure 4: Competency in General Surgery procedures among doctors

Among the ophthalmological procedural skills as described in Figure 8, doctors reported as being highly competent in removal of foreign body from eye but not competent in procedures such as incision and drainage of Meibomian cyst and tonometry. Amongst the paediatric procedures as shown in Figure 9, the doctors assessed themselves as highly competent in procedures such as intravenous infusion, suprapubic bladder puncture and lumbar puncture but not competent in performing intraosseous infusion. In the urology procedures as shown in Figure 10, doctors assessed themselves highly competent in doing procedures such as reduction of paraphimosis and suprapubic and urethral catheterization and but not competent in performing vasectomy.

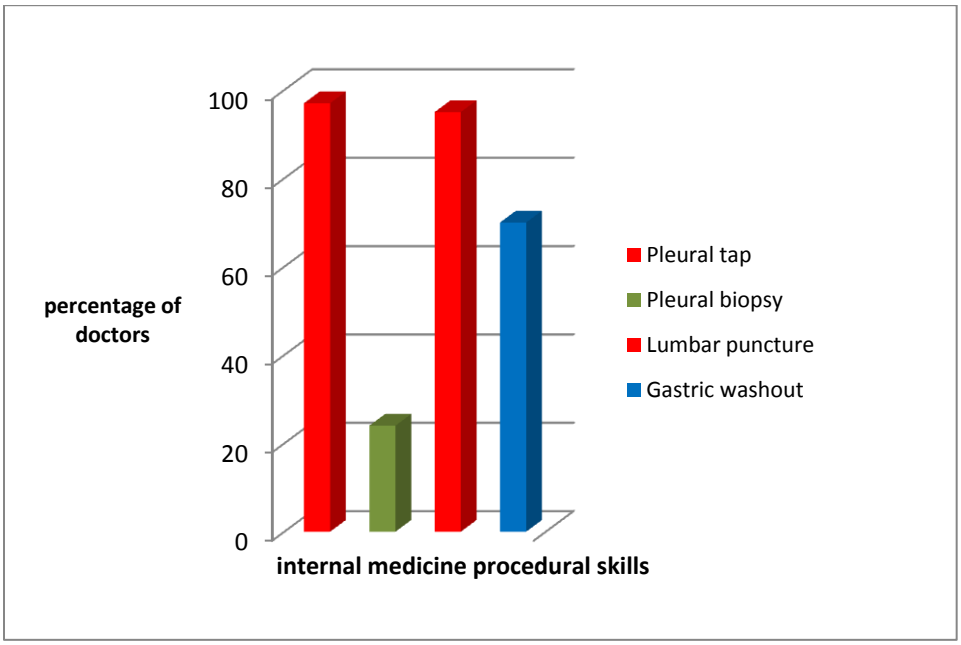

Figure 5: Competency of Internal Medicine procedures among doctors

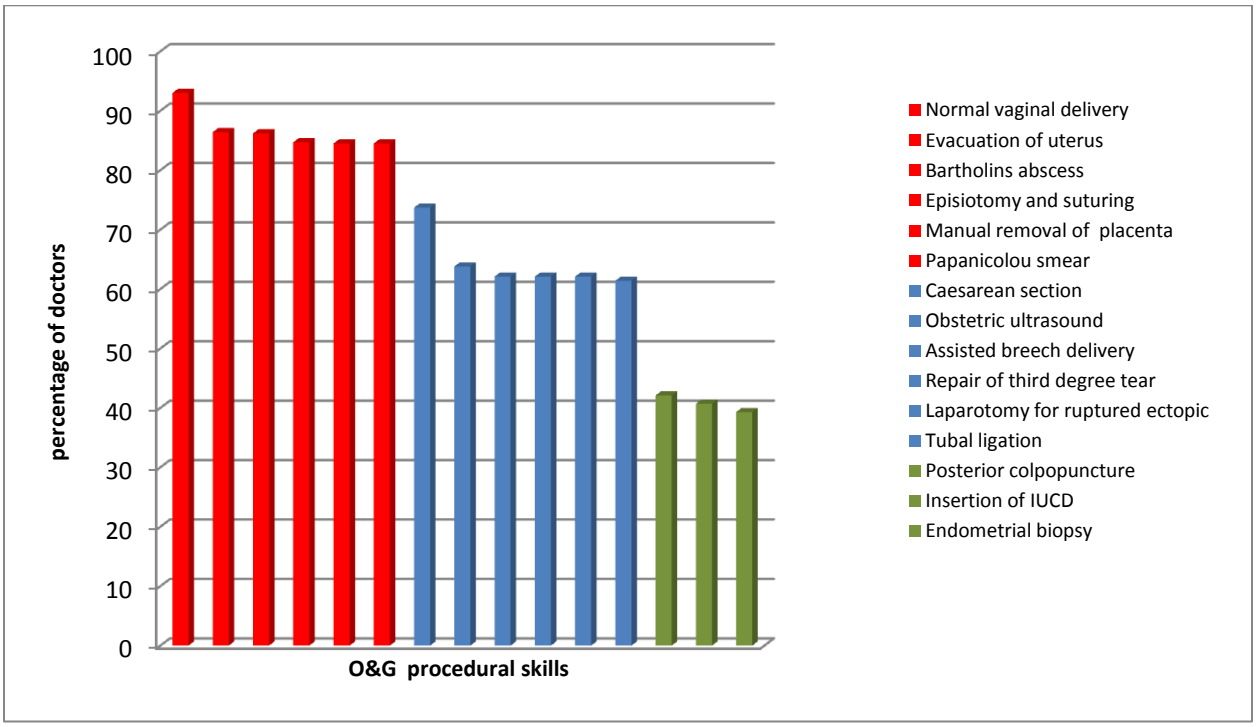

Figure 6: Competency in Obstetrics and Gynaecology procedures among doctors

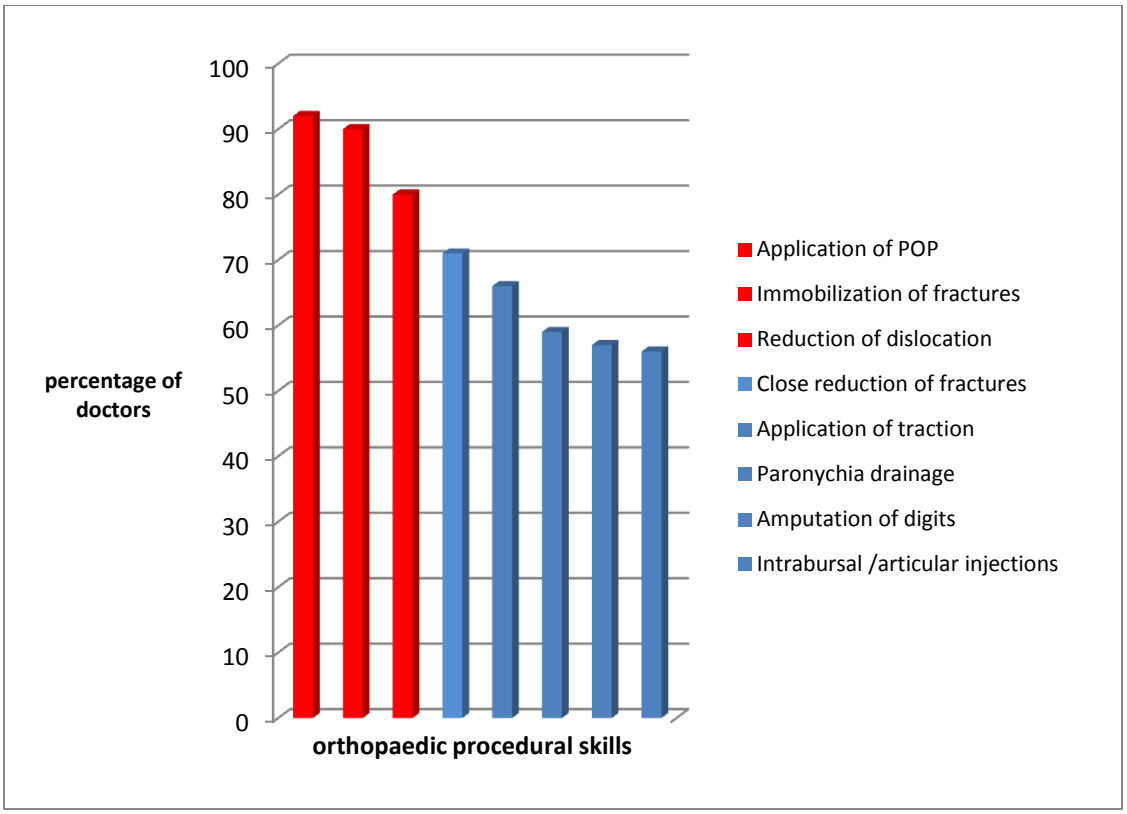

Figure 7: Competency in Orthopaedic procedures among doctors

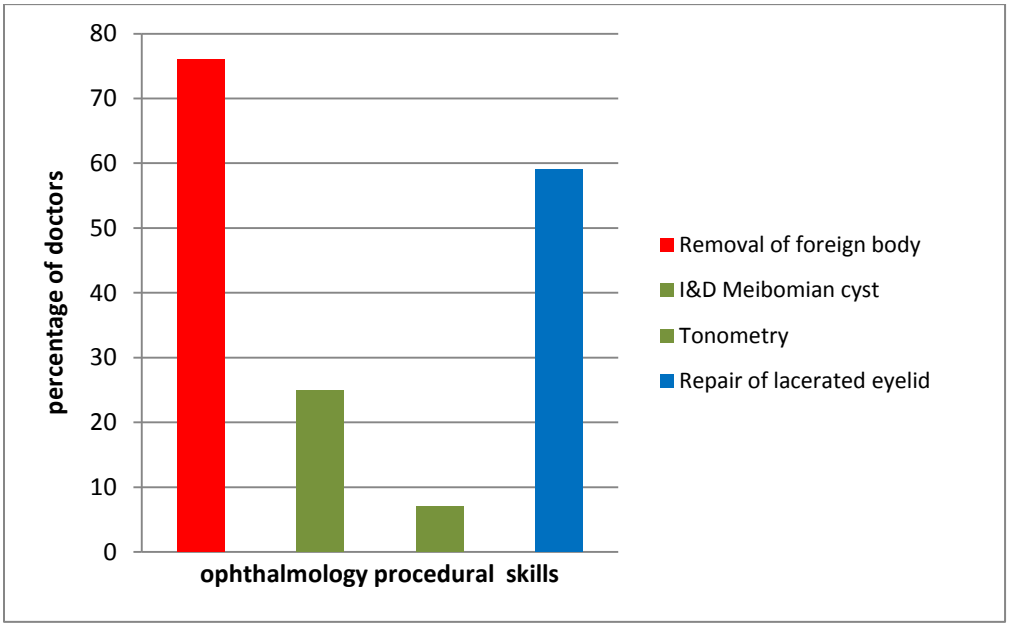

Figure 8: Competency in Ophthalmology procedures among doctors

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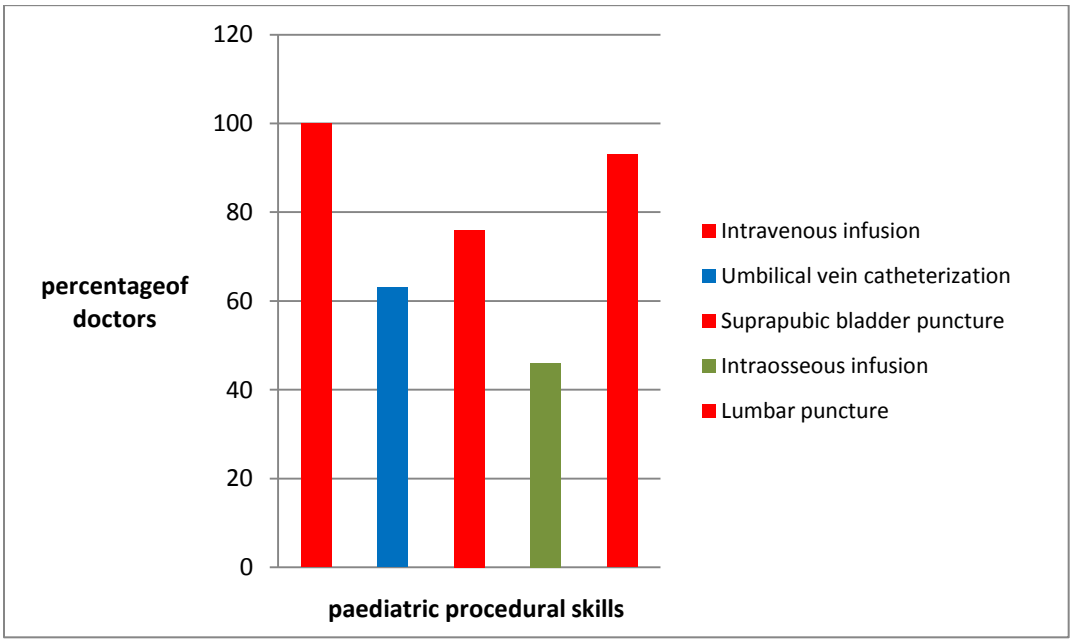

Figure 9: Competency in Paediatric procedures among doctors

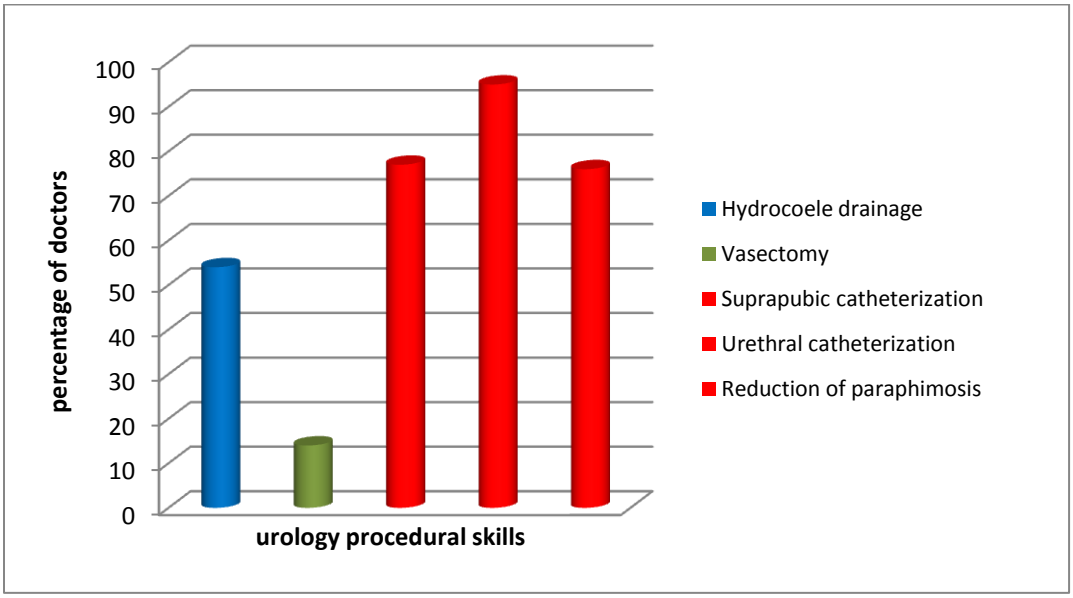

Figure 10: Competency in Urology procedures among doctors

4.3 Results of overall competence in procedural skills

The varying levels of skills in different disciplines were grouped together to assess the total numbers of those competent in each group of skills. In order to determine the overall competency of each doctor for a particular discipline and the relevant procedural skills, the following assumptions were made. If a doctor was able to perform less than 50% of the procedural skills in a discipline (determined by the numbers of category 3 scores in that discipline), it was assumed that the doctor was **overall not** competent in the procedural skills of that discipline. If the doctor was able to perform between 50-75% of the procedural skills in the discipline, he was considered **overall competent**. If the doctor was able to perform 75% and more of the procedural skills in the discipline, he was determined to be **overall highly competent** in the procedural skills of that discipline.

For example, among surgical skills the total 'surgical skill' score was assessed for each doctor. This was dependent on the number of category '3' scores. Among the total of 13 surgical procedures if a doctor was able to perform 10 or more procedures (i.e. >75%) independently, the doctor was considered **overall highly competent** in surgical procedures. If the doctor was able to perform between 7 and 9 procedures (i.e. 50-75%), the doctor was considered **overall competent**. If the doctor was able to perform 6 or less (i.e. <50%) of procedures independently, he was considered **overall not competent** in surgical procedures. The overall competence was assessed for all doctors in each discipline in this way.

Comparisons were performed between the total score of each of these groups of skills and the main variables such as age, gender, years of experience, place of undergraduate study, family medicine training, discipline and the current hospital of employment. The results showed that there was a statistically significant association between age and the overall competence in anaesthetic skills; between gender and overall competence in surgical skills, orthopaedic and urology skills; between years of experience and overall competence in dermatology skills; and between the current hospital and the anaesthetic, obstetrics and gynaecology and dermatology procedural skills. These results are presented in more detail below.

4.3.1 Age

There was a statistically significant association between age and the overall anaesthetic competence among doctors (*p value = 0.03)*. Only less than 20% of doctors reported to be highly competent in anaesthesia skills among all the age groups. The doctors among the age category 25 to 34 years perceived to be overall more competent than the other age groups. The age category above 55 years reported as overall not competent as the other groups. There was no statistically significant association between age and the overall competence in other group of skills.

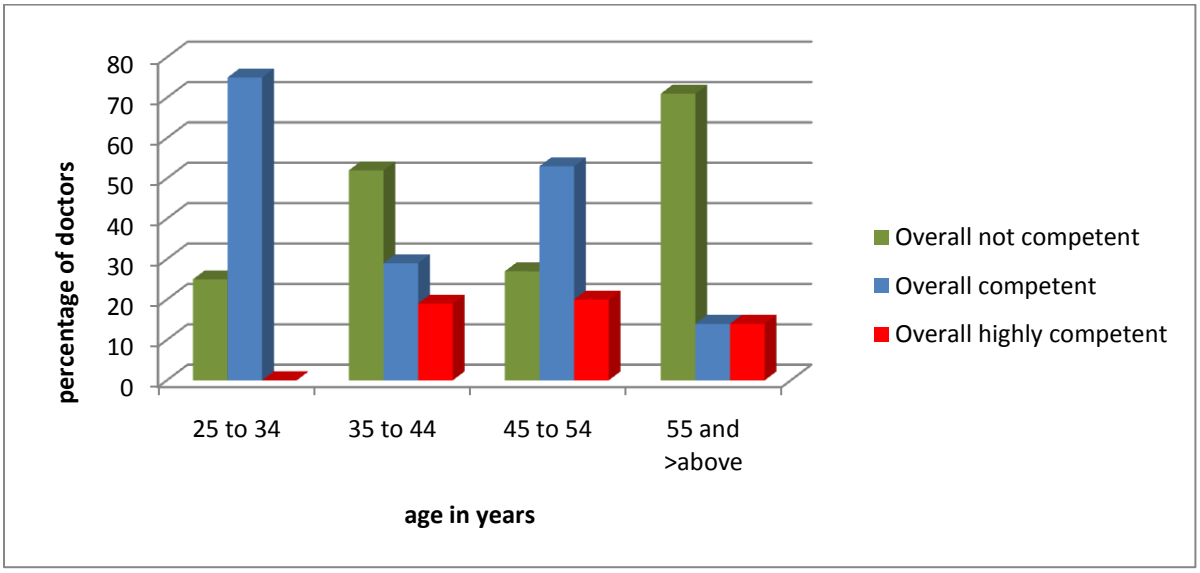

Figure 11: Comparison of overall competency in Anaesthesia procedures in various age groups

4.3.2 Gender

There was a statistically significant association between gender and overall competence in general surgical skills (*p value = 0.03*), orthopaedic skills *(p value = 0.02*) and urology skills (*p value = 0.005*). As seen in the Figure 12, among the doctors who were overall highly competent in general surgical skills 53% were male doctors compared to 18% of female doctors. Close to 50% of female doctors were overall not competent. Among the male doctors 73% of doctors were scored as overall highly competent in orthopaedic skills compared to 36% of female doctors as illustrated in Figure 13. Among the urology procedures as shown in Figure 14, approximately 60% of male doctors perceived themselves as highly competent whereas 57% of female doctors perceived themselves to be overall not competent.

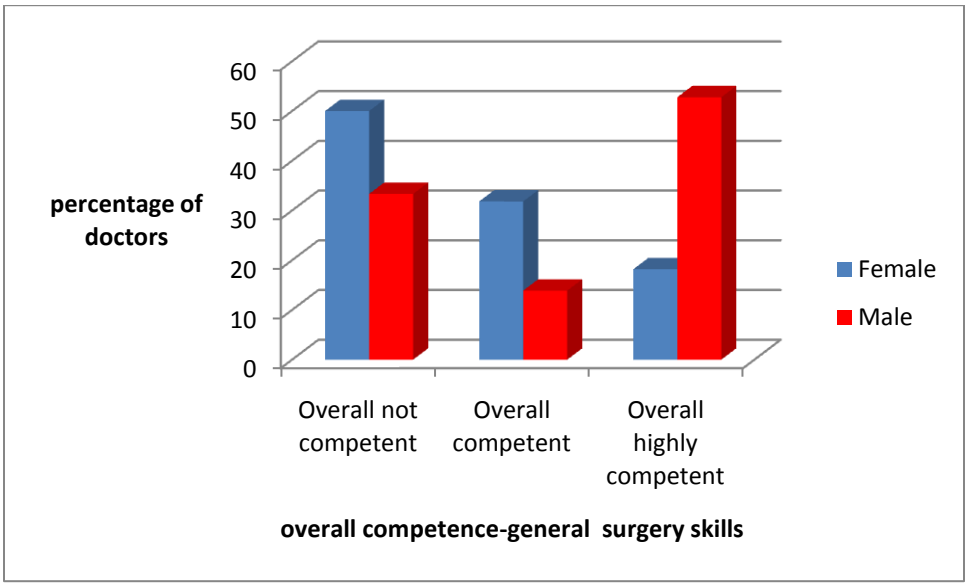

Figure 12: Comparison of overall competency in General Surgery procedures among Male and Female groups

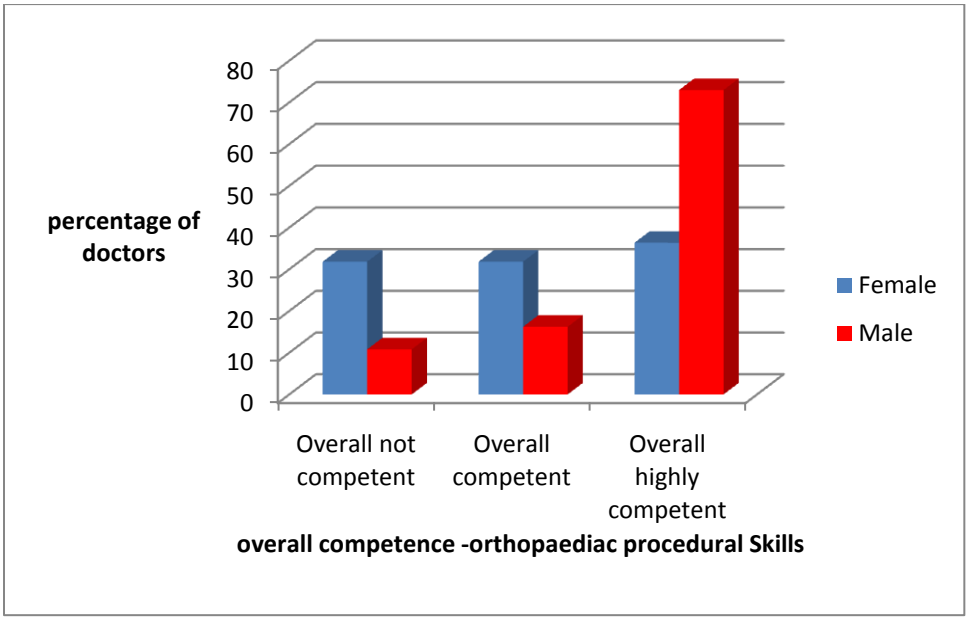

Figure 13: Comparison of overall competency in Orthopaedic procedures among Male and Female groups

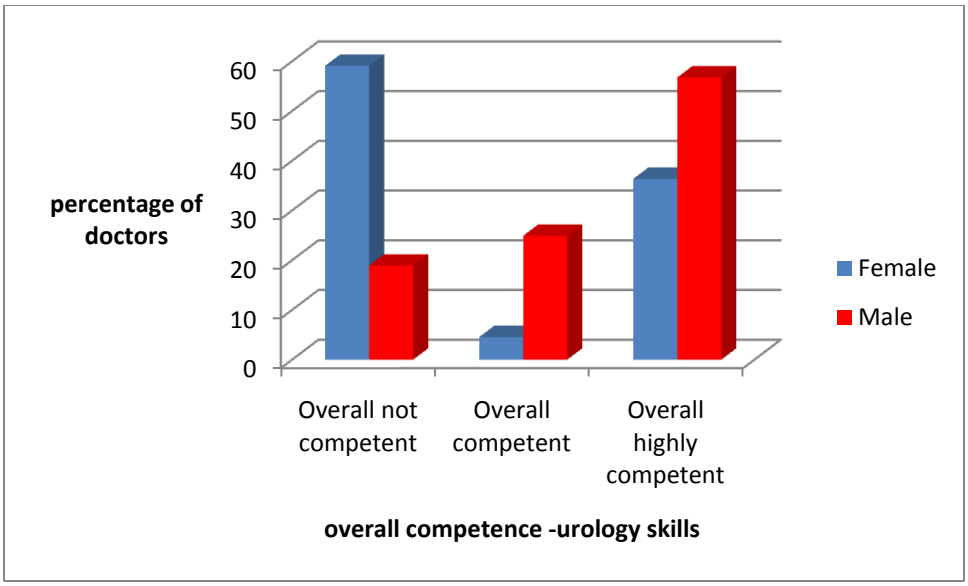

Figure 14: Comparison of overall competency in Urology procedures among Male and Female groups

4.3.3 Years of experience

There was a statistically significant association between years of experience and overall competence in dermatology skills (*p value =0.02*). Figure 15 below shows that all the doctors with less than two years of experience perceived themselves as overall competent in these skills. 65% of the doctors with 3 to 5 years of experience reported as being overall not competent whereas 43% of doctors with more than 10 years of experience reported as being highly competent in these procedures. There was no statistically significant association between years of experience and the overall competence in other group of skills.

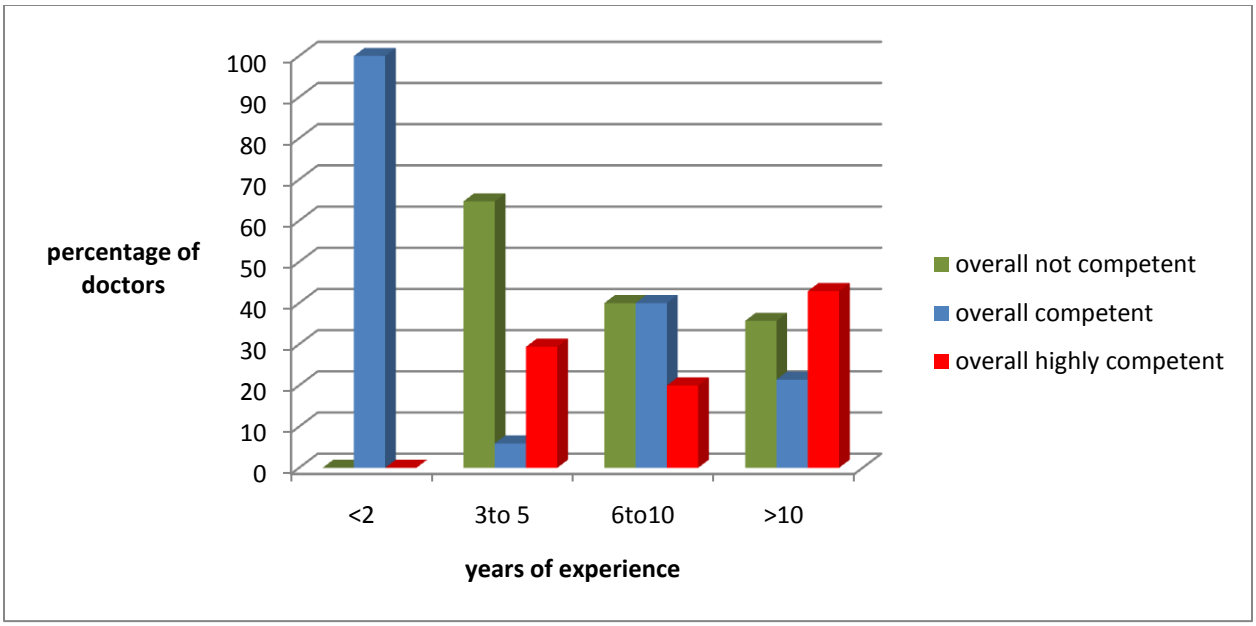

Figure 15: Comparison of overall competency in Dermatology procedures among doctors with years of experience

4.3.4 Discipline, Place of undergraduate study and Family medicine training

There was no statistically significant association between the different disciplines in which doctors spent most of their times, place of undergraduate training whether they are trained in South Africa or outside South Africa and whether the doctors had family medicine training or not, and the overall competence in procedural skills in various disciplines

4.3.5 Current Hospital of Employment

Doctors from three district hospitals participated in the study. When 67% of doctors were scored as overall competent in anaesthesia in Hospital A only 38% and40% doctors perceived as overall competent in Hospital B and Hospital C respectively. Only less than 30% of doctors were overall highly competent in anaesthesia skills in all three hospitals.

When 87 % of doctors were scored as highly competent overall in obstetrics and gynaecology skills in Hospital A, 38 % and 40% of doctors reported overall highly competent in these skills in Hospital B and Hospital C respectively. Among the doctors in Hospital C and Hospital A, 50%

and 47 % scored as highly overall competent in dermatology skills whereas 58 % of doctors in Hospital B perceived as not overall competent in these procedures

There was statistically significant association of overall competencies in anaesthesia skills (*p value = 0.01*), obstetrics and gynaecology skills (*p value = 0.015*) and dermatology skills (*p value = 0.01*) of the doctors to the current hospital that they are working.

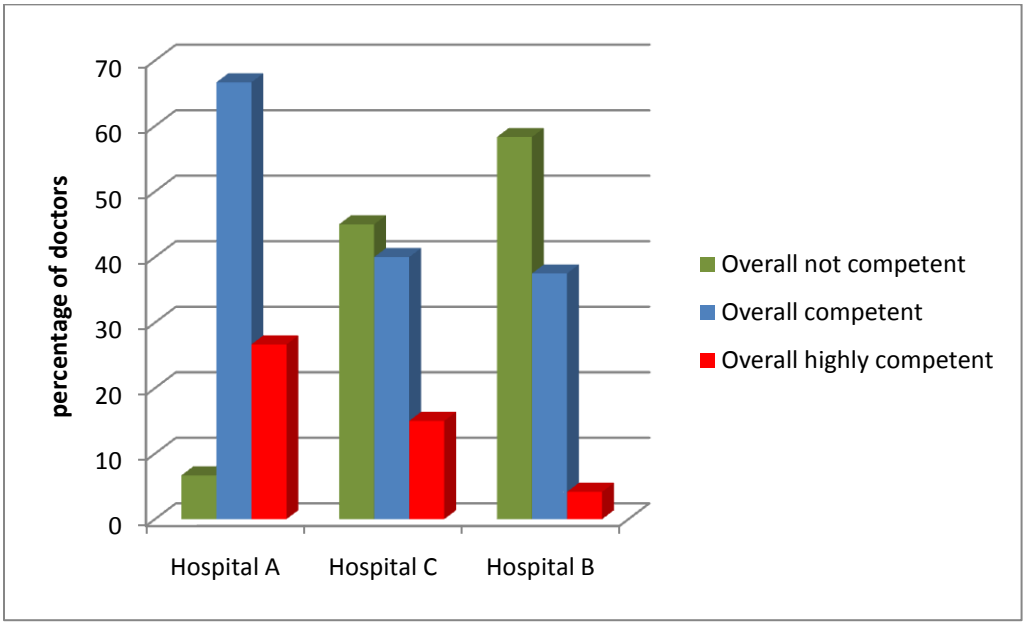

Figure 16: Comparison of overall competency in Anaesthesia procedures in three hospitals

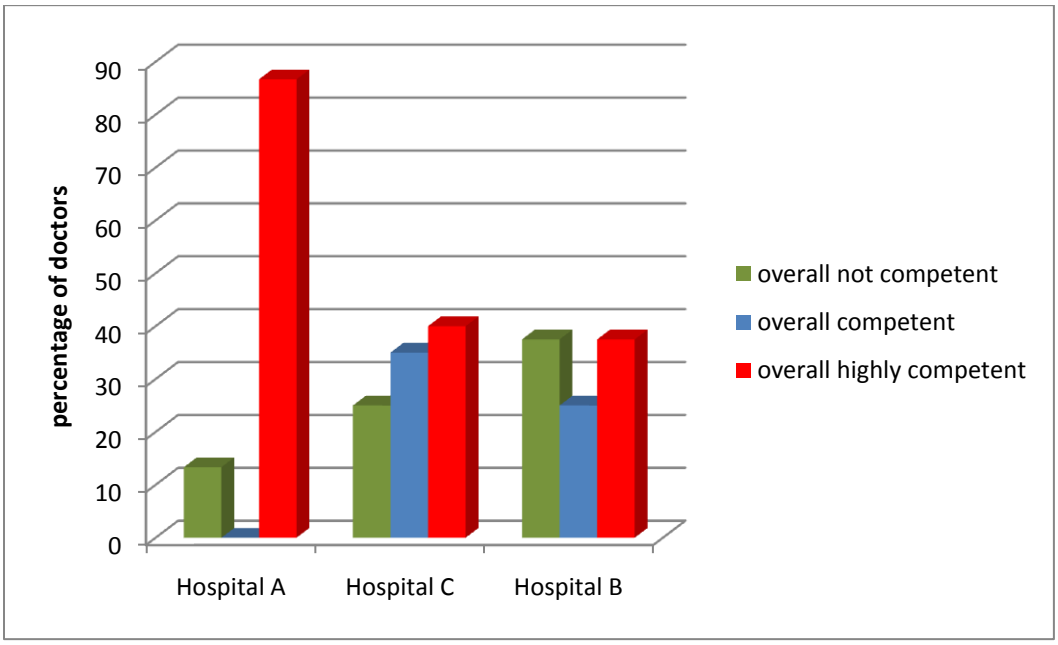

Figure 17: Comparison of overall competency in Obstetrics and Gynaecology procedures in three hospitals

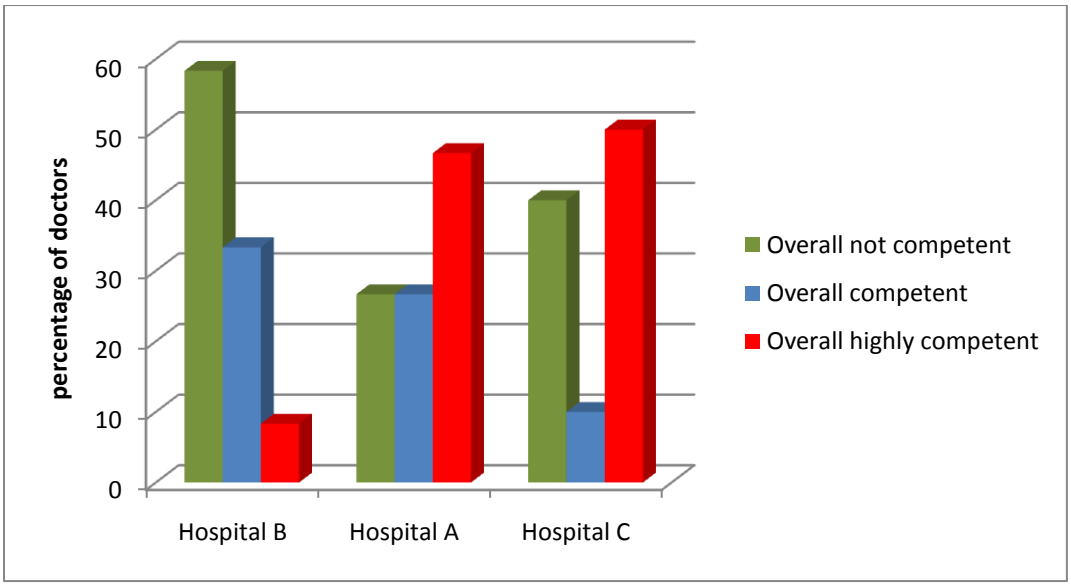

Figure 18: Comparison of overall competency in Dermatology procedures in three hospitals

CHAPTER 5: DISCUSSION

5.1 Discussion of Results

The findings of this study show the general picture of procedural skills among doctors in urban and peri-urban district hospitals in South Africa, unlike previous studies mentioned in the literature review which primarily focused on rural hospitals. The study findings in this report also help to understand perceived competence among doctors for a significantly larger number of common procedural skills performed in district hospitals, compared to other studies. The doctors showed varying levels of competence in the different group of skills. The level of competence varied from some of the procedures they were able to do independently to others they were able to do with support, to those procedures the medical officers were even unfamiliar with.

The study had a larger number of doctors per hospital (20), on average in each of the three hospitals studied, than the study conducted in Western Cape by De Villiers which had five doctors per hospital. This may have resulted in many of the doctors in the study focusing on skills in certain disciplines instead of overall competencies in all disciplines; however from the perspective of the health service, the competencies required for the service package at the district hospital level should be the same for all doctors and not influenced by the number of doctors in that facility. The average age of doctors in the study was 41 years, with over 63% being male. Approximately half the numbers of doctors have more than 10 years of post-qualification experience. These findings were similar to the De Villiers' study[7] where they found that the average age was 40 years, 75% were male, and average years of experience since qualification was 15.6 years. 17% of doctors in the study had post graduate family medicine qualification compared to 5% doctors in the De Villiers' study.

The group of doctors who were able to do procedures independently also reported the number of times they had done these procedures; this was an indicator of whether they had gained adequate experience in those skills as shown in Table 3. The data in this table illustrated that the procedures the doctors reported that they have performed more than 10 times were the ones that

were also reported as being independently performed by majority of the doctors. These were the most commonly done procedures in these hospitals.

Overall in the findings of the study, it was determined that doctors lacked confidence in reporting certain procedures. However a certain proportion of doctors reported that they were able to do procedures such as those listed in Table 3 (e.g. cricothyroidotomy, intraosseous infusion, etc.) only with support. A significant proportion of doctors also reported unfamiliarity with other procedures in Table 3 (e.g. general anaesthesia, spinal anaesthesia, etc.). This was assumed to be mainly because they may not have received training in some of these procedures and they had not adequately performed certain procedures to be really confident in that procedure.

It was also demonstrated that competency levels varied among different disciplines. The doctors were generally less competent in anaesthesia, ENT and ophthalmology procedures compared to general surgery, medicine, orthopaedics, obstetrics and gynaecology, urology and paediatric procedures (see Table 3).This may be due to the fact that certain procedures are commonly done while others are not commonly done in these hospitals. The procedures listed in Table 4 are the set of procedures that the majority of the doctors were most confident in doing alone which were also the most commonly done procedures in these settings. According to Mash et al[12] these procedures are those that Family Medicine registrars should be able to perform independently or even teach other doctors.

The list of procedures as shown in Table 5 listed the just competent procedures such as spinal anaesthesia and caesarean sections. It was illustrated that the majority of the doctors reported that they were competent to perform caesarean sections; however in the researcher's opinion ideally all the doctors should be competent to perform caesarean sections. Other reasons could be the relative abundance of obstetricians in urban hospitals and a larger number of medical officers in the study compared to rural hospitals and hence the need for doing caesarean sections by all medical officers had decreased in these settings. Appropriate competence in caesarean sections is a critical skill needed in district hospitals and the Saving Motherhood Initiative[11] identifies the inadequate competence in caesarean sections as a major factor contributing to Maternal Mortality

in those mothers undergoing caesarean sections in district hospitals. This implies that training is needed for doctors in this specific skill within district hospitals.

As shown in Table 5 as well, only 61% of doctors were able to perform tubal ligation in an urban setting which in the researcher's opinion infers just competence, yet this procedure was identified as one of the most commonly done obstetric procedure in rural district hospitals.[5] This indicates that it may be probable that these procedures were not as commonly done in urban hospitals, due to a variety of possible reasons such as not many women requesting the procedure, lack of information on the procedure amongst women, or may be these patients are referred to regional hospitals and others which are beyond the scope of this study.

Table 6 includes emergency procedures such as cricothyroidotomy, tracheostomy, intraosseous infusion and venous cut down which the researcher assumes all the doctors are expected to know but at the same time few doctors reported that they were able to do these procedures independently. When compared to the De Villiers' study[7] the percentages scored on competencies in procedures such as tracheostomy and intraosseous infusion were very similar among rural and urban doctors, and demonstrating low levels of competencies in these areas. This illustrates that there is not much difference in competencies among doctors in rural and urban district hospitals in these emergency procedures, probably due to the fact that these procedures are rarely required to be performed in the district hospitals whether in rural or urban settings. However, being an emergency procedure and when in a critical situation, ideally all doctors should be able to perform these procedures independently. This emphasizes the importance of continuous training in these emergency procedures in all settings.

Once more in Table 6, only less than half of the doctors reported as being able to do general anaesthesia independently, this is also of concern because there are many obstetric procedures such as evacuation of uterus, repair of third degree tear, laparotomy for ruptured ectopic or even a failed spinal anaesthesia that require general anaesthesia in a district hospital setting. The percentage of doctors who were able to do general anaesthesia was less when compared to other similar studies done before in South Africa. But the percentage among doctors in the usage of spinal anaesthesia is slightly higher in this study than previous studies. This may be because

these doctors are using more spinal anaesthesia compared to general anaesthesia for common procedures such as caesarean sections and others. Another reason may be due to the fact that more doctors are trained in these procedures after the introduction of the compulsory two year internship rotations in disciplines like anaesthesia and the one year community service. The study reiterates the fact that there is need for training on anaesthesia for these medical officers working in district hospitals.

The study finding that less than a quarter of doctors perceived that they were able to perform certain of the procedures such as epidural anaesthesia, endometrial biopsy, proctoscopy and pleural biopsy (Table 6) implies that these are the least commonly performed procedures in a district level hospital setting. Whether or not doctors in district hospitals should be able to do these procedures still remain questionable and more clarity is needed about the level of competence for these procedures if at all these procedures are to be done at district hospital level. Another discussion is whether or not there should be different skills lists for rural and urban settings. At present what can be assumed to be applicable is the procedural skills list mentioned in the District Level Service Package which remains the same for both rural and urban district hospitals.

The percentage of doctors who reported competence in performing certain procedures independently was less in this study compared to the similar studies done in other hospitals in South Africa. This supports the view that certain procedural skills levels among doctors in urban hospitals are lower than among doctors in rural hospitals. The researcher assumes that procedures such as skin graft, appendicectomy and endometrial biopsy are procedures for which doctors in urban settings refer patients to the next higher referral facility more frequently probably due to the accessibility of these services. In rural settings, doctors appeared more competent in these procedures: skin graft (71%) and appendicectomy (56%) as shown in the De Villiers study.[7] Once more it is inferred that doctors were able to do so due to the lack of easy accessibility to higher centres of referral. These therefore are also skills that doctors in urban district hospitals can be trained to do, in order to reduce the unnecessary referral of patients to higher facilities.

The overall reported competence in all the different disciplines did not show any association with the different age groups in this study except in anaesthesia. This finding was different to the study done by De Villiers where it showed that older doctors had higher perceived skills than the young doctors.[7]The overall competence in anaesthesia in the current study was generally less among all the age groups; however the age groups between 25 to 34years and 45 to 54years reported a higher overall competence in anaesthesia skills. This is probably due to the fact that the recently trained doctors who did their two year internship and community service rotations had compulsory rotations in these disciplines and hence reported higher competencies in these areas. This however must be viewed with caution, as junior doctors may tend to overestimate their level of competence as illustrated in the study by Barnsley etal.[19] The overall competency in anaesthesia was found to be decreasing across all the other age groups except among the age group between 45 to 54 years. Once more, this is of concern, as it indicates that there is need for further development of anaesthesia skills in most of the doctors; competency in anaesthesia being a major requirement in a district hospital setting in the researcher's opinion.

The gender variations in the overall competency in surgical, orthopaedic and urology skills are demonstrated in this study where male doctors self-reported as being more competent in the procedural skills in the disciplines mentioned above compared to their female counterparts. Current literature illustrates that male doctors do tend to prefer the more 'surgical' specialties such as those indicated above, however these studies do not reflect self-reported competence nor observed competence.[22,23]

When the overall competences in different disciplines were compared with years of experience there was no statistical association in all disciplines except with dermatology skills. This is an interesting finding due to the fact that this shows that more years of experience do not necessarily make much difference on the overall competence level of procedural skills of the doctors. Even if doctors initially gained adequate level of competence in certain set of procedures, in the researcher's opinion, not practicing those procedures meant losing their skills over time. This may have been due to the larger number of doctors in the hospitals studied. Regular training is hence required among doctors to update these procedural skills when needed.

However with dermatological skills, the overall competencies improved with years of experience; this was a positive statistical association which couldn't be explained.

Another interesting finding is that the overall competence of procedural skills did not show any differences among the doctors who did their undergraduate training in South Africa when compared to those doctors who were trained outside South Africa. The majority of foreign qualified doctors were from the Democratic Republic of Congo, and most of the foreign qualified doctors had in excess of 10 years of working experience. It is beyond the scope of this study to determine if the foreign qualified were competent in these procedures prior to or after coming to South Africa or if there were differences between the countries of undergraduate training of the doctors studied. Further studies are needed to examine in detail the influence of place of training on procedural skills competence.

The other important study finding is that there was no difference among overall competence in procedural skills reported by doctors who did their family medicine training when compared to those who did not do the training. This may be due to the fact that there was no formal clinical training component in the previous part-time Masters in Family Medicine programme, in which 17% of the doctors in the study had been exposed to, and also the few who were in the current MMed programme were in their first and second year of training. The current MMed programme in Family Medicine however has a formalized clinical component aimed at improving and strengthening procedural skills of those doctors who complete the training. In future a similar study conducted may demonstrate a difference in overall competence in doctors who have completed the MMed in Family Medicine.

The overall competence in all the different procedural skills was compared among the hospitals the doctors were currently working in, it was demonstrated that there were significant differences in anaesthesia, obstetrics and gynaecology and dermatology skills (Figures 16, 17 and 18). The doctors working in District hospital A showed an overall higher competence in anaesthesia and O&G skills than doctors working in the other two hospitals. This may be due to the reason that in District hospital A the doctors were rotating among the different disciplines like OPD, casualty, maternity and theatre gaining all these skills compared to the doctors in the other two hospitals

where they worked in the same discipline such as OPD or casualty and not rotating in theatre and maternity wards. The latter is a form of 'departmentalizing' within a district hospital. Not practicing these skills in some areas may have resulted in less competence in some procedures among the doctors who were working in only certain disciplines. The merits or demerits of 'departmentalizing' therefore can be further argued. In the researcher's opinion, doctors themselves also tend to argue as to why they cannot be utilized in their area of expertise or interest within the hospital, which then directly or indirectly leads to departmentalization.

5.2 Limitations

Since this was a self-assessment study, the participants indicated varying levels of confidence in certain procedural skills that may or may not have been the actual competence of the participant. Both competence and experience were self-reported. The researcher however assumes that the number of the times the procedures was performed independently was a measure of actual competence. This was reinforced in the findings as most of the commonly done procedures were those that were reported as performed independently by most of the doctors. The study also could not look into all the clinical and procedural skills needed for the doctors at these levels. For example some of the critical skills like the Cardiopulmonary resuscitation (CPR) in adult and children were not included.

The relationship between the determined competency levels and quality of procedural skills performed also could not be evaluated in this study and this may be a scope for a future study. The study was able to do a self-assessment of only certain procedural skills and not the total management of a particular condition. Therefore the self-expressed ability to perform the procedure independently does not infer that the patient was managed appropriately or holistically. Again only one region amongst the three regions in Gauteng province was included in the study. However, it is anticipated that the results can be generalized to other district hospitals in the province to certain extent. The study was able to look at skills of doctors in district hospitals, and not regional and tertiary level facilities and therefore these results cannot be extrapolated to other levels of care.

CHAPTER 6: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

The findings in this study have helped to reach the conclusion that the doctors working in district hospitals have varying levels of competence in procedural skills required at a district hospital setting. There are a defined set of skills that they should be able to perform at this level. The majority of the doctors reported competence in most of the skills, however the converse is true for certain specialized and uncommon skills such as general anaesthesia, ophthalmology and emergency ENT skills. This research clearly identifies the skills gap that exists at present among these doctors in the different set of skills.

Generally the procedural skills among doctors varied among different disciplines. The doctors were more competent in general surgery, medicine, orthopaedics, obstetrics and gynaecology, paediatric and urology procedures. Anaesthesia was identified as an area where majority of the doctors lack competence.

There should be greater clarity on whether doctors working in the urban and rural district hospitals should be practicing the same set of procedural skills at the same level of competence.

The study also highlights the fact that factors such as age and years of experience do not necessarily increase the knowledge and competence in performing these skills.

The place of undergraduate training of the doctor (South Africa and outside South Africa) did not also show any variation in the self-reported level of competence.

The post graduate family medicine training that existed before 2008 (MFamMed) did not formalize the uniformity of the skills needed in such a training programme. Hence the doctors who did the MFamMed training before 2008 did not demonstrate differences in their levels of competence in the procedural skills compared to doctors without the training.

The research reiterates the fact that male doctors prefer to do more surgical, orthopaedics and urology procedures compared to female doctors.

The organizational and management structure of the hospital of current employment is identified as another factor which could have affected the doctors' skills levels. This means that in the hospitals where the doctors rotated in all departments like theatre, obstetrics and gynaecology, and outpatient departments had overall a better competence than doctors in the other hospitals where these regular rotations are not compulsory.

6.2 Recommendations

This research study identifies the need for training in the skills in which the doctors have identified themselves as not competent. At District hospital level, a regular rotation for these doctors in all the areas or disciplines within the district hospital is recommended as a way of gaining these skills. This will help to prevent the departmentalizing of doctors even in a district hospital where doctors are supposed to know a definite set of skills. The managers in these hospitals should be informed on these issues of rotations of doctors in all disciplines within these hospitals.

An initial assessment of the skills of these doctors before starting work in the hospital is also necessary so that training can be offered for these doctors by referring them to regional hospitals to gain the required skills or even training them in the same facility, which is more feasible. The training in areas like general anaesthesia, spinal anaesthesia and operative procedures such as caesarean section needs special emphasis. The doctors need to be trained in emergency procedures like cricothyroidotomy, insertion of central venous line, tracheotomy and intraosseous infusion through the regular participation in short courses which give adequate training in these procedures such as Advanced Trauma Life Support (ATLS) or similar courses.

At provincial level another recommendation is that there should be a process to strengthen the procedural skills of the present specialist Family Physicians who were trained in the previous

part-time programmes and who are now required to train the new Family Medicine registrars. This should involve Family Medicine departments from all the Universities and an agreement should be reached on this process with regular updating of these skills among the Family Physicians.

The National Department of Health should determine the list of procedures in a district hospital setting, related to context taking into consideration that the current lists are quite exhaustive and may not often be applicable to urban settings. There could be justification for separate lists for rural and urban district hospital settings which should even include the level of competence needed by doctors in performing each of these procedures independently or with support. However this should also take into account the constant movements of doctors between rural and urban employments. This may imply the need for training and retraining, competence and incompetence, depending on the direction of movement, and becomes part of a continuous process of skills transfer and training at a district hospital level.

The skills list developed by Mash et al[8]could be considered or used as the recommended list to update the skills of the medical officers in district hospitals in urban settings.

Regular skills audits should be conducted in district hospitals to determine gaps in competencies and training needs thereof. The findings of this study can be utilized as a baseline for future skills audits of doctors in urban district hospitals.

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APPENDICES

APPENDIX 1: Information Letter and Informed Consent Form

Dear Doctor

My Name is Dr Neetha Joe Erumeda, I am a final year student in Family Medicine at the University of Witwatersrand South Africa.

As part of the course requirement I have to do a research project. The research study is to determine the competence of doctors in performing certain procedures. This competency would have been obtained through previous or current work experience and or post graduate training.

The study is being conducted with the approval of the Human Research Ethics Committee (Medical) of the University of Witwatersrand.
The Chief Medical officers in the study site hospitals have been informed of the study. The study would like the participation of all the doctors currently working in district hospitals of region B in Gauteng province. Hence you are kindly requested to go through the self assessment questionnaire and answer all the questions as honestly as you can. The completed questionnaire will be collected in a sealed envelope to ensure confidentiality.

Be informed that participation in the study is voluntary.
There is no penalty for not participating in the study
There is no financial gain or loss if you participate or not in the study
Please be assured that this is a study done for research purposes and any information provided will be confidential.
The identity of any participant will not be revealed in the study or in any future publication.
If you have any queries or want to know more about the study please do not hesitate to contact me
Cell no 0827913898
Email drsjoeneetha@telkomsa.net
drsjoeneetha@absamail.co.za

Thank you for your cooperation

(RESEARCHER)

APPENDIX 2: Research Questionnaire

QUESTIONNAIRE ON PROCEDURAL SKILLS

I. GENERAL INFORMATION OF PARTICIPANT

a) Age in years……

b) Gender

Male	Female

c) Years of experience after graduation including internship and community service.
e.g. Completed community service in 2004. Currently medical officer in 2009. Years of experience: 7 years
e.g. Currently doing community service in 2009. Years of experience: 2

Please tick appropriate column below

Less than or=2 years	3-5 years	6-10 years	More than 10 years

d) In what department or discipline do you spend most of your time?
……..

e) Where did you train for your undergraduate medical degree?
South Africa Outside South Africa

f) If outside South Africa, indicate country of undergraduate medical training
…….…….

g) Have you completed any postgraduate family medicine training in South Africa? Yes No

h) if 'No' to (g), are you currently enrolled for family medicine training? Yes No

i) If 'Yes' to (h), when did you register/enroll? Please indicate year of first registration.
……

j) If 'Yes' to (i) when did you complete your training? Please indicate year of completion of your family medicine training.
……

2. PROCEDURAL SKILLS AUDIT

The following is a procedural skills list that will be used as a tool for the study.

Please complete the questionnaire as honestly as you can and use the following scoring system

0	Unfamiliar with procedure
1	Familiar enough to explain to patient but cannot perform it
2	Perform the procedure with support
3	Perform the procedure independently

If you have selected '3' above, which indicates procedures independently, please also respond to the column in the right which is marked A, B, C.

A	<5 procedures done
B	5-10 procedures done
C	>10 procedures done

Example: Dr X has performed endotracheal intubation independently, and has done 8 such procedures. In the table below, Dr X will tick under column '3' and 'B'.

0	Unfamiliar with procedure		
1	Familiar enough to explain to patient But cannot perform it	A	<5 procedures done
2	Perform the procedure with support	B	5-10 procedures done
3	Perform the procedure independently	C	>10 procedures done

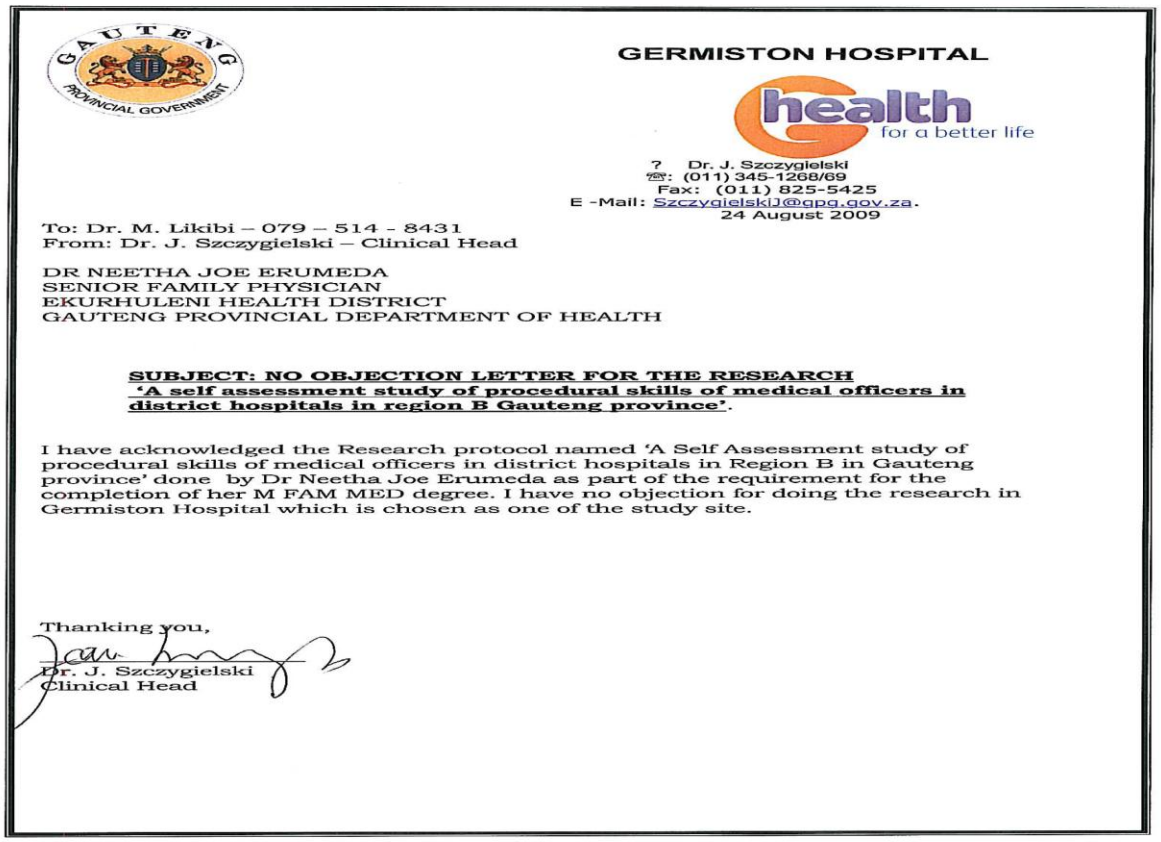
	ANAESTHESIA								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
201	Bier's block								
202	Ring block								
203	Endotracheal intubation								
204	General anaesthesia								
205	Spinal anaesthesia								
206	Epidural anaesthesia								
	DERMATOLOGY								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
207	Cauterization of warts								
208	Skin biopsy								
209	Excision of bumps and lumps								
	ENT								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
210	Removal of foreign body								
211	Ear syringing								
212	Nasal packing								
213	Indirect laryngoscopy								
214	Cricothyroidotomy								
215	Tracheostomy								
	GENERAL SURGERY								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
216	Intercostal drain insertion								
217	Insertion of Nasogastric tube								
218	Proctoscopy								
219	Circumcision								
220	Venous cut down								
221	Debridement of wounds								
222	Drainage of perianal heamatoma								
223	Excision of ingrowing toenail								
224	Aspiration of breast cyst								
225	Excision and incision biopsy								
226	Insertion of central venous line								
227	I& D abscesses								
228	Appendicectomy								

	MEDICINE								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
229	Pleural tap								
230	Pleural biopsy								
231	Lumbar puncture								
232	Gastric washout								
	OBSTETRICS ANDGYNAECOLOGY								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
233	Evacuation of uterus								
234	Posterior colpopuncture								
235	Insertion of IUCD								
236	Manual removal of placenta								
237	Episiotomy and suturing								
238	Assisted breech delivery								
239	Repair of third degree tear								
240	Tubal ligation								
241	Obstetric ultrasound								
242	Bartholin’s abscess								
243	Endometrial biopsy								
244	Papanicolou smear								
245	Normal vaginal delivery								
246	Caesarean section								
247	Laparotomy for ruptured ectopic								
	ORTHOPAEDICS								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
248	Close reduction of fractures								
249	Reduction of dislocation								
250	Application of POP								
251	Amputation of digits								
252	Paronychia drainage								
253	Intrabursal/articular injections								
254	Immobilisation of fractures								
255	Application of traction								

0	Unfamiliar with procedure		
1	Familiar enough to explain to patient But cannot perform it	A	<5 procedures done
2	Perform the procedure with support	B	5-10 procedures done
3	Perform the procedure independently	C	>10 procedures done

	OPTHALMOLOGY								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
256	Removal of foreign body								
257	I&DMeibomian cyst								
258	Tonometry								
259	Repair of lacerated eyelid								
	PAEDIATRICS								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
260	Intravenous infusion								
261	Umbilical vein catheterization								
262	Suprapubic bladder puncture								
263	Intraosseous infusion								
264	Lumbar puncture								
	PLASTIC SURGERY								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
265	Skin graft								
266	Injection of keloids								
	UROLOGY								
	PROCEDURAL SKILLS	0	1	2	3		A	B	C
267	Hydrocoele drainage								
268	Vasectomy								
269	Suprapubic catheterization								
270	Urethral catheterization								
271	Reduction of paraphimosis								

APPENDIX 3: Approval letter from Germiston Hospital



GERMISTON HOSPITAL

health for a better life

Dr. J. Szczygielski
(011) 345-1268/69
Fax: (011) 825-5425
E -Mail: SzczygielskiJ@gpg.gov.za.

24 August 2009

To: Dr. M. Likibi – 079 – 514 - 8431
From: Dr. J. Szczygielski – Clinical Head

DR NEETHA JOE ERUMEDA
SENIOR FAMILY PHYSICIAN
EKURHULENI HEALTH DISTRICT
GAUTENG PROVINCIAL DEPARTMENT OF HEALTH

SUBJECT: NO OBJECTION LETTER FOR THE RESEARCH 'A self assessment study of procedural skills of medical officers in district hospitals in region B Gauteng province'.

I have acknowledged the Research protocol named 'A Self Assessment study of procedural skills of medical officers in district hospitals in Region B in Gauteng province' done by Dr Neetha Joe Erumeda as part of the requirement for the completion of her M FAM MED degree. I have no objection for doing the research in Germiston Hospital which is chosen as one of the study site.

Thanking you,

Dr. J. Szczygielski
Clinical Head

APPENDIX 4: Approval letter from Heidelberg Hospital

GAUTENG DEPARTMENT OF HEALTH, HEIDELBERG HOSPITAL

Eng.: Dr E.K Pavlova
☎ (016) 341 1209
(016) 349 5259
Email:Elena.Pavlova@gauteng.gov.za.
25.08.2009

To: Dr. M. Likibi- 079 514-8431
From: Dr EK Pavlova-Clinical Manager

DR NEETHA JOE ERUMEDA
SENIOR FAMILY PHYSICIAN
EKURHULENI HEALTH DISTRICT
GAUTENG PROVINCIAL DEPARTMENT OF HEALTH

SUBJECT: NO OBJECTION LETTER FOR THE RESEARCH
'A self assessment study of procedural skills of medical officers in district hospitals in region B Gauteng province'.

I have acknowledged the Research protocol named 'A Self Assessment study of procedural skills of medical officers in district hospitals in Region B in Gauteng province' done by Dr Neetha Joe Erumeda as part of the requirement for the completion of her M FAM MED degree. I have no objection for doing the research in Heidelberg Hospital which is chosen as one of the study site.

DR E K PAVLOVA
CLINICAL MANAGER

APPENDIX 5: Approval letter from Kopanong Hospital

DEPARTMENT OF HEALTH
KOPANONG HOSPITAL
CHIEF EXECUTIVE OFFICER
Private Bag X031
Vereeniging
1930

Enquiries : Dr. A.M. Kgomojoo
Tel :016-4287177
Fax :016-4281148

DR NEETHA JOE ERUMEDA
SENIOR FAMILY PHYSICIAN
EKURHULENI HEALTH DISTRICT
GAUTENG PROVINCIAL DEPARTMENT OF HEALTH

SUBJECT: NO OBJECTION LETTER FOR THE RESEARCH
'A self assessment study of procedural skills of medical officers in district hospitals in region B Gauteng province'.

I have acknowledged the Research protocol named 'A Self Assessment study of procedural skills of medical officers in district hospitals in Region B in Gauteng province' done by Dr Neetha Joe Erumeda as part of the requirement for the completion of her M FAM MED degree. I have no objection for doing the research in Kopanong Hospital which is chosen as one of the study site.

In proviso that Dr. Likibi's office has given an approval – kindly submit the report of this research outcome to the management of Kopanong Hospital at the end of the study.

DR. A.M. KGOMOJOO
CLINICAL MANAGER
KOPANONG HOSPITAL

03/September/2009.
DATE

APPENDIX 6: Approval for Research from Gauteng

CONDITIONS OF APPROVAL OF RESEARCH CONDUCTED BY POST GRADUATE STUDENTS IN GAUTENG DEPARTMENT OF HEALTH AND SOCIAL DEVELOPMENT (GDoH & SD)

GAUTENG DEPARTMENT OF HEALTH & SOCIAL DEVELOPMENT (GDOH & SD)

POLICY, PLANNING AND RESEARCH

Enquiries: Sue le Roux

Tel: +2711 355 3212

Fax: +2711 355 3007

Email: Sue.LeRoux@gauteng.gov.za

CONTACT DETAILS OF THE RESEARCHER	
Date	02/10/2009
Tel number	011 717 2119
Fax number	011 717 2745
Email	None
Researcher /Principal Investigator (PI)	Dr NJ Erumeda
Supervisor	Prof I Couper
Institution	University of the Witwatersrand
Research title	A self assessment study of procedural skills of medical officers at district hospitals in region B, Gauteng Province

Approval is hereby granted by the Gauteng Department of Health for the above research project to be conducted. Approval is limited to compliance with the following terms and conditions:

1. All principles and South African regulations pertaining to ethics of research are observed and adhered to by all involved in the research project. Ethics approval is only acceptable if it has been provided by a South African research ethics committee which is accredited by the National Health Research Ethics Council (NHREC) of South Africa; this is regardless of whether ethics approval has been granted elsewhere.

   Of key importance for all researchers is that they abide by of all research ethics principles and practice relating to human subjects as contained in the Declaration of Helsinki (1964, amended in 1983) and the constitution of the Republic of South Africa in its entirety. Declaration of Helsinki upholds the following principles when conducting research, respect for:
   - Human dignity;
   - Autonomy;
   - Informed consent;
   - Vulnerable persons;
   - Confidentiality;
   - Lack of harm;
   - Maximum benefit;

2

- and justice

2. The GDoH is indemnified from any form of liability arising from or as a consequence of the process or outcomes of any research approved by HOD and conducted within the GDoH domain;
3. Researchers commit to providing the GDoH with periodic progress and a final report; short term projects are expected to submit progress reports on a more frequent basis and all reports must be submitted to the Director: Policy, Planning and Research of the GDoH;
4. The Principal Investigator shall promptly inform the above mentioned office of changes of contact details or physical address of the researching individual, organisation or team;
5. The Principal Investigator shall inform the above office and make arrangements to discuss their findings with GDoH prior to dissemination;
6. The Principal Investigator shall promptly inform the above mentioned office of any adverse situation which may be a health hazard to any of the participants;
7. The Principal Investigator shall request in writing authorization by the HOD: Gauteng Department of Health for any intended changes of any form to the original and approved research proposal;
8. If for any reason the research is discontinued, the Principal Investigator must inform the above mentioned office of the reasons for such discontinuation;
9. A formal research report upon completion should be submitted to the Director: Policy, Planning and Research of the GDoH with recommendations and implications for GDoH, the Directorate will make this report available for the HOD

AGREEMENT BETWEEN THE GAUTENG DEPARTMENT OF HEALTH AND SOCIAL DEVELOPMENT (GDoH & SD) AND THE RESEARCHER



Dr NJ Erumeda

Principal Researcher

Date: 10/10/09



Sue le Roux

Director: Policy, Planning and Research (GDoH)

Date: 02/10/2009

APPENDIX 7: HREC Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Erumeda

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M070202**
PROJECT	Determination of Procedural Skills of Medical Officers in Disctrict in Hospitals in Region B Gauteng Province
INVESTIGATOR	Dr NJ Erumeda
DEPARTMENT	Dept of Family Medicine
DATE CONSIDERED	07.03.02
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 09.06.19 **CHAIRPERSON** .....
(Professor P E Cleaton Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Prof I Couper

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10005, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES