KNOWLEDGE, ATTITUDES AND CURRENT PRACTICE OF SPECIALISTS AND REGISTRARS IN OBSTETRICS AND GYNAECOLOGY REGARDING THE USE OF THE INTRAUTERINE CONTRACEPTIVE DEVICES POSTPARTUM

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DECLARATION

I declare that this research report is my own, unaided work. It is being submitted for the Degree of Master of Medicine (Obstetrics and Gynaecology) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to this or any other University. _____

_____day of _____20_____in_____

For my daughter

Madison Dale Catherine Demartinis

ABSTRACT

Introduction: Intrauterine devices (IUD's) are a reliable long acting form of contraception. The American Congress of Obstetrics and Gynaecology, The WHO, The American College of Obstetrics and Gynaecology and The South African guidelines encourage immediate postpartum insertion of the device. The use of intrauterine devices in South Africa however remains low. The aim of this study was to assess the knowledge, attitude and practice of specialists and registrars in obstetrics and gynaecology with regards to the intrauterine device postpartum.

Methods: A descriptive cross sectional study was conducted. It consisted of a self-administered questionnaire. A total of 170 specialists and registrars in South Africa were questioned as to their knowledge, attitude and practice regarding the IUD's in the postpartum period.

Results: Knowledge amongst doctors was good. Of those interviewed, 93.6% (n=147), were aware that you could insert the IUCD in the postpartum period. The IUCD was view favourably by most doctors; however the fear of expulsion was noted to be a barrier to its use. The IUCD is inserted in the postpartum period by 71.2% (n=111) of the doctors questioned.

Conclusion: Knowledge in this subgroup of doctors, regarding the IUD in the postpartum period, is good. The attitude towards the IUD postpartum is favourable. Practice however is not reflective of the good knowledge and favourable attitude demonstrated.

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ABBREVIATIONS

i.	AIDS	Acquired Immune Deficiency Syndrome
ii.	CPD	Continuing Professional Development
iii.	FCOG	Fellow of the College of Obstetrics and Gynaecology
iv.	HIV	Human immunodeficiency virus
v.	HPCSA	Health Professions Council of South Africa
vi.	IUCD	Intrauterine contraceptive device
vii.	IUD	Intrauterine device
viii.	LARC	Long acting reversible contraception
ix.	MEC	Medical Eligibility Criteria
x.	PID	Pelvic Inflammatory Disease
xi.	SASOG	South African Society of Obstetrics and Gynaecology
xii.	SDG	Sustainable development goals
xiii.	STI	Sexually transmitted infection
xiv.	WHO	World Health Organisation
xv.	WITS	University of the Witwatersrand

CHAPTER 1

1.1 General Introduction

Contraception can empower women to make a choice about when they wish to conceive. Fathalla in the British Medical Bulletin from January 1993 stated that 'The ability to regulate and control fertility is a basic component of health, positively defined as a state of physical, mental and social well-being'.[1] Contraception contributes to improved infant and child survival. When women have a short time interval between children it results in increased infant mortality rates of between 60 and 70% and increased childhood (under the age of 5) death rates of 50%.[1] It is estimated that over 500 000 women die each year as a result of conditions occurring in pregnancy and childbirth.[1] Contraception can thus assist with the new Sustainable Development Goals (SDGs), namely:

- No Poverty (SDG 1)
  Contraception helps with this sustainable development goal by allowing women to dictate when they choose to have children. Women that access contraception can then choose the size of family they wish to have. This will reduce the financial impact that unwanted pregnancies have on family finances.
- Good Health and Well-being (SDG 3)
- Gender Equality (SDG 5)
  Contraception helps promote gender equality by preventing or postponing pregnancy. This allows women to be more economically active.

This problem was addressed more directly in the Millennium Development Goals (MDGs) which were in place prior to 2015. Namely the following:

- To promote gender equality and empower women (MDG 3)
- To reduce child mortality (MDG 4)
- To improve maternal health (MDG 5)

African countries have the lowest prevalence of contraceptive use.[1] Women often either do not have access to contraception or are not free to access contraception. Some of the

problems with regards to contraceptive use identified in South Africa include the lack of information regarding contraception, ignoring the information provided and the use of alternative medicine with contraception.[2]

Antenatal care visits and the postpartum period create excellent opportunities to counsel, educate and provide women with contraception. LARCs (long acting reversible contraceptives) provide women with long term contraception. The Nova T IUD (intrauterine device) is said to have a pearl index of 1.2 and the levonorgestrel intrauterine system to have a pearl index of 0.09.[3, 4] The Pearl Index is a commonly used measure of contraceptive effectiveness. It measures the percentage of sexually active women who become pregnant while using a method for 1 year.[5] If effective contraception in the form of the IUD is provided at the time of delivery it could significantly improve family spacing. A cohort study done in Texas demonstrated that most unwanted pregnancies occurring within 2 years postpartum could have been avoided by providing a LARC or permanent method of contraception.[6] Another study in the United States revealed that 65% of women desiring a LARC as a method of contraception postpartum did not receive it and that some of the barriers to receiving a LARC included the lack of immediate access to the LARC as well as the requirement for a follow up visit.[7]

Health care workers are therefore pivotal in discussing contraception antenatally and providing contraception post-delivery. One of the factors that affect women's uptake of contraception is the education they receive from health care workers. Doctors' knowledge and attitudes towards contraception, in particular IUCD's (Intrauterine Contraceptive Device), may affect their practice. This study therefore aimed to assess the knowledge, attitudes and current practice of specialists and registrars in obstetrics and gynaecology regarding the use of the IUCD immediately postpartum.

1.2 Literature Search

In this section I will address the importance of contraception and barriers to its use. I will address the types and use of the IUCD generally, the use of the IUCD postpartum, the complications thereof and the knowledge and attitude of doctors regarding the IUCD.

1.2.1 Importance of contraception

South Africa has a high prevalence of unplanned and unwanted pregnancies. Between a third and a half of all pregnancies are unwanted in South Africa.[8] Low socioeconomic status is associated with an increased risk of unplanned and unwanted pregnancies.[9] Unwanted pregnancies are thought to be associated with an impaired ability to continue education, poverty and problem behaviour.[10] Unwanted pregnancies and early pregnancy denial is associated with very low birth weight babies with odds ratios of 1.53 and 1.54 respectively.[11]

Unplanned pregnancy is especially associated with South Africa's teen population. A study in four of South Africa's nine provinces revealed that 19.2% of young women (age 18-24) had had an adolescent pregnancy (between the ages 10-19) and 5.8% of the male youth (age 18-24) had impregnated a girl when they themselves were an adolescent.[12] That same study revealed that 16.2% of those women had ever had an unwanted pregnancy.[12]

Contraception helps save women's lives from the dangers associated with unwanted pregnancy. Following the Choice on Termination of Pregnancy Act, which was passed in 1996 and amended in 2004, the rates of legal termination have increased, however the number of illegal abortions remains the same.[13] It is estimated that between 125 000 and 170 000 women worldwide die per year as a result of unsafe abortions.[1]

Contraception is one of the five 'Cs' recommended by the saving mothers report as an implementation strategy to reduce maternal deaths. Contraception helps target the three 'H's' the saving mothers report has identified as targeted activities to reduce maternal deaths. The three 'H's include reducing maternal deaths as a result of HIV and TB, haemorrhage and hypertension. The saving mothers report goes on further to recommend that all healthcare

workers should encourage contraceptive use to prevent unwanted pregnancy. Various modalities of contraception should always be available and it is 'the responsibility of managers to ensure availability'.[14]

The postpartum period provides an excellent opportunity to counsel women regarding contraception and to provide this service to women who desire it. Following delivery and prior to the 6 week postpartum visit between 40 and 57% of women report having unprotected intercourse. Ovulation occurs around day 39 after delivery in those women who are not breastfeeding.[15] First ovulation post-delivery is more difficult to predict in breastfeeding women as persistent hyperprolactinemia caused by breastfeeding results in anovulation or reduced ovulation and thus relative infertility.[16] This provides an opportunity for an unintended pregnancy to occur. In the first year post-delivery approximately 70% of pregnancies are unintended.[15] These pregnancies occurring within the first year following delivery are an independent risk factor for preterm delivery and poor neonatal outcomes. Those women at highest risk of short interval (less than a year) pregnancies are also those with poor postpartum follow up rates.[15] These women could benefit from immediate postpartum contraception.

A study shows that childbirth influences a woman's priorities with regards to contraception choice. Many women (40% of the study population) is this particular study wished to changed their contraception methods post-delivery.[17] Women should be partners in decision making when it comes to postpartum contraception.

1.2.2 Barriers to contraceptive use

Barriers to contraceptive use need to be looked at and addressed.

Worldwide the contraceptive uptake in women, between the ages of 15 and 49 and are married or in-union, is 63.6% for all methods. The IUCD is used by 13.7% of these women.

South Africa has a similar contraception uptake of 64.8%; however IUCD prevalence is only 1.1% with injectable contraception being favoured at 30.3%.[18]

A study in the United States looked at adolescents between the ages of 14 and 19 years old. The women in the study were sexually active and presented to the emergency department for reproductive health complaints. They were all at risk for pregnancy as defined by the World Health Organisation (WHO) as they were not using an effective form of contraception. The most common barrier to contraception was health effects; mainly physical side effects for example the fear of gaining weight and changes in menstrual cycle. There was mistrust when it came to contraception including the efficiency of contraception. There was also a large amount of ambivalence regarding pregnancy intentions and plans for the future.[19]

This study also looked at other factors that influenced contraceptive use. Access to contraception particularly if it was a school or college based clinic was noted to be an enabling factor to contraceptive used. The doctor-patient relationship also seemed to play a role and could have either a positive or negative effect. Patients liked doctors that took their time and when confidentiality could be assured. Friend, family and partners also had an impact. Female extended family members, for example aunts and cousins, were enablers to contraceptive use. Partners' desire for pregnancy also influenced patients' choices. The media and the patients' own personal experience also had a role to play when it came to choice regarding contraception.[19]

A study looked at the lack of use of contraception in developing countries. The factors identified as being of importance to women not using contraception include reporting infrequent or no sexual intercourse, concern over side effects or health risks related to the contraceptive method or direct opposition to using contraception. Lack of knowledge and lack of access appear to play a much smaller role.[20]

A number of factors are said to influence women's contraceptive use. These include their partner's opinion, the source and availability of contraceptives as well as the side effects of contraceptives.[21]

A further study looked at the causes of unmet contraception need. Sub-Saharan Africa is noted to have the highest unmet need for contraception worldwide. This study found that, for many, access to contraceptive services remains a problem. The main reasons, in this study, for nonuse are lack of knowledge (25%), fear of side effects (20%) and concern regarding familial disapproval (9%).[22]

When looking specifically at intrauterine contraceptive devices the following barriers were identified.

- The fear of weight gain
- Concern regarding mood swings
- Fear of future infertility
- Perceived side effects[23]

1.2.3 Types of IUCD and their prevalence of use

Contraception is used by only 62.7% of women worldwide. This varies between developed areas where the uptake is 72.4% and developing areas where the uptake is 61.2%.[24]

The use of the IUCD worldwide is documented as 14.3% of women of reproductive age (between the ages of 15 and 49 years). The range between countries varies however between less than 2% and greater than 40%.[24] This discrepancy is largely due to a difference in the acceptably of the IUCD as a contraceptive method. There is also a difference between the frequency of IUCD use between developing and developed areas. The use of the IUCD in developing areas is higher (15.1%) than that of developed areas (9.2%).[24] This is as a result of the IUCD being favoured in Central and Eastern Asia which forms part of the developing world.[24]

The most commonly used IUCDs in South Africa include the Copper-T™, Multiload™, Nova T™ and the Mirena™.[25] When looking at the total number of IUCD users 83% reside within Asia and only 4% in Africa. The rate of IUCD use of women in Africa is 4.4%. This makes up 15.4% of contraceptive users in Africa. There is however a large discrepancy between Northern Africa where the rate is 18.1% of women and the rest of Africa where the rate is <2% of women.[24]

A long term (12 years) prospective study looked at the performance of the Copper T. The study looked at 446 women who were fitted with their first Nova T device in New Zealand. Multiparous women tolerated the device better than nulliparous women with 70% of insertions being uncomplicated. The biggest factor contributing to removal of the device was noted to be abnormal uterine bleeding. The removal rate was higher in nulliparous (40%) as opposed to multiparous (19%) women for this reason. The expulsion rate was noted to be 4.9% for both groups. The accidental pregnancy rate was 3.5% with a Pearl Index of 1.2. This rate was lower, in other words more effective, in older women. Possible pelvic inflammatory disease (PID) was recorded in 2.8% of women. In the 53 women desiring pregnancy, after removal of the device, there was no evidence of subfertility. The study thus recommended that the ideal population group was multiparous females older than 40 as these are the women that tolerated the device the best.[4] This article shows that the Copper T is an effective form of contraception and helps to guide us on the ideal population group for this particular form of contraception.

The above being said, the adolescent population could really benefit from a form of long acting but reversible contraception. A study done in a tertiary level hospital in Canada reported on the experience of the use of the IUCD in the adolescent population. It was a small study that looked at 20 patients under the age of 21. The average number of pregnancies per patient prior to insertion was 1.4. Approximately a third, i.e. 35%, discontinued use and the most common reason for removal was heavy bleeding. The most common side effect was cramping. Overall, 85% of this population group were satisfied with this form of contraception.[26] One of the downfalls to this study is its small sample size. This study is

however useful in averting fears about using this type of contraception in the adolescent population group. An IUCD inserted at the time of delivery could help prevent a subsequent teenage pregnancy.

A recent systematic review published in 2017 included 14 studies comparing the use of IUCDs in younger (25 years or younger) as opposed to older women. It was reported by six studies, that there was an increase rate of expulsion with younger patients when using the copper IUCD. There were four retrospective cohort studies that looked at perforation rates. The rate of perforation in these four studies was noted to be low. The rates ranged between 0% - 0.1%. There was no difference in the rates of perforation between the two groups. Pregnancy was rare in 9 of the studies. PID was also noted to be rare. One study reported no cases of PID.[27]

It is important to compare this type of contraception to one of the most commonly used forms of contraception in South Africa, Medroxyprogesterone acetate.[28] A Cochrane systematic review, conducted in 2010, made such a comparison. This review compared two randomised control trials and involved 967 women. Both studies were done in developing countries. Primary outcomes included pregnancy prevention and continuation rates of each method. Secondary outcomes included HIV (Human Immunodeficiency Virus) disease progression and pelvic inflammatory disease rates. The IUCD was noted to be more effective in preventing pregnancy with a risk ratio of 0.47 (95% confidence interval 0.26 to 0.85). The risk ratio when comparing discontinuation rates between the IUCD group and depot progesterone group was 0.17 (95% confidence interval 0.07 to 0.39) for the one study and 4.20 (95% confidence interval 3.06 to 5.78) for the other study. Therefore, no conclusion was made regarding comparative continuation rates as the studies each had a different conclusion. HIV disease progression was better in the IUCD group. HIV disease progression was assessed by measuring adverse events including death. The incidence of pelvic disease was noted to be low and was not significantly different between the IUCD and progesterone.[29] The IUCD is thus a very suitable alternative to Medroxyprogesterone acetate.

1.2.4 Motivation for use of the IUCD as a contraceptive device postpartum

The first group of patients to consider are those following early pregnancy losses. A review in the British Journal of Obstetrics and Gynaecology on the safety and efficacy of IUCD insertion immediately after induced or spontaneous abortion looked at the evidence. Complication rates were shown to be low with a perforation rate of approximately 0.1%. The expulsion rates at one year ranged from 1.8% to 12.6%. The unwanted pregnancy rates ranged from 0.6% to 2.1%. There was a wide range in continuation rates, ranging from 54% to 90%. Discontinuation due to pelvic inflammatory disease was rare with the rate ranging from 0.0 to 0.8 per 100 women at one year. Increasing gestational age at insertion was associated with increased expulsion rates. The risks of expulsion were thought to be outweighed by the benefits of immediate contraception.[30]

There is often a misconception that an IUCD cannot be inserted at the time of a surgical delivery. Once again, at the time of caesarean section, it provides an opportunity to give immediate contraception. A study which was conducted in India in 2014 considered 300 primiparous women who had Copper T 380A^{TM} inserted at the time of caesarean section. Four outcomes were assessed including expulsion (5.33%), removal (7%), failure (0.67%) and continuation (91%). The most common post insertion complication observed in the immediate post-operative period was febrile morbidity (2%). The majority of women (94.33%) had a hospital stay of less than four days. The study concluded that IUCDs (Copper T 380A) inserted at caesarean section are a safe and effective form of contraception with a low expulsion and a high continuation rate.[31]

A Cochrane review published in 2016 compared immediate (as defined in this review as insertion within 10 minutes) postpartum insertion of the IUCD with later placement. This review compared immediate insertion with insertion done early and with standard placement. In this review early insertion is defined as insertion done between 10 minutes and 48 hours after delivery. Standard placement is defined as insertion done at the time of the post-partum visit. When immediate insertion is compared with early placement this review showed no difference in the expulsion rate or usage of the IUCD at 6 months between the two groups. When immediate insertion is compared with standard placement there was an increased rate

of expulsion but also an increased rate of usage at 6 months post-delivery in those patients who had immediate insertion.[32]

A 2017 systematic review highlights the main advantage of postpartum IUCD insertion namely that a woman will be protected from pregnancy even if she is lost to follow-up, provided the IUD remains in place. They have identified 3 problems that need to be addressed to expand access to this procedure.

- Expulsion.
- Need to ensure that strings are visible.
- Reduce puerperal bleeding.[33]

The impact of the IUCD on breastfeeding needs to be addressed. The fall in progesterone levels post-delivery is thought to trigger lactogenesis. There is a theoretical concern that immediate use of exogenous progesterone may interfere with breastfeeding. Thus the levonorgestrel IUCD has been rated as a Medical Eligibility Criteria (MEC) category 2 by the WHO with the advantages outweighing the risk. The copper T contains no progesterone and is therefore an MEC category 1.[15]

1.2.5 Current guidelines regarding insertion of the IUCD postpartum

The American Congress of Obstetrics and Gynaecology recommends immediate postpartum insertion as these women are often highly motivated to use contraception, they are known not to be pregnant and the hospital setting is convenient.[34]

The World Health Organisation (WHO) also recommends postpartum insertion of the intrauterine device. This should occur within 10 minutes of delivery of the placenta. There is noted to be an increased expulsion rate when compared to interval insertion. Interval insertion is standard insertion between 4 and 12 weeks post-delivery. Immediate postpartum insertion, according to the WHO, can be implemented in most developing countries.[35]

In August of 2016 the American College of Obstetrics and Gynaecology released new guidelines regarding the immediate postpartum use of long acting reversible contraceptives including the IUCD. They agreed on the following recommendations:

- Women should be counselled antenatally regarding the immediate postpartum use of LARCs. Advantages and risks of IUCDs should be explained. Alternatives should also be discussed.
- A LARC (IUCD or implant) should be offered in the immediate postpartum period as it is effective and there are few contraindications to their use.
- Obstetrician – gynaecologists should counsel women about the ease, convenience and efficacy of postpartum LARCs. Women should also be counselled about pregnancy spacing.
- Counselling regarding the risks should also take place. Women should be counselled about the increased risk of expulsion with immediate postpartum insertion of the IUCD when compared with interval IUCD insertion. The expulsion may not be recognised.
- There should be opportunity in subsequent postpartum visits for those women that desire a LARC but did not receive it immediately postpartum to receive it.
- Infrastructure should be in place to aid in immediate postpartum insertion of LARCs.
- Health care providers should advocate for appropriate reimbursement for immediate postpartum LARC from public and private insurers.[15]

The South African guidelines state that the copper IUD may be inserted immediately postpartum or within the first 48 hours following delivery by trained providers, if not, insertion should be delayed until at least four weeks postpartum.[36]

Patients who are HIV infected and well can safely use IUCDs. Those patients who become unwell whilst using the IUCD may continue this form of contraception. Those patients who are unwell with AIDS (Acquired immune deficiency syndrome) should not have an IUCD

inserted. The IUCD can generally be used in teenagers as well as those patients with candida.[36]

1.2.6 Barriers identified to using the IUCD

A study in Canada identified some barriers as to why a patient would not choose the IUCD as a form of contraception.

- Lack of awareness of IUCDs
- Concerns about safety
- Concerns about efficacy
- Lack of knowledge about the mechanisms of action
- Misconception regarding the pain and difficulty of IUCD insertion
- Lack of understanding of bleeding changes[37]

Another study attempted to identify barriers to the use of the IUCD in nulliparous women. This was done by means of a survey of European and Canadian providers. The barriers identified include the following:

- Nulliparity
- Pelvic inflammatory disease
- Insertion difficulty
- Insertion pain
- Infertility[38]

The barriers to the use of the IUD in the local patient population need to be addressed. A study done in Cape Town found that women viewed the IUD favourably. Nearly two thirds of the women in this study reported that they would consider using this form of contraception in the future. This may however be an overestimate. The study was conducted by means of interviews and the women that were interviewed may have responded favourably in order to please the interviewers. This was mentioned in the limitations of the study. This study indicated that amenorrhea associated with using the levonorgestrel-releasing intrauterine

system (LNG-IUS) was a barrier to its use. More than 50% of the women in that study stated that amenorrhea was unacceptable to them even though some of them were using injectable contraceptives and experiencing amenorrhoea from the injectables.[39] Increased pain and bleeding associated with the IUD was also noted to be a barrier to its use.[39]

Providers advising against the IUCD as a form of postpartum contraception have been shown to be a barrier to its use. In one particular study only 60% of women desiring the IUCD postpartum actually received it.[40]

Health care providers were asked as to what they thought were barriers to patients using the IUD as a form of contraception. The following barriers were mentioned:

- A lack of skilled providers
- A lack of patient knowledge
- Myths and rumours among patients (This however was found not to be the case, only 3% (n=7) of patients mentioned this as a barrier)
- The fact that the IUD is not being promoted by providers.[39]

This study also looked at barriers to a health care provider recommending the IUD as a form on contraception. The main barrier identified in the study was the lack of acceptability of the IUD to providers themselves. Only a few providers indicated that their own lack of knowledge regarding the IUD and their attitudes were providing a barrier to use of the IUD.[39]

It is important to look at the factors that will make a woman stop using the IUCD. A retrospective descriptive study done in Benin looked at the factors that could influence the continuation of the IUCD as a form of contraception. The most common reason for discontinuation was a desire for further pregnancy (93%). Other reasons for women discontinuing the use of the IUCD include heavy bleeding (3.8%) as well as pelvic inflammatory disease (1.7%). The continuation rate at the end of one year was 75.1% and at

the end of two years was 61.7%. The side effects and complications were noted to be minimal.[41]

A recent retrospective analytical study of 593 women in India looked at the complications of immediate post-delivery insertion of the IUCD. In this study there were no reports of perforation or pregnancy. The expulsion rate is listed as 5.3% with the rate being significantly higher following a normal delivery as opposed at a caesarean section ($p = 0.042$). The rate of undescended strings was 38% overall but it was significantly higher following caesarean delivery as opposed to vaginal delivery. The rate of undescended strings following caesarean section was 55.1% compared to 22.1% following normal vaginal delivery. This results in a p value of 0.000.[42]

A larger study of 61 448 women looked at the rate of uterine perforation following delivery. This study compared perforation rates for both lactating and non-lactating women. The timing of insertion following delivery was noted to be associated perforation risk. The incidence of uterine perforations in lactating women was 4.5 per 1000 insertions. It found that delivery and lactation are independent risk factors for perforation.[43]

The uptake of the IUCD amongst women in the postpartum period is low. A study done in India indicated that only 94 out of 500 participants were willing to have a contraceptive device inserted. Furthermore, they were unwilling to have the device inserted immediately following delivery due to fear of side effects. This study concluded that knowledge and acceptance was also low. This was thought to be due to the fact that it is a new concept within communities.[44]

The contraceptive CHOICE project is a prospective cohort study that looked at 10 000 women desiring contraception. Financial barriers were removed as the choice of contraception was provided at no cost. Patients were provided with information regarding LARCs. The contraceptive CHOICE study demonstrated that when financial and knowledge

barrier were removed two thirds (67%) of women chose LARCs. The IUD was selected by 56% of women and the subdermal implant was selected by 11% of women.[45]

Contraindications to immediate postpartum insertion of the IUCD include intrauterine infection at time of delivery, postpartum haemorrhage and puerperal sepsis.[15]

1.2.7 Knowledge of health care professionals

Doctors in South Africa have been shown to have a limited knowledge with regards the use of the IUCD and that that knowledge is not in keeping with current guidelines.[39]

In a study looking at provider (nurses and doctors) knowledge in more detail in southern Africa, knowledge of evidence-based patient selection criteria for IUD use was low and not in keeping with the WHO Medical Eligibility Criteria for Contraception guidelines. This particular study asked about different patients that were all eligible for IUD use. Less than 50% of providers said they would consider the IUD for nulliparous women or women that were unmarried. This study indicated that less than 25% of clinicians thought that it could be placed immediately post-partum or post-abortion. Fewer than 10% of providers thought that the IUD was appropriate for women with prior ectopic pregnancy and less than 5% thought it could be used with a prior history of PID. [46]

Similarly, in Nepal, providers' knowledge was noted to be low. Knowledge was assessed by means of a questionnaire. Providers scored an average of 61.4% when responding to these questions. Knowledge of the MEC criteria for IUCD insertion was poor. Providers failed to identify postpartum women as suitable candidates for IUCD insertion.[47]

Knowledge, attitude and practice regarding provision of the postpartum intrauterine contraceptive device is important and may affect use. A study in Ghana looked at all maternity care providers including specialists, residents, house officers and midwives. It

showed that 77% of providers had received training in IUCD insertion, but only 1 in 3 had ever done so. It revealed that very few were confident in their ability to insert an IUCD. It was noted that 'provider bias regarding the appropriateness of IUD use among subpopulations of women continues to be a major barrier to IUD uptake'.[48]

Another study in the United States looked at doctor's knowledge, attitude and practice towards the IUCD as a form of contraception in various subpopulation groups of women. Only 78% of doctors considered nulliparous women and only 45% of doctors considered adolescents appropriate candidates for insertion on the IUCD. Of these doctors, 67.3% thought that an IUCD can be inserted immediately after an abortion or miscarriage. This dropped to 43.5% that thought that an IUCD can be inserted immediately postpartum. Only 11.4% actually inserted IUCDs following an abortion or miscarriage and only 7.2% provided this service postpartum.[49]

The knowledge of the IUCD in other situations such as in emergency contraception is also poor. A study looked at a diverse group of health care providers in term of knowledge and provision of the copper IUD as a form of emergency contraception. The copper IUD has been found to be nearly 100% effective when it is used as a form of emergency contraception. Only 49% of this study population were aware that the copper IUD could be used as a form of emergency contraception. When it came to use of the copper IUD as a form of contraception, only 14% of the study population recommended or provided this device.[50]

1.2.8 Attitudes of health care professionals

There has not been much research assessing doctors' and other health care workers' attitudes towards contraception. This is particularly true of their attitude towards the IUCD. Certain barriers have however been identified that prevent healthcare workers from using this form of contraception.

- Concern about difficult insertion
- Concern about PID
- Concern about infertility

- Concern about insertion pain
- Sexual promiscuity
- Financial cost
- Concern about ectopic pregnancy
- Concern about women's preference
- Concern about women's age
- Concern about expulsion
- Disruption of menstruation
- Concern about legal risks
- Ethical/ Religious concerns
- Lack of training
- Concern about efficacy[37]

Paediatricians are often the doctors counselling adolescents about contraception. Few paediatricians have been shown to have favourable attitudes and beliefs towards the IUCD. Most do not routinely include the IUCD when counselling their patients. This was found to be due to poor and/or out-dated knowledge.[51]

Primary care physicians' attitudes are also thought to impact adolescents' access to IUCDs. They have been shown to be overly restrictive and prioritise STI prevention as opposed to pregnancy prevention therefore not offering an IUCD to their patients.[52]

A study done in Southern Africa looked at clinicians' beliefs towards the IUCD as a form of contraception. This study included doctors and nurses in Zimbabwe and South Africa. Most of these clinicians (82%) felt that the IUCD was underutilised by patients. Approximately half of these clinicians desired more training with respects to the IUCD.[46]

When looking at attitudes, one study indicates that providers' perceptions towards the IUCD create a barrier to its use. These perceptions are based on psychological, moral and religious

prejudices. These should not be allowed to interfere with the provision of the IUCD as a form of contraception.[53]

1.2.9 Practice of health care professionals

Cape Town healthcare providers were assessed as to their practice regarding the IUCD. 90% of these healthcare providers had less than 10 patients for IUCDs in the previous year.[39] The study population however was very small with only 30 participants.

A larger group of 1444 participants, consisting of nurses and doctors, were questioned regarding their use of the IUD. This study showed that the provision of the IUD was limited. Only 14% of clinicians provided copper intrauterine devices and only 4% of clinicians provided levonorgestrel-releasing IUDs. The clinicians' practices in terms of patient eligibility for the IUD were noted to be overly restrictive. Clinicians in this study were asked about provision of the IUD medically eligible candidates. Less than 50% of providers considered the IUD for nulliparous women or for unmarried women. In this study less than 25% thought that it could be placed immediately post-partum or post-abortion. Very few, less than 10%, of those questioned agreed that the IUD was appropriate for women with a history of ectopic pregnancy and less than 5% considered women with a history of PID. The clinician were noted to be particularly restrictive when it related to HIV risks.[46]

1.4Aims and Objectives

Main objective of this study: To determine the knowledge, attitude and practice of specialists and registrars in Obstetrics and Gynaecology toward the use of the IUCD in 2016.

- To describe knowledge of the use of the IUCD within the postpartum period.
- To describe the attitudes toward the use of the IUCD in the postpartum period.
- To describe the practice of the use of the IUCD in the postpartum period.
- To describe the reasons for current practices.

CHAPTER 2

2.1 Methods

2.1.1 Setting

Currently there are 1275 obstetrician gynaecologists registered with the Health Profession Council of South Africa (HPCSA) [54]. Not all of these doctors are currently in practice. It is difficult to determine how many of these specialists are actively practicing and in what capacity. Contraception is provided by general practitioners, midwives, pharmacists, primary health care nurses and other doctors. Most women in South Africa are delivered by midwives or obstetricians. These health workers are therefore well placed for providing postpartum contraception.

Women are assessed for suitability for use of the IUCD based on the WHO medical eligibility criteria. According to the National Contraception Clinical Guidelines most women can use the IUCD safely. A complete history is taken prior to insertion. A general examination, including thorough abdominal and pelvic examinations, is performed. The pelvic examination must include a speculum examination. A pap smear, is not essential prior to insertion, but can be done if necessary and equipment permits. Special tests should be done if indicated. [36]

2.1.2 Study Population

The study population consisted of specialists registered with the South African Society of Obstetrics and Gynaecology (SASOG) as well as specialists and registrars working in the Department of Obstetrics and Gynaecology within the University of the Witwatersrand (WITS). SASOG is a uniting body for obstetrician and gynaecologists. It was assumed that those questioned had had training in IUCD insertion. All registrars are required to undergo training in the provision of contraception. They are required to provide various forms of contraception and their proficiency is evaluated. Registrars' logbooks are signed by a consultant stating that the registrar is proficient.

The Department of Health is prioritising the training and availability of the Copper IUD at all clinical levels of care. The Mirena^{TM} is not readily available in government practice.[36]

2.1.3 Study design

This was a descriptive cross sectional study. It consisted of a self-administered questionnaire of 27 questions (Appendix A). The questionnaire contained a number of closed ended as well as open ended questions. The first 8 questions helped describe the study population. The remaining 19 questions assessed the knowledge, attitude and practice regarding the IUCD in the postpartum period. This questionnaire was sent to specialists in South Africa as well as registrars within the University of Witwatersrand circuit in obstetrics and gynaecology. Reminders were sent twice. The reminders were sent approximately two weeks and four weeks following the initial mail.

The doctors were given two documents; the first was an information sheet which outlined the purpose of the study as well as explained that by answering the questions they agreed to be involved in the study. The second document was a questionnaire consisting of two parts. Demographics details were addressed in the first part and the remainder of the questions in the second part.

2.1.4 Data Collection

A pilot study was done with two of the medical officers within the Department of Obstetrics and Gynaecology at the Chris Hani Baragwanath Academic Hospital.

The questionnaire was originally in word format. SASOG was contacted for their assistance. The questionnaire was loaded onto SurveyMonkey® S. Africa and then distributed to all Obstetrician Gynaecologists on their mailing list. The responses then went back to them anonymously and the raw data was then analysed.

Registrars on the Wits circuit were handed paper based questionnaires. They were distributed at the three teaching hospitals at academic meetings. These hospitals consisted of the Charlotte Maxeke Johannesburg Academic Hospital, Chris Hani Baragwanath Academic Hospital and Rahima Moosa Mother and Child Hospital. The questions were answered and the completed forms were then deposited anonymously in a collection box

2.1.5 Data Analysis

Data was analysed by the communications and events manager at SASOG using Microsoft Excel. Descriptive statistics were employed. Categorical variables described using frequencies and percentages. Continuous variables were described using means with calculation of the standard deviation and medians with calculation of the interquartile range. The open ended questions were analysed using a thematic analysis.

The results were displayed using graphs and tables.

2.1.6 Sample Size

At the time of questioning SASOG had 661 members (approximately 75% coming from private practice). This number represents almost 85% of all practising Obstetrics and Gynaecology specialists.

The number of people who received the questionnaire is uncertain, but it is estimated at approximately 727. This number consists of the 661 SASOG members as well at 66 registrars. It may be that the SASOG data base has old email addresses for some doctors and not all registrars may have been in attendance at the academic meetings.

This is a descriptive study and as such a sample size calculation was not done.

There were a total of 57 registrars and 9 supernumerary registrars on the University of Witwatersrand circuit at the time of the study. A supernumerary registrar is a registrar from another country. These registrars are either self- funded or funded by their respective countries. They are exposed to the same programme as that followed by the local registered trainees. They must sign a contract and acknowledge that the education and training is not valid for specialist registration in South Africa and that they will be returning to their country of origin.

Medical officers were excluded from the study.

2.2 Ethics

Permission was received from the Human Research Ethics Committee (Medical).

Clearance certificate number M160519 (Appendix B).

Permission was received from Prof Parbhoo, Dean of Students in order to include registrars in this study (Appendix C).

CHAPTER 3

3.1 Results

3.1.1 Demographics

A total of 170 people answered the questionnaire. The response for each question individually however was not a 100% of the total. The sample size was approximately 727 people. This gives a response rate of 23.4%. The respondents were 48.2% (n = 81) female and 51.8% (n = 87) were male. The demographics including age, race and nature of employment are reflected in Table 1 below.

Table 1 Demographic Characteristics

Demographic Characteristics		
Characteristic	*n*	%
Gender (n=168)		
Male	87	51.80%
Female	81	48.20%
Age (n=168)		
< 30	12	7.10%
31 - 45	73	43.50%
46 - 60	57	33.90%
61 +	26	15.50%
Racial Group (n=168)		
White	93	55.30%
African	41	24.40%
Indian	19	11.30%
Coloured	11	6.60%
Other	4	2.40%
Public/Private Practice (n=167)		
Private	87	52.10%
Public	63	37.70%
Both	17	10.20%

Numbers may not add up to total as not all participants answered all questions. The total number of respondents for each question is reflected in the sub section.

Most of those that answered the questionnaire were specialists. At the time of the study 80.7% (n = 134) were specialists and 19.3% (n = 32) were registrars. This is demonstrated in Figure 1.

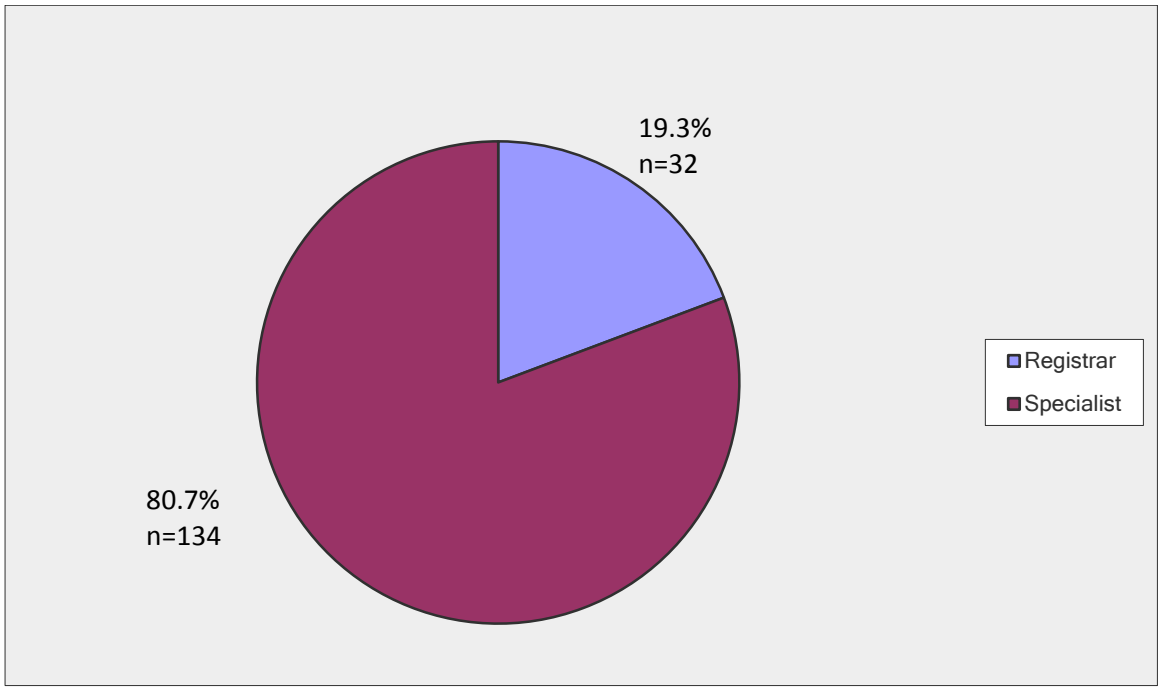

Figure 1 A description of whether the doctor is currently a registrar or specialist

When the level of qualification was further analysed the response differed slightly. The response number dropped from 166 to 160. See Figure 2 below

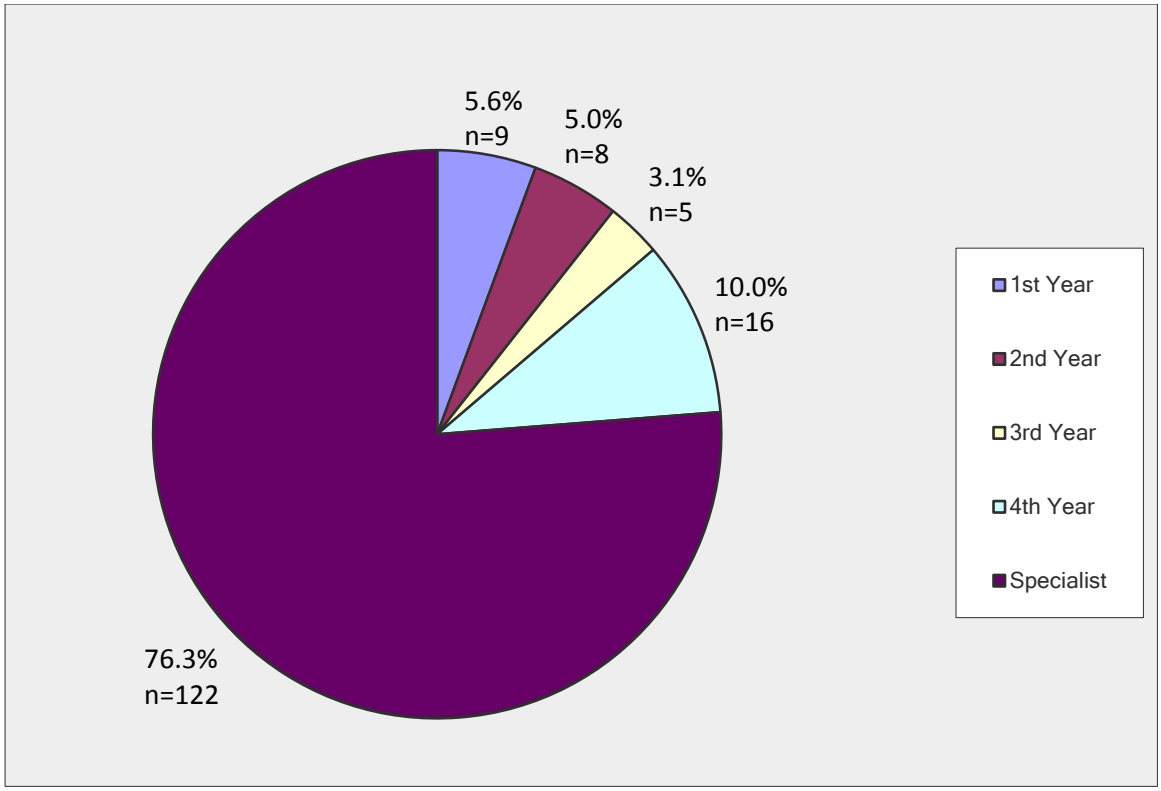

Figure 2 Current year of registrar time or time practising as a specialist

The specialists were then asked how long they had been qualified. The mean number of years was 16.3(SD±10.9). The median length of time as a specialist was 14 years (IQR 7-25). The range was between 1 and 47 years.

The majority of participants received their undergraduate training at the University of the Witwatersrand. There were 6.1% (n= 10) foreign graduates. These graduates were from the following countries; Zimbabwe, Kenya, Cameroon, Nigeria, Ghana, Germany, Canada, Poland, West Indies and Scotland. The institution in which undergraduate training occurred is shown in Figure 3 below. The 'Other' Universities are foreign Universities.

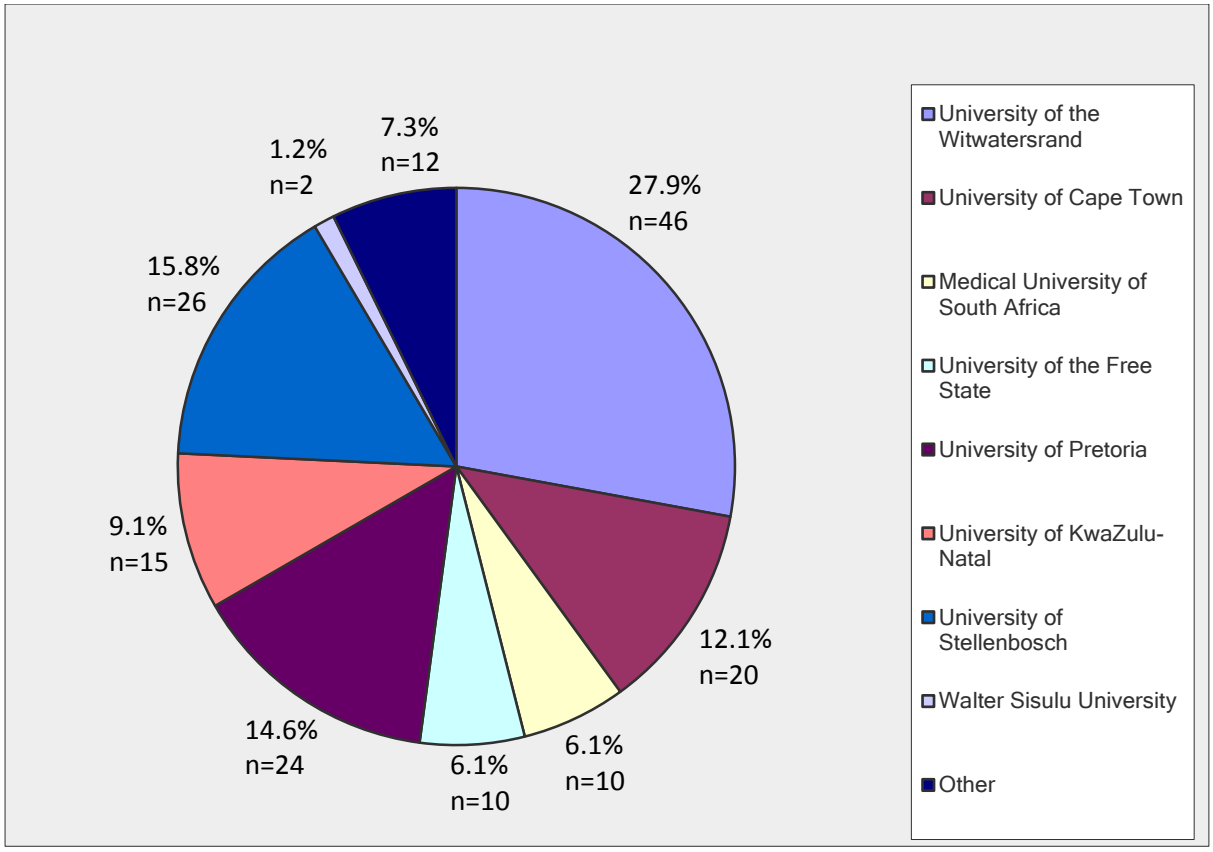

Figure 3 University attended for undergraduate training

Postgraduate training occurred at the University of the Witwatersrand in 38.1% (n=64), at the University of Stellenbosch in 14.9% (n=25), at the University of Cape Town in 13.7 % (n =23) and at the University of Pretoria in 12.5% (n=21). The institution in which postgraduate training occurred is shown in Figure 4 below.

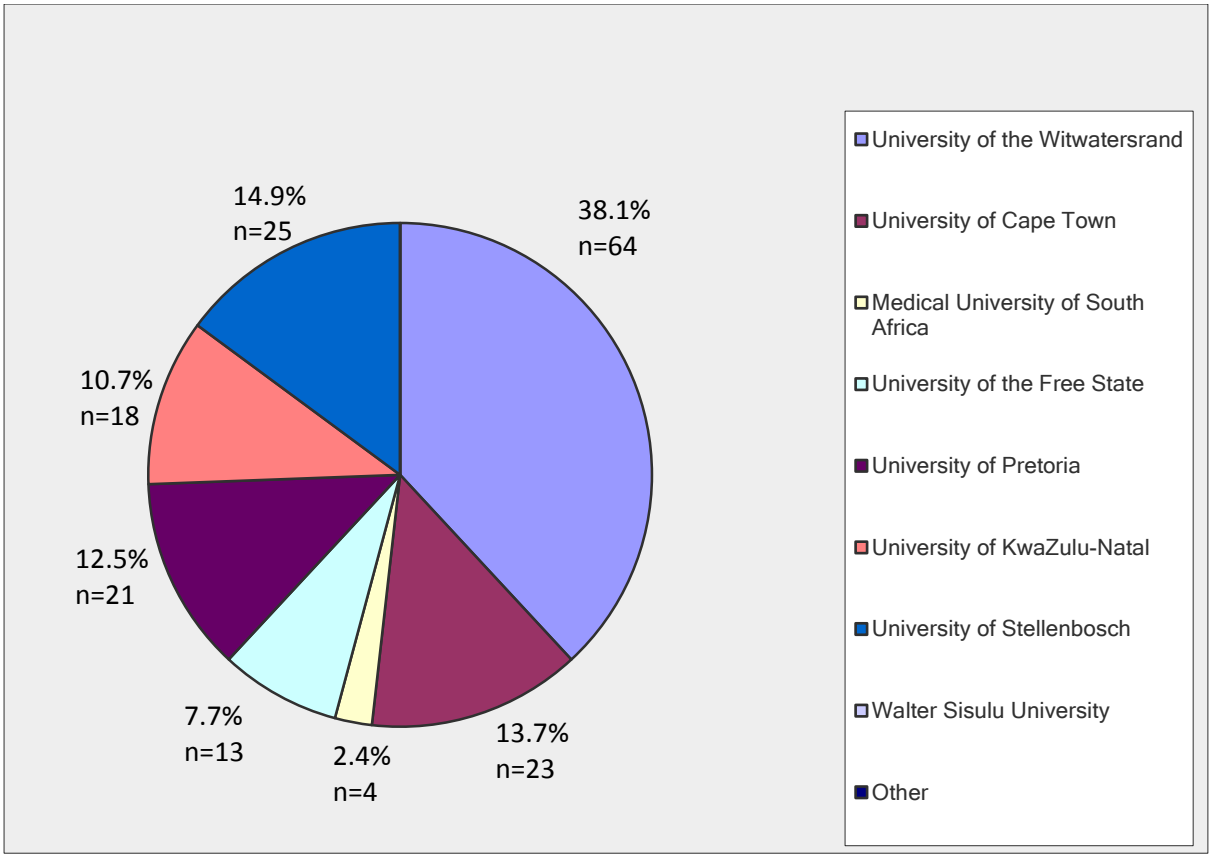

Figure 4 University attended for postgraduate training

3.1.2 Knowledge

The respondents were asked whether they knew that an IUCD could be inserted immediately postpartum. There were 157 responses. Most, 93.6%, of these doctors (n = 147) were aware that you could insert the IUCD in the postpartum period and 96.8% (n=152) were aware that the IUCD could be inserted at 6 weeks post-delivery.

Doctors were asked what they believed the expulsion rate was when the IUCD was inserted immediately postpartum. There were 156 responses. They were given four options of which to choose from. This is represented graphically in Figure 5 below. The expulsion rate does vary between studies but is generally around 5%. This is the figure used when patients are counselled regarding this contraceptive device.

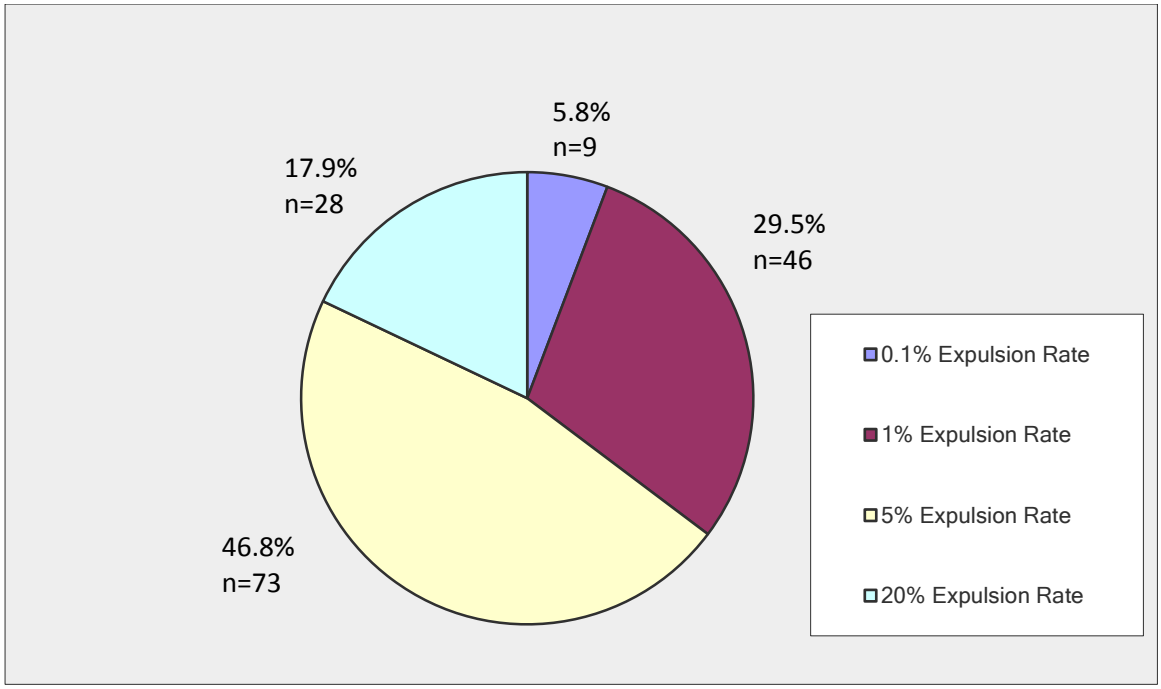

Figure 5 Doctors' knowledge of the expulsion rate of an IUCD placed postpartum

When asked what factors were thought to influence the expulsion rate the response was as demonstrated below in Figure 6. The percentages don't add to 100% as respondents could choose more than one option.

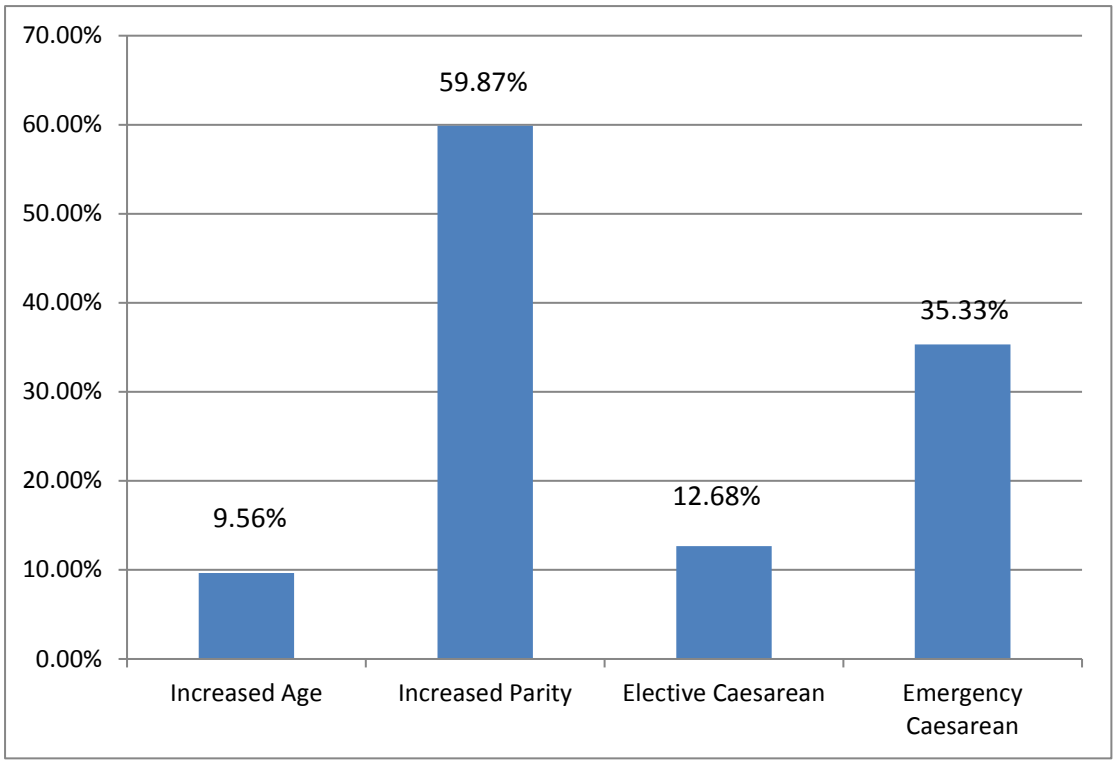

Figure 6 Doctors' knowledge of factors that increase expulsion rate of an IUCD placed postpartum

When questioned 59.87% (n = 91) of respondents identified that increased parity increased expulsion rate of the IUCD.

The doctors were asked as to whether they recommended the IUCD if a number of different subpopulation groups of women. The doctors where asked to answer 'yes', 'maybe' or 'no' for each group as to whether they would make a recommendation. See figure 7 below.

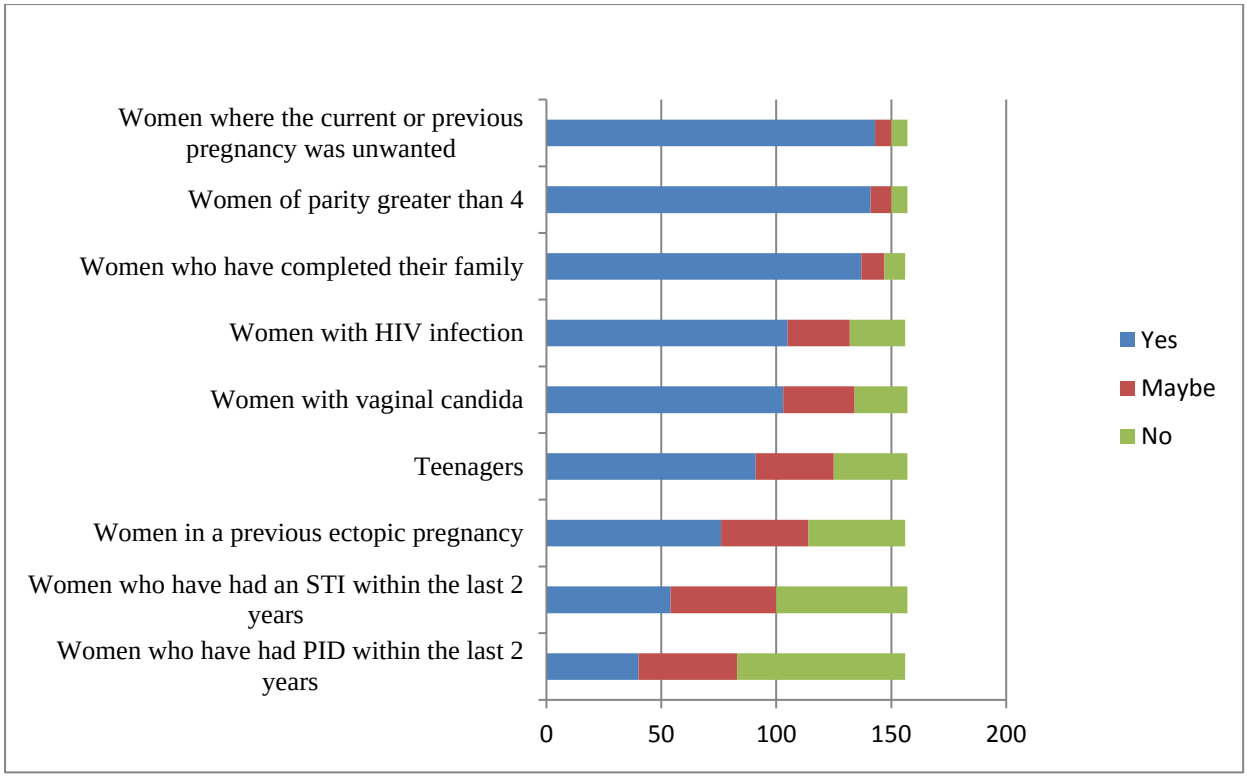

Figure 7 Doctors' recommendation of IUCD in women with different conditions

3.1.3 Attitudes

Respondents were asked why they would or would not advise the use of the IUCD postpartum. There were 87 responses to this question.

The reason given for not inserting the IUCD in the postpartum period, as expressed by 15 respondents, was the concern about the risk of expulsion. It was thought the device 'might be expelled as the uterus contracts'. One doctors expressed concern regarding the cost of the Mirena^{TM}. This doctor commented that 'the Mirena is too expensive to risk expulsion immediately postpartum'. There were five doctors who expressed concern regarding misplacement of the device. There were further concerns regarding a risk of perforation which was mentioned by 6 of the respondents. Some (14) respondents indicated that they preferred to delay insertion. One person indicated that their patients were 'not sexually active until 6 weeks'. One person said that it was 'not their choice' and one person said they have

‘no experience’ with insertion. One person wanted to have a normal pap smear of the patient prior to insertion of the IUCD.

Doctors were asked why they would advise the IUCD postpartum. It was favoured for it efficacy which was mentioned by 12 respondents. The fact that it is long acting was mentioned by 5 respondents and ease of use by 9 respondents. The lack of an effect on breastfeeding was also important to note. This was mentioned by two people. Two people mentioned that it was good for child spacing. One respondent felt that it was an excellent method as the ‘Risk for DVT or pulmonary embolism is low’. One respondent reported regarding the IUCD that it is the ‘perfect method during this period of upheaval and transition for the family’.

Doctors were asked regarding the timing of insertion of the IUCD in the postpartum period. In this question they were asked whether they would insert the IUCD immediately (within 48 hours), between 48 hours and 6 weeks or at 6 weeks post-delivery. Of the 156 doctors that answered this question 71.2% (n=111) inserted the IUCD post-delivery. Following this question they were then asked as to their reasoning behind selecting a particular time frame. There were a total of 41 responses. At this point 7 doctors raised a concern regarding the risk of expulsion and 3 raised a concern regarding sepsis. Five doctors delayed insertion to between 8 and 10 weeks post-delivery. Four stated that they were most confortable inserting it at 6 weeks post-delivery and reported good follow up of their patients at this stage. A lack of skill or knowledge was mentioned by two people. One reported ‘No skilled personnel in public hospitals’ and one stated ‘I lack the knowledge’. Lack of availability or system issues was mentioned by 3 doctors. One mentioned that the neonatal outcome had an impact on the timing of insertion ‘When emergencies and when baby's outcome uncertain, less likely to do early or immediate postpartum insertions’.

Doctors on the whole, 123 of 154 amounting to 79.9%, felt confident in inserting the IUCD postpartum. When it came to encouraging this form of contraception, 84.6% (n = 132) admitted to encouraging the IUCD use in their patients.

3.1.4 Practice

The doctors questioned were asked for each contraception method, how likely they were to recommend that particular method in the postpartum period. They are most likely to recommend IUCD's (n = 126), progesterone only pills (n=110) and sterilisations (n = 80) as forms of contraception to their patients after delivery. Natural methods (n=9) and lactational amenorrhea methods (n=7) are not frequently recommended. The contraceptive methods that doctors are most likely to recommend are demonstrated in Figure 8 below.

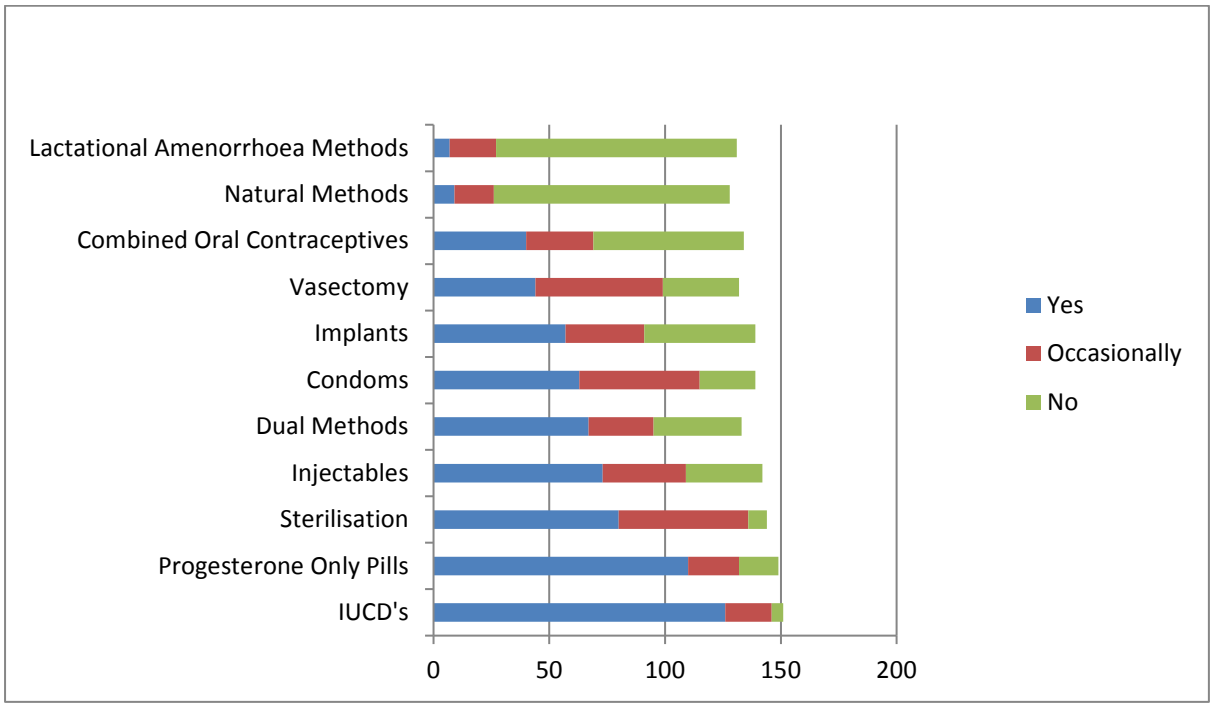

Figure 8 Doctors preferred forms of contraceptive methods postpartum

We looked at whether these doctors recommended any form of contraception immediately (within 48 hours) post-delivery. There were a total of 156 respondents, 80 of these would recommend contraception following caesarean section and 77 of them would recommend contraception following a normal delivery.

Whether doctors provided advice on contraception in the antenatal period was then questioned. The majority of doctors (98.1%) discussed contraception with their patients antenatally. Doctors were then questioned as to the frequency that contraception was discussed with patients in the antenatal period. There were a total of 156 respondents. The results are given in Figure 9 below.

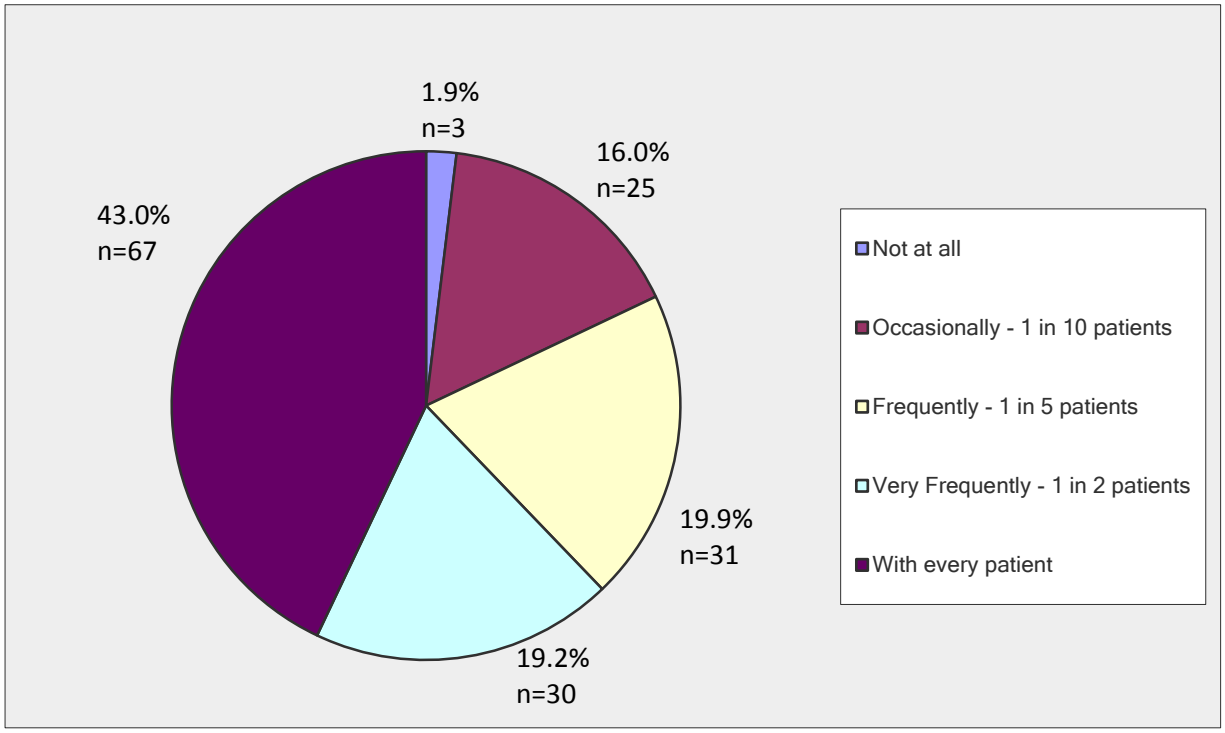

Figure 9 The frequency that contraception is discussed with women antenatally

When looking at the IUCD specifically it was noted to be discussed by 92.4% of doctors antenatally. Over a quarter of respondents report discussing the IUCD with all patients in this period (Figure 10).

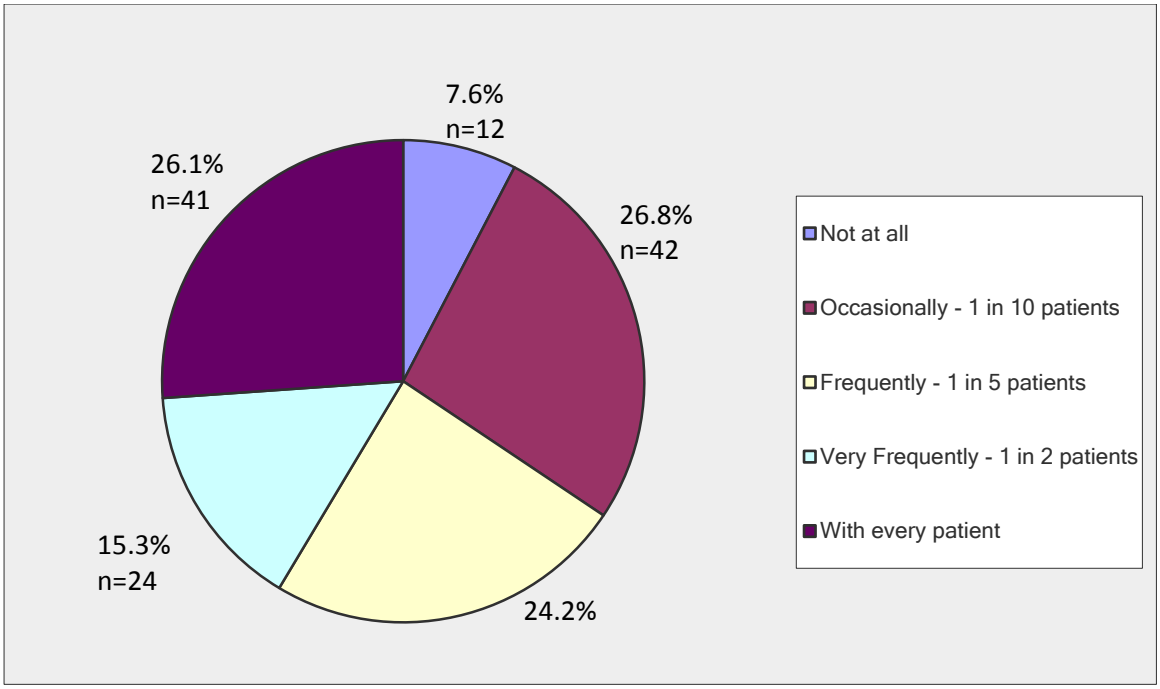

Figure 10 The frequency the IUCD is discussed by doctors with women antenatally

Doctors were then questioned regarding the frequency with which they discussed the IUCD with their patients in the post-partum period. The immediate postpartum period was assessed resulting in 69.4% of doctors discussing the IUCD with their patients at least occasionally (Figure 11).

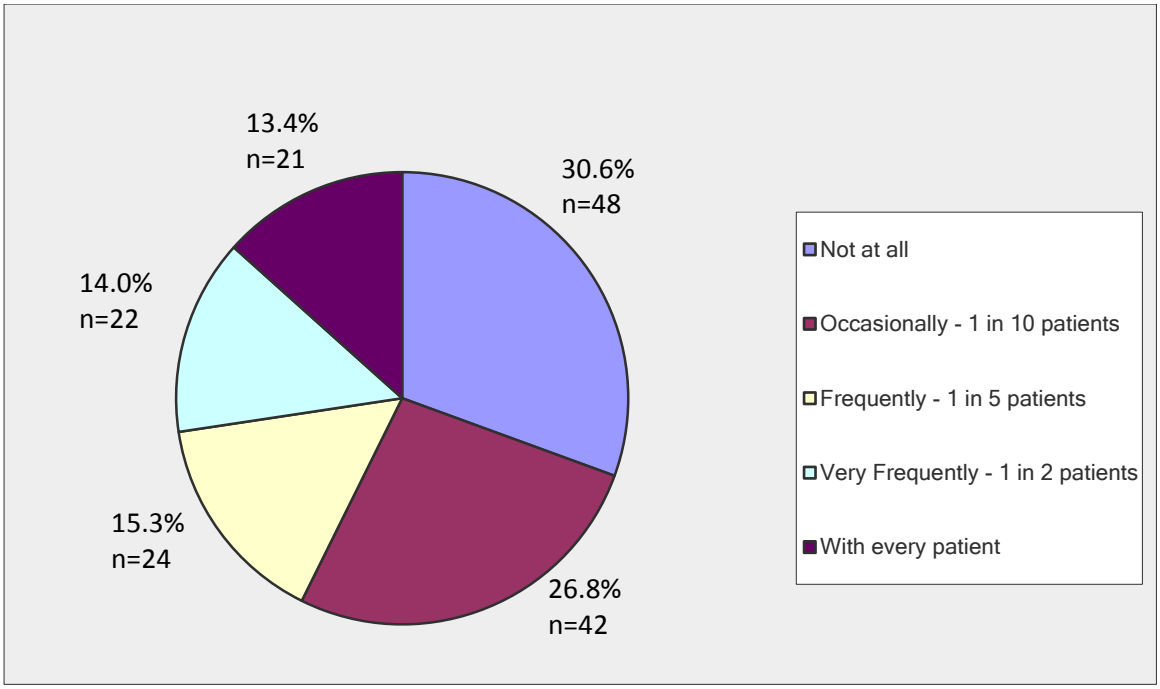

Figure 11 The frequency the IUCD is discussed by doctors with women postpartum

The IUCD is inserted in the postpartum period by 71.2% (n=111) of the 156 doctors questioned. The preference for timing is represented in Figure 12.The majority (90.4%) preferred to insert the IUCD at 6 weeks postpartum. Doctors mostly avoided placing the within 48 hours post-delivery regardless of the delivery method (caesarean section or normal delivery) Only 28 doctors inserted the IUCD immediately following emergency caesarean section, 47 doctors inserted the IUCD immediately following emergency caesarean section and 34 doctors inserted the IUCD immediately following a normal delivery.

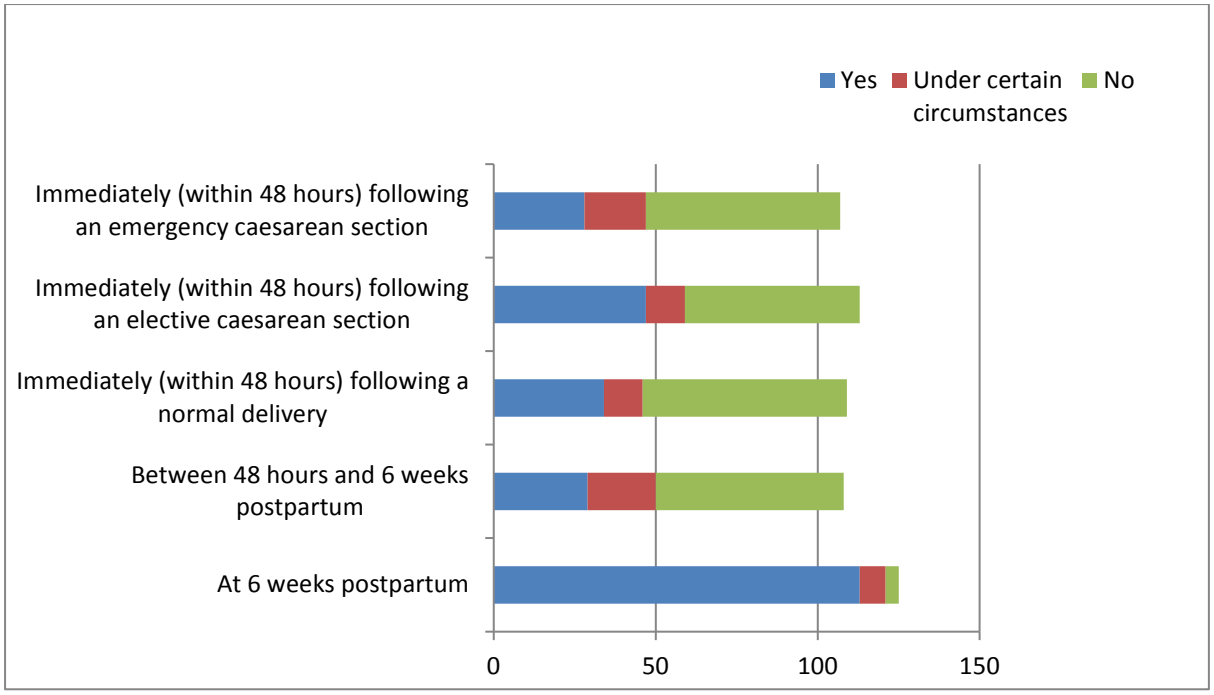

Figure 12 Doctors' preference of timing of IUCD insertion postpartum

Doctors were asked whether they routinely gave antibiotics at the time of insertion of the IUCD. There were 157 respondents. On insertion of the IUCD 15.9% (n=25) of doctors routinely gave antibiotics and 8.9% (n=14) occasionally gave antibiotics. There were 75.2% (n= 118) of doctors that did not give antibiotics when the IUCD was inserted.

Almost all doctors counselled their patients regarding the risk of expulsion, side effects and removal of the IUCD. There were 157 doctors who answered this question. When it comes to counselling 155 (98.7%) doctors discussed expulsion, 154 (98.0%) doctors discussed side effects and 151 (96.1%) doctors discussed removal regularly.

CHAPTER 4

4.1 Discussion

The World Health Organisation, the South African guidelines, the American College of Obstetrics and Gynaecology and the American Congress of Obstetrics and Gynaecology all recommend the IUCD within the immediate postpartum period. . I will discuss the main findings regarding knowledge, attitude and practices of doctors in Obstetrics and Gynaecology as they relate to postpartum IUCD insertion. This study included specialists throughout South Africa and registrars from the University of the Witwatersrand.

To my knowledge this is the first study in South Africa looking solely at specialists and registrars' knowledge, attitude and practice regarding the IUCD in the postpartum period. Antenatal care and provision of contraception in South Africa is frequently provided by midwives and specialist obstetricians.[55] It is therefore, important to understand the knowledge, attitudes and practice in this subgroup of health workers. We only questioned doctors in the process of specialising as well as specialists. There have been a number of similar studies. These studies are either not in South Africa, look at a wider demographic of study population or are not isolated specifically to the postpartum period. The one study that was done in Cape Town, South Africa, looked at knowledge and acceptability of the intrauterine device within family planning services. This study, whilst including health care providers, mainly addressed the knowledge and attitude of clients.[39] The similar study in Ghana looked at providers' knowledge, attitudes, and practices regarding provision of the IUCD postpartum. This study included 91 maternity care providers, 52 of these providers were midwives and 39 were physicians.[48] This study cannot be generalised to specialists within South Africa.

The uptake of the IUCD in South Africa is only 1.1%.[18] There may be many reasons for the low prevalence of IUCD use in South Africa. One of these reasons may be that it is not being adequately prescribed. This exploration of doctors within obstetrics and gynaecology provides some valuable insights into their knowledge, attitude and practice regarding the IUCD postpartum.

Knowledge regarding the use of IUCDs amongst specialists and registrars was good. They were aware that the IUCD could be inserted in the postpartum period both immediately and at 6 weeks. However, as the study population group were specialists and registrars, one would expect the knowledge to be 100% for these two questions. Here the knowledge was 93.6% regarding immediate postpartum insertion and 96.8% for the 6 week postpartum insertion. This is an improvement on prior research. A previous study included doctors and midwives. In that study only 41% of doctors and 33% of midwives were aware that the IUCD can be inserted immediately following delivery.[48] This study and the previous research study are similar when it comes to 6 week postpartum insertion. Previous research revealed that, 95% of doctors and 94% of midwives were aware that the IUCD can be inserted at 6 weeks post-delivery.[48]

Patient selection is important when it comes to immediate postpartum insertion. Absolute contraindications to the use of the IUCD include a pregnancy, patients with recent postpartum endometritis, uterine anomalies, active infection, gynaecological malignancy, genital bleeding of unknown cause and gestational trophoblastic disease.[57] These contraindications, other than suspected infection, are very unlikely immediately post-delivery. According to the American College of Obstetrics and Gynaecology the contraindications to immediate postpartum IUD placement is intrauterine infection at time of delivery, postpartum haemorrhage and puerperal sepsis.[15]

Doctors were asked as to which groups of women they recommended IUCD use. The IUCD was recommended in patients with a recent unwanted pregnancy, a high parity and those that had completed their family. The IUCD was less frequently recommended to those women that either had a sexually transmitted disease or pelvic inflammatory disease within the last two years.

The above reflects good knowledge of these doctors with regards to those patients who are eligible to receive an IUCD including teenagers and patients with a candida infection. This

was an improvement on prior research where knowledge regarding medical eligibility was low. Research looked at midwives in Nepal who are providers of contraception including the IUD. Less than 50% of providers correctly identified the conditions under which a woman would be eligible for an IUD. This research indicated that women who are eligible for the IUD without screening include women with a history of ectopic pregnancy, anaemia, pelvic inflammatory disease 3 years ago, less than 48 hours post-partum and irregular menstruation. Women who are eligible for the IUD with screening include the STI patient, HIV positive women, antiretroviral therapy use and those with a vaginal discharge.[47] These recommendations would account for the IUCD being less frequently recommended in those patients with prior infection in this study.

A study addressed health practitioners' beliefs and practices regarding the IUCD in nulliparous females. This study looked at providers' attitudes to providing the IUCD as well as perceived barriers to its use. It also assessed knowledge of the WHO Medical Eligibility Criteria for IUCD use. In this study, knowledge was noted to be poor. Only 49.7% correctly identified the WHO MEC category for IUCD use in nulliparous women. The main barriers to providing the IUCD which were identified in this study included concern regarding difficult placement of the device in nulliparous women and possible PID.[58]

Doctors' knowledge regarding medical eligibility criteria with regards to the IUCD has been shown to influence their prescribing practice. Research has shown that those doctors who are more knowledgeable and thus have a more favourable attitude to the IUCD being used in many different subgroups of women are more likely to counsel their patients on the use of the IUCD. Adequate medical education alongside training is therefore important in improving IUCD provision.[59]

In this study doctors were aware of the expulsion rate when inserting an IUCD postpartum as well as factors influencing expulsion. There was a large amount of variation in what doctors thought the expulsion rate to be of an IUCD inserted immediately postpartum. This may be as a result of different practitioners inserting different devices. All devices have a different expulsion rates. The 1 year expulsion rate is for the Nova-T380 is 13%, for the Multiload 375

is 5% and for Cu-T380A is 15%.[56] In this study 46.8% (n=73) of doctors answered that the expulsion rate is around 5%. This expulsion rate was felt to be unacceptable as it was still named as a reason the IUCD was not inserted in the postpartum period. The cost of the Mirena^{TM} was alluded as being a barrier to postpartum insertion given the above expulsion rate. The cost of this device is approximately two thousand rand. This does not include the cost of the insertion. Many felt that the cost of the device was too high to risk possible expulsion and the Copper-T^{TM} is not considered an alternative. Some doctors however, did have misconceptions as to what factors increased expulsion rate. These factors included increase age and elective caesarean sections. High parity is the only independent factor that is known to increase the risk of IUD expulsion.[60]

Knowledge overall was improved when compared to previous research, but is likely due to a difference in the study population. Prior research looked at a far more diverse study population including general practitioners, midwives, paediatricians and other healthcare providers. When looking at this population group, knowledge was noted to be poor. This study looked at a subjective assessment of knowledge of the IUD as well as objectively assessed providers' knowledge. Only one provider in the study stated that she had excellent knowledge regarding the IUD. In that study 76% of providers felt the IUD was more effective than combined oral contraceptives and 23% felt that injectables were more effective that the IUD.[39] This study looked only at specialists and registrars within the field of obstetrics and gynaecology and is thus expected to reflect a greater knowledge regarding the IUCD and contraception.

All healthcare practitioners have a responsibility to keep up to date with their professional knowledge. This is to benefit the patients that they treat. To ensure this, the Health Profession council of South Africa has a Continuing Professional Development (CPD) programme. Every practitioner is required to increase their knowledge and earn points every year. This includes points on ethics, human rights and medical law. There are random audits to ensure compliance. Specialists keep up to date by reading journal articles, going to CPD meetings and attending various conferences.[54]

Little research has been done assessing doctors' attitude toward the IUCD postpartum. This study helps to gives some insight to doctors' attitudes as well as how their attitudes influence their practice. An attitude is "a relatively enduring organization of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols".[61] This study attempted to assess practitioners attitudes towards the IUCD with particular emphasis on the postpartum period. The IUCD was noted to be a preferred form of contraception. It was commonly recommended to patients by those questioned. Postpartum use was encouraged by most of those questioned. The difference of opinion came in as to the preferred timing of postpartum insertion. This was different from prior research most likely as a result of improved knowledge of this form of contraception. Progesterone only pills were also seen favourably as a form of contraception postpartum.

In this study the following barriers were identified to inserting the IUCD postpartum.

- The financial cost of the device
- Concern about the rate of expulsion
- Concern about the risk of uterine perforation
- Concern regarding misplacement of the device
- Doctor's preference to delay insertion

The following were identified as barriers, as noted in prior research, in the study population to inserting the IUCD postpartum.

- Concern about difficult insertion
- Concern about insertion pain
- Financial cost
- Concern about ectopic pregnancy
- Concern about women's preference

- Concern about expulsion
- Lack of training[37]

Many of the barriers identified are the same as prior research, such as cost and risk of expulsion of the device. Lack of training and concern about difficulty of insertion were not identified as barriers in this study. This is likely as a result of our study population having training regarding insertion. The main barrier to immediate postpartum insertion is doctors' preference for delayed insertion. Doctors preferred insertion at the time of the postpartum visit; either at 6 weeks following delivery or later.

The IUCD and the progesterone only pills were noted to be the preferred forms of postpartum contraception. Many (71.2%) of specialists and registrars insert the IUCD postpartum. This is a significant drop from how many practitioners had the knowledge that the IUCD could be inserted postpartum either immediately or at 6 weeks. This discrepancy is most likely due to the practitioners' attitudes which affect their practice. There are patient factors to consider here as well. Patients' attitude and the doctor's perception of patient attitude influence doctors prescribing practices.

The above results are very similar to a study done in the United States. This study looked at specialists' practice and opinions regarding the IUD in various patient subgroups of women. It is similar as the study showed that whilst specialist offered the IUD as a form of contraception many excluded eligible patient population groups. In this study only 11.4% of respondents inserted the IUD after a miscarriage and only 7.4% inserted the IUCD immediately post-delivery.[62]

The difference with regards to timing of insertion was not unexpected as there are many different guidelines regarding this. The timing of insertion will likely be as a result of which guidelines the practitioner is following. The guidelines followed could be a result of where and when the practitioner qualified or received training. The American Congress of

Obstetrics and Gynaecology, The WHO, The American College of Obstetrics and Gynaecology and The South African guidelines all however allow for, and advise, postpartum insertion. It was difficult to evaluate further as the question was not asked as to how many patients they inserted the IUCD in within the last year.

Doctors were asked about the frequency that contraception was discussed in their practice. There was particular reference to the frequency that the IUCD was discussed both antenatally and postpartum. Contraception including the IUCD is frequently discussed with patients antenatally as well as post-delivery. This is once again reflective of the study population. This study did not however provide any insight as to the quality of the counselling given. Interviews would have to take place in attempt to address this. This is an area for further research. There was 30.6% of this study population that didn't discuss the IUCD post-delivery at all. This is similar to prior research where 26% of physicians did not discuss post-partum IUCD use.[48]

Patients in this study are almost always counselled regarding the risk of expulsion (n=155), side effects (n=154) and removal (n=151) of the IUCD. This may not be a true reflection however as the counselling in this study was not assessed objectively. This question potentially had a response bias as those responding would want to appear to be doing the correct thing.

Antibiotics are found not to be given routinely after insertion. In this study only 15.9% of doctors routinely gave antibiotics. The study done in Cape Town reports a lower rate with only 3% of providers giving antibiotics routinely.[39] This is in keeping with current literature where a Cochrane review concluded that there was low risk of IUD-associated infection regardless of whether antibiotics were given or not.[63]

The sample population consisted of more specialists than registrars. This is likely due to two factors. The first is that only registrars at the University of the Witwatersrand were included in this study. Registrars from other Universities were not included. This was a convenient

sample. The second reason is that all specialists registered with SASOG were sent a questionnaire. There are more specialists than registrars in training.

In South Africa there is a large disparity between the private and the public health care sectors. The study population had 52.1% of doctors working solely within the private sector. When the additional 10.2% that do both private and public sector work are added to this number, this results in a total of 62.3% of these doctors performing at least some private work. This reflects the situation nationally with 59% of doctors being documented as working within the private sector. Only 15% of the population makes use of the private sector.[64]

The above difference is important to know as it has a significant influence on the results. Patients making use of the private sector are more likely to follow up at 6 weeks postpartum as a result of greater contact with healthcare providers.[65] They also have continuation of care as they are generally seen by the same healthcare provider antenatally, for their delivery and post-partum and therefore have the same information. Healthcare providers in private may therefore be more inclined to delay insertion of the IUCD deeming it safer and having little concern regarding possible loss to follow up. The patients making use of the public sector (85% of the population)[64] are those most likely to benefit from immediate insertion as they are usually down referred to their local clinic for their 6 week visit where there may not be the expertise to insert an IUCD. Approximately 10 to 40% of women are lost to follow up and are therefore at higher risk for a short interval pregnancy.[15] Patients who plan to use the IUCD postpartum often, 40 to 75% of these women, don't receive it.[15] Lack of resources and guidelines appear to be the most common barriers for doctors in the public sector. These guidelines are available, but doctors may not access it.

It is difficult to distinguish the attitude and practice of those doctors working in the public sector from those working in the private sector from the data collected in this study. The sample size is too small which means comparing sub-groups is unlikely to yield a statistically significant result. This may be an area for further research as there are many challenges facing the public sector.

Many of the state hospitals are in a state of crisis.[66] The public health care infrastructure is run down and dysfunctional as a result of underfunding, mismanagement, and neglect.[63] The health care system as a whole is understaffed.[66] The ratio of physicians per 1000 population was 0.76 in 2011. The amount of graduating doctors fails to keep up with population growth.[66] Many doctors leave the government sector to go into private or leave the country entirely worsening the staffing crisis. This will influence doctors' practice within the public sector.

The data provided by this study does not allow us to distinguish the knowledge of those doctors working in the private sector and those doctors working in the public sector. The knowledge however is expected to be similar as all of the respondents received their post graduate training within South Africa. In Nepal the knowledge of providers was noted to be greater in the public sector as opposed to the private sector. Knowledge of the IUCD in this study was noted to be significantly associated with recent training.[47] This means that specialists that graduated recently may likely have better knowledge regarding the IUCD.

There was also a slightly higher response from males as opposed to females. The difference between the genders however was very small with 51.8% being male. In South Africa there has been a deliberate shift of graduating doctors to include more women, more Black Africans and persons of mixed ancestry whilst there are fewer Whites and Indians.[66] Obstetrics and Gynaecology was a previously male dominated field. This is no longer the case. This is in keeping with trends internationally with a lower proportion of men specialising in Obstetrics and Gynaecology.[67]

Two of the respondents expressed concern as to why race was included in the questionnaire. Race was looked at as an indication of cultural background. Cultural background has been shown to influence attitude toward contraception. Personal life circumstances have also been shown to influence attitude towards contraception.[68] These attitudes may then influences a

clinician's practice. The effect of culture on attitudes or practice however, was not assessed in this study.

Race was asked as a preface to culture and thus attitude. This question was asked in order to see whether there was any racial disparity between the various groups rather than assessing any direct effect of race on doctors' knowledge, attitude and practice. This disparity may arise because of different cultural contexts. The 'effects of race' on a particular outcome are difficult to clarify.[69] In this study the respondents were asked open ended questions regarding their attitudes towards contraception. However we did not look at whether culture had any impact on attitude in this study.

4.2 Study Limitations and Strengths

The limitations of this study included the following:

- The low response rate.
- The format of the questionnaire.
- The inability to know how many people of the target population received the questionnaire.

One of the limitations of this study is that there was a response rate of 23.4%. This introduces the possibility of non-response bias. It is possible that those clinicians with strong opinions towards the IUCD, whether those are positive or negative opinions, were more likely to respond. This response rate does fall short of the goal response rate which should be at least around 60% according to an article from The American Journal of Pharmaceutical Education.[70] This response nonetheless higher than originally anticipated as it is often felt that specialists are too busy to respond to questionnaires. This response rate is not high enough to generalise the findings to all obstetrician gynaecologists.

A response rate of 23.4% is similar to the response rate of 21% of a nationwide study done in Germany. This was a similar study looking at attitude and practice of gynaecologists to different forms of contraception. The study assessed German gynaecologists' preferred choice of contraception. The combined oral contraceptive was the most commonly prescribed method. The levonorgestrel-releasing intrauterine system is the next most commonly prescribed method. This is then followed by the vaginal ring, the progestin-only pill, the patch and the progestin-only injectables.[71]

The low response rate could be a result of the format of the questionnaire. This questionnaire was distributed as a single sided paper based questionnaire as well as via electronic format. Research however, has shown that the format of a study does not to impact on response rates.[72] Similarly the length of the questionnaire has not been shown to have a significant impact on response rate.[73] There was no incentive given, financial or otherwise, to complete this questionnaire. A financial incentive may have been used to improve response rate.[74]

The questionnaire in this study was self-administered. Self-administered questionnaires are noted to have a low response rate. They also have a low rate of respondents completing the questionnaire in its entirety.[75] This occurred in this study as not all respondents answered all the questions. It does however reduce interviewer bias and participants are more willing to disclose sensitive information.[75]

A further limitation to this study as a result of the low response rate is that it was difficult to draw conclusions about various subcategories. This makes it difficult to generalise the results to other centres. In this study it is difficult to distinguish the knowledge, attitude and practice with regards to the IUCD between those doctors working in government, and those doctors working in private practice for example.

Another limitation is that we are unable to know how many doctors received the questionnaires. SASOG distributed the questionnaires to its members to aid with anonymity.

Although those in the study population are all specialists or are busy specialising in Obstetrics and Gynaecology, not all participants practice obstetrics. Many specialists no longer practice obstetrics due to high malpractice insurance fees.[76] Some have further subspecialised in Oncology or Fetal Medicine for example.

One of the strengths of this study was that all questions were answered anonymously thus reducing bias. Those responding to the questions were free to answer the questions honestly without fear of judgement.

The fact that this study specifically looked at specialists and registrars within Obstetrics and Gynaecology is a further strength. There is limited prior research regarding the knowledge, attitude and practice towards the IUCD in this subpopulation group. This study provided good insight in these doctors.

4.3 Conclusions

This study provides new insight with regards to the knowledge, attitudes and practice with specific reference to specialist obstetrician gynaecologists and registrars. Knowledge with regards to the IUCD postpartum was good overall. The study population has favourable attitude towards the IUCD. Practice, however, seemed to be determined by the individual's personal preference and experience and was low given the high level of knowledge and favourable attitude.

4.4 Recommendations

Following this study we recommend the following in order to change clinical practice

- CPD meetings to be conducted on the use of the IUCD in the postpartum period.
- Improve availability of the IUCD, especially in the public sector.

- Institutions to have guidelines in place regarding IUCD insertion postpartum.

The following are recommendations for further research

- A prospective study looking at the knowledge, attitudes and practice of doctors regarding the IUCD before and after receiving training on its use.
- Quantitative research to be done regarding the number of IUCD inserted by various practitioners.
- Further research needs to be done to look at which factors do influence expulsion rate when the IUCD is inserted post-partum.
- A study to be done looking at the quality of contraception counselling given to patients.
- There was not a clear connection between knowledge and practice. It is obvious that knowledge on its own does not affect practice. A study which looks at other factors that affect practice would be useful.

4.5 Funding and Competing Interests

This research was done with assistance from and resources of The South African College of Obstetrics and Gynaecology. SASOG assisted with loading the questionnaire onto SurveyMonkey® S. Africa. They also distributed the questionnaire to all Obstetrician Gynaecologists on their mailing list. SASOG also assisted with analyses of the raw data. All printing was self-funded.

No competing interests were identified.

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Appendix A

INFORMED CONSENT

Dear Colleague

My name is Dr Natalie Alexandra Louise Braam. I am a registrar in the Department of Obstetrics and Gynaecology at the University of the Witwatersrand. The title of my MMED is KNOWLEDGE, ATTITUDES AND CURRENT PRACTICE OF SPECIALISTS AND REGISTRARS IN OBSTETRICS AND GYNAECOLOGY REGARDING THE USE OF THE INTRAUTERINE CONTRACEPTIVE DEVICES POSTPARTUM. I believe there is a big gap in contraception being provided in postpartum period. I will therefore be looking particularly at the insertion of the IUCD postpartum. Your participation in this study should take approximately five minutes to complete. Answering this questionnaire is implied consent. Your personal information will not be used. The questionnaire that you answer will be given a study number to aid in maintaining confidentiality. Your assistance would be greatly appreciated.

Appendix B

QUESTIONNAIRE

Section 1: Demographic details:

Gender	Female		Male	
Age	≤30	31 – 45	46 - 60	61+
Racial group	African	Indian	White	Mixed
	Other:			
Public/Private practice	Public	Private	Both	
Current level of training	Registrar		Specialist	
Year of Registrar time or Year of Qualification (FCOG)	1st Year	2nd Year	3rd Year	4th Year
University Attended:				
Undergraduate training	University of the Witwatersrand	University of Cape Town	MEDUNSA	University of the Orange Free State
	University of Pretoria	University of Natal	University of Stellenbosch	Walter Sisulu University
	Other:			
Postgraduate training	University of the Witwatersrand	University of Cape Town	MEDUNSA	University of the Orange Free State
	University of Pretoria	University of Natal	University of Stellenbosch	Walter Sisulu University
	Other:			

Section 2: Contraception Questionnaire

1. In your practice, in women who are postpartum, which contraception methods are you most likely to recommend?

Tick all that apply	Yes	No	Sometimes
Condoms			
Injectables			
Progesterone only pills			
Combined oral contraceptives			
IUCDs			
Implants			
Sterilisation			
Vasectomy			
Lactational amenorrhoea methods			
Natural methods			
Dual methods			
Other			

2. Would you ever recommend contraception immediately (within 48 hours) after a caesarean section?

(Excluding sterilisation)

Yes		No	

3. Would you ever recommend contraception immediately (within 48 hours) after a NVD? (Excluding sterilization)

Yes		No	

4. Do you discuss contraception with your patients antenatally?

Not at all	Occasionally 1 in 10 patients	Frequently 1 in 5 patients	Very frequently 1 in 2 patients	All the time

5. Do you discuss the IUCD with your patients antenatally?

Not at all	Occasionally 1 in 10 patients	Frequently 1 in 5 patients	Very frequently 1 in 2 patients	All the time

6. Would you discuss the IUCD with your patients immediately (within 48 hours) postpartum?

Not at all	Occasionally 1 in 10 patients	Frequently 1 in 5 patients	Very frequently 1 in 2 patients	All the time

7. Do you insert the IUCD in the postpartum period?

Yes		No	

8. If yes when do you recommend insertion?

(You may pick more than one)

	Yes	No	Under certain circumstances
Immediately (within 48 hours) following a normal delivery			
Immediately (within 48 hours) following an elective caesarean section			
Immediately (within 48 hours) following an emergency caesarean section			
Between 48 hours and 6 weeks postpartum			
At 6 weeks postpartum			

9. If you answered 'No' to any of the above please explain.

10. Why do you/ do you not advise the IUCD in the postpartum period?

11. Do you feel confident in inserting the IUCD postpartum?

Yes		No	

12. Do you encourage this form of contraception (IUCD) in your patients?

Yes		No	

13. Do you recommend the IUCD in the following population groups?

	Yes	No	Maybe
Teenagers			
Women with a previous ectopic pregnancy			
Women who have had an STI within the last two years			
Women who have had PID within the last two years			
Women with HIV infection			
Women with vaginal candida			
Women where the current or previous pregnancy was			

unwanted			
Women of parity greater than 4			
Women who have completed their family			

14. When inserting the IUCD do you routinely give antibiotics?

Yes		No		Occasionally	

15. Do you counsel patients about the following when inserting the IUCD?

	Yes	No	Occasionally
Side Effects			
Risk of Expulsion			
Removal of the IUCD			

16. Were you aware that you can insert an IUCD immediately postpartum?

Yes		No	

17. Were you aware that you can insert an IUCD at 6 weeks postpartum?

Yes		No	

18. What do you think the expulsion rate is when the IUCD is inserted immediately postpartum?

0.1%	
1%	
5%	
20%	

19. Which of these do you feel increases the expulsion rate?

	Yes	No
Increased age		
Increased parity		
Elective caesarean		
Emergency caesarean		

Appendix C

ETHICS CLEARANCE CERTIFICATE

R14/49 Dr Natalie Alexandra Louise Braam

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M160519

NAME: (Principal Investigator)	Dr Natalie Alexandra Louise Braam
DEPARTMENT:	Obstetrics and Gynaecology
PROJECT TITLE:	Knowledge, Attitudes and Current Practice of Specialists and Registrars in Obstetrics and Gynaecology Regarding the Use of the Intrauterine Contraceptive Devices Postpartum
DATE CONSIDERED:	27/05/2016
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Prof Yasmin Adam and Dr Trudy Smith

APPROVED BY: Professor P Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL: 29/08/2016

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

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 10004, 10th floor, Senate House/2nd Floor, Phillip Tobias Building, Parktown, University of the Witwatersrand. I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in May and will therefore be due in the month of May each year.

Principal Investigator Signature Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix D

PERMISSION FROM THE DEAN OF STUDENTS

Faculty of Health Sciences (Office of Student Support)

The Phillip Tobias Health Sciences Building, 29 Princess of Wales Street, Parktown 2193, South Africa
* Tel: +27 11 717-2000 * Fax: +27 11 643-4318 * Telegrams: 'Witsmed'

15 August 2016

TO: Ms Natalie Braam
Department of Obstetrics and Gynaecology

Dear Ms Braam

RE: **RESEARCH PROJECT ENTITLED** – *Knowledge, attitudes and current practice of specialists and registrars in obstetrics and gynaecology regarding the use of the intrauterine contraceptive devices postpartum.*

I have reviewed your research protocol & questionnaire and permission is hereby granted for you to proceed with the research.

PLEASE NOTE: that permission has been granted subject to the following conditions:

1. Anonymity of participants secured and participants to take part in the study on a purely voluntary basis.
2. Consideration and approval of the proposal by the Ethics Committee.

Yours sincerely

Professor T Parbhoo
ASSISTANT DEAN (Student Support)
Faculty of Health Sciences
University of the Witwatersrand
JOHANNESBURG

Appendix E

PLAGIARISM ASSESSMENT

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ORIGINALITY REPORT

2%	1%	2%	0%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Morse, J, T Chipato, K Blanchard, T Nhemachena, G Ramjee, C McCulloch, M Blum, E Saleeby, and CC Harper. "Provision of long-acting reversible contraception in HIV-prevalent countries: results from nationally representative surveys in southern Africa", BJOG An International Journal of Obstetrics & Gynaecology, 2013. Publication	1%
2	Rupley, Devon M., Emmanuel S.K. Morhe, Cheryl A. Moyer, and Vanessa K. Dalton. "Maternity care provider knowledge, attitudes, and practices regarding provision of postpartum intrauterine contraceptive devices at a tertiary center in Ghana", International Journal of Gynecology & Obstetrics, 2015. Publication	1%
3	www.infoforhealth.org Internet Source	1%