AN EXAMINATION OF THE MANAGEMENT OF INFERTILITY IN THYOLO AND BLANTYRE DISTRICTS

MSC. (REPRODUCTIVE HEALTH) THESIS

ANDA NINDI-NYONDO

UNIVERSITY OF MALAWI

KAMUZU COLLEGE OF NURSING

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MSC (REPRODUCTIVE HEALTH) THESIS

By

ANDA NINDI-NYONDO
BSc. Nursing/UCM-University of Malawi

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Declaration

I, Anda Nindi-Nyondo, hereby declare that this thesis titled "An examination of the management of infertility in Thyolo and Blantyre Districts" is a result of my original work. This write-up has never been submitted to any university for any award. All information taken from other sources have been acknowledged in text and in the reference list.

ANDA NINDI-NYONDO

Candidates' Name

_____

Signature

_____

Date

Certificates of approval

The undersigned approves that this submitted thesis is the original work of Anda Nindi-Nyondo.

Signature_____ Date_____

Lignet Chepuka, PhD (Lecturer)

Main supervisor

Signature _____Date_____

Evelyn Chilemba, PhD (Lecturer)

Second supervisor

Dedication

To Alinuswe, my timely gift, who in so many ways has shown me that God is always with us.

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Abstract

The provision of infertility services is given a very low priority in many developing countries as it is mainly regarded as none life threatening and usually associated with high cost of treatment. Nonetheless, in Malawi, infertility is one of the priority sexual and reproductive health (SRH) issues according to the national SRH and Rights policy (2009). However, little is documented on the availability and quality of infertility services in the country. This study therefore sets out to assess the type of infertility services provided at all levels of health service delivery by assessing health care providers (HCP) knowledge, practice, barriers to provision of services and client's satisfaction. The study was conducted over a period of one year. It employed a cross section research design using a mixed method approach. Quantitative data was collected from 73 HCP through interviews and observation while qualitative data was collected through in-depth interviews with 27 clients receiving infertility services. Quantitative findings were analysed using SPSS version 16 and descriptive statistics were computed. While qualitative data was analysed manually using thematic content analysis. Study results revealed a generalised lack of knowledge and good practice of infertility management among all HCP assessed. Similarly, HCP cited lack of knowledge and skills (45.2%, n=33) as the main barrier to provision of infertility services. Clients cited long duration of receiving infertility services and failure to integrate male clients in the service as reasons for their dissatisfaction. A gap exists between policy and the actual infertility management practice. In order to improve infertility service provision, there is need for Ministry of Health, Reproductive Health Unit and its policy makers to develop a standard

guideline for training and provision of infertility services. Furthermore, there is need for integration of infertility services in already existing RH services in all levels of service provision.

Keywords: Infertility, infertility management, infertility AND health care providers, infertility AND resource poor countries.

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List of Abbreviations

AMOG:	Association of Malawian Obstetricians and Gynaecologists
CC:	Clomiphene Citrate
FP:	Family Planning
HAART:	Highly Active Antiretroviral Therapy
HCP:	Health Care Provider
HSSP:	Health Sector Strategic Plan
HIV:	Human Immunodeficiency Virus
IMNH:	Integrated Maternal and Neonatal Health
MDHS:	Malawi Demographic and Health Survey
MSTG:	Malawi Standard Treatment Guideline
TDHO:	Thyolo District Health Office
OPD:	Out Patient Department
POCs:	Polycystic Ovarian Syndrome
QECH:	Queen Elizabeth Central Hospital
RH:	Reproductive Health
SD:	Standard Deviation
SRH:	Sexual and Reproductive Health
SSA:	Sub-Saharan Africa
STIs:	Sexually Transmitted Infections
VMMC:	Voluntary Medical Male Circumcision
VDRL:	Venereal Disease Research Laboratory
WHO:	World Health Organisation

Chapter 1

Introduction and Background

Introduction

Infertility is given very low priority in most developing countries because it is expensive to treat and is mainly regarded as none life threatening (Akinloye Truter, 2011). Most of these countries are highly populated and have high fertility rate. As a result, decreasing fertility growth among the population is considered to be more important and cost effective than treating infertility (Okanofua, 2009; Ombelet, 2009). In addition, these countries have a heavy burden of life-threatening conditions like HIV/AIDS, maternal and neonatal mortality; and the scarcity of health resources, hence it is understandable for their governments not to prioritize infertility services (Inhorn and Birenbaum-Carmeli, 2008; Okanofua, 2009; Ombelet, 2009).

Infertility is a condition of the reproductive system which is defined as the inability to achieve clinical pregnancy after 12 months or more of regular unprotected sexual intercourse (WHO-ICMART, 2009). This failure to achieve pregnancy is categorized as follows i) primary infertility occurring in individuals or couples characterized by failure to achieve conception ii) secondary infertility occurring in individual or couple unable to achieve subsequent pregnancy after 12 months of regular

unprotected sexual intercourse (Mascarenhas, Cheung, Mathers & Stevens, 2012). In most instances both primary and secondary infertility is preventable and treatable.

However, unavailability of infertility preventive, investigative and treatment services in developing countries are known to aggravate the psychosocial problems that commonly accompany infertility (Ombelet, 2009). Such is the case as childlessness is associated with inadequacy and inability to fulfil ones sexual and reproductive obligations since children are considered very important in most societies (Donkor & Sandall, 2007; Donkor, 2008). Therefore, setting infertility as a low priority problem has contributed to limitations in availability and/or access to infertility treatment thus contributing to many psychosocial problems (Akinloye & Truter, 2011; Ombelet, Cooke, Dyer, Serour, & Devroey, 2008b).

In Malawi, infertility is considered one of the priority SRH components (SRH and Rights policy, 2009; Malawi SRH Strategy, 2006). However, very little has been documented on the problem and more so regarding its management in public health facilities in Malawi. This study therefore examined the management of infertility in the primary, secondary and tertiary levels of health service delivery in Thyolo District Health Office (TDHO) and Queen Elizabeth Central Hospital (QECH).

Background

The global prevalence of infertility is not well known. However, literature estimates it at 1.9-10.5 % of the total population of people between the age of 20 to 44 years old (Mascarenhas et al., 2012). Literature further indicates that there is a global disparity existing in the prevalence and causes of infertility between developed and

developing countries. Developed countries have lower prevalence of both primary and secondary infertility (0.5-1.1% and 5.9-8.6% respectively), compared to developing countries with the prevalence of 2.0-2.5% and 13.8-24.1% respectively (Mascarenhas et al., 2012). The major causes of infertility in the developed countries are related to ovulatory problems while reproductive infections, including sexually transmitted infections (STIs) and pregnancy related infections, are responsible in developing countries (WHO, 2012; Ombelet, 2011).

Significant advances have been made in the diagnosis and treatment of infertility in the past decades (Quaas & Dokras, 2008). Treatment of infertility has evolved over the decades from use of divine intervention in the biblical era, to discovery of oestrogen and progesterone in 1920s, to the first successful In Vitro Fertilization in the 1970s, then successful surrogate in 1985, and to a successful intracytoplasmic sperm injection in the 1990s (PRC TEAM, 2010). However, despite all the innovations that have been made, infertility treatment is not widely available or readily accessible to the majority of people that experience the problem (Dhont et al., 2010). This is due to the expensive cost of the treatment which is especially felt in poor settings with few resources (Dhont et al., 2010;Sharma et al., 2009). These developing countries are also faced with many competing health problems including HIV and AIDS, high fertility rates, severe malnutrition, and high infant, neonatal and maternal mortality. For instance in Malawi, the Maternal mortality ratio is estimated at 675/100 000 live births, neonatal mortality rate of 33/1000 per live births and high fertility rate of 5.7 births per individual, with primary infertility estimated at 2% (National Statistical Office & ICF Macro, 2011). Statistics like these make many developing countries, and their policy makers to perceive

infertility as an insignificant (low priority) health problem because it affects a minority of the population and because it is a condition that can never be construed as urgent since it is usually none life threatening (Bahamondes & Makuch, 2014; Hammarberg & Kirkman, 2013;Akinloye & Truter, 2011; Ombelet, Cooke, Dyer, Serour, & Devroey, 2008). In addition, some governments regard infertility as a natural way of controlling the population (Inhorn, 2008).

Despite being seen as a low priority problem by most developing governments, infertility is known to bring in many social, economic, relationship and psychological problems (Parrot, 2014;Patel, 2014). Social problems are aggravated by some customary law and cultures that have negative attitudes towards infertility hence contribute to discrimination against infertile individuals (Dyer & Patel, 2012). Some customary laws take away infertile people's right to security and land claims (Dhont et al., 2010) thus undermining their esteemed position in the society (Patel, 2014). Infertility is also associated with high expenditure in paying for services since most of the services are available in private facilities; this leaves most people to be economically vulnerable. Nahar and Ritchter, (2011) looks at how men and women in Bangladesh are denied jobs because they are infertile; this makes access to infertility services to be a challenge.

Furthermore, in most societies infertility brings about marital insecurity, risk of divorce, extramarital affairs and polygamous unions (Hollos, Larsen, & Obono, 2009; Nahar & Ritchter, 2011). A combination of losing your social standing in society, having no economic support and failed relationship, is known to contribute to numerous psychological problems. However, it has been noted that such problems affect women more than they affect men (Dyer & Patel, 2012; Hemmings, 2007; Parrott, 2014).

Women are mainly objectified since many cultures and societies perceive infertility as a female only problem and because many women depend on their husbands for financial support (Hemmings, 2007; Parrott, 2014). As a result, women are more vulnerable to economic, physical abuse and psychosocial problem (Hemmings, 2007). Even in cases were a marriage survives, a childless women are denied the right to inherit anything from their late husband's estate (Hollos et al., 2009).

Society usually associates infertility with being sexually and/or reproductively inadequate. This contributes to people going outside their marriage in order to prove their fertility thus contributing to increased occurrences of extra marital affairs, failed marriages and being in a polygamous union. In an effort to prove their fertility these individuals put themselves at risk of contracting and transmitting HIV (Okonofua & Obi, 2009).

Another common societal belief in Malawi is that adolescents and young adults should not use modern contraceptive methods (including condoms). It is believed that modern family planning methods affect a person's fertility later on in life. However, not using condoms increases the risk of contracting STIs (known to cause infertility) including HIV. STIs may cause infertility while treating HIV (a priority problem) infections may divert funding to treatment of infertility since resources will go to treating HIV/AIDS and its complications as it is a priority problem.

Additionally, reviews have shown that HIV and Highly Active Antiretroviral Therapy (HAART) drugs used in the treatment of HIV and AIDS are known to cause infertility (Nezar et al., 2009; Quaas & Dokras, 2008; Shaheem, Subhan, & Tahir, 2006). In men, HIV is known to reduce sperm quality (Apari, Dinis de Sousa, & Muller, 2014).

Some reviews suggest that Saquinavir, a type of HAART, is known to cause a 60% reduction in sperm motility, thus reducing the sperms likelihood of fertilizing the ova (Brezina, Yunus, & Zhao, 2012). Furthermore, it is estimated that 20 to 40 % of HIV positive couples have a higher risk of being infertile compared to HIV negative couples (Basu, Basu, & Ellison, 2010). This shows that HIV and its treatment contribute to infertility.

Some of the unsafe sexual practices highlighted earlier, for example, negative promotion on modern FP methods and extra marital affairs, are known to increase the occurrences of STI and unwanted pregnancies (especially in adolescents). These untreated STIs and unwanted pregnancy that led to unsafe abortions and pregnancy related infection are known to bring in complications such as tubular blockage which cause infertility. Infertility caused by tubular blockage is a type that is highly prevalent in developing countries (Apari et al., 2014; Macaluso et al., 2010; Wiesenfeld, Hillier, Meyn, Amorteguin, & Sweet, 2012). It is known to be responsible for most secondary infertilities. Furthermore, it is difficult and expensive to treat (Macaluso et al., 2010; Novy, Eschenbach, & Witkin, 2009; Ombelet et al., 2008b; Sharma et al., 2009; Widge & Cleland, 2009).

While infertility is a major problem in Africa, very little has been done at the programme and service delivery levels to address the problem. Reducing the burden of infertility in Africa would involve the implementation of several primary (community sensitisation on how STIs, pregnancy related infections and safe motherhood affect infertility), secondary (screening for STIs, TB and pregnancy related infections) and tertiary initiatives (actual treatment of the disease) (Okonofua & Obi, 2009). Therefore,

in order for this to be successful, training of health care providers, development and proper implementation of policies to govern such programs is paramount (Widge & Cleland, 2009). However, in areas where policies have been adopted or developed, a lot of irregularities are observed in the implementation of the policies in our health care settings. Problems in implementation of such policies are sometimes created during the policy development (planning) phase where policies are made to be over ambitious and are not in accordance to the country's ability to source resources so as to enforce implementation of the program (Palihawadana, Wijesinghe, & Senevirante, 2012).

Lack of commitment from the government is also another problem. Akinloye and Truter (2011) in Nigeria recommend the importance of government support in developing countries. He emphasizes that policy statements that guide infertility management should focus more on infertility preventive services over the expensive assisted reproductive technology. Furthermore, use of policies as a guide when implementing programs increases the chance of providing quality and uniform health care services (Dhont et al., 2010).

Finally, studies conducted in Malawi mainly focus on looking at treatment seeking behaviour, perception of infertility by people affected (De Kok, 2006; Hemmings, 2007; Parrott, 2014). Not many studies have been conducted to examine the quality of infertility services or how the framework that is stipulated in this nations guiding documents on how infertility it to be managed is implemented. This study, therefore, was set out to assess the type of infertility services provided at all levels of healthcare provision.

Problem statement

Following recommendations from the 1994 International Conference on Population and Development that was held in Cairo, Egypt, the Malawi government included infertility management in its national SRH and Rights Policy (2009), national Reproductive Health Strategy (2010), and syndromic management of STI guideline for service providers (2007). These documents act as frameworks for provision of infertility services at every level of the health service delivery system.

Despite the availability of these frameworks, infertility has received relatively less attention in academic and at program level. In academics very little research has been conducted and at program level there are no indicators in the Health Management Information System (HMIS) to capture data on infertility services. As such little is known about the nature of services provided to people with infertility in health care. Lack of attention to infertility in the country can partly be attributed to that fact that Malawi is faced with many competing priority RH problems. Some of these are more prevalent than infertility. Managing these competing heath problems overshadows the provision of infertility services in health care and as such infertility is neglected.

However, in availability of infertility services is known to aggravate social, economical and psychological problems that people with infertility face (Parrot, 2014). Lack of indicators may result in poor quality care as they are no means of monitoring. Therefore this study aimed to examine provision of infertility services by assessing HCP knowledge and practices on infertility management as well as clients' satisfaction with the services.

Justification of the study

The study examined the implementation of the infertility policy by determining the type of infertility management provided in primary, secondary and tertiary care levels with the aim of identifying the type of services provided at all levels of health service provision and determine the gaps that exist between the guidelines and the management of infertility at all levels of health service provision. The study results will serve as a learning point for nurses, clinicians, doctors and specialists, and based on its recommendations will aid in adoption of evidence based practices in infertility interventions. The study will also recommend measures to be adopted in order to reduce the gap between the guidelines and actual practice in infertility management. Finally, the results will contribute to the development of interventions to overcome barriers to delivery of infertility care thereby improving the standard of care.

Objectives

Broad objective

The aim of this study was to assess the type of infertility services provided in all levels of health service delivery in Thyolo district health office and Queen Elisabeth Central Hospital.

Specific objectives

I. Assess health care providers' knowledge in the provision of infertility management.
II. Assess health care providers' practice in the provision of infertility management.
III. Identify health care providers' barriers to the provision of infertility services.
IV. Assess client satisfaction levels with infertility services.

Chapter 2

Literature Review

Introduction

This chapter presents an analysis on literature that informs how infertility is managed in resource poor settings. This follows the fact that a wide disparity exists in the quality, availability and delivery of infertility management services between developed and developing countries (Nachtigall, 2006). However, due to limited studies on infertility management at all level of the health delivery (Primary, secondary and tertiary); this review focuses on management of infertility regardless of the level of service provision. A review of relevant literature puts into perspective what is known in the field of interest and identifies the gaps in knowledge that may be the focus areas for further research (Burns & Groove, 2011). It therefore helps put into perspective the problem at hand and provides a basis for discussion on current study findings (Polit & Beck, 2010).

Literature search was conducted using electronic databases such as Google, Google scholar, Hinari, Pub Med, and science direct. Articles from 2005 to 2016 were searched for literature relevant to this study. The search terms used were: infertility, infertility management, infertility AND health care providers, infertility AND resource poor countries, infertility AND Sub Saharan Africa STI AND infertility and finally health policies AND infertility.

The following sections present the reviewed literature as follows: infertility policy, causes of infertility, prevention of infertility, infertility education and counselling, screening and diagnosis of infertility, infertility treatment and finally work experience and how they influence service provision.

Infertility policy

Successful development and proper implementation of policies that govern infertility programs is paramount to reducing the burden of infertility. This involves the implementation of several initiatives at all levels of service provision and political willingness (Okonofua & Obi, 2009; Widge & Cleland, 2009). However, very little has been done at programme and service delivery levels to address infertility service provision. Lack of commitment from government is a common problem when it comes to dealing with infertility in resource poor settings (Widge & Cleland, 2009). Furthermore, there are a lot of irregularities observed in the implementation of the policies in areas that have adopted or developed policies to guide infertility. Literature cites over ambitious plans (plans that are beyond a country's ability to afford) as the main contributing factor to failure to implement the programs (Palihawadana et al., 2012). Akinloye and Truter (2011) look at the need of policy statements in developing countries to focus more on infertility preventive services over the expensive assisted reproductive technology and the importance of government support.

Infertility management and prevention needs a collaborative effort from many sectors and agencies (Osman, 201; Macaluso et al., 2010); and the support of local policy makers for it to work (Ombelet e al., 2014; Macaluso et al., 2010). Involvement of local policy makers would help develop reproductive health (RH) programs that would

effectively integrate infertility services into already existing RH services (Dyer, 2008). In addition, a collaboration of various sectors can help with development of materials that would inform both the community and health care providers.

Having international community support is also paramount in provision of infertility services in resource poor countries (Bonnet, 2014; Ombelet Cooke, Dyer, Serour, & Devroey, 2008). This is putting into consideration that most health services provided by resource poor countries are funded with aid from developed countries (Bonnet, 2014). However, critics look at treating infertility in resource poor countries as unjustifiable considering the numerous priority pressing issues versus the expensive infertility treatment options (Akinloye & Truter, 2011; Okonofua & Obi, 2009). Additionally, due to high fertility rates and over population in most resource poor countries, concentration diverts to promotion of modern family planning in efforts to reduce the fertility rate rather than towards treating infertility (WHO, 2010; Ombelet, 2009).

Furthermore, evidence shows that most resource poor countries lack protocols that guide infertility management (Dhont et al., 2010; Widge et al., 2009, Sharma et al., 2009). It is known that use of protocols as a guide when implementing programs increases the chance of providing quality and uniform health care services (Dhont et al., 2010: National Reproductive Health Strategy, 2011; Sharma et al., 2009). This helps with provision of standardized care, continuity of care, and ease monitoring and evaluation of the service provided.

At the 1994 International Conference on Population and Development (ICPD) held in Cairo Egypt, the Malawi government committed itself to providing

comprehensive Sexual and Reproductive Health (SRH). Following this commitment, Malawi, developed a national RH strategy (1999) that included infertility as one of its priority components. However, due to the other priority problems, the progress of implementing infertility services in Malawi has been significantly slow. It was furthermore included in the 2006 and 2009 RH policies and was strategized in the national RH strategy of 2011 to 2016 (2011).

Causes of infertility

Infertility causes can be categorised mainly into two groups: preventable causes such as infection of the reproductive tract and non-preventable causes such as anatomical anomalies, immunological (ovulatory problems) and genetic problems (WHO, 2012; Ombelet, 2011 & Sharma, 2009). Preventable causes are seen to be more prevalent in developing countries compared to developed countries (WHO, 2012& Ombelet, 2011) and are known to contribute to almost 85% of all cases of infertility in both sexes (Ombelet et al., 2008).

Reproductive tract infections (STIs, pregnancy related infections and pelvic tuberculosis) if left untreated or if ineffectively treated are known to cause scarring, which results into unilateral or bilateral tubular obstruction (Boivin et al., 2007& Widge & Cleland, 2009). This tubular obstruction is known to cause both primary and secondary infertility (Novy et al., 2009; Widge & Cleland, 2009; Ombelet et al., 2008a & Boivin, Bunting, Collins, & Nygren, 2007).

In sub Saharan Africa (SSA) and Asia, reproductive tract infections are known to be caused by STIs and upper genital tract infections (related to pregnancy) that consequently cause pelvic inflammatory diseases (PID) (Widge & Cleland, 2009&

Ombelet et al., 2008). Chlamydia, Trichomonas and Neisseria gonorrhoea are known to be leading causes of PIDs (Apari et al., 2014; Macaluso et al., 2010; Sharma et al., 2009 & Wiesenfeld et al., 2012) and attributes to 10 to 40% of all infertility (Apari et al., 2014). However, despite an increase in reporting of cases of acute PID in the hospital, evidence still shows no reduction in number of infertility cases, indicating that PIDs are still under reported and therefore undertreated (Wiesenfeld et al., 2012). Furthermore, infections are known to stay longer with no treatment since approximately 75% of women and 50 % of men with gonorrhoea and Chlamydia are asymptomatic (WHO, 2013). Therefore, there is need for routine screening for people in the reproductive age.

In men, the most common STIs that cause infertility are Trichomonas Vaginalis and Human Papiloma Virus (Apari et al., 2014) and HIV (Abdalla, 2011). These STIs are known to distort normal production, quality and function of sperm and as a result cause infertility (Ochsendorf, 2008). Trichomonas Vaginalis and Human Papiloma Virus are known to cause post inflammatory changes that are responsible for cell and/or organ damage that cause tubular obstruction similar to what happens in women (Apari et al., 2014). Additionally, some pathogens bind to the spermatozoa and distort the sperm form and/or its motility (Apari et al., 2014; Ochsendorf, 2008). Furthermore, progression of immunodeficiency due to HIV is also known to affect testicular function thus contributing to infertility (Apari et al., 2014).

Contrary to most SSA countries, Sudan records low cases of tubular obstruction infertility caused by STI in both males and females (Abdalla, 2011; Osman, 2011). A prolonged cohort study that run through 2008 to 2010 assessed the aetiology of infertility among males was held in 4 of 19 primary level health facility in central Sudan revealed

no cases of STIs among the 200 men who participated in the study. This study concluded that there were no cases of infertility caused by tubular obstruction due to STIs (Abdalla, 2011). Similarly, there was a very low prevalence of treatable STIs among female clients (Osman, 2011), and this may be attributed to their religious beliefs, conservative culture and instability in the country (Abdalla, 2011; Osman, 2011; Almroth et al., 2005). However, unlike males who did not record infertility due to tubular obstruction, females registered infertility due to tubular obstruction but were as a result of female genital mutilation (FGM) of which Sudan has high rates of (Osman, 2011; Almroth et al.,2005). A hospital case control study in Sudan conducted among 99 women with primary infertility (after ruling out infertility caused by surgery, hormones or male factors) and 190 primigravida (control group) revealed that the anatomical extent of FGM contributed to the presence of infections in the upper reproductive system and/or scarring of the fallopian tubes in almost 48 of the 99women (Almroth, 2005). Thus providing evidence that there is a positive association between FGM and infertility (Osman, 2011; Almroth et al., 2005). Interestingly, Sri Lanka a country that does not report any cases of FGM, is also seen not to be affected by STIs but rather its infertility is due to abnormalities in sexual function and ovulatory dysfunction (Palihawadana, Wijesinghe, & Senevirante, 2012; UNICEF, 2012).

Literature has also shown that most pregnancy related sepsis are caused by complications of unsafe abortion (Sharma et al., 2009 & Ombelet et al., 2008). This according to a review article on management of infertility in low resource countries looks at complications of unsafe abortion to be more relevant to SSA where 97% of abortions are unsafe and between 20 to 30 % are associated with upper genital tract infection which

may later complicate to infertility (Sharma et al., 2009). This makes interventions to tackle unsafe abortion significant in prevention of infertility.

Other causes of infertility include systemic diseases such as pelvic Tuberculosis (TB), Mumps, Schistosomiasis and cancer (Management of STI using Syndromic Management Approach: Guidelines for Service Providers, 2007 & Shaheem, Subhan, & Tahir, 2006). Pelvic TB is known to cause infertility in both men and women; however, it is more prominent in women (Ilmer et al., 2010; Shahzard, 2012& Nezar et al., 2009). Pelvic TB accounts for 1% of all TB cases (Shahzard, 2012; Ilmer et al., 2010 & Nezar et al., 2009) and contributes to 2.43% of infertile cases in women (Nezar et al., 2009 & Shaheem et al., 2006). The syndromic management of STI providers' guideline (2007) cites that Malawi registers cases of Tubo ovarian and endometritis TB in women and Orchitis TB in men, though no statistics have been published. Evidence shows that pelvic TB has ability to cause tubular blockage as prolonged exposure to the infection causes scarring in the uterine tubules (Afzali et al., 2013; Shahzard, 2012; Nezar et al., 2009 & Shaheem et al., 2006). Furthermore, Pelvic TB is also known to cause tubo ovarian abscesses that interfere with fertility (Ilmer et al., 2010). The infection has an ability to remain asymptomatic in almost 40% of infected women thus increasing the risk of infertility in women (Ghosh, Mitra, & Choudhury, 2013). Therefore, when a person presents with infertility or amenorrhea, pelvic TB should be considered a possible diagnosis (Cookson et al., 2008). However, shortage of diagnostic facilities poses a challenge in early screening and diagnosis of pelvic TB.

Non preventable causes are responsible for 5 % of all infertilities and are more prevalent in developed countries than developing countries (Mascarenhas et al., 2012;

WHO, 2012 & Ombelet, 2011). Anatomical abnormalities are known to cause infertility in both male and female clients. In men, congenital abnormalities such as undescended testes and hypospadias are known causes of infertility as they affect the quality and delivery of the sperm, thus affecting its function (Abdalla, 2011). However, structural problems (blockage or damage in the reproductive organ), sexual problems (premature ejaculation) and genetic diseases (cystic fibrosis) are known as causes of infertility since they affect the delivery of sperm despite production of quality sperm. Female abnormalities such as uterine septum, arcuate uterus, and retroverted uterus are some of the abnormalities that cause infertility (Botwe, Bamfo-Quaicoe, Hunu, & Anim-Sampong, 2015).

Ovulatory dysfunction is a female related cause of infertility. It is caused by disruption in the functioning or levels of hormones such us follicle stimulating hormone, luteinizing hormone, progesterone, oestrogen and raised levels of testosterone (Ombelet, 2011). Ovulatory dysfunction can either be an ovulatory (a condition were a woman does not release a ripen egg monthly for fertilization to occur) or Oligo ovulatory (infrequent or irregular menstrual cycles) and both affect a persons' fertility (Denson, 2006). According to Palihawadana (2012), a majority (97%) of clients with polycystic ovarian syndrome (POS) had ovulatory dysfunction.

These days' ovulatory dysfunctions are seen to be on the rise. Literature cites life style changes such us late child bearing, obesity, rising cases of polycystic ovarian syndrome (POS) and increase in stress as leading cause of ovulatory dysfunction that lead to infertility (Palihawadana et al.,2012; Ombelet, 2011). Palihawadana et al, (2012) look

at most facilities' ability to test ovulatory dysfunction as a factor that makes these cases to seem to be on the rise.

Prevention of infertility

Categorizing health issues as priority problems in most resource poor countries contributes to most of these countries' inability to provide infertility management services to its people (Inhorn and Birenbaum-Carmeli, 2008; Okanofua, 2009 & Ombelet, 2009). This follows the assumption that infertility is non-life threatening and affects a minorities of people in these countries (Akinloye & Truter, 2011). The fact that infertility has a high price tag attached to its management services further contributes to most countries inability to provide these services (Akinloye & Truter, 2011). Therefore, various researchers recommend that the best hope of reducing the burden of infertility in resource poor countries is through addressing interventions that concentrate on prevention (Macaluso et al., 2010; Eschenbach, & Witkin 2009; Sharma et al., 2009; Widge & Cleland 2009& Ombelet et al 2008)

Preventable causes of infertility such as tubular obstruction caused by infertility can be prevented by: screening and effective treatment of STIs, prevention of unwanted pregnancies, promotion of safe obstetric practices and prevention of systemic diseases. Early detection and treatment of curable STI is important in the prevention of infertility (Sharma et al., 2009). Additionally, reducing the prevalence of these STIs by increasing the age of sexual debut in adolescents and promotion of use of preventive measures such as use of condoms can help reduce cases of STIs and hence reduce risk of infertility (Ombelet, 2012).

Unwanted pregnancies are known to increase the occurrences of unsafe abortions which in turn cause infection of the reproductive tract (Boivin, 2007). Reducing the number of unsafe abortions is therefore, another way of preventing infertility (Dhont et al., 2010; Makuch, Petta, Jose, Osis, & Bahamondes, 2010; Ombelet et al., 2008; Sharma et al., 2009;Widge & Cleland, 2009; Boivin et al., 2007) . One of the ways of reducing/eradicating unsafe abortions is making available safe abortion services. However in countries (for example Malawi) where abortions are illegal, legalizing abortions can help prevent infertility by increasing access to safe abortions services hence reducing the risk of reproductive tract infections. Additionally, sensitisation and strengthening of post abortion care and early detection of complications of abortions is key to reducing pregnancy related sepsis (Sharma et al., 2009; Penning et al., 2009).

The risk for infertility can be reduced by observing aseptic technique during obstetric procedures, when managing obstetric conditions, and early diagnosis and treatment of infections caused during labour and delivery (Widge et al., 2009). Unfortunately, only 71% of women deliver with the assistance of a skilled birth attendant and under some sort of hygienic conditions (NSO, 2017). This means that a good percentage of women still deliver under unsafe hygienic conditions which may predispose them to infection and later result in sepsis which may complicate to infertility.

Social habits such as bad eating habits and smoking are known to affect a persons' fertility. Therefore, healthy eating is another strategy that can be used to prevent infertility, particularly in cases where infertility has been associated with ovulatory problems (Macaluso et al., 2010; Chavarro, Rich-Edward, Rosner, & Willet, 2007). Being overweight is associated with risk of developing polycystic ovarian syndrome

(Macaluso et al., 2010), while modifying environmental factors such as prevention of cigarette smoking prevents infertility in both males and females. In females, smoking is associated with decrease fecundability (probability of conception in a month), ovulation dysfunction and early menopause. In men smoking is known to reduce ejaculatory volume, lower sperm density and worse sperm morphology (Macaluso et al., 2010).

Prevention, early detection and/or treatment of systemic diseases such as Pelvic TB is another intervention used in prevention of infertility (Ghosh, Mitra, & Choudhury, 2013). Routine screening for pelvic TB in clients with disturbed menstrual cycles, un-explained high or low grade fever, vaginal discharge, sudden weight loss, pelvic pain and infertility can result in early diagnosis and treating of pelvic TB that may result in prevention of infertility (Afzali, Ahmadi, & Akhbari, 2013;Ghosh et al., 2013). Clients that are asymptomatic but have unexplained infertility can also be routinely screened for pelvic TB. This can aid in early diagnosis and treatment of pelvic TB that may lead to improved chances of conception by limiting exposure to the infection (Cookson, Brachman, & Oladele, 2008). However, this may pose a challenge in asymptomatic patients. Pelvic TB is known to be the main cause of both primary and secondary infertility in India and Pakistan; however it is more prominent in primary infertility (Shahzard, 2012; Sharma et al., 2009).

Infertility screening

When screening for infertility three essential investigative services are crucial. These include: history taking, physical assessment and laboratory investigations (Osman, 2011; Macaluso et al., 2010; Okonofua & Obi, 2009; Ombelet et al., 2008; Denson, 2006; Frey & Patel, 2004). These screening services are mainly aimed at diagnosing the type of

infertility that eventually guides the HCP on the type of treatment the client is to receive (Sharma et al., 2009).

Evidence shows that a detailed history can help a HCP to isolate the cause of the problem that may point to relevant investigative service (Sharma et al, 2009; Frey & Patel, 2004). A detailed medical history should include all aspects in the client's life that are suspected to cause infertility (Esteves, Miyaoka, & Agarwal, 2011) and this includes: age of a client (Maheshwari, Hamilton, & Bhattacharya, 2008). Evidence shows that ascending age is known to cause age related infertility (Loh et al., 2014). This type of infertility affects both sexes though it is more pronounced in females. Asking for the age of a client is even more important now as many women are delaying child birth in pursuit of education and/or further career (Maheshwari et al., 2008). It is therefore recommended that if a person is failing to get pregnant investigations should be started after 12 months of trying to have a child but for female above the age of 35years, investigations can start within 6 months of trying (Kamel, 2010).

In order to attain accurate history, it is advisable that providers should pay attention to clients coming in as couples so that they should be interviewed both together as partners and then separately as individuals (Loh et al., 2014; Kamel, 2010). Interviewing couples separately after a session together bring to light issues that a client may not have been comfortable discussing with a HCP in the presence of the partner (Loh et al., 2014; Osman, 2011; Kamel, 2010).

Physical assessment is very important because if it is correctly done a HCP should be able to pinpoint the problem and should be able to come up with the right diagnosis

without having to conduct some investigative services (Loh et al., 2014). A comprehensive review of evidence based intervention in the management of infertility in couples recommends that a physical assessment in females should always include bimanual pelvic examination, Pap smear, genital cultures and fallopian tube patency (Kamel, 2010). This is aimed at identifying the aetiology of infertility. In males, appropriate sexual development should be assessed (Esteves et al., 2011). A HCP can look for a diminished body hair distribution or gynaecomastia that should make one suspect androgen deficiency, while a genital exam can surface issues like hypospadic urethral meatus, STIs and surgical scars that can cause infertility due to obstruction (Esteves et al., 2011).

Laboratory investigations are the tests that confirm what was suspected by the specialist. In men, investigation includes semen analysis whose results are tested against the WHO reference values (Parrot, 2014; Lampiao & Katengula, 2013) as follows: a semen volume of 1.5mls, a concentration of 15million/ml, progressive motility of 32% and a normal form of 4% (WHO, 2010). A combination of a thorough history taking and a semen analysis can determine if the cause of infertility is by a female or male factor (Lampiao & Katengeza, 2013). As a result, semen analysis has helped to remove the blame of infertility on women as the sole causes of the problem (Parrott, 2014). In a qualitative study held in Karonga a rural district in northern Malawi, results from the 14 male participant interviews revealed that investigations without proper treatment have led to stigma, poor relationship and divorce among men found with the problem (Parrott, 2014). Despite such risks however, men still find sufficient reasons for seeking biomedical care. However, some men look at this intervention as one that brings them

problems because even after the diagnosis the hospital does not have the capacity to treat their problem.

There are various investigative services that can be used in order to determine the aetiology of female infertility. Hormonal assay assesses availability of the key reproductive hormones such as follicle stimulating hormone (FSH), luteinizing hormone (LH), progesterone and oestrogen (Ombelet, 2011).

Infertility education and counselling

Evidence shows that fertility seeking behaviour, use of preventive measures and compliance to treatment is highly influenced by a person's understanding of fertility and infertility (Bunting et al., 2013; Chhabra et al., 2012; Nahar, 2010 & White, McQuillan, & Greil, 2006). A lack of information has been blamed for delays in treatment seeking. This information includes biological awareness of signs of ovulation such as a small rise in basal body temperature and cervical mucus consistency and appearance (Osman, 2011; Sharma et al., 2009). Therefore, it is believed that infertility education and counselling are two main important components in the management of infertility (Makuch, Petta, Jose, Osis, & Bahamondes 2010), with information on causes of infertility, preventive measures and treatment of infertility seen as vital (Dhont et al., 2010; Sharma et al., 2009; Ombelet et al., 2008). Educated individuals and couples can make timely decisions regarding when to seek treatment (Chhabra et al., 2012). Apart from influencing treatment seeking, fertility awareness equips clients with methods of enhancing conception (Penning et al., 2009; Sharma et al., 2009; Ombelet et al., 2008), hence help clients to time their sexual intercourse with their ovulation.

Additional education can include the importance of pacing the frequency of sexual intercourse to 2 to 3 days in a week in order to avoid the frustration that comes with targeting the day of ovulation (Dhont et al., 2010). Information on importance of timing of intercourse also comes in with the importance of raising hips after intercourse and avoidance of using saliva as a lubricant since it alters motility of the sperm (Loh et al., 2014). However, factors such as lack of formal education (knowledge) and cultural beliefs can negatively affect their reception of information that is given to them.

It is also advisable that HCP are equipped with information on infertility management in order for them to be able to integrate services, look out for signs of infertility and know when to refer clients to the next level of service delivery (Makuch, Petta, Jose, Osis, & Bahamondes, 2009; Penning et al., 2009; Sharma et al., 2009 and Ombelet et al., 2008). The providers should be able to consider factors such as; low literacy level, poverty, early sexual debut and risk behaviours in order for their education and counselling to be effective (Makuch et al., 2010; Chhabra et al., 2012).

Counselling is known to help in addressing psychosocial and emotional needs of infertile couples and individuals (Kamel, 2010). In low resource areas where fertility rate is high, diagnosis and treatment of infertility is not set as a priority despite the psychological and social effects that arise because of the condition (Makuch et al., 2009 and Sharma et al., 2009). It is therefore recommended that health facilities must be equipped with counselling services to support individuals and couples with infertility (Penning et al., 2009). Penning et al (2009) further recommends the importance of including infertility counselling and education in the government plans by policy makers.

In Malawi, education and counselling has been put as a strategy for management of infertility in the primary and secondary level of health service delivery. However, the tertiary level of health service delivery cannot work without education and counselling (National Reproductive Health Strategy, 2006). Therefore the need to assess the type of education and counselling that is given at each level of service delivery is paramount in knowing the type of information clients are given. Furthermore, in order to promote appropriate delivery of infertility messages, development of evidence based infertility treatment guidelines and integration of infertility treatment in other reproductive health programs and services should take a leading role in management of infertility (Penning et al., 2009; Sharma et al., 2009). This is more relevant to Malawi where there are no specific guidelines on detection and management of infertility.

Infertility treatment

Infertility treatment options depend on factors such as age of the affected person and the cause of infertility. Literature recommends urgency in treating infertility since progressive age is known to cause infertility in both males and females (Kamel, 2010) and this age related infertility is seen to be on the rise due to an increase habit of delayed child bearing since education and careers take centre stage (Palihawadana et al., 2012; Ombelet, 2011).

A combination of stimulation of ovulation and education on timing of sexual activity and biological signs of infertility is the most common treatment for infertility caused by ovulatory dysfunction (Inhorn, 2010). Ovulatory dysfunction occurring without history of genital infection is commonly treated with Clomiphene Citrate (CC). Clomiphene Citrate is used for induction or stimulation of the ovaries in order to facilitate

ovulation (Osman, 2011; Frey &; Macaluso et al., 2010; Sharma et al., 2009; Ombelet et al., 2008; Denson, 2006; Patel, 2004). Evidence shows that CC achieves ovulation in 50 to 70 % women and it is known to realize pregnancy per cycle in 15-25% of women (Sharma et al., 2009; Ombelet et al., 2008). Stimulation of ovaries with CC is usually combined with timed sexual intercourse. However, in cases where the woman's infertility is combined with male factors, cervical mucus problems or unexplained infertility, intrauterine insemination (IUI) can be used in combination with CC (Macaluso et al., 2010; Sharma et al., 2009). Further evidence shows that CC has a low risk of multiple pregnancies accounting for 6-8% compared to other drugs that are used to stimulate the ovaries (Macaluso et al., 2010). CC in the most common infertility treatment in resource poor countries. Malawi is known to use CC in its private facilities, while not much is known about the use of CC in government sponsored health facilities.

Furthermore, Assisted Reproductive Therapy (ART) is considered as the most effective and the best option in treatment of infertility caused by obstruction of the tubules and anatomical abnormalities (Sharma et al., 2009). However, it is considered highly expensive and time consuming for both people in developed and developing worlds (Bahamondes& Makuch, 2014; Kamel, 2010). It is known to have a high chance of multiple pregnancies compared to the use of Clomiphene Citrate and intra uterine insemination (IUI). Furthermore, the success of ART is dependent on the woman's age, cause of infertility, if the procedure will use frozen or fresh eggs or embryos (Ombelet, 2011). Nevertheless in developing countries there are very limited treatment options and they are known to be available only in private facilities (Barden-O'Fallon, 2005). Inhorn (2009) looks at the importance of developing ART that are more convenient for

developing countries in order to increase the chances of treating infertility. In Malawi, not much has been published on the type of advanced care that is provided in public and private health care facilities.

Special attention with antibiotic treatment should be given when treating conditions like genital tract infections such as prostatis and epididymitis (Denson, 2006). Additionally, men with abnormal semen analysis and a palpable varicocele should be referred to urologist for further tests and treatment (Denson, 2006; Frey & Patel, 2004), while men with oligospermia (a low sperm count of10million/ml) should be urgently referred to infertility specialist for aggressive treatment such as IUI and/or IVF at tertiary level (Ombelet et al., 2008; Denson, 2006; Frey & Patel, 2004). Since men are considered to be the common risk taker, life style modification should be emphasized. Unhealthy habits such us heavy use of alcohol, cigarettes and drugs, exposure to pesticides, supplementation of testosterone and use of steroids in body builders should be considered by HCP when treating male clients (CDC, 2013). Penning et al, (2009) looks at availability of semen analysis in Malawian hospitals, however he looks at how when a diagnosis has been made no further treatment is provided. Furthermore, Malawi's majority citizens are farmers' thus increasing likelihood of exposure to pesticides that may contribute to abnormal semen analyses.

Work experience in HCP and how they influence service provision

Literature shows that work experience is a pre requisite to becoming an expert in provision of health care services (Benner, 2011; Hill, 2010). Benner's 1984 nursing theory looks at 5 levels of experience that are known to affect practice. The level of experience starts with novice (a beginner with no experience) who needs to be told what

to do, this is followed by the advance beginner level (begins to formulate a guide to action) were HCP are seen to demonstrates an acceptable performance. The competent level is the third level (observed in people with 2 to 3 years of experience in the same field) where HCP are seen to have competent skill to provide services since they are able to observe a pattern on how interventions should be provided. Proficient level (achieved at 3 to 5 years experience) nurses exhibit pure understanding of the service provided holistically. While finally Expert (achieved 5 years or more) does not need a guide to determine action, action is highly proficient (Hill, 2010).

Summary

In conclusion, this chapter covered a review of management of infertility using relevant existing literature. This review revealed that many studies agree that infertility is a prevalent problem that is very expensive to manage despite most of its causes being preventable. The expensive nature of managing infertility has resulted in most low resource countries having limited infertility management services at health facility level. However, in places where infertility management is available, accessibility is very limited. Furthermore, this review uncovered that a more cost effective measure of treating infertility in low resource countries is through preventive intervention which includes screening and timely treatment of STI and all pregnancy related infection, screening for systemic disease that affects a person's fertility and finally, raising fertility awareness. An integrated approach of infertility management service into already existing RH services can also help in cutting down cost of infertility services

Chapter 3

Methodology

Introduction

This chapter looks at the strategies used to conduct this study. It therefore, gives a description of the study design, setting, population, inclusion and exclusion criteria, sampling method, sample size, data collection method, data management, data analysis, reliability, viability, trustworthiness and ethical considerations.

Study design

Research design provides a framework for the collection and analysis of data (Burns & Grove, 2012). This study deployed a cross section concurrent mixed method approach to assess the type of infertility services provided in the selected health care facilities and clients' satisfaction with services received. Both quantitative and qualitative methods were used. A cross section approach entails collecting data at a certain one point in time (Lavrakas, 2008) which the researcher thought was an ideal method due to the time constraint attached to this study. The mixed method approach was preferred because of its ability to answer the research questions from different perspectives (Creswell, 2008). A concurrent approach was preferred because it enabled the researcher to assess the service providers and conduct exit interviews with infertility clients almost at the same time.

Study setting

A study setting refers to the place where data is collected (Polit & Beck, 2008). This study was conducted in Thyolo district and Blantyre city in the Southern Region of Malawi. Thyolo shares boundaries with Chiradzulu to the north, Blantyre to the North West, Mulanje to the east, Chikhwawa to the west, Nsanje to the South and an international boundary with Mozambique to the south east. Thyolo District was selected because it has high rates of STI and early pregnancies (NSO, 2017), additionally, the Thyolo District Health Management Information System (HMIS) shows a high proportion of STIs among males (38%) and non pregnant women (56%) in the data collected in the 2014/15 financial year. These are known to contribute to reproductive infections which in turn increase the prevalence of infertility (Novy et al., 2009 &Boivin et al., 2007). Fifteen Health Centers in Thyolo district were purposively selected based on their ability to provide the following RH services: STI and FP. However, data was collected only in 14 Health Centers because one of the health facilities was hard to reach during the rainy season as the road was impassable. The facility was not replaced because of bad road network in the remaining facilities. Blantyre was selected because of Queen Elizabeth Central Hospital (QECH), which is the tertiary level hospital

Quantitative methodology

Study population

The study population included all nurses, specialists, medical officers (Doctors), clinical officers and medical assistants working in the following clinics; STI, FP Voluntary Medical Male Circumcision (VMMC) and gynaecology ward in the participating health facilities.

Inclusion and exclusion criteria

Inclusion criteria

The study included all willing health care providers who at the time of this study were allocated in the following clinics: STI, FP, VMMC, Gynaecology and Gynae ward. And all health facilities that provide the following outpatient department services: STI and Family planning in the primary health facility and gynaecology and VMMC in secondary and tertiary levels.

Exclusion criteria

All health care providers who at the time of the study were not allocated at the STI, FP, VMMC and Gynaecology clinic were excluded from the study. In addition all primary health facilities which do not provide STI and FP services were excluded.

Sampling strategy

The investigator purposively used a total population sampling strategy to select all Health Care Providers (HCP) from the selected health centers, district hospital, Malamulo mission hospital and QECH allocated to the STI, FP, VMMC and gynaecology clinics and gynaecology ward to participate in the study. A total population was selected because the population of HCPs working in the respective departments was small (Lund, 2012).

Sample size

Health facilities

The study planned to include 15 primary level health facilities offering both family planning and STI services, however, a total of 14 government, mission and estate owned clinics were purposively selected for the study. The total of 14 out of 26

(excluding the district and Malamulo mission hospitals) represented more than 50% of all health centers in Thyolo district. Table 3.1 shows all health facilities included in the study, their level of service provision and residence. The investigator failed to go to Mitengo (mission) HC because of its bad terrain which was made impassable due to rains since it was the rainy season. Thyolo district hospital and Malamulo mission hospital were assessed as the secondary level health facilities while QECH was assessed as the tertiary level facility. All the above selected health facilities provide RH services in their Out Patient Department such as STI and FP clinics. While QECH also included the gynae clinic conducted on Tuesday and Thursday.

Table 3.1:

Characteristics of the health facilities by level, residence and ownership

	Level of health facility			**Residence**			**Management**		
Facility	Primary	Secondary	Tertiary	Rural	Semi urban	Urban	Government	CHAM	Estate
Bvumbwe HC	**X**			**X**			**x**		
Makungwa HC	**X**			**X**			**x**		
Mangunda HC	**X**			**X**			**x**		
Khonjeni HC	**X**			**X**			**x**		
Chingazi HC	**X**			**X**				**X**	
Chimaliro HC	**X**			**X**			**x**		
Chisoka HC	**X**			**X**			**x**		
Mikolongwe HC	**X**			**X**			**x**		
Chimvuu HC	**X**			**X**			**x**		
Thomas HC	**X**			**X**				**X**	
Makandi HC	**X**			**X**					**x**
Miyanga HC	**X**			**X**					**x**
Satemwa	**X**			**X**					**x**
Didi	**X**			**X**			**x**		

Mitengo	**X**			**X**				**X**	
Malamulo		**X**		**X**				**X**	
Thyolo district		**X**			**X**		**x**		
QECH			**x**			**x**	**x**		

Health care providers

Stanley Lemeshow formula was used to calculate sample size based on 50% of health care providers who had knowledge on how to manage/provide infertility services.

Sample size $\mathbf{n= Z^2 P (1-P)/e^2}$

Where **Z** is the standard normal variate with a level of confidence of this study, set at 95% confidence level, given as 1.96 from tables

P is the proportion of the population expressed as a decimal 0.5

E the margin of error for the study expressed as decimal, set at 5 % i.e 0.05

$n = 1.96^2$ X 0.5 (1-0.5)/ $(0.05)^2$

n = 3.8416 X0.5 (0.5)/.0025

n = 0.9604/0.0025

n =384.16

n= 385

Since the total number of HCPs working in the STI, FP, VMMC and gynaecology clinics was small (78 HCP) compared to the sample size calculated above, the investigator adjusted the sample by calculating the finite sample. This was done in order to know how many HCP to involve in the study. The formula below was used.

Finite sample: $\mathbf{na} = \frac{ur}{1+\frac{(ur-1)}{N}}$

Where ur = the calculated sample size in this case 385

N = the population of health care providers in this case 78

na = 385/(1+(384-1)/78)

na = 385/(1+(383/78)

na= 385/(1+ 4.91)

na=385/5.91

na= 64.97

Since the finite sample result was 64.97 which is a fraction, the sample was rounded up to 65 as fraction of a person cannot be interviewed. Since 65 is closer to 78 the investigator decided to interview and observe the total population of HCPs. As such, all HCP working in the STI, FP, VMMC and gynaecology clinics at the participating facilities were interviewed and observed offering a service to a client.

Data collection tools

Quantitative data collection used two tools (questionnaire and observation checklist) to collect data from HCPs. These tools were used concurrently.

Questionnaire

This tool was developed by the investigator with reference to the sexual and reproductive health and rights policy (2009), the 2011-2016 reproductive health strategy (2011), Management of STI using syndromic management approach, a guide for service providers (2007), The association of Malawian gynaecologist and obstetrician, the QECH gynae and obstetric manual (2015), Densons' Diagnosing and managing infertility (2006) and other documents by Loh et al 2014 and Frey et al, 2004. The questionnaire (Appendix IV) was divided into 3 sections. Section A was designed to collect HCP demographic characteristics such as sex, age, professional characteristics and years of work experience. Section B included questions on knowledge on infertility management catagorised in 5 sub sections of interest which were: Knowledge on infertility guideline, history taking, investigative studies, counselling and treatment. The last section, Section

C included questions that assessed HCP's barriers to provision of infertility services. The guide to the response was checking either 1 for yes or 0 for no.

In relation to the study objectives section B of the questionnaire answered the first specific objective on assessing HCP knowledge in provision of infertility services. While section C answered the third objective on identifying barriers to provision of infertility services.

Observation checklist

The checklist was developed by the investigator using the same documents used to develop the questionnaire. This tool (Appendix V) was used to observe HCP providing infertility services to infertility clients. This tool had one section with 5 sub-sections that had questions assessing practice on History taking, physical examination, investigative studies, counselling and treatment. The tools' guide was to tick 0 if the activity was not observed and 1 if the activity was observed. Identification numbers for this tool was similar to the ones on the questionnaire hence there was no need for demographic characteristics to be collected as they had already been captured in the first tool. This tool was used to answer the second objective on assessing HCP practice on infertility management.

Validity and Reliability of the study tools

Content validity

According to Polit & Beck (2008) face validity refers to whether the people that are in the field are able to see that the instrument measures what it is supposed to measure. The data collection tools (questionnaire and observation checklist) were both

seen by the two supervisors of this study who are vastly experienced in this field. The study tools were further edited by two independent specialists in the field of practice in order to assess face validity. Furthermore, the tool was pretested at Chiladzulu. This pretesting helped to refine the tool.

Reliability

To ensure the study results obtained were reliable, the questionnaire and observation check list were piloted. The pilot study was conducted at Chiradzulu District Health Office. During the pilot study the questionnaire and observation checklist were administered twice at different times (test-retest reliability). The test produced similar result from the two different tests conducted thus making the tools reliable and stable. After the pilot the investigator reviewed the questionnaire with two of the reproductive health expert in the field.

Data collection procedure for quantitative methods

This study was conducted from December 2015 to December 2016. Data was collected by the investigator between 24th January to 26th February 2016. The investigator reported to the Thyolo district hospital and started with a courtesy call to the District Health Officer who referred the investigator to the District Nursing Officer (DNO) for a data collection planning meeting. After meeting the DNO the team travelled to the health centers for data collection which started with the recruitment process. Process was repeated at QECH.

Recruitment process

Before data collection, the investigator met with the health centre and/ or department in- charge. The investigator explained the aim of the study to the in-charge and asked for permission to meet the HCP working in the following OPD clinics: FP, STI, VMMC and Gynaecology. The in charge introduced the investigator to the HCP in the department and the investigator explained the aim and process of the study to the HCPs. The investigator then approached each HCP separately, explained the purpose of the visit and offered them the information sheet (Appendix I) to read. The HCP was then given a chance to ask any questions and to seek clarification on any area. After responding to questions, the potential participant was then asked if they were willing to participate in the study .Those that were willing were asked to sign the consent form. The investigator approached 76 HCPs but 73 agreed to participate in the study. Three declined to participate because they were busy.

Data collection

After obtaining consent form the HCP and following the HCP to their clinics consultation room, data collection commenced. Quantitative data was collected in two parts.

Part 1: This involved direct observation of the providers practice using an observation checklist. The observation was aimed at assessing the type of infertility services provided in the health facility. The time taken for each observation depended on the HCP consultation time (on average it took 20 minutes). The investigator scored the HCP activity using the checklist. The checklist ranked the score on how the HCP is providing

the service, based on predefined set categories with 0 representing not observed and 1 representing observed.

Part 2: The second part of the data collection involved assessing HCP knowledge through an interview. The investigator used a questionnaire to assess the provider knowledge and the questionnaire was administered by the investigator. The interview followed the observation because the investigator had anticipated that some of the questions in the questionnaire may influence the providers practice. This meant that after the consultation was finished and the client was out of the consultation room the HCP was interviewed.

Data management and analysis

Data management

To ensure quality data the filled up checklist and questionnaires were immediately checked if they were completely filled and for accuracy of the response. The completed questionnaires and checklists were then kept locked in a cupboard until the data was entered into SPSS version 16.

Data analysis

Data from the questionnaire and checklist was analyzed using SPSS version 16. Descriptive statistics such as, mean and standard deviation were computed for the dataset. Results were summarized in frequency tables and graphs which included occurrences of the variables such as age, sex, cadre, education, level of health service delivery, knowledge, practice, barriers to provision and access of infertility services. Furthermore, the observation checklist was scored using a scale. Then the mean scores from each

variable on the checklist were calculated. Actual scores were compared to the standard of 80% (indicative of standard practice) adopted from the Infection Prevention and Reproductive health assessment tool.

Qualitative methodology

The qualitative method was selected for the exit interview in order to collect subjective responses on the clients real perception of the service compared to picking a bracketed response in a quantitative study (Shukla & Deb, 2017).

Study population

The study population included all willing clients who came to receive infertility services or were diagnosed with infertility at the health facility.

Inclusion and exclusion criteria

Inclusion criteria

All clients (male or female) and couples who came to receive infertility services or were diagnosed with infertility were deemed legible to participate in the study.

Exclusion criteria

All clients who at the time of the study visited the clinic for other RH problems were not included in the study.

Sampling strategy

Participants who met the inclusion criteria of the study were recruited using purposive sampling. A purposive sample in a non-probability sample selected based on the characteristics of population and objective of the study (Crossman, 2017). The investigator purposively selected infertility clients that accessed services on the day of the

study for exit interviews. Clients who accessed these services were deemed appropriate for a study assessing clients' satisfaction with infertility services. Since the selected participants were seen to be the best to help understand our phenomenon.

Sample size

In qualitative studies sample size is usually determined based on information needs and its guiding principle is that sample size is sufficient when data reach saturation (Polit, 2008). Creswell (2013) recommends a sample between 5 to 25 participants as adequate for data saturation. This study set out to interview 17 participants, one from each health facility (male/female or couple). However to reach data saturation, extra 10 participants (2 from TDH and 8 from QECH) were interviewed to make a total of 27 participants. The 27 comprised of 7 males and 20 females.

Data collection tool

Interview guide

This tool (appendix VI) translated in Chichewa (Appendix VII) was developed and translated by the investigator based on literature and objective of the study. This tool had 2 sections, section A used to assess infertility clients demographic characteristics such as age, marital status, number of children and clients education level. While the section B assessed clients satisfaction with infertility services provided by the HCP. In relation to the study objective this tool was used to answer objective 4 on assessing clients' satisfaction with infertility services.

Data collection

Recruitment process of qualitative participants

Participants for exit interviews were recruited through referral from HCPs who had offered the service. The HCPs invited the client to participate in the exit interview after briefly explaining the study to the client. Emphasis was placed on the fact that participation was voluntary and that clients were free to deny participating in the study without compromising the care they will receive at the facility. This was done at the end of the consultation. Clients who accepted to participate in the study were then referred to the investigator. The investigator then met the clients in a private room where details of the study aim and the participant information section of the informed consent form was read to the client. After explaining and clarifying all areas that potential participants needed clarification on, informed consent was obtained from the client.

Data collection

Exit interviews followed the HCP observation or interview. The participants were interviewed in a private room and all interviews were audio taped. After finishing data collection; the data collected was kept in a lockable cabinet in preparation for data analysis.

Trustworthiness of the Qualitative part of the study

The qualitative section used an interview guide. The data and results collected using this tool were trustworthy because they meet the criteria were credibility, dependability, conformability and transferability will be observed (Polit & Beck, 2010).

Credibility

Credibility relates to how faithful the study findings will be. This was achieved by making sure that all participants were not coerced to participate and that it only included participants that genuinely want to participate. This helped in promoting people to give honest answers. Furthermore, the investigator used a probing as a technique to get thorough and detailed information from the participant. Finally, data was collected in Chichewa and later translated into English in order to remove language as a barrier.

Dependability

Dependability was achieved by specifying how study participants were selected this was attainable by understanding the method used.

Confirmability

Confirmability was achieved by audio taping the interview with a tape recorder so that the investigators interpretation can be supported with exactly what the participant actually said.

Transferability

Transferability is when study makes sure that data collected should have meaning to people in a similar situation. It looks at how the collected data can be applicable and meaningful. It provides sufficient descriptive data in the research report to ensure that anyone who wants to use it can evaluate the applicability of the data to other or similar contexts. In this study transferability was achieved by involving participants from different health facilities

Data management and analysis

Data management

Each in depth interview with the clients was audio taped. Notes were taken for any other observation done during the interview. The nature of the recording was assessed at the clinic by replaying the recording. The tape recorder was then stored in a lockable cupboard until the interview was transcribed, translated and analyzed. All the interview guides and the transcripts were identified with numbers and stored in a computer only assessed by the researcher and people directly involved in the research.

Data analysis

The qualitative data was transcribed (verbatim) and then translated from Chichewa into English by the researcher. These interviews were manually analysed using thematic content analysis. Thematic content analysis is a method of organising and integrating information according to emerging themes (Polit & Becks). The investigator read each transcript to have a picture of the collected data. Then the transcript was read sentence by sentence and the words/sentence that were related to this study were labelled and coded in order to recognize the similarities and differences that the data collected had. Similar codes were grouped together, from the group sub themes were categories. Significant statements from the themes were identified and triangulated into quantitative data.

Triangulation

Triangulations of 3 tools were used to increase reliability of the study findings. A questionnaire was used to assess participants knowledge, the observation check list was aimed at assessing participants' actual practice of provision of infertility services. This

was done in order to see if the participants' knowledge translated into practice. Finally, the exit interview was aimed to assess clients' satisfaction thus assessing if services provided were acceptable to the clients.

Ethical consideration

This study proposal was submitted to the University of Malawi, COMREC for ethical review and approval to conduct the study (Appendix XI). After receiving ethical approval (December, 2015) further permission was obtained from TDHO, Malamulo mission hospital research and ethics committees (Appendix X, XII) and from QECH director (Appendix VIII), all heads of departments and health centre in-charges before data was collected in any of the planned health facilities.

Consent forms (Appendix I, II and III) with two sections: section A which included participant information which briefly describes the research aim, objectives, participant selection process, expectation from both the participant and the investigator and benefits and risks of their participation in the study. Section B which asked the participant to sign or place a thumb print (for participants who are illiterate) as a sign of consent. Section A was given to the participant to read or was read to participant by the investigator. If the person was in agreement, the investigator then gave him/her section B to sign or put a thumb print on.

No coercion of any sort was used to recruit people for this study. Furthermore, participants were made aware that they were allowed to terminate their participation at any time should they feel the need to. In this study no one discontinued participation.

However, clients who were distressed were given time to collect themselves and then after the interview the investigator provided a counselling session if needed.

Codes were used in place of participants' name; this was done in order to promote anonymity hence avoiding tracing information back to the client. Confidentiality was observed by conducting the interview and observation in a private room with only those participating in the study present. The interview and the observation were not discussed outside the data collection room. Furthermore, data collected was stored in a lockable cabinet.

Summary

This chapter has discussed the methodology used to conduct this study. Data collection, data management, inclusion and exclusion criteria, data analysis and ethical consideration have also been discussed in this chapter.

Chapter 4

Presentation of Study findings

Introduction

This chapter presents study findings obtained from a study conducted to examine the management of infertility in the primary, secondary and tertiary levels of health service delivery. These results will be presented in two sections: Section A presents the Quantitative data results under the following four subsections i) Health Care Providers' (HCP) demographic characteristics ii) infertility management knowledge iii) infertility management practice iv) barriers to health service provision. Section B presents qualitative data results obtained from the clients' post service interview under the following subsections i) Clients demographic characteristics ii) health seeking behaviour iii)influencing factors to decision making iv) barriers to treatment seeking and v) clients satisfaction.

Section A: Quantitative study findings

Health Care Providers demographic characteristics

This study targeted a total population of 78 HCPs working at QECH, TDH and 14 Health Centres (HC) in Thyolo District. However, the investigator was only able to approach 76 HCPs because two HCPs were out of their duty station at the time of data collection. Out of the 76 approached only 73 HCPs gave consent to participate in the study thus giving it a response rate of 95%. Out of the total (N=73) interviewed; only 69

HCPs were observed providing infertility services since four did not have clients to provide the service to.

The respondents' ages ranged from 22 to 73years with a mean age of 39 years and Standard deviation of 14.96. The majority of participants were females (59%, n=43) and female (53.4%, n=39). More than a third of respondents (45.2%, n=33) had the lowest level of tertiary education qualification (certificate) and their work experience varied greatly. Table 4.1 presents the demographic characteristics of Health Care Providers (HCPs). These demographic characteristics play a part in understanding the determinants of the infertility management phenomenon**.**

Table 4.1:

Characteristics of Health Care Providers

Variable	Number of respondents (n)	Percentage (%)
Age in years		
15-24	6	8.2
25-34	**38**	**52.1**
35-44	6	8.2
45-54	4	5.5
>55	19	26.0
Sex		
Male	30	41
Female	43	59
Profession		
Doctor	7	9.6
Nurse	**39**	**53.4**
Clinical officer	10	13.7
Medical Assistant	17	23.3
Education Level		
Certificate	33	45.2
Diploma/Diploma RN	31	42.5
Bachelor's Degree	7	9.6
Masters Degree	2	2.7
Duration in the department		
>1year	25	34.2
1to 2 years	11	15.1
3 years or mores	**37**	**50.7**
Level of service delivery		
Primary level	**45**	**61.6**
Secondary level	14	19.2
Tertiary level	14	19.2

HCP knowledge of infertility management

This section will present HCPs' results on infertility management knowledge assessed using an investigator administered questionnaire (Appendix IX). Presentation of results will start with descriptive results on HCPs' knowledge on infertility management presented under the following headings: infertility guidelines, history taking, investigative services, counselling and treatment.

HCP knowledge on infertility guideline

The Majority (78.1%, n=57) of HCPs were not aware of any infertility guidelines while less than a third (21.9%, n=16) were knowledgeable. HCPs who were knowledgeable (21.9%, n=16) of infertility guidelines mentioned varied types of guidelines. Figure 4.1 shows the distribution of the type of guidelines that the knowledgeable respondents mentioned.

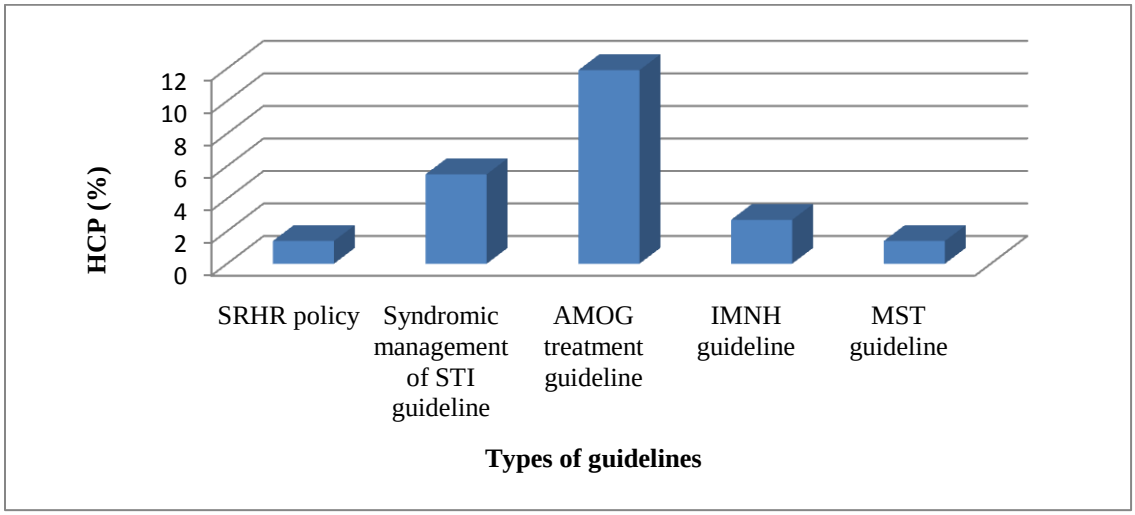

Figure 4.1: Distribution of Infertility Guidelines Mentioned by Respondent.

Knowledge on infertility history taking

In order to assess knowledge on infertility history taking, HCP were asked a series of questions. Table 4.2 shows distribution of HCP knowledge on history taking on a client with infertility.

Table 4.2:

HCP knowledge on history taking

	Knowledge	
Variable	Frequency (n)	%
Consults as partners then individuals	4	5.5
Schedules meeting with partner	22	30.1
Asked clients age	14	19.2
Review body systems/changes	0	0
Asks if any surgical problems	14	19.2
Reviews menstrual cycle	40	54.8
History of infertility treatment	56	76.7
Asks clients social history	10	13.7
Previous pregnancy	56	76.7
Ask medical history	54	74
Drugs history such as NSAID	10	13.7
Asks clients contraceptive history	37	50.7
Asks clients sexual frequency	20	27.4
Asks if any erectile dysfunction	1	1.4
Ask clients if any children	56	76.7

The HCP knowledge on history taking were scored and compared to the standard score of 80% (indicating best practice) which the study adopted from the Infection Prevention and Reproductive Health (IP/RH) assessment tool. The total questions asked for each HCP was scored out of 100%. On knowledge, HCP scores ranged from 0% to 73% with a mean score of 34.9% and a standard deviation (SD) of 1.06. All HCP scores were below the standard performance score of 80%. Figure 4.2 shows HCPs' knowledge on history taking.

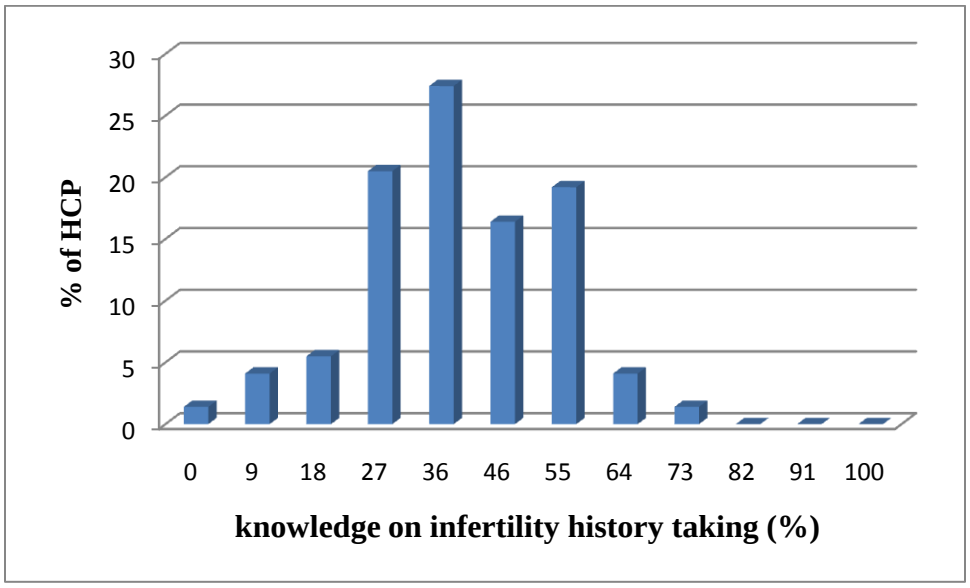

Figure 4. 2: Knowledge on Infertility History Taking

Knowledge on infertility investigative services

A series of questions were asked to assess whether HCP were knowledgeable of infertility investigative services provided in their health facilities. Individual question performance on this section showed that the majority 83.6% (n=61) were aware of VDRL as a primary laboratory investigative service that is provided to a client with infertility while HCP were least knowledgeable about conducting hormonal assay for women 4.1%

(n=3) and men 8.2% (n=6) as an investigation for infertility. Table 4.3 shows HCP distribution in percentage on their knowledge of infertility investigation.

Table 4.3:

HCP distribution of infertility investigative services knowledge

	Knowledge	
Variable	n	%
Blood group and rhesus factor	6	8.2
Full blood count (FBC)	6	8.2
Pelvic Ultra Sound Scanning (USS)	18	24.7
Hormonal Assay	5	6.8
Hysterosalpingography (HSG)	16	21.9
Endometrial biopsy	1	1.4
TB culture	0	0
Urinalysis	6	8.2
VDRL	61	83.6
HIV	47	63

Furthermore, the results showed that scores on knowledge on infertility investigative services ranged from 0% to 90% with a mean score of 26.2% and a SD of 1.81. Only one scored above 80% showing that only one was knowledgeable on infertility investigative services. Figure 4.3 shows distribution of HCP knowledge on infertility investigative services in percentages.

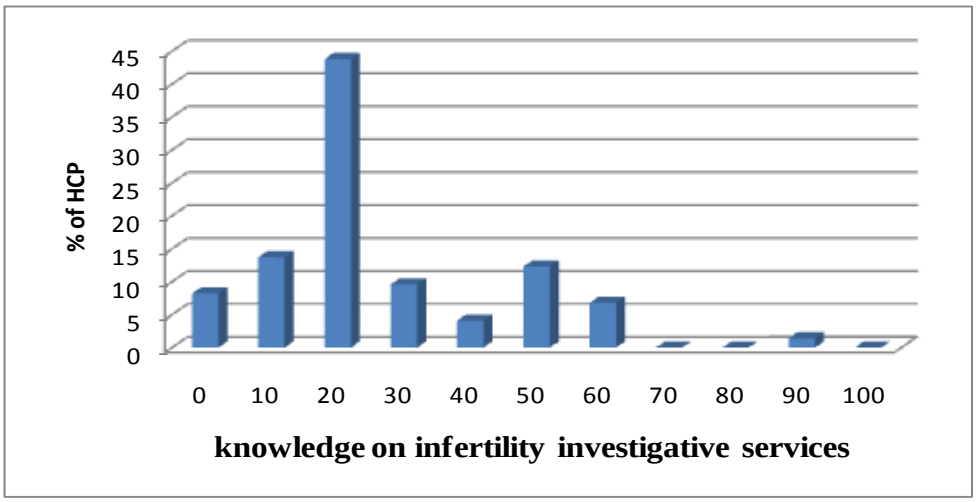

Figure 4. 3: HCP Knowledge on Infertility Investigative Services

HCP knowledge on infertility counselling

To assess HCPs' knowledge on counselling five questions were asked. Over half (56.2%, n=41) of the HCP knew that avoidance of stress prevents stress related infertility and 43.8% (n=32) mention the coinciding of sexual intercourse and ovulation as crucial education points in clients with infertility. Table 4.4 shows the distribution of HCP knowledge on infertility counselling.

Table 4.4:

Knowledge of infertility counselling

	Knowledge	
Variable	n	%
Timing of sexual intercourse coincide with ovulation	32	43.8
Advise on frequency of sexual intercourse	18	24.7
Modify social habits such as smoking/alcohol use	4	5.5
Advise on avoiding excess use of lubricant	2	2.7
Avoidance of stress and promotion of emotional	41	56.2

Additionally, HCPs' scores ranged from 0% to 80%with a mean score of 26%, and a SD of 0.92. Only one scored 80% indicating knowledge of infertility counselling. Figure 4.4 shows distribution of infertility counselling knowledge scores in percentages.

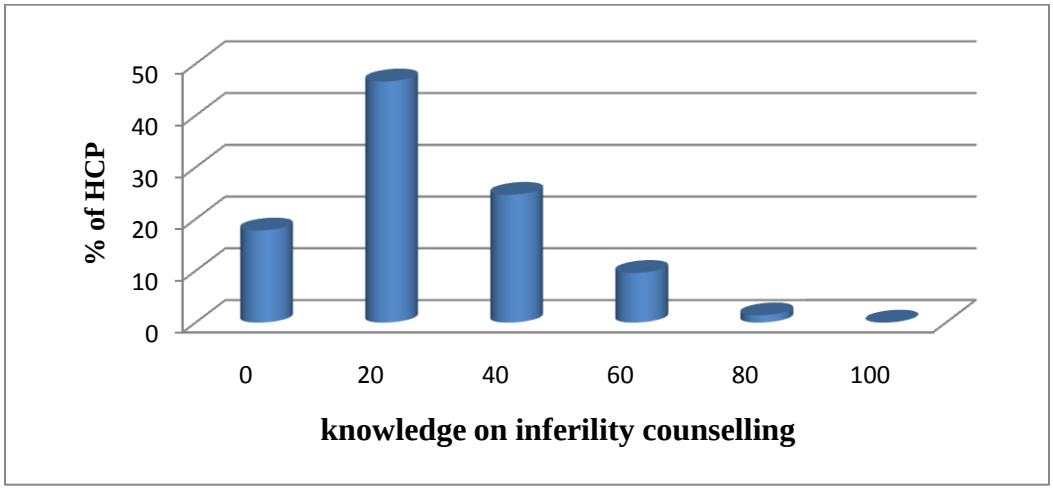

Figure 4.4:

HCP Knowledge on Infertility Counselling

Knowledge on treatment of infertility

HCPs' knowledge on infertility treatment was assessed by asking a total of 11questions. HCPs Knowledge is presented under the following known causes of infertility: Polycystic Ovarian Syndrome, tubal blockage and male factors. Table 4.5 show HCPs knowledge on infertility treatment.

Table 4.5:

HCP knowledge on infertility treatment

Variable	Knowledge	
	n	%
Treatment of polycystic ovary syndrome		
Preconceptual weight loss is a must	4	5.5
Life style modification i.e. cessation of smoking and alcohol use	2	2.7
Clomiphene citrate is the first line ovulation induction drug	3	4.1
Metformin should be used routinely with Clomiphene citrate	2	2.7
Treatment of tubal blockage		
Identify high risk women i.e. early sexual debut/promiscuity	10	13.7
Start with screening and treating Chlamydia	33	45.2
Management of other STIs should be priority.	43	58.9
Assessing tubal patency should be considered	10	13.7
Treatment of male infertility		
Semen analysis as a primary investigation	29	39.7
Cessation of smoking	1	1.4
Use of PDE 5 inhibitor for men with premature ejaculation	1	1.4

Furthermore, HCPs' individual scores on knowledge of infertility treatment ranged from 0% to 55% with a mean score of 17.18% and a SD of 1.36. None of the HCP

scored above 80%. Figure 4.5 shows distribution of HCP scores of knowledge on infertility treatment.

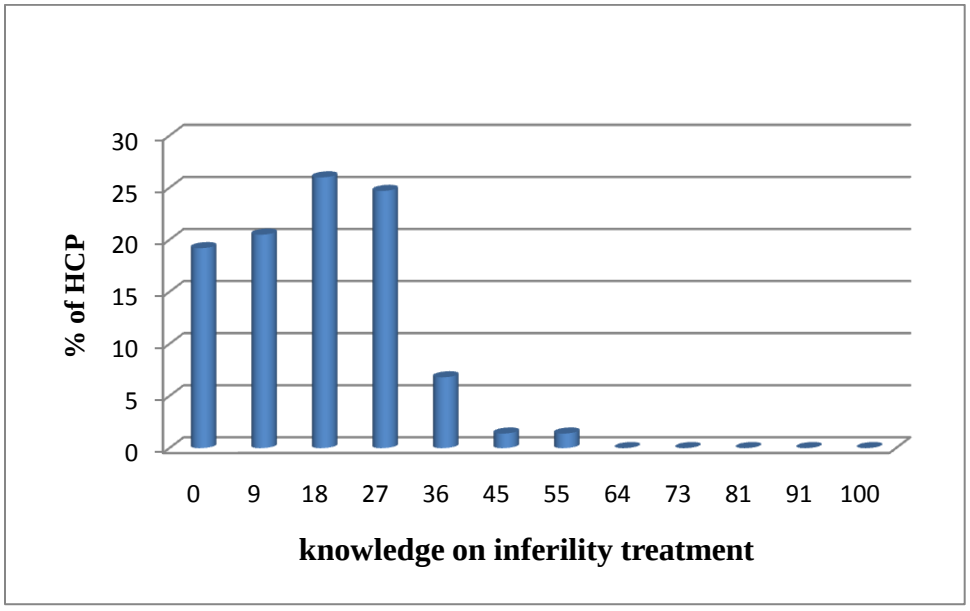

Figure 4.5: HCP knowledge on infertility Treatment

HCP practice of infertility management

Presentation of HCPs' results on infertility management practice assessed using an observation checklist (Appendix X) will be presented. A description of HCP practice on infertility management will be presented under the following headings: history taking, physical assessment, investigative services, counselling and treatment.

Practice on infertility history taking

In order to assess practice on infertility history taking, HCP practice was observed on several parameters. Table 4.6 shows distribution of HCP infertility history taking practice.

Table 4.6:

HCP practice on history taking

	Practice	
Variable	n	%
Consults as partners then individuals	4	5.8
Asks present complaint	69	100
Schedules meeting with partner	23	33.3
Review body systems/changes	5	7.2
Asks if any surgical problems	12	17.3
Reviews menstrual cycle	40	58
History of infertility treatment	29	34.8
Asks clients social history	4	5.8
Previous pregnancy	24	34.7
Ask medical history	45	65.2
Drugs history such as NSAID	10	14.5
Asks clients contraceptive history	40	58
Asks clients sexual frequency	28	34.8
Asks if any erectile dysfunction	6	8.7

The performance of HCP on history taking practice were scored and compared to the standard score of 80%. The total parameters observed score for each HCP was scored out of 100%. HCP practice on history taking scores ranged

from 7% to 60 % with a mean score of 31.53% and a SD of 1.92.Figure 4.6 shows HCP practice on infertility history taking.

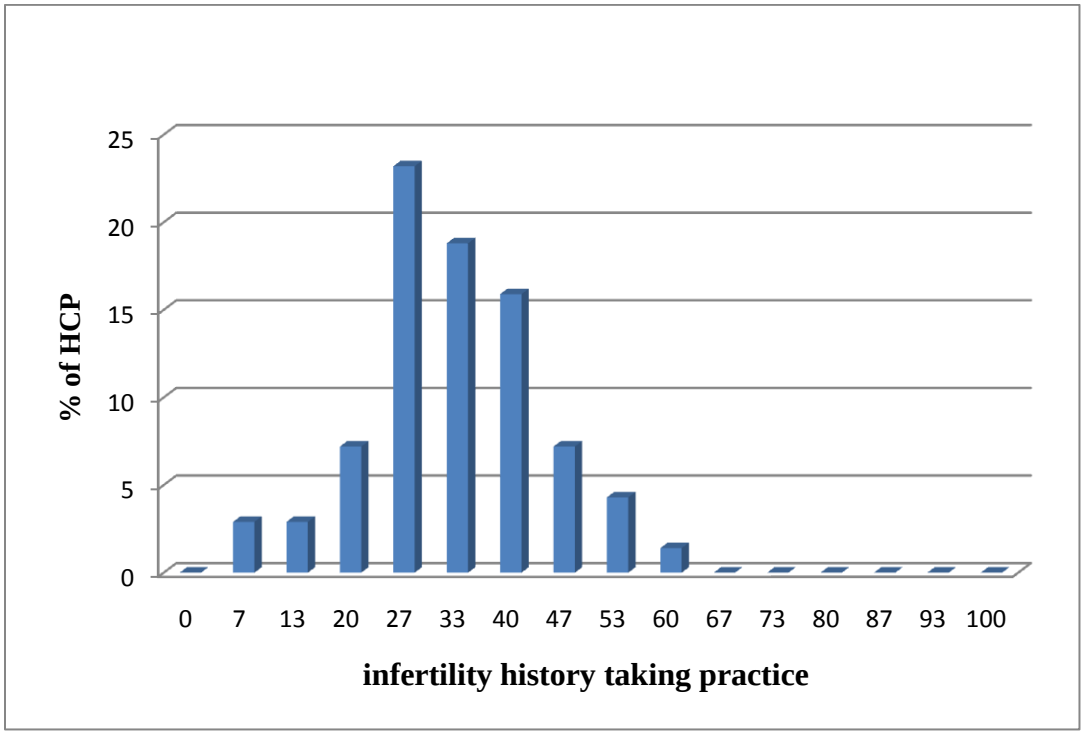

Figure 4. 6: HCP Practice on Infertility History Taking

Practice on infertility physical assessment

Only HCPs' practice on physical assessment was observed by the investigator. This was because, through observation, one is able to determine HCP knowledge and practice at once while asking questions on a questionnaire will give the HCP clues on what they are expected to assess. In this section, 10 areas were observed. Table 4.7 shows the percentage of HCP who were observed conducting a certain parameter.

Table 4.7:

HCP practice on physical assessment

Variable	Frequency(n)	%
Female physical assessments		
Assess weight, height and Body Mass Index (BMI)	9	13
General exam	3	4.3
Breast exam for galactorrhea	6	8.7
Pelvic exam	23	33.3
Abdominal exam for masses and/or surgical scars	29	42
Male physical assessments		
Abdominal exam	1	1.4
Secondary sex characteristic	2	2.9
Undescended testis	1	1.4%
Genital exam size and shape	1	1.4%
Breast exam for gynaecomastia	0	0%

This section, further presents scores attained from observing individual HCP on infertility physical assessment by comparing with the standard score of 80%. HCPs' scores ranged from 0% to 40 % with a mean score of 10.73% and a SD of 1.18. Figure 4.7 shows distribution of HCPs scores on physical assessment.

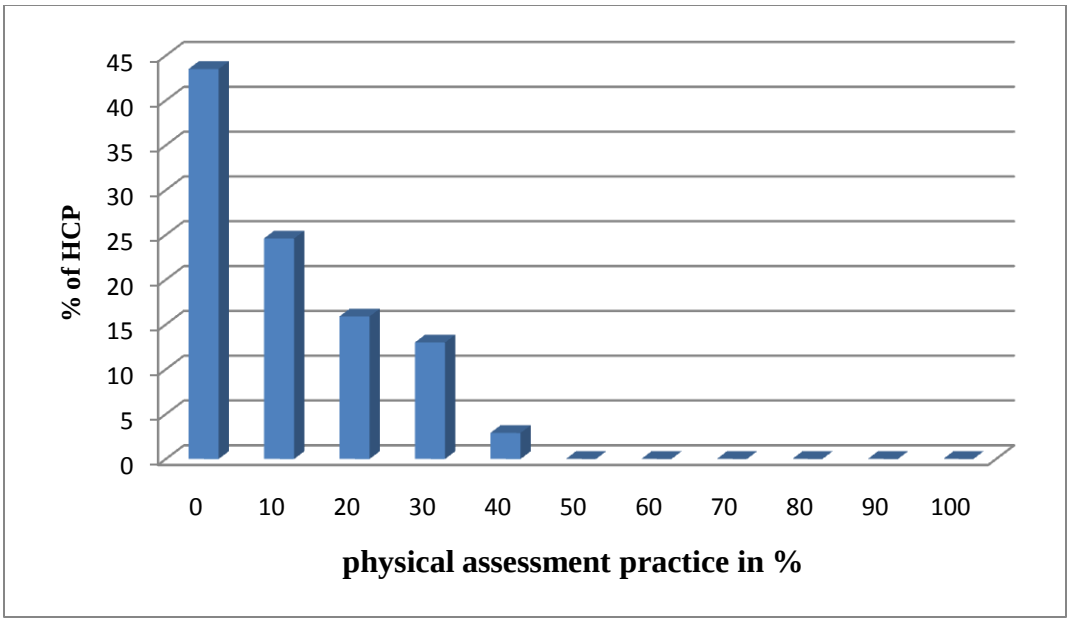

Figure 4.7: HCP Practice on Physical Assessment

Infertility investigative services practice

Individual question performance on this section showed that the majority 84.1% (n=58) of HCPs provided or ordered a VDRL test to assess clients for syphilis. More than a third (76.8%, n=53) offered an HIV test to the clients. These (VDRL and HIV) were the primary laboratory investigative service that is provided to infertile clients. While only one requested for a hormonal assay to be done for a female client.

Table 4.8:

HCP distribution of infertility investigative services practice

	Practice	
Variable	n	%
Blood group and rhesus factor	23	33.3
Full blood count (FBC)	18	26.1
Pelvic Ultra Sound Scanning (USS)	18	26.1
Hormonal Assay	1	1.4
Hysterosalpingography (HSG)	11	15.9
Endometrial biopsy	1	1.4
TB culture	0	0
Urinalysis	5	5.8
VDRL	58	84.1
HIV	53	76.8

Furthermore, the results showed that practice scores ranged from 0% to 70% with a mean score of 15.06% and a SD of 1.73. The total population (N=69) scored below the

standard of 80%. Figure 4.8 shows distribution of HCP practice on infertility investigative services.

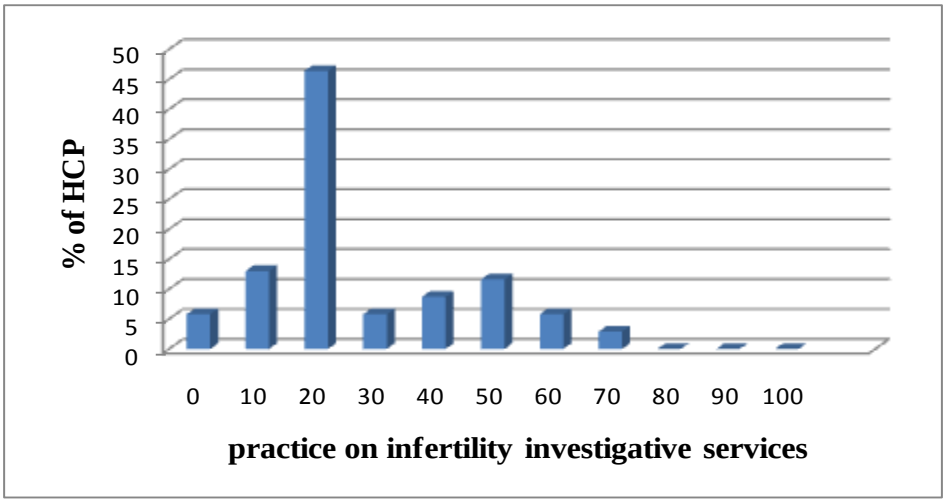

Figure 4.8: HCP Practice on Infertility Investigative Services

Practice on infertility counselling

Table 4.9 shows the distribution of HCP practice on infertility counselling. Four parameters were observed to assess the practice of infertility counselling and just as in the knowledge section, the majority (72.5%, n=50) gave emotional support to their clients, while only 14.5% (n=10) advise people on modification of social habits and 10.1% (n=7) advise on frequency of sexual intercourse.

Table 4.9:

Practice of infertility counselling

	Practice	
Variable	n	%
Timing of sexual intercourse coincide with ovulation	23	33.3
Advise on frequency of sexual intercourse	7	10.1
Modify social habits such as smoking/alcohol use	10	14.5
Advise on avoiding excess use of lubricant	*	
Avoidance of stress and promotion of emotional	50	72.5

***parameter not observed**

Figure 4.9 further shows distribution of HCP's scores on practice of infertility counselling. HCP's scores ranged from 0% to 75% with a mean score of 33.58% and a SD of 0.83. No HCP scored above the standard of 80%, to be deemed as practicing above standard.

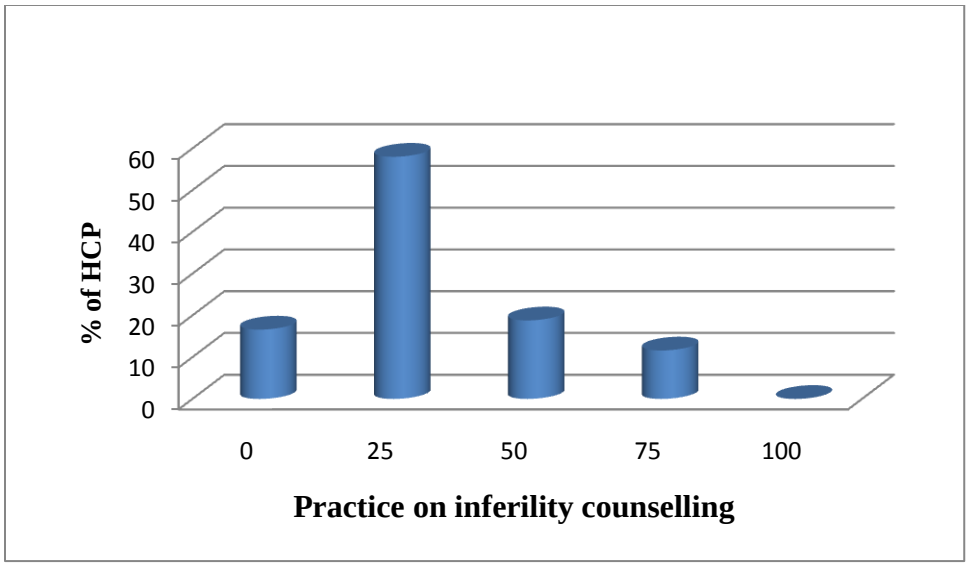

Figure 4.9: HCP Practice on Infertility Counselling

Practice on treatment of infertility

This section presents HCPs' distribution of practice on infertility treatment. A total of 7 parameters on practice were observed (Table 4.11).

Table 4.10: ***HCPs infertility treatment practice***

Variable	Practice	
	n	%
Treatment of polycystic ovary syndrome		
Preconceptual weight loss is a must	2	2.9
Life style modification i.e. cessation of smoking and alcohol use	2	2.9
Clomiphene citrate is the first line ovulation induction drug	*	*
Metformin should be used routinely with Clomiphene citrate	*	*
Treatment of tubal blockage		
Identify high risk women i.e. early sexual debut/promiscuity	*	*
Start with screening and treating Chlamydia	32	46.4
Management of other STIs should be priority.	32	46.4
Assessing tubal patency should be considered	11	15.9
Treatment of male infertility		
Semen analysis as a primary investigation	5	7.3
Cessation of smoking	1	1.4
Use of PDE 5 inhibitor for men with premature ejaculation	*	*
Refers client to next level	61	91.3

***service not observed due to unavailability.**

Furthermore, infertility treatment practice was assessed by comparing HCPs' score to the standard of 80%, meaning that in this section HCP needed to score at least 6 out of 7. HCP scores ranged from 0% to 100% with a mean score of 51.4% and a SD of 1.24 with only one scoring 7 (100%). Figure 4.10 shows HCPs' infertility treatment practice scores.

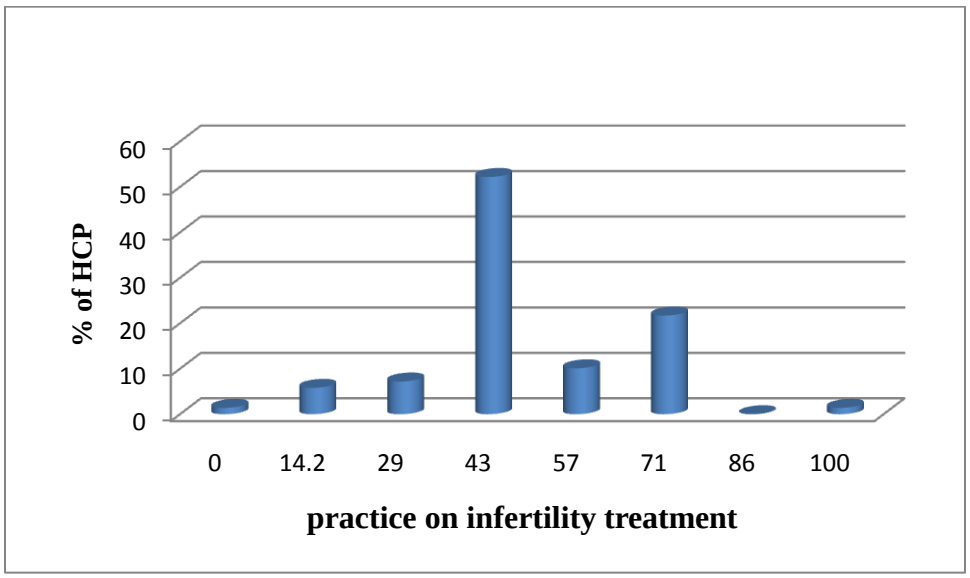

Figure 4. 10: HCP Practice on Infertility Treatment

Comparison of study findings among the three levels of service delivery.

This section summarises the HCPs' knowledge and practice on infertility management by comparing the mean scores (in percentages) among the level of service delivery. Mean scores in percentages for infertility management and practice were also compared among HCP cadres and years of work experience.

Comparing infertility knowledge by level of service delivery, cadre and work experience.

Overall, facilities across the levels of service delivery scored less than 80%. However, slight variations exist in the scores on knowledge of infertility management among HCP in the three levels of health service delivery with the primary level scoring the lowest on all parameters assessed. Figure 4.11 shows mean scores percentages comparing infertility management knowledge across the levels of health service delivery.

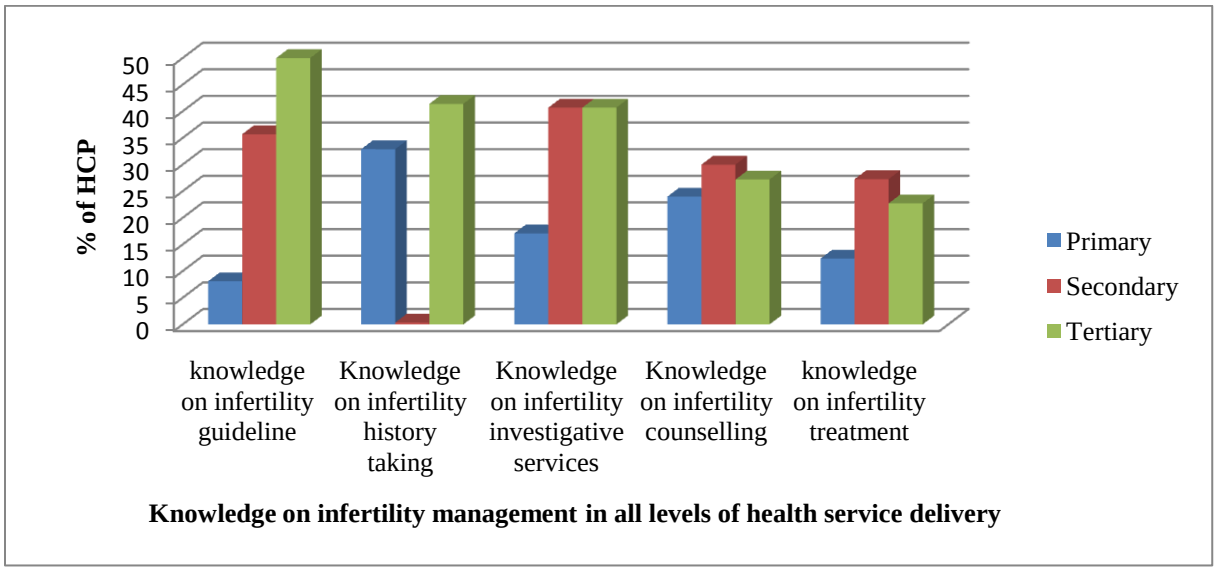

Figure 4. 11: Comparing Infertility Management Knowledge among Levels of Service Delivery

Knowledge on infertility management among cadres varied. Doctors scored higher than all cadres in all but one sections. However, Clinical Officers scored higher than doctors on counselling). Figure 4.12 compares mean score percentage on knowledge of infertility management among HCP by cadre.

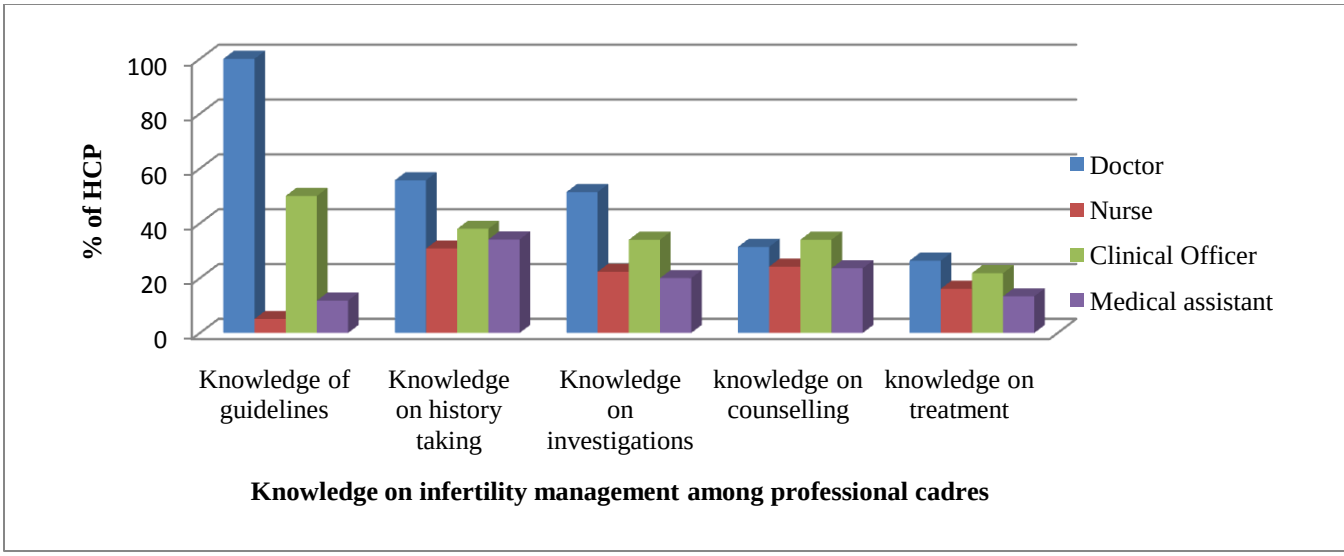

Figure 4. 12: Comparing Infertility Management Knowledge among Professional Cadre

Figure 4.13 shows mean score percentages comparing knowledge on infertility management among HCP with years of experience. Additionally, slight variations existed in the knowledge of infertility management among HCP with the number of years of work experience.

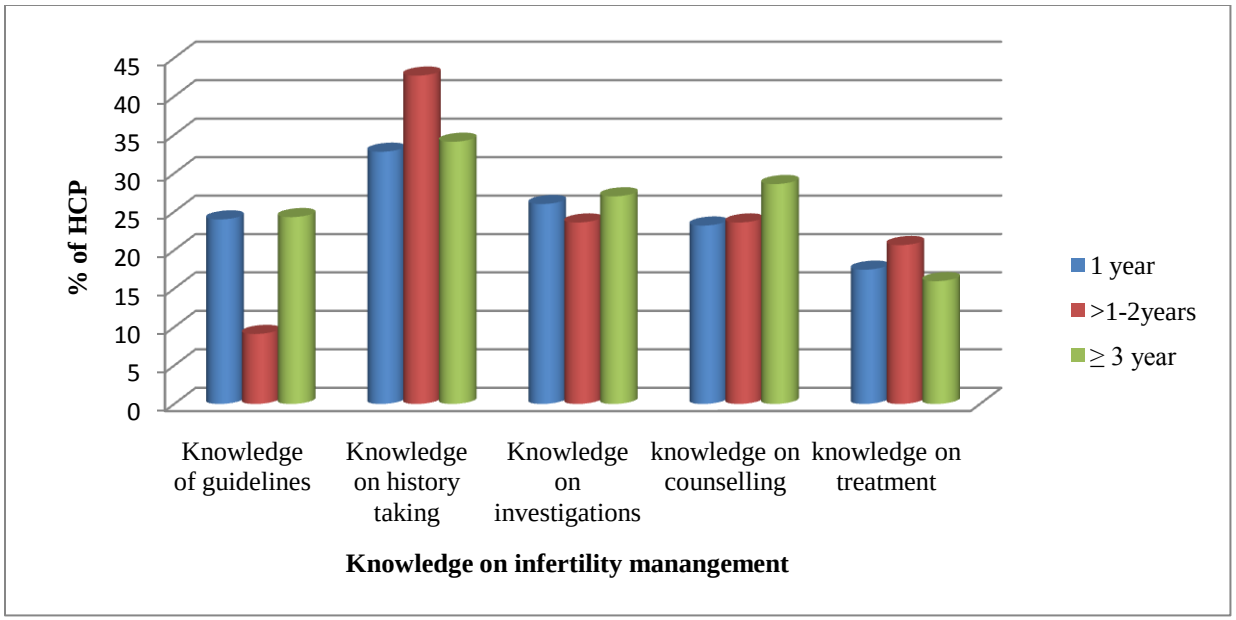

Figure 4. 13: Comparing Infertility Management Knowledge with Years of Experience

Comparing infertility management practice among health service levels and professional cadre

This section presents the findings on HCPs' practice on infertility management among the three levels of service provision. Scores for all levels were below the 80% determining score of best practice but still slight variations exist in the practice of infertility management with the primary level practice being higher than the rest. Figure 4.14 compares infertility management practice among HCP in the three levels of health service delivery.

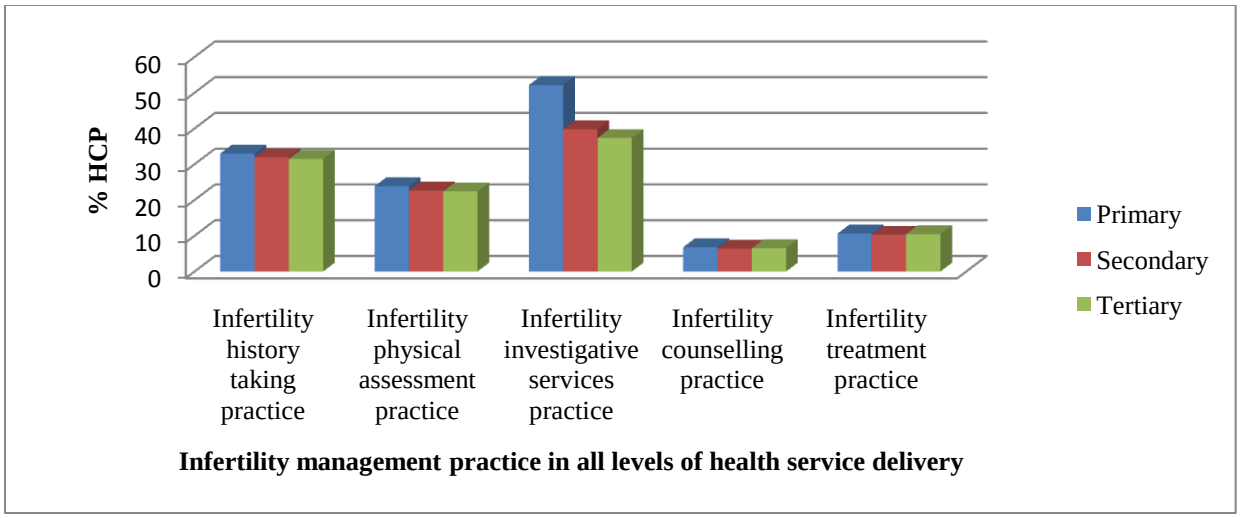

Figure 4.14: Comparing Infertility Management Practice among Health services

However, slight variations existed in the provision of infertility services among cadres, with nurses recording higher management scores than the other 3 cadres. Figure 4.15 compares HCPs infertility management practice among professional cadre.

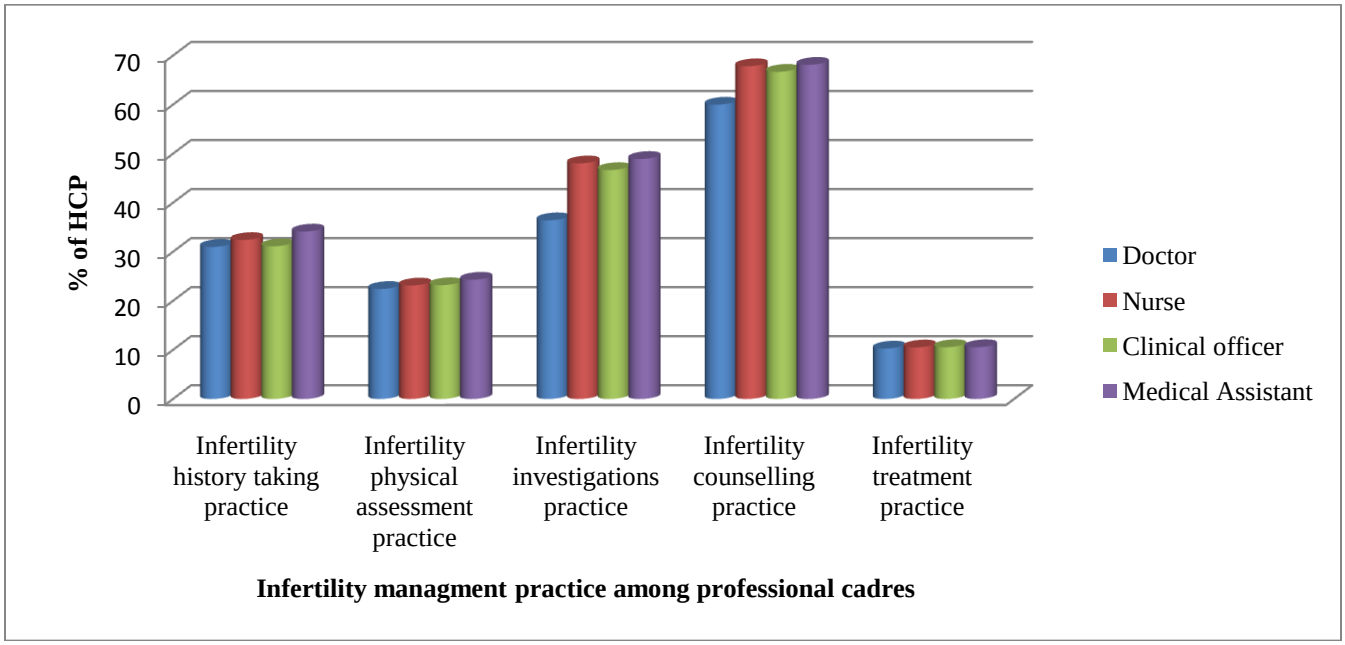

Figure 4.15: Comparing Infertility Management Practice among Professional Cadres

Barriers to provision of infertility services

This study investigated HCP barriers to provision of infertility services. Approximately half of the participants 45.2 % (n=33) cited lack of knowledge on infertility management as the main barrier to provision of infertility services. Table 4.7 below shows the distribution of the barriers. Almost a quarter of the participants 20.5% (n=15) choose others as their option. One mentioned low client turnout, another mentioned only women seeking services), one mentioned difficulties in handling men, recurrent STIs in clients was also mentioned by one HCP , HCP lack of effort to treat clients with HIV 2.7% (n=2), cancellation of nurses infertility clinic 2.7% (n=2), the expensive nature of some investigative services 5% (n=4), one mentioned lack of other services in health facilities and finally, lack of community sensitisation on infertility services 2.7% (n=2).

Table 4.11:

Barriers to provision of infertility health services

Barrier to provision of services	n	%
Lack of knowledge/confidence	33	45.2
Lack of appropriate supplies	19	26.0
It is time consuming	4	5.5
It is considered a low priority problem	1	1.4
Limitation due to level of service delivery	1	1.4
Low client turnout	1	1.4
Only women seek infertility services	1	1.4
Men are difficult clients to handle	1	1.4
Recurrent STIs	1	1.4
HCP neglect of infertile HIV positive clients	2	2.7
Cancellation of nurses infertility clinic	2	2.7
Expensive investigative services	4	5
Lack of infertility services	1	1.4
Lack of community sensitisation on infertility	2	2.7

Section B: Qualitative study findings

Clients post-service interview

This section will firstly present respondent's demographic characteristics and, later, report findings under the following themes: infertility treatment seeking behaviour, barriers to seeking treatment and clients' satisfaction.

Respondent's demographic characteristics

The post-service interview set out to interview one client per health facility, which came to a total of 16 respondents. However the investigator increased the number of clients interviewed as data collected from the 16 people had not reached saturation. As a result, the investigator interviewed 11 more clients making it a total of 27 respondents. The 27 respondents included 7 males and 20 females. Five of the interviews were couple interview while 17 were individual interviews. Respondent ages ranged from 25 to 55 years old with a mean of 37 and a standard deviation of 7.97.

Respondents interviewed were from primary (15), secondary (4) and tertiary (8) level health facilities. Most of them were Lomwe (18), Chewa (3), Ngoni (3), Mang'anja (2) and Nyungwi from Mozambique (1). The majority had secondary infertility (15) while 12 had primary infertility. Table 4.12 shows respondents' demographic characteristics.

Table 4.12.

Respondents' demographic characteristics

Variable	Number of participant (n)	Percentage (%)
Age in years		
25-34	13	48
35-44	11	41
≥ 45	3	11
Education		
None	3	11
Primary	13	48
Secondary	7	25
Tertiary	2	7
Marital status		
Married	23	86
Divorced	4	14
Occupation		
Own small business	10	37
Employed	5	19
Unemployed	12	44
Number of living children		
None	24	89
One	1	4
Three	2	7
History of STI and HIV		
Positive (STI)	13	48
Negative (STI)	14	52
Positive (HIV)	8	30
Negative (HIV)	12	45
Unknown (HIV)	7	25

Health seeking behaviour

Modern medicine is regarded as a last resort for clients with infertility after traditional medicine has failed. This study revealed that the majority of clients considered treatment from a health facility/ health care provider as a second or third option. None of

the clients considered modern/western medicine as a priority treatment option for their infertility problem.

In many cases, it took some of the clients more than 3 years to seek help from a health facility despite having started using treatment from traditional healers as early as six months into their marriage. Even when it was obvious that the treatment from the traditional healers was not working, they never thought modern medicine could be an option. Many cited lack of knowledge of availability of infertility services in health facilities as a contributing factor.

The following is a typical example:

> *"For as long as I can remember I have only heard that people with such problems seek help from traditional healers. I don't know anyone with infertility that has gone to the hospital for help and she has gotten pregnant* (Male, 45years old C004).

It is important to note that even those participants that were aware of availability of infertility services in health facilities did not immediately seek help from the facilities. They explained that culturally infertility is a problem for traditional healers and not for modern medicine. Others indicated that they opted for traditional medicine because they felt that they spent less time receiving treatment from traditional healers compared to health facilities.

Very few participants indicated that they went straight to the hospital for infertility treatment. It must be noted that at the hospital even these presented other related illnesses to health care practitioners and not the infertility problem itself. The

most common presentation as narrated by female participants included abnormal vaginal bleeding and/or abdominal pains. The infertility problem was discovered by the health care practitioners in the course of management.

Influencing factors to decision making

There were several factors that influenced clients' decision to seek infertility treatment from the health facility. Discussions with participating clients revealed that their decisions were motivated by the need to have a child and encouragement by others. Participants mention inability to conceive, being envious of their friends' children and/or being referred by a traditional healer as direct factors that motivated them to seek help. While other disease conditions such as abdominal pains, STIs or abnormal vaginal bleeding were considered as indirect factors.

The need to have a child stood out as the most compelling reason for seeking help in most narratives. However, some gender differences with regards to the motive for desiring a child was observed. Women were seen to want a child so that they can have someone to take care of them when they are older and are unable to take care of themselves. Most men on the other hand, wanted children in order to have someone that can inherit investments. Some of the men expressed worry that if they were to die without leaving any child, all their investments would be inherited by their wives and/or their wives families. Worst still if the wife remarries their property will be used by the next husband.

In the following excerpt, a female participant explains her motive for wanting to have a child:

"My parents were able to have two children of their own, I am the only one who survived, so I really want a child of my own to help me when I get old and cannot help myself." (Female 33 years old C001)

One of the male participants had this to say:

'I am in my second marriage and if I die my children will not be able to inherit my property because it is in my current wife's village. As a Lhomwe, when I get married I am supposed to settle in my wife's village by custom. This has forced me to want to have another child, so that my wife and her children should not inherit any of my investments' (Male 45 years old CH004).

Others reported that they decided to seek help because they were encouraged by other people who had or are undergoing similar problems. Pressure from spouses, family and community was another factor. Existence of other medical conditions motivated some to seek help. The duration it took to seek help depended on the severity of the problem. The majority of clients with secondary infertility but no living children were more motivated to decide to get treatment from HCP in health facilities after a short period of visiting a traditional healer. In addition, clients perceived failures of traditional healers and traditional medicine as a great influence to seeking help from the health facility.

Education seemed to play a part in the decision making process. The majority of male and female clients with a secondary and tertiary education perceived that traditional treatment lacked the ability to discover the real cause of infertility. They were disheartened by the increase in number of bogus traditional healers who use guess work

to treat people and point fingers and blame others. On the other hand, they were encouraged by health facilities which have the capacity to scientifically give you evidence on the cause of your infertility. This is how one participant narrated:

> "*The problem is that the traditional healer just thinks that this could be a problem. They said because I have small breasts then I should be responsible, while the doctor will do a lot of tests before saying anything"* (Couple/Female 25 years old Q009).

Barriers to seeking infertility treatment

The findings revealed various barriers that clients face when seeking infertility treatment in health facilities. These factors include: lack of knowledge on availability of infertility management services, religious beliefs, lack of spousal support, family influence and laziness.

Lack of knowledge on availability of infertility services in health facilities was cited as a barrier to seeking infertility treatment by a number of clients. In such cases, people's options were either to seek treatment from traditional healers or use of spiritual interventions.

Clients' religious beliefs were also seen as a barrier to the early seeking of infertility treatment at the health facilities. Clients who got married at a very young age were seen to mostly believe that prayer would help them receive healing from God's sovereign power. Hence it was common among this age group to go for fellowship prayers to ask God for a child. The husbands' belief system was also a major predictor of whether the woman would seek help from the other sources or from health facilities.

Women who were married to men who had strong faith in God reported that their spouses discouraged them from using traditional medicine since they believed that such medicine originates from the dark world. In spite of this, women still sought help from traditional healers.

A woman interviewed in one of the rural health centers complained that she was scolded by her husband because she went to a traditional healer. *"...I went to a traditional healer with my mother, when my husband heard of it he was very angry (Female 39 years old TH007)..."* However, this woman interpreted her husband's action as lack of emotional support.

The issue of lack of emotional support from husbands was raised by many women in the study and this was perceived to be another barrier to seeking infertility services. Furthermore, women who solely relied on their husbands for financial support cited lack of financial support from their spouses as a barrier to seeking modern infertility management services. They were of the impression that their husbands did not want them to get help either because they suspected themselves (the husband) to be responsible for the problem or because they already have enough children from a previous marriage or from another woman. However, some believed that their husbands failed to support them because of genuine financial reasons. This is what one client/participant said:

> *"I wanted to go but when I told my husband he told me that I had to wait for him to find money. But now with this hunger the little money he gets goes to food"* (Female 35 years old D004)

Transportation was another barrier. A woman who used an ambulance to travel to the district hospital failed to maintain her next appointment due to lack of transport. She could also not rely on the ambulance as it was not predictable as to when it goes to the district hospital.

This is what the participant said:

"*I could not go back to the clinic on the appointment date because the ambulance was not going to the district and we did not have money for the clinic*" (Female 55 years old D006).

Prolonged engagement with the health services was regarded as another barrier. Both male and female respondents explained that the process of infertility treatment is long. It takes more than three months of going to the health facility without getting any form of medication. To many, this was considered a barrier to receiving treatment because of delays and increased cost due to money spent on transport.

"*I was looking at getting medication to clean my body just like they do at the local doctors but this is taking a lot of my time with nothing to show for*" (Couple/male 28 years old M010).

Most of the visits one goes for are usually for investigative services where people don't get any medication to take at home. For this reason, participants especially women were worried that going home without any drugs raised suspicion to their husband who doubt if they had really gone to the health facility.

In addition, one woman believed that her chance of going to the hospital was reduced because she believed that she had been bewitched because she always planned to go to the hospital but could not take a step because of '*Chipha mtima*' (lack of urgency to do things that will help her). This belief reduced her chances of going to the hospital.

Clients' satisfaction

Clients were asked about satisfaction with the services that they had received for infertility. Study results revealed that there were variations in their satisfaction levels. This led to the emergence of three sub-themes which are: i) being fully satisfied ii) partially satisfied and iii) not satisfied.

Clients who were satisfied were as such because their expectations were met by HCP. Satisfaction was not dependent on the successful outcome of the infertility treatment but on the various types of other services they received at the facility such as STI treatment and medications for other presenting problems. Some participants understood that various levels of service provision had limitations with regards to the extent to which they can offer certain services. For these clients, they were satisfied as long as management was done at an expected level. Even though other clients complained that they were not given adequate information by the health care providers and they had waited for a very long period to receive the service, they still expressed satisfaction with the care they received. This was particularly attributed to some investigations that were done such as HIV, VDRL, abdominal ultra sound scanning, pregnancy test and cervical cancer screening.

This is what one participant had to say:

> *"I think I am mainly satisfied because I have been scanned and they have given me the pictures* (Female 39 years old Q019)."

Despite receiving various investigative services some participants were somehow dissatisfied with the services. They complained that the services took a long period to be conducted and, in addition, no medications were given to the clients to take home. In this group, some gender differences were also observed. For those participants who came as a couple, the females were almost always satisfied with the services whilst men expressed some reservations. In some cases, the men felt that the infertility treatment was gender biased. Many investigations were targeting the female than the male client. This is how one participant/client explained:

> *"All I wanted was for the nurse to focus on me and give me a body cleaner like they do at the traditional healer. All she did was examine my wife and asked me a few questions* (Couple/male 28 years old Q018)

Some participants felt that some of the investigative services were irrelevant:

> *"My wife was examined for cervical cancer, what does infertility have to do with cervical cancer?"* (Couple/male 32 years old QECH 007)

The last group of participants were the ones that expressed complete dissatisfaction with the services they received at the facility. These participants disclosed that they were not satisfied because the HCP only asked questions without conducting any physical assessment. This was a common concern among men. Others were

dissatisfied due to lack of proper explanation from the health care providers. They believed that at least HCP needed to explain the way forward even if all their tests come out negative.

Participants who reported to the health facilities without their spouse were disappointed because they were sent back without any treatment by the health workers. This was commonly expressed by participants at primary and tertiary levels. These sentiments were equally shared by both males and females.

This is what one participant said:

"I am not satisfied because when we came here last month I was returned home because I did not come with my husband since he was busy. That has delayed my process of getting help" (Female 28 years old Q016).

Summary

This results section has revealed that there is generalised lack of infertility management knowledge and practice among HCP in all levels of health service delivery. Among various reasons, lack of universal guidelines to guide the management of infertility contributes greatly to HCP lack of knowledge and provision of sub-standard services. Lack of knowledge and skills among HCP, lack of material resources and low reporting of clients to the clinic were some of the barriers to provision of infertility services. While the post-service interviews clients cited lack of awareness of availability of infertility services as the main reason it took them a long time to seek infertility services. Furthermore this study revealed that lack of knowledge, support, finances,

evidence of treatment, prolonged period of receiving medication and being bewitched were the main barriers to receiving infertility.

Chapter 5

Discussion

Introduction

This study aimed at assessing the type of infertility services provided in all levels of health service delivery. This chapter therefore, presents a discussion on how infertility is managed in primary, secondary and tertiary levels of health service delivery in relation to the reviewed literature. Demographic characteristics of Health Care Providers (HCP) (professional cadre, level of service provision, education and work experience) will be discussed in association with provision of infertility services. Additionally, clients' demographic characteristics (Age, gender, parity, education and marital status) will be discussed in relation to treatment seeking behaviour.

The discussion will focus on the following three specific study objectives: to assess HCP knowledge and practices in provision of infertility management; to identify HCP barriers to provision of infertility services and to assess client satisfaction with infertility services. Finally, this chapter will present a conclusion of the discussion, limitation and recommendations to the study.

Respondent demographic characteristics

The demographic characteristics of HCPs and clients are discussed separately as they are a different population of participants.

HCPs demographic characteristics

A HCP professional level of training has a bearing on one's knowledge and practice on infertility management. Level of training is expected to have a significant influence on the type of infertility services provided (Mosadeghrad, 2014). In this study, HCPs had varied levels of preparations as represented by the various professional cadres interviewed (Nurses, Doctors, Medical Assistant and Clinical Officers). However, nurses dominated at every level of health service delivery. Doctors were found at secondary and tertiary levels and were few. This finding may not be surprising as Malawi has the largest patient doctor ratio in sub-Sahara Africa (WHO, 2015). In addition, Malawi health sector has higher staff establishment requirement for nurses compared to all the other 3 professional cadres involved in the study (HSSP, 2011). Hence despite the persistent shortage of nursing staff, nurses still form the back bone of the health sector in Malawi (MoH, 2011).

All HCP were trained at a tertiary education level with the highest qualification being a Master's degree. However, close to half were trained at certificate level which is the lowest training qualification for HCPs in the country with most of them manning services at primary level. It was expected that HCP with a lower education level (medical assistants (MA) and some nurses) will be allocated in the primary level because primary level health facilities usually serve rural and hard to reach areas that provide only basic essential health services (Makaula et al., 2012); including basic infertility counselling services (The Malawi national RH strategy, 2011). Doctors and other HCP with Master's degree, who are expected to have expertise in this field, were mostly found at tertiary level hospital where they are expected to provide more specialised services (The national

RH policy, 2009). However, findings of this study revealed that there was no significant difference in the knowledge and practice of management of infertility among the cadres. This is except for all doctors who were knowledgeable of infertility treatment guidelines while the other cadres were not knowledgeable. This could be due to lack of universal infertility guidelines and educational programmes (pre and post service) that focus on infertility (Widge, 2009). Additionally, low turnout of clients (due to their lack of knowledge on availability of infertility services) reduced HCP ability to practice provision of these services. This study's findings are contrary to Widge (2009) findings in India where public primary level health facilities were manned by specialist (were as in Malawi they are manned by medical assistants and nurses) whose main problem was lack of infrastructure and ability to accommodate high turnout of clients.

Most HCPs had at least 3 years of work experience in the RH department that provides infertility services. The investigator expected that with 3 years work experience, the right training, and use of guidelines, HCPs should have the right knowledge and skills to manage infertility. According to Benner's from novice to expert nurses theory of the 1984 looks at nurses (in this study health care provider) who has 2 to 3 years of experience in the same field as having competent skill to provide services since they are able to observe a pattern on how things (Interventions) occur (Benner, 2011). After 3 to 5 years, a HCP moves to a more proficient stage where a HCP exhibit pure understanding of the service provided while expertise is achieved with 5 years or more experience (Hill, 2010). On the contrary, participating HCP in this study did not perform at the expected level of a competent HCP. This lack of competence could be attributed to low turnout of clients seeking infertility services in health facilities. Although many of them had at least

3 years of work experience, which is the period expected for one to develop competence in the field of practice, low turnout of clients may have affected their ability to form patterns as expected by Benner. Lack of guiding documents and supplies may have also contributed to this.

Clients demographic characteristics

In this study, post service interviews included clients between the ages of 25 to 50 years. Many fell within the reproductive age range of 15 to 49 years (WHO, 2013). It was expected that those seeking infertility services should be within the reproductive age range. This is because age is of significance as it has a direct bearing on a person's fertility (the higher the age the lower the rate of fertility) (Maheshwari, Hamilton, & Bhattacharya, 2008). In addition, it is expected that people below 35 years will seek treatment after a year of experiencing infertility while those above 35years will seek treatment as early as 6 months (Kamel 2010 & Denson, 2006). The study however, revealed that majority of clients started help seeking from the traditional healer in their first year of their union. However, many delayed in seeking infertility services from the health facilities. Participants in the study took a minimum of 3 years before they visited a health facility for infertility treatment. This shows that while many people realise that infertility needs urgency in its treatment biomedical care is not regarded as first line response for many (Maheshwari, Hamilton, & Bhattacharya., 2008). This is consistent with the findings of Parrott, (2014) in Karonga (rural Malawi) where many couples began visiting traditional healers for fertility problem a few months into marriage but took an average period of 3 years to visit a health facility for the same. These observations are supported by earlier sentiments shared by Barden O'Fallon (2005) who

observed that people in Africa wait significantly longer before seeking for infertility services from health care services.

The majority of the clients found in the participating health facilities were females. In all the cases except for two, females were initiates and their male partners followed as a requirement for their spouse's continuation of treatment. This is similar to findings in Rwanda where only 22% of males were the first to initiate seeking infertility treatment at the health facility (Dhont, 2010). One of the reasons that can explain this pattern is that both males and females regard infertility as a female only problem (Parrot, 2014; Dhont, 2010 & Hemming, 2007). Another reason is that infertility services were perceived to be biased towards female clients. Male participants of this study felt insignificant in the process when they accompanied their wives to seek infertility interventions. As such, fewer men would feel comfortable to patronise such services as noted by male clients of this study. The issue of biasness in the provision of infertility services was also raised by Arya & Dibb (2016) study in the UK whose male participants reported that they felt insignificant throughout the process of infertility treatment. They also observed that information giving targeted their spouses and not themselves.

The greatest motivator for many to seek help appeared to be the state of childlessness. This study revealed that most participants who sought help had no living children. This is consistent with observations of other authors who also reported that childlessness is another determining factor for people to seek help for fertility problems (Fisher & Hammarberg, 2012; Barden-O' Fallen, 2005). Similarly Donkor (2009) in Ghana and Dhont (2011) in Rwanda reported that having no living children was a leading motivator to treatment seeking. Dyer (2012) systematic review of 21 papers (that

included both males and females participants) looks at social and financial reasons as motivating factors to infertility help seeking especially in childless participants. However, in this study reasons for desiring to have children varied between the genders. For women, children were desirable for future financial and material support while men were looking for heirs to inherit their investments. This may be related to the dependence by many women in developing countries on their husbands for financial support and the children may eventually provide a safety net should the spouse be no longer available. In Rwanda, Dhont (2011) focus group discussions revealed that men refused to support their wives if infertility is suspected while others who were chased away from the matrimonial homes lost their right to utilisation of land and property as traditionally land belong to males and their family. They expressed fear of reaching old age without someone to help them. Dhont (2011) further looks at males not being motivated to work or start new projects because they have no one to work for.

Most of the clients interviewed had a primary school education. This is similar to Hemmings (2007) study in northern Malawi whose majority of participant also had at least a primary school education. The Malawi demographic health survey looks at education as an important determinant for health, and explains that the higher the education level, the lower the prevalence of disease, the higher the awareness of disease process and the higher the chance of seeking treatment from a trained health care facility (NSO, 2017). Hence it was expected that most of the participants in this study should have minimal understanding of the disease process and be less likely to seek treatment from a trained HCP. Literature shows that client's knowledge of RH issues influence their help seeking behaviour for services which eventually influences their health

outcome (Dyer, 2008). Majority of clients who participated in this study cited lack of knowledge on treatment options available in health facilities and/or manifesting factors that indicate infertility as a reason for their lack of urgency in treatment seeking. This concurs with Parrot (2014) who described knowledge as a motivating factor to help seeking and following the treatment options that increases positive outcome among infertile people in rural northern Malawi. However, in this study client's treatment seeking pattern was not dependent on client's education, all clients treatment seeking started with traditional healer then later the health facility.

Health care providers' knowledge and practice

Knowledge on infertility guidelines

This study revealed that knowledge of infertility guidelines was generally low among health care service providers but varied significantly across the various levels of service delivery with those at tertiary level possessing more knowledge compared to those at secondary and primary levels. This is consistent with the findings of another infertility study that was conducted in Aberdeen where usage of infertility guidelines was more pronounced at higher levels of service provision compared to primary health facilities (Morrison, Bhattacorya, Hamilton, Zempleton, & Smith , 2007). The investigator attributes the higher score of knowledgeable of infertility guidelines at the tertiary level to the presence of doctors who formed close to half of the participants at this level. The investigator is of the belief that since doctors have higher level of medical training compared to the other professional cadres in the study; they should have better knowledge and practice of the standard requirements.

The use of universal standard guidelines is encouraged, since having numerous guides is known to encourage HCPs to use different ways of managing infertility, hence creates difficulties in monitoring standard quality of treatment (National Reproductive Health Strategy, 2006). The use of universal guidelines also helps HCPs to provide uniform services thus helps with continuity of care and reduces client's concern of long waiting period when receiving infertility services. Sharma et al (2009) agrees with the National Reproductive Health Strategy (2006) recommendation that the principle of using universal guidelines is an effective way of improving management of infertility services. Similarly, a lack of specific infertility guidelines was blamed for lack of focused education and management in India (Widge, 2009). It is not surprising that the Reproductive Health Unit (RHU) of the Ministry of Health in Malawi was mandated to develop standard guidelines to be used as a guide in service delivery and training of infertility by 2008 (Malawi National Reproductive Health Strategy, 2006).

The question one may have is, does Malawi have specific guidelines to guide management of infertility. If not what are some of the reasons for this? Results of this study show that there are no universal guidelines dedicated to infertility management. Existing documents contain only a section that describes how infertility should be managed. Malawi as a low resource country with many competing priorities may lack resources to develop a dedicated program that deals with infertility that is similar to dedicated programs that deal with management of what are considered higher priority issues like HIV/AIDS and/or safe motherhood. Secondly, since health services are provided for free it may be difficult to include infertility as it is extremely expensive to manage (Parrot 2014). Finally, since most developing countries rely on aid from

developed countries to provide most health services, this aid does not include provision of infertility services. This is as a result of developed countries dismissive attitude towards infertility services in low resource countries that are already struggling to manage high fertility rate and over population (Bonnet, 2014).

In spite of the lack of dedicated infertility guidelines, the Malawi National SRHR Policy (2009) stipulates that random screening for infertility is available at the primary level while more advance diagnostic and treatment services are available at the tertiary level. However, despite having a SRHR policy and/or strategy that includes infertility management as one of its components, the study results show that there was universally lacking of infertility management knowledge and practice among HCPs in all levels of health service delivery. The question in most people's mind could be 'why is there a gap in HCPs practice when the SRHR policy clearly guides what should be made available at every level of health service delivery? Soko et al (2012) and Zurovac et al (2008) looks at Malawi as a country known for developing and/or adopting very good policies but struggles to implement them. This clearly points to the policy planning and implementation gap that has been highlighted by several authors in resource poor countries (Bahamondes & Makuch, 2014; Widge & Cleland, 2009).Among other reasons, the lack of translation of policies into guidelines and lack of financial support in the facilities that are intended to provide the service contribute to the gap.

Infertility screening and diagnosis

Infertility screening and diagnosis involves three assessments: history taking, physical assessment and investigative services. In order for HCPs to confirm the

diagnosis of infertility all three assessments need to be used. This study however, revealed that HCPs in all levels of health service delivery had low knowledge and practice in these three areas. In history taking for example, several parameters needed to be assessed but one crucial area that needed to be observed was how this history taking was to be conducted. It is recommended that when interviewing couples, HCPs should see couple together and then separately. This is key to effective screening and diagnosis of infertility as it helps to bring out issues that the other partner may not have been comfortable to discuss in the presence of the partner (Kamel, 2010). Lack of awareness on this aspect meant that the history collected from clients coming in as couples was not thorough as there was an increased likelihood that some aspects that could have easily helped with the diagnosis were not disclosed. This is particularly worrisome considering that most infertility cases in developing countries, Malawi inclusive, are a result of tubal blockage which in many cases is associated with reproductive tract infection whose aetiology was as a result of STIs and/ or unsafe abortions (Ombelet, 2014; National Reproductive Health Strategy, 2006) of which many are unwilling to disclose to their spouses.

Surprisingly there were no observed significant differences in the performance of health care workers across settings. This is contrary to earlier sentiments that there should be better performance among HCPs at tertiary and secondary level compared to the primary level because there are more specialised HCPs and clinics providing this service (The National Reproductive health strategy, 2006). In fact, the National SRHR policy (2009) expects basic intervention at the primary level (counselling and screening) while advanced services are expected to be provide at tertiary level. Performance on physical

assessment was universally low among all participating professional cadres with doctors being the lowest performers (Figure 4.15), and the scores were lower on the assessment of the male client (Figure 4.4). This resonated well with findings from the post service interviews where male clients complained that most assessments were targeted toward female clients. The low performance is a significant finding as physical assessment is considered very important since if correctly done can help to isolate the problem and come up with right diagnosis or plan for the right investigative service to confirm a suspected diagnosis (Loh et al., 2014). It can also help identify some findings uncovered by the HCP during history taking and can be used as a means of confirming some diagnosis without having to perform a test (Frey & Patel, 2004).

More than a quarter of HCPs who's physical assessment performance was low attributed their low performance to lack of appropriate equipment and supplies (Table 4.7). However, it can be argued that low performance on physical assessment was not due to unavailability of equipment, as some assessments required equipment and supplies that were readily available at all facilities for example weighing scale and Stadiometer (used to measure height) but both weight and height were not assessed. Failure to use this equipment could be as a result lack of knowledge on the relevance of weight, height and body max index to infertility and its treatment.

However, HCPs excelled in linking infertility to HIV infection and other treatable STIs such as syphilis and provision of HIV and a VDRL test. These medical investigations are important in people suspected of infertility as literature shows that men and women suspected of infertility are likely to be involved in unsafe extra marital affairs (Tabong & Adongo, 2012) leading to many being infected and affected with HIV and

other STIs (Tabong & Adongo, 2012; Nahar et al., 2011). HIV and its treatment is known to reduce the quality and motility of sperm in men (Nezar et al., 2009; Quaas & Dokras, 2008; Shaheem et al., 2006), while treatable STIs that are left untreated for a long time or are ineffectively treated are known to cause pelvic inflammatory disease that is known to cause tubular obstruction by scarring the tubules (Apari et al., 2014; Wiesenfeld et al 2012).Both the infertility caused by HIV and treatable STIs are a challenge to treat in resource poor settings (Ombelet, 2008). Furthermore, the effect of these extra marital affairs including polygamy increases the number of failed marriages which contributes to psychosocial issues that contribute to stress related fertility problems (Nahar et al., 2011; Ombelet, 2011 & Hallos et al., 2009) which further complicated treatment of infertility.

The study findings however are contrary to findings in Rwanda where there was very poor association (linkage) between infertility and STIs/HIV (Dhont et al., 2011). The researcher feels that HCPs in Malawi were likely to link infertility to HIV and other STIs than their Rwandan counterparts because the prevalence of HIV in Malawi is much higher compared to Rwanda (WHO, 2014). Furthermore, the STI guidelines in Malawi contain some aspects on infertility and how it is caused by STI including HIV and why it is important to screen everyone in the reproductive departments. As such, it was very likely that HCP would link infertility to STIs and HIV. In this study most clients had a history of STIs and a good number were HIV-positive.

The study revealed that HCP had no knowledge on the relationship between infertility and pelvic TB, although HCP had good level of knowledge on the link between, STIs, HIV and infertility. While Malawi is known to register cases of Pelvic

TB: Tubo ovarian TB and endometritis TB in women and Orchitis TB in men (syndromic management of STI manual, 2007), the lack of knowledge may be attributed to low caseloads as pelvic TB accounts for 1% of all causes of infertility (Shahzard, 2012; & Nezar et al., 2009). However, one would expect that HCP in Malawi would pay particular attention to screening for pelvic TB considering that the prevalence of TB in the country is high at 334/ 100 000 (WHO, 2014). Additionally, because the link of TB and infertility is also mentioned in the national SRH policy (2009) it would be assumed that HCP were able to link the two. How this was not the case as most HCPs were un aware of the national policy and most health facilities especially the primary level were not equipped to screen for Pelvic TB.

Another area of interest was on the use hysterosalpingography (HSG) to rule out infertility if suspected. HSG is regarded as an important infertility investigative method because tubal problems are prominent in infertility (Kamel, 2010). In this study however, only a small number of HCP were knowledgeable of HSG while even fewer practiced or referred their clients for HSG. Considering that infertility in sub Saharan Africa is mainly caused by uterine infections (Sharma et al., 2009), it is important for the HCP to be knowledgeable and refer clients for the service accordingly in order to confirm the diagnosis of tubular obstruction.

The number of HCP who used and were knowledgeable of Hormonal assay test was significantly low. Many health care providers explained that they were unable to use this test because it was expensive and virtually not available in all levels of health service delivery points. Hormonal assay is important because it assesses availability of the key reproductive hormones such as follicle stimulating hormone (FSH), luteinizing

hormone (LH), progesterone and oestrogen (Kamel, 2010) hence it is important in assessing ovarian function. However, the few that prescribed the test had to refer their client to private laboratories. In this study most of the client's social economic status could not allow them to visit a private laboratory as most of them had very low income and relied on free health services. Additionally, it is known that most people who are able to go to private health facilities use medical schemes; however, these schemes do not cover infertility services thus making infertility management expensive for people who are able to access private services as they needed to pay out of their pocket.

Education and counselling

This study reveals that there is overall low performance on HCP knowledge and practice on education and counselling on infertility management. Additionally, majority of the HCP lacked knowledge on what information to give clients in order to enhance their natural fertility for example preconceptual weight loss and modifying social habit such as alcohol use, smoking and recreational drug use as intervention reduce ovulatory dysfunction. Macaluso et al (2010) Novy, Eschenbach, & Witkin (2009), Sharma et al (2009), Widge & Cleland (2009) and Ombelet et al (2008) look at behaviour modification (cessation of smoking, alcohol and drug use and promotion of healthy diet) as cost effective intervention in managing infertility as cessation of such behaviour reduces the chances of infertility. Furthermore, HCPs lacked knowledge on sex education that increases clients' chances of conceiving. Information such as: avoiding excessive use of lubricant during sexual intercourse (which is known to reduce sperm motility) and frequency of sexual intercourse (to alternate 2 to 3 days a week). Alternating days help clients to easily target ovulation thus avoiding the stress that comes in wanting to target

the ovulation date (Dhont et al., 2010). This information when provided to the clients by the HCP is able to increase the likelihood of conceiving especially in clients with unexplained infertility (Loh et al., 2014). However, this study's result show that many HCP provided counselling on avoidance of stress when one is trying to conceive. This addresses psychosocial and emotional needs of infertile couples and individuals (Kamel, 2010). The investigator looks at this lack of knowledge as being a result of lack of a guiding document that guides what information to give clients. Similarly, Widge (2009) results show that HCP lack of knowledge on education and counselling was as a result of lack of educational materials to aid them in counselling clients. This was seen to affect most post service clients who complained that they were not given any explanation on the cause of infertility and/or on how the treatment process will go (which led to most clients being not satisfied with these services). The investigator however expected that these services should be available in all health facilities as the Malawi National Reproductive Health Policy (2009) and strategy (2006) included education and counselling as one of its important strategies in infertility management and further stipulates that by 2010 the Health Education Unit with the following partners: RHU, Ministry of Information, White Ribbon Alliance, Local government, Banja La Mtsogolo, Christian Hospital Association of Malawi (CHAM), Family planning Association of Malawi, Umoyo network and Ministry of Gender develop and implement a communication strategy targeting traditional healers, leaders, service providers and community awareness of infertility.

Chhabra et al (2012) looks at inadequate knowledge as a source of stress and anxiety among clients that in turn acts as a barrier to seeking infertility treatment. Lack of information may also lead to dissatisfaction with services as some clients may believe

that they are being provided with investigative services that were irrelevant to their problem. Nonetheless, service providers perceived heavy workloads as a potential barrier for effective counselling.

Infertility treatment

Overall performance on both knowledge and practice of infertility treatment was low (Figure 4.6 and 4.10). This is similar to Barden-O'Fallon (2005) study findings in Mangochi Malawi where a limited treatment option in the management of infertility was revealed. The investigator looks at this low performance being as a result of lack of treatment options in the health facilities assessed and lack of knowledge on how to treat infertility. This lack of treatment option is as a result of poor or no interpretation of the infertility component in the policy by the MoH, failure by MoH to distribute the policy and its strategy to people on the grass root which has significantly contributed to the lack of implementation of the infertility policy. However, study participants (HCP) cited lack of knowledge (45.2 %, n=33) and limited supplies (26%, n=19) as the main reasons for lack of infertility treatment services in the health facilities.

Barriers to provision of infertility services

The results from this study showed that more than a third of the participating HCP cited 'lack of knowledge on infertility management' as the main barrier to provision of infertility services. Similarly, a study in India also cited lack of knowledge as a barrier to provision of infertility services, though the main barrier was high cost of treatment (Widge, 2008). Literature agrees that knowledge on management of infertility equips a HCP with a technical knowhow on how to screen, treat and /or when to refer clients with infertility (Makuch, Petta, Jose, Osis, & Bahamondes,2009; Penning et al.,2009; Sharma

et al.,2009&Ombelet et al.,2008). Findings further showed that there were no universal guidelines used in all health facilities assessed. This may have contributed to lack of knowledge which translated to lack of technical skill. The Malawi National RH strategy (2006) stipulates that by 2008 the RHU with the help of DHOs, training institutions, centre for RH (College of Medicine), regulatory bodies, CHAM, BLM and FPAM should develop guidelines and standards for infertility service delivery and training. However, the training and standard guidelines have not yet been developed.

Additionally, a small percentage of HCP cited 'lack of appropriate supplies' and 'expensive nature of some investigative services' as a barrier in delivering infertility services in the health facility. High cost was also a main barrier to provision of infertility services in India (Widge, 2008). However, high cost was not cited as a barrier to access for many service users since public health services in Malawi are offered for free. Although this is the case, cost was associated with frequent travels to the clinic as infertility treatment requires prolonged engagement. Such costs are known to reduce universal accessibility of infertility services. That is why it is recommended that costs of treatment should be greatly considered when policy makers decide on what infertility options to make available for its citizen when developing the guideline (Macaluso et al., 2010).

Limited availability of medications of treatment for infertility in all levels of health service delivery was another barrier. In many countries including Malawi, Clomiphene citrate (CC) is the first line drug used for stimulation of the ovaries in order to facilitate ovulation (Frey & Patel, 2004; Macaluso et al., 2010 & Sharma et al, 2009).

In this study no government, estate owned or mission health facilities had CC in stock for clients hence those who were knowledgeable of the drug referred their clients to the private pharmacies. This is similar to Sharma et al, (2009) study findings in low resource countries were public health facilities did not have CC in stock despite it being simple, safe and most importantly cost effective to use. This is however, contrary to finding in Rwanda where CC was the most common drug used to treat ovulatory problems (Dhont et al., 2010).

Client satisfaction levels with infertility services.

This study revealed that clients who were exposed to infertility services were either satisfied or dissatisfied with the service. Several reasons were responsible for client's satisfaction after being exposed to infertility services. These included; HCP ability to meet their varied expectations while others with unmet expectation still expressed satisfaction because they had accessed other types of services. Clients cited services such as screening and treatment of STIs and HIV, investigative services such as abdominal USS, cervical cancer screening and semen analysis. In a study in Karonga (Malawi) similar findings were observed. Clients looked at syndromic treatment of STI and fertility awareness as effective treatment especially in the primary level health facilities (Parrott, 2014).

The extent of satisfaction and dissatisfaction varied among the genders. Males cited HCP inability to include them in the treatment process as their source of frustration with infertility services. Similarly male clients in South Africa also complained that HCP were not able to integrate males' needs in the infertility services which were biased towards women (Dyer, 2008). A similar observation was also made in the northern

Malawi by Hemmings (2007).The National SRH policy (2009) acknowledges failure to meet needs of males in RH services in government sponsored health facilities as a major challenge. Public health facilities in the country rarely run services specifically meant to meet needs of male clients. In many cases, services focus on women's health needs such as FP, antenatal and postnatal clinics. In addition, RH policies focus more on women and children (safe motherhood and maternal and neonatal health) than it does on men, thus making HCP more equipped to handle female only services. The lack of focus on male clients has also been reported among clients who seek infertility services from traditional healers (Parrott, 2014). However, the introduction of Voluntary Medical Male Circumcision (VMMC) has given an opportunity to male clients to have an entry point to receiving RH services. It is therefore important for HCP to be knowledgeable of interventions that they can use to integrate male clients (physical assessment and investigative services) and knowledge to help them give information to clients with infertility.

On the other hand, female clients were frustrated by the long waiting time it took them to get treatment for infertility. The numerous investigative services that targeted them were also seen to prolong the process of treatment. This is similar to Morrison (2007) study findings that revealed that clients had problems with waiting for a long time for services. Another finding was that despite the prolonged process, they were being sent back home without medications, which according to them created issues with their husbands at home. The women complained that their husband doubted that they spent all that time at the hospital but did not receive any medications

Conclusion

This study set out to answer what type of infertility management is provided in all levels of health service delivery by examining HCP's knowledge and practice, identifying barriers in service provision and finally assessing clients satisfaction level post service delivery. The study findings showed that there is universal low level of knowledge on management of infertility among all HCP in all levels of health service provision. Practice of infertility was observed to be generally below the required standards, with all activities/interventions performed rated as being below the standard score of 80%. The study also revealed that there was lack of universal guidelines to guide infertility management. The main barriers to service provision include lack of knowledge and resources among HCP.

The study has also highlighted factors that lead to dissatisfaction with the service provided. In addition, help seeking behaviours for infertility has revealed that traditional medication is regarded as first line management for infertility. Health services are sought only after these have failed and this results in delayed help seeking from health care facilities. Women are initiators for help seeking in the case of infertility and that men feel left out.

In general it is safe to conclude that a gap exists between actual practice and what is stipulated in the Malawi National Reproductive Health and Rights Policy (2009), and strategy (2006) and Management of STI using syndromic management approach (2007).

Limitations

- Clients lack of knowledge on availability of infertility management services in health facilities and sociocultural stigma attached to people with infertility has contributed to a low turnout of clients. This impacted on the studies ability to observe HCPs practice as low turnout affected availability of clients.
- Time was a significant constraint as the study was for academic purposes hence there was need for it to be completed within a specific period.
- No framework was used in this study
- HCP working in the gynaecology ward were not included because all infertility clients were seen as outpatient.
- There were only a few specialists (Gyneacologist) present at the Gynae clinic at QECH on days allocated for infertility treatment. This resulted in assessing a few specialists.
- Data collection was conducted during the rainy season and as a result the investigator did not manage to access hard to reach facilities (Mitengo Mission Hospital).
- Limited funding for the study was another constraint in conducting the study.

Recommendations

Policy

- The RHU and its partners to develop infertility management program with simple, realistic, cost effective and time efficient intervention that the country is able to implement.

- Since there are no standard detailed documents to guide the management of infertility, this study recommends that the RHU and all its partners develop an evidence based standard infertility guideline of practice that should focus on all the three levels of health service delivery. The guidelines should include strategies on how to increase community awareness on availability of infertility services and encourage political willingness in order to improve practice.
- Screening and treatment for infertility can be integrated in the RH activities in all level of health service delivery.
- The Ministry of health (MoH) in corroboration with RHU and DHOs should strategize on how to disseminate infertility guidelines to all HCP for implementation of the program.
- MoH with corroboration with RHU and DHO to improve advocacy and networking through use of media and stakeholder meetings can be used to improve/start infertility management services in all health facilities.
- RHU and its partners to develop a guide on how to monitor and evaluate service provision in all levels of service provision.

Practice

- This study recommends developing of programs by the MoH, RHU and DHO that targets infertility preventive intervention such as routine screening of STIs, screening and treatment of pelvic TB, weight loss programs and routine pre conceptual care.

- DHOs to improve access to FP in order to reduce unwanted pregnancy that increases chance of unsafe abortion and pregnancy related infection.

- RHU and DHOs to improve quality of safe motherhood interventions i.e. using aseptic techniques during delivery in order to prevent pregnancy related infections.

- Promotion of education and counselling on intervention that boost client natural fertility, for example signs of ovulation, how to time sexual intercourse to correlate with their ovulation and avoidance of use of too much lubricant during sex by health care providers and health education institution.
- MoH, RHU, DHO and its partners to integrate infertility services in already existing RH services (in order to limit costs of infertility treatment).
- The study recommends that DHO and Health education institutions build capacity by including infertility management in all pre service training programs. This will help the newly qualified HCP to be equipped with knowledge and practice on how to manage infertility before joining the work force.
- DHO with its partners to provide on the job training to build capacity on infertility management of already qualified HCP at all levels of health service delivery will help with the implementation of infertility management program.

Community awareness

- The study recommends policy makers, MoH and Health Education Unit (HEU) to include infertility messages in already existing community RH messages.
- MoH, RHU, HEU and DHO to use different media such as: radio, television, billboards, notice boards, churches and community open days to raise awareness on infertility treatment options and how to eradicate stigma and discrimination.
- HEU to raise awareness on child adoption as an option to treating childlessness.

Areas for further research

- Due to generalised low knowledge and practice of infertility management it would be important to examining the type of pre service training on infertility provided in training institutions.
- There is no evidence that shows the impact of infertility in Malawi; therefore, there is need to assess the impact and prevalence of infertility in Malawi.

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Appendices

Appendix I: Health care providers consent form

TITLE: An examination of the management of infertility in Thyolo and Blantyre.

Section A: Participants information

Introduction

I am Anda Nindi-Nyondo a Master of Science degree in Reproductive Health student at Kamuzu College of Nursing. As part of my study requirements I am conducting a research study "An Examination of the management of infertility in Thyolo and Blantyre". This form has been designed to give health care workers working in STI, FP, VMMC and gynaecology clinic information about the need to the conduct of the study to fully informed them on the details should they agree to participate. After reading this form you will be given time to ask questions for any clarification before you are asked to give consent.

Purpose of the study

Infertility is a problem that is associated with psychosocial problems among people affected with it. In efforts to reduce this problem the government has included infertility management in the sexual and reproductive health and rights policy with specific guidelines on what and how infertility services are supposed to be provided. The aim of this study is to assess whether infertility management at all three levels of health service delivery is provided in accordance to guidelines.

Participation selection

We are interested in all health care workers (Nurses, Medical officers, clinical officers and medical assistants) who at the time of this study are allocated to either of the following Out Patient Departments: Gynaecology, Family Planning Sexually Transmitted

Infection or voluntary medical male clinics. Therefore you have been selected only because you provide health services in these departments.

Voluntary participation

Your participation in this study is entirely voluntary. Therefore it is your right to choose to participate or to refuse to participate in the study. If at any point you feel distressed or uncomfortable to continue participating after you have already given consent, be assured that you are allowed to discontinue participation with no consequences.

Procedure of data collection and duration

This study will be done in two parts. Firstly, the investigator will observe you as you provide infertility services to a client coming in for infertility consultation or who has come in with another person but has been diagnosed with infertility. The duration of this section will depend on how long it takes you (the health care provider) to manage your client. The second part of data collection will comprise of the investigator asking you questions while filling in a questionnaire, this process will take approximately 15 minute.

Anonymity and confidentiality

You should be assured that at no point will the investigator ask for your personal details. A code will be used in place of your name and the data collected will not be traced back to you. The interview and the observation will take place in a private room and data collected will not be discussed with anyone else.

Benefits

Please take note that no financial benefits will be provided for your participating. And that this study may not have direct benefits towards you however this study may help to improve the standard of infertility management at all levels of health service delivery if need be.

Risks

There are no unforeseen risks anticipated due to your participation in the study. Furthermore, this proposal has been reviewed by the University of Malawi, College of Medicine Ethics Review Committee (COMREC), which ensures research participants are protected from any harm.

For any clarifications or concerns involving this study please contact:

The Chairperson
College of Medicine Ethics Review committee,

Mahatma Gandhi Campus,

Postgraduate Building Ground Floor,

Room number 822.

P/Bag 360,
Chichiri, Blantyre 3.

Email: comrec@medcol.mw **Institution website**: http://www.medcol.mw/comrec/

Telephone: +265 187 4377 **Fax Number:** 265 187 4740

Or

Study Investigator: Anda Nindi-Nyondo
Kamuzu college of Nursing,
P.O. Box 415
Blantyre
Email address: andanindi@gmail.com or nindi2014@kcn.unima.mw
Cell phone number: 0888375537

Section B: Informed consent for health care worker

Certificate for informed consent for health care workers in STI, FP, VMMC and gynaecology clinic to participate in a study entitled "Examining the management of infertility in Thyolo and Blantyre."

I have read the personal information form/the personal information form has been clearly read to me. I have been given the opportunity to ask questions to clarify areas that

were not clear, and the investigator has answered all my questions to my satisfaction. I therefore, consent voluntarily to participating in this research.

Participant Sign…….……..Date……..

Researcher Sign……..…… Date…….

Appendix II: Clients consent form-English Version

TITLE: An examination of the management of infertility in Thyolo and Blantyre District.

Section A: Participants information (to be read to participant by the interviewer)

Introduction

I am Anda Nindi-Nyondo a Master of Science degree in Reproductive Health student at Kamuzu College of Nursing. As part of my study requirements I am conducting a study to "An examination of the management of infertility in Thyolo and Blantyre District." This form is aimed at giving information about the study to clients in STI, FP, VMMC and gynaecology clinic who have come in for infertility consultation or have been diagnosed with infertility despite coming in with another problem. This information is aimed at should be fully informed when you are invited to participate in the study. After reading this form you will be given time to ask questions for any clarification before you are asked to give consent.

Purpose of the study

Infertility is a problem that is associated with psychosocial problems among people affected with it. In efforts to reduce this problem the government has included infertility management in the sexual and reproductive health and rights policy with specific guidelines on what and how infertility services are supposed to be provided. The aim of this study is to assess if the policy is being implemented by assessing infertility management at all levels of health service delivery is provided in accordance to guidelines.

Participation selection

We are inviting all men, women and/or couples who have come to either of the following Out Patient Departments: Gynaecology, Family Planning Sexually Transmitted Infection or voluntary medical male clinics for infertility consultation or has been diagnosed with infertility even after coming in with other related problems. You have therefore been selected only because you have a problem with infertility.

Voluntary participation

Your participation in this study is entirely voluntary. Therefore it is your right to choose to participate or to refuse participation in the study. If at any point you feel distressed or uncomfortable to continue participating after you have already giving consent, be assured that you are allowed to discontinue participation with no consequences.

Procedure of data collection and duration

After you have been helped by either a nurse, Medical officer, clinical officer and/or medical assistant the investigator will take you to a private room where after giving consent you will be asked a few questions form a questionnaire. The investigator will also ask to see your health passport. This whole process will take approximately 20 minute.

Anonymity and confidentiality

You should be assured that at no point will the investigator ask for your personal details. A code will be used in place of your name and the data collected will not be traced back to you. The questions asked and information from the health passport will take place in a private room and will not be discussed with anyone.

Benefits

Please take note that no financial benefits will be provided to participants for participating. This study may not have direct benefits towards you however this study will help in improving the standard of infertility management at all levels of health service delivery if need be.

Risks

There are no unforeseen risks anticipated due to your participation. Furthermore, this proposal has been reviewed by the University of Malawi College of Medicine ethics

review board, which is a board that ensures that research participant are protected from any harm.

For any clarifications or concerns involving this study please contact:

The Chairperson
College of Medicine Ethics Review committee,

Mahatma Gandhi Campus,

Postgraduate Building Ground Floor,

Room number 822.

P/Bag 360,
Chichiri, Blantyre 3.

Email: comrec@medcol.mw **Institution website**: http://www.medcol.mw/comrec/

Telephone number: 265 187 4377 **Fax Number:** 265 187 4740

Or

Study Investigator: Anda Nindi-Nyondo

Postal address: Kamuzu college of Nursing,
P.O. Box 415
Blantyre

Email address: andanindi@gmail.com or nindi2014@kcn.unima.mw

Cell phone number: 0888375537

Section B: Informed consent

Certificate for informed consent for clients visiting the STI, FP, VMMC and gynaecology for an infertility consultation of have been diagnosed with infertility. The study is titled "An examination of the management of infertility in all levels of in Thyolo and Blantyre District".

I have read the personal information form/the personal information form has been clearly read to me. I have been given the opportunity to ask questions to clarify areas that were not clear, the investigator has answered all my questions to my satisfaction. I therefore, consent voluntarily to participate in this research.

Participant Sign…….……..Date……..

Researcher Sign……..…… Date…….

Appendix III: Clients consent form-Chichewa version.

An examination of the management of infertility in Thyolo and Blantyre Districts.

Gawo Loyamba (A): Utenga wakafukufuku

Malonje

Dzina langa ndine Anda Nindi-Nyondo ndine wophuzila wakusukulu yakachenjede ya Kamuzu, ndikuphuzila degiri ya umoyo wa ubeleki. Ngati chimodzi cha zinthu zondiyeneledza kutenga degiriyi ndikuyenela kupanga kafukufuku. Ichi ndichifukwa ndikupanga kafukufuku wa vuto lakusabeleka. Cholinga cha kalatayi ndikuti ndikupatseni utenga wa zomwe kafukufuku akufuna kupanga, ndicholinga choti mukamapanga chisankho choti mu khale nawo pa kafukufuku mukhale mukuziwa kuti kafukufuku ndiwachani.

Cholinga cha kafukufuku

Vuto lakusabeleka limadziwika kuti limabweletsa mavuto osiyanasiyana monga ngati kutozedwa, kusalidwa ndi kukhala okhumudwa. Pofuna kuchepetsa vuto lakusabeleka boma linayika ndondomeko yake ya bukhu la umoyo wa ubereki kuti achipatala agwilitsile pothandizila anthu amene alindivutoli. Cholinga cha kafukufukuyi ndikuona ngati zipatala zikukwanilitsa kupereka thandizo la vuto lakusabereka motsatila ndondomekoyi.

Kusankha anthu olowa mukafukufuku

Kafukufuku ameneyu akukhuza abambo ndi amayi amenene akukumana ndi vuto losabeleka. Anthu osankhidwa akhala amene abwela kuchipatala chamatenda oopatsilana pogonana, chakulela, chandulidwe wa bambo ndi chipatala chowona za amayi. Anthu amenewa akhale kuti apezeka ndi vuto losabeleka atabwelera vuto lina kapena anabwelera vuto losabelekalo. Pachifukwa chimenechi inuyo mwasankhidwa chifukwa mukukumana ndi vutoli.

Kafukufuku ndi osakakamiza

Chonde dziwani kuti kafukufukuyu ndi osakakamiza. Aliyense alindi ufulu olowa kapena kusalowa nawo mukafukufuku. Ngati mwaona choletsa chinachili chonse ndinu ololedwa kusiya kafukufuku, olo patakhala pakati pa kafukufukuyo.

Katoleledwe ka zofunikira mukafukufuku

Mukatha kuthandizidwa ndi anamwino kapena a dotolo, wazaumoyo amene akupanga za kafukufukuyu azakutengelani poduka mphepo kuti akufunseni mafunso angapo ngati muli olora. Osadandaula zonsezi zizakutengelani mphindi 15 zokha.

Kusunga chinsinsi

Kafukufukuyu azakhala wa chinsisi ndipo opangitsa kafukufuku sazakufunsani dzina lanu kapena komwe mumakhala. Aza gwilitsila nambala pa pepala lanu kuti munthu wina aliyanse asadziwe kuti ndi inu amene mukupanga kafukufukuyou. Mukavomeledza kulowa mukafukufuku muzalowa muchipinda chomata kuti anthu ena asakuoneni kapena kumvela zomwe tilikukambirana.

Mupindulapo chani?

Kafukufukuyu sazakuthandizani kupeza ndalama inailiyonse ndipo polowa kafukufuku simupindulapo kalikonse. Koma zosatila zakafukufuku zizathandiza kuunikira malo amene zipatala zikufunika ku konza kuti tsogolomu anthu azathe kulandila chithandizo chabwino pavuto la kusabeleka.

Chiopsyezo chomwe mungakumane nacho

Palibe choopsya kapena vuto mungakumane nalo ngati mutasankhe kulowa nawo mukafukufuku. Kuwonjezelapo, kafukufukuyu wavomeledzedwa ndi bungwe lomwe limaona za kafukufuku laku sukulu ya ukachenjedwe ya Medicine.

Ngati muli ndi funso kapena dandaulo lokhuzana ndi kafukukuyu chonde yankhulani ndi:

A Chairperson

College of Medicine Ethics Review committee,

Mahatma Gandhi Campus,

Postgraduate Building Ground Floor (Room 822),

P/Bag 360,

Chichiri, Blantyre 3.

Email: comrec@medcol.mw

Nambala: 265 187 4377 **Nambala ya fax:** 265 187 4740

Kapena

Mwini wakafukufuku: Anda Nindi-Nyondo

Keyala: Kamuzu college of Nursing,

P.O. Box 415

Blantyre

Email: andanindi@gmail.com or nindi2014@kcn.unima.mw

Nambala: 0888375537

Gawo Lachiwiri (B): Kalata yovomeledza kulowa mukafukufuku

Kalata yovomeledza kulowa mukafukufuku kwa anthu omwe abwela ku chipatala cha matenda opasilana pogonana, cholela, chandulidwe wa a bamboo ndi chipatala chowona mavuto azimayi chifukwa alindi vuto losabeleka kapena awapedza ndivuto losabeleka olo kuti vuto lomwe anabwela nalo ndi lina. Kafukufuku akufuna kuwona ngati vuto la kusabeleka anthu amathandizidwa mwa ndondomeka yake. Atatha

kundiwelenga/ nditawerenga kalata yachidziwitso cha kafuku fuku. Azaumoyo anandipatsaso mpata oti ndifunse mafunso pa zinthu zomwe ine sindinamvetse ndipo mafunso anga onse andiyankha ndipo ndakhutisidwa. Ichi ndichifukwa ndikuvomeledza kutengapo mbali mu kafukufuku ameneyu opanda kundikakamiza.

Siyini …….……..Tsiku……..

Sayini ya mboni……..…Tsiku…..……

Ngati simutha kulemba chonde dindani chala chanu chachikulu mu ka bokosi kali mmusimu

Siyini ya munthu opangitsa kafukufuku…….....

Tsiku……

Appendix IV: Questionnaire -Health care providers

Study Title: An examination of the management of infertility in Thyolo and Blantyre District.

Respondent ID _____ Facility Name _____

Facility type _____ Interviewer _____ Date _____

Section A: Demographic information

Instruction: Please put a tick [X] in the bracket for the best response

1.Sex: Male [ ] Female [ ] **2. Age:** _____ **3.Cadre:** Doctor [ ] Nurse [ ] Clinical Officer [ ] Medical Assistant [ ] **4. Professional qualification:** Certificate [ ] Diploma [ ] Diploma RN [ ] Degree [ ] Masters [ ] Others [ ] Specify _____	**5. What department are you working in?** Gynae Clinic [ ] FP Clinic [ ] Gynae ward [ ] STI Clinic [ ] VMMC Clinic [ ] **6. How long have you worked in the department mentioned?** < 1 year [ ] 1 to 2 years [ ] 3years or more [ ]

Section B: Knowledge of infertility

Instruction: Please put a tick [] in the bracket for the best response or on yes or No response

1. Knowledge on infertility guidelines

i. Are you aware of any infertility management guidelines? Yes [ ] No [ ] **ii. Please state the guidelines that you know**	**iv. Which guidelines do you use?** Sexual and Reproductive Health Rights Policy [ ] Syndromic management of STI providers guide [ ]

Sexual and Reproductive Health Rights Policy [ ] Syndromic management of STI providers guide [ ] Other (specify) _____ **iii. Do you use any of the guidelines mentioned in 2 above?** Yes [ ] No [ ]	Other (specify) _____ **v. How often do you use the guidelines?** Never [ ] rarely [ ] often [ ] always [ ]

2. Knowledge on medical history taking

i. Consultation with a client is done as?

A couple [ ] An individual [ ] A couple then individual [ ] An individual then as a couple [ ]

The following should be asked as part of medical history to investigate infertility?

[No= 0, Yes= 1]

ii. Clients age	[0]	[1]
iii. Clients complaints	[ ]	[ ]
iv. Body changes i.e. excessive hair growth, increase cervical mucus	[ ]	[ ]
v. Social habits e.g. eating disorder, tobacco, alcohol and steroid use	[ ]	[ ]
v. A woman's menstrual history	[ ]	[ ]
vi. Use of contraceptive	[ ]	[ ]
vii. History of infertility treatment	[ ]	[ ]
viii. History of previous pregnancy	[ ]	[ ]
ix. Coital frequency and associated sexual problem	[ ]	[ ]
x. Current use of NSAID drugs i.e. Brufen	[ ]	[ ]
xi. Presence of diseases such as diabetes mellitus, STI and TB	[ ]	[ ]
xii. Any abdominal surgery	[ ]	[ ]

3. Knowledge on investigations

Which of the following investigation should be part of infertility diagnosis?

i. Semen analysis and sperm function test	[0]	[1]

ii. Hormonal assay for female client	[ ]	[ ]
iii. Blood group and Rhesus factor	[ ]	[ ]
iv. Full Blood Count	[ ]	[ ]
v. Hysterosalpingography for tubal damage in women.	[ ]	[ ]
vi. Abdominal/pelvic Ultra Sound Scanning for women	[ ]	[ ]
vii. Venereal Disease Research Laboratory for both men and women	[ ]	[ ]
viii.HIV for both men and women	[ ]	[ ]
ix. Stool microscopy for men and women	[ ]	[ ]
x.Urinalysis for women	[ ]	[ ]
xi. Hormonal assay for men done before sperm analysis	[ ]	[ ]

4. Knowledge on infertility counselling

The following advice should be given to a optimise their natural fertility

i.Timing of sexual intercourse to coincide with ovulation	[0]	[1]
ii. Advice on frequency of sexual intercourse (2-3days)	[ ]	[ ]
iii. Modifying social habits like smoking and alcohol use	[ ]	[ ]
iv. Advise on avoiding excess use of lubricant	[ ]	[ ]
v. Avoidance of stress and promotion of emotional support	[ ]	[ ]

5. Knowledge on treatment

In the management of infertility in women with polycystic ovary syndrome

i.Preconceptual weight loss for overweight clients is a must	[0]	[1]
ii. Life style modification include no smoking and alcohol use	[ ]	[ ]
iii. First line ovulation induction treatment with Clomiphene citrate	[ ]	[ ]
iv. Metformin should be used routinely with Clomiphene citrate	[ ]	[ ]
In the management of tubal infertility		
v. High risk women include early sexual debut and multiple sexual partner	[ ]	[ ]
vi. Start with screening and treating Chlamydia	[ ]	[ ]
vii. Management for other STIs should be priority	[ ]	[ ]
viii. Assessing tubal patency should be considered	[ ]	[ ]
In the management of male infertility		
ix. Semen analysis should be done as a primary investigation	[ ]	[ ]

x. Cessation smoking and use of steroids at primary level	[ ]	[ ]
xi. PDE 5 inhibitors is prescribed to men with premature ejaculation	[ ]	[ ]

Section C: Barriers to provision of infertility services.

Instruction: Please put a tick [] in the bracket for the best response

What main problem do you have when providing infertility services?

1. Lack of knowledge/confidence [ ] 2. Lack of appropriate supplies [ ]

3. Is it time consuming [ ] 4. It is considered a low priority problem [ ]

5. Limitation due to level of service delivery [ ] 6. Others [ ] specify _____

Appendix V: Observation check list-Health care providers

An examination of the management of infertility in all levels of health care services delivery in Thyolo and Blantyre.

Code Number _____ Service provision level_____

Cadre_____ Date _____/_____/_____

Instruction: Tick '×' in the corresponding space for the intervention observed [No=0 Yes= 1].

Criteria	**Score**	
History taking	0	1
Consultation done with partner and then as an individual		
Asks clients present complaint		
One client present provider schedules meeting with both partner		
Reviews system to assess abnormal hair growth, weight gain, breast discharge or any thyroid problem.		
Asks if clients has had any fallopian tube surgery, ectopic pregnancy and/or any pelvic surgery		
Reviews menstrual cycle, asks when menarche was attained and menstrual characteristics		
Ask for history of infertility treatment		
Ask for social history include use of alcohol, smoking, caffeine and/ or recreational drugs		
Ask if any family history of infertility		
Ask any medical and drug history		
For male partner		
Ask history of Erectile Dysfunction, STI, mumps, testicular infections and genital trauma		
Asks if any hernia, testicular or varicocele surgery		
Asks sexual frequency, use of contraceptive, infertility in previous relationship and use of lubricant.		
Social history of alcohol, tobacco, caffeine, chemotherapy and recreation drug use		
Ask if previously able to father a child		
Physical examination		
Females		
Assesses weight, height and body mass index		

General exam on hirstutism, acanthosis nigricans, acne, thyroid disorders		
Breast exam for galactorrhea		
Abdominal exam for masses and surgical scars		
Pelvic for enlarged clitoris, cervical excitation, vaginal discharge and thickened uterosacral ligament		
Males		
Examines for secondary sexual characteristics		
Breast examination for gynaecomastia		
Abdominal exam for abdominal masses		
Assesses for undescended testicles and inguinal hernia		
Genital exam for size and shape of a penis, position of external meatus position & prostate		
Investigative studies (Laboratory and radiology)		
Female		
Blood group and rhesus factors		
FBC for Haemoglobin level and WBCs		
Abdominal / pelvic USS		
Hormonal assay for levels of FSH, prolactin		
Hysterosalpingography (for tubal problems)		
Laparoscopy		
Uterine cavity for adhesions, congenital abnormalities, fibroids and polyps		
Endometriosis		
Endometrial biopsy		
Ovarian biopsy		
Stool microscopy		
Culture for TB		
Urine analysis		
VDRL blood test		
Males		
Semen analysis		
VDRL		
ESR		
Counselling		

Is the health care worker able to provide the following counselling		
Information to optimise client natural fertility		
Treatment implication counselling		
Emotional support counselling		
Therapeutic counselling		
Treatment		
Advise on behaviour modification in POS i.e. weight loss		
Screening of STI i.e. Chlamydia		
Treating STI		
Treatment of cervical mucus problems		
Ovulatory drugs Clomiphene citrate as the first line drug		
Tubal patency		
Management of varicocele		

Appendix VI: Clients interview guide-English version

An examination of the management of infertility in all levels of health care services delivery in Thyolo and Blantyre.

Section A: Demographic information

Instruction: Please tick your response in the appropriate bracket [x]

Marital status: Single [ ] Married [ ] Divorced [ ] other [ ]
specify_____

Number of time you have been marriages: _____

Education level: None [ ] Primary [ ] Secondary [ ] Tertiary [ ]

Monthly income: _____

Number of children: _____

Tribe: Lomwe [ ] Tumbuka [ ] Yao [ ] Sena [ ] Chewa [ ] Others [ ]
Specify_____

HIV status: Negative [ ] Positive [ ] Unknown [ ]

STI History: Negative [ ] Positive [ ] Unknown [ ]

Abortion: Yes [ ] No [ ]

Section B: Assessing client satisfaction

Is this your first time to seek for treatment?

Who initiated seeking treatment?

Explain what difficulties you encountered to access infertility treatment?

What service did you receive today?

Explain whether you are satisfied in the services that you received?

How long did you wait to receive the service?

Explain the information you got from the health worker?

Appendix VII: Clients interview guide-Chichewa version.

An examination of the management of infertility in Thyolo and Blantyre Districts.

Malangizo: Chonde chongani [×] yankho lomwe mukugwirizana nalo

Gawo Loyamba (A): Mbiri ya mayi ndi abambo amene abwela ndi vuto losabeleka

Maphunziro: Sindinapiteko [ ] Pulayimale [ ] Sekondale [ ] Sukulu ya ukachenjede [ ]

Pamwezi mumapata ndalama zingati: _____

Kodi ndinu a: Lomwe [ ] Tumbuka [ ] Yao [ ] Sena [ ] Chewa [ ] _____

Muli pa banja? Ayi [ ] Eya [ ] Banja linatha [ ] Dzina [ ] Tchulani _____

Muli banja lachingati? _____

Muli ndi ana angati: _____

Munayedzetsako HIV? Eya [ ] Ayi [ ]

Munadwalako matenda opatsilana pogonana: Eya [ ] Ayi [ ]

Munakhalako ndi mimba zochoka: Eya [ ] Ayi [ ]

Gawo Lachiwiri (B):

Anakumemani kuti mubwere kuchipatala ndi ndani?

Kodi aka ndikoyamba kubwela kuzalandila chithandizo? Eya [ ] Ayi [ ]

Mwalandira chithandizo chotani lero?

Kodi munakumana ndi mavuto anji polandila chithandizo kuchipatala?

Munadikila nthawi yayitali bwanji kuti mulandire chithandizo?

Munalandira uthenga wotani kuchokela kuchipatala?

Ndinu okhutisidwa ndi chitandizo mwalandira?

Appendix VIII: Authorisation letter-Queen Elizabeth Central Hospital

All communications should be addressed to: The Hospital Director
Telephone: (265) 01 874 333/877 333 Facsimile: (265) 01 876928 Email: aechdirector@gmail.com

In reply please quote **No.** QEC/GEN/2
QUEEN ELIZABETH CENTRAL HOSPITAL
P.O. BOX 95
BLANTYRE
MALAWI
06th November 2015

The Chairman COMREC P/Bag 360 Chichiri Blantyre 3

Dear Sir,

RE: EXAMINING THE MANAGEMENT OF INFERTILITY AT ALL LEVELS OF HEALTH CARE DELIVERY BY ANDA NYONDO

We are writing in support of the above named study that it can take place at QECH as envisaged. It will be a cross sectional study aiming at assessing the type of infertility management provided at all levels of health care.

We hope that the results will further inform the adoption of evidence based practices in infertility interventions.

The Hospital Director
Queen Elizabeth Central Hospital
2015 -11- 06
P.O. Box 95
Blantyre

Dr Andrew Gonani

HOSPITAL DIRECTOR

Appendix IX: Authorisation letter- Thyolo District Health Office

Telephone: + 265 1 473 411

Facsimile: + 265 1 473 409

In reply please quote NoTDH/

Ministry of Health,

Thyolo District Hospital,

P.O. Box 21,

Thyolo.

Malawi.

All Communications should be addressed to:

The District Health Officer:

Anda Nindi Nyondo

Kamuzu College of Nursing,

P.O. Box 415,

Blantyre.

Dear Miss Nindi,

Re: Letter of support to conduct research at Thyolo District Health Office

This letter serves as authorisation for you to conduct research on topic "**Infertility Management**" for your Master's degree in Reproductive Health. Permission has been granted to conduct the study in the proposed health centres and the District hospital as indicated in your study protocol.

We expect that you will follow ALL ethical considerations as stipulated in your study protocol.

Yours sincerely,

THYOLO DISTRICT HOSPITAL
DISTRICT MEDICAL OFFICER
24 SEP
P.O. BOX 21
THYOLO

Dr. Michael Murowa.

DISTRICT HEALTH OFFICER

Appendix X: Approval letter from the department of Obstetrics and Gynaecology

QECH

Telephone: (265) 01 874 333 / 677 333
Facsimile: (265) 01 876928
Email: queenshosp@globemw.net

All communications should be addressed to:
The Hospital Director

In reply please quote **No.**

QUEEN ELIZABETH CENTRAL HOSPITAL
P.O. BOX 95
BLANTYRE
MALAWI

The Chairman
COMREC

10th November, 2015

SUBJECT: RE: EXAMINING THE MANAGEMENT OF INFERTILITY IN ALL LEVELS OF HEALTH CARE SERVICE DELIVERY

The Department of Obstetrics and Gynaecology offers its full support to Anda Nindi Nyondo's request to conduct the above mentioned study.

The overall aim of the study is to determine if infertility management is provided accordance with guidelines at the three levels of health care delivery.

The work from the study will help Ms Nyondo in her pursuit for MSc Degree in Nursing.

The Department of Obstetrics and Gynaecology fully supports research and would like to offer its support for the above named research protocol.

Sincerely,

Dr. Phylos Bonongwe, MBBS, FCOG (SA)
HEAD OF DEPARTMENT

Appendix XI: COMREC certificate of approval

UNIVERSITY OF MALAWI

CERTIFICATE OF ETHICS APPROVAL

This is to certify that the College of Medicine Research and Ethics Committee (COMREC) has reviewed and approved a study entitled:

P.11/15/1840 - Examining the management of infertility at all levels of heath care service delivery: a case of Thyolo District Hospital and Queen Elizabeth Central Hospital by Anda Nindi Nyando

On 8 December 2015

As you proceed with the implementation of your study, we would like you to adhere to international ethical guidelines, national guidelines and all requirements by COMREC as indicated on the next page

Dr. Y. Mlombe- Vice Chairperson (COMREC)

Approved by College of Medicine
(COMREC) Research and Ethics Committee

Date 18/12/2015