SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

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UTILIZATION OF HERBAL MEDICINES IN THE TREATMENT OF INFERTILITY IN SELECTED HEALTH FACILITIES IN THE GREATER ACCRA REGION

BY

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26TH APRIL 2023

STUDENT DECLARATION

I, Sharon Owusu hereby declare that apart from specific references made which have been duly acknowledged, this completed dissertation is my own independent work undertaken under the supervision of Dr. Adanna Nwameme. I also declare that no part of this proposal has not been submitted for the award of nay degree in this University or any University elsewhere.

…….. …4th October, 2023…..

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ACKNOWLEDGEMENT

The successful completion of this thesis would not have been possible without the guidance, assistance and support of my supervisor, Dr. Adanna U. Nwameme. I wish to express my profound gratitude to her and to my family for their support during the entire research.

DEDICATION

I dedicate this project to my family and friends especially Mr. Ellis Apatu for their support, encouragement, and good counsel. I also dedicate this work to my parents who supported me in diverse ways.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
ART	Assisted Reproductive Technology
CDC	Centers for Disease Control
ESHRE	European Society for Human Reproduction and Embryology
FDA	Food And Drug Authority
FSH	Follicle Stimulating Hormone
GIFT	Gamete Intrafallopian Transfer
GHS	Ghana Health Service
HSG	Hysterosalpingogram
ICMART	International Committee for Monitoring Assisted Reproductive Technologies
ICPD	International Conference on Population and Development
IDIs	In-depth interviews
IVF	In Vitro Fertilization
ICSI	Intracytoplasmic Sperm Injection
ICPD	International Conference on Population and Development
LH	Luteinizing Hormone
LMIC	Low- and Middle-Income Countries
MoH	Ministry of Health
PI	Principal Investigator
PCOS	Polycystic Ovary Syndrome
RAs	Research Assistants
SPH	School of Public Health

STI	Sexually Transmitted Infections
TRM	Traditional Medicine
TAMD	Traditional And Alternative Medicine Directorate
USA	United States of America
UG	University of Ghana
WHO	World Health Organization
ZIFT	Zygote Intrafallopian Transfer

ABSTRACT

Background: Infertility is a condition which affects the reproductive system and hinders the body's capacity to carry out the fundamental reproduction process. Infertility is regarded as a major public health issue owing to factors such as unprioritized diagnosis and treatment at the national population level, lack of public financing covering reproductive health strategies and development policies, lack of infrastructure and high costs of medicinal treatment. In Africa, including Ghana, infertility is due to several factors such as infectious causes, sexually transmitted diseases, bilateral uterine tube blockage, and has largely remained an unresolved issue for the human species. The aim of this research is to assess the utilization of herbal medicines or products in the treatment of infertility in selected health facilities.

Methods: This study adopted a mixed method approach. The research was conducted in government hospitals with herbal units. The study population include herbal doctors and the patients coming to seek treatment for infertility. The researcher interviewed the selected respondents, five herbal doctors through In-depth Interviews with the use of an interview guide while 88 patients were sampled from the health facilities and data were collected using a structured questionnaire. The interview guide covered the experiences of the herbal doctors in treating infertility, the factors that influence the frequent use of herbal medicine in treating infertility and the limitations of using herbal medicines to treat infertility. The questionnaire covered the factors and limitation influencing herbal medicine use for infertility treatment from the patients' perspective.

Outcome/Conclusion: The researcher found that herbal medicines are readily available and affordable at the treatment centers and other vending shops for patients to use them. Patients are concerned about the adverse effect of the orthodox medicines and others suggest that herbal

products are natural as a result of historical, cultural, and psychosocial factors. The negative perceptions and comments about herbal medicine is a major barrier or challenge patients encounter when seeking treatment for infertility. Furthermore, the study found that NHIS does not cover for herbal medications thereby creating a barrier for its patronage. Therefore, the Food and Drug Authority must enforce policies on the standardized dosages and preparations of herbal products. In addition, the National Health Insurance Authority should consider having key herbal medicines on the National Health Insurance Scheme to encourage patronage of the herbal units in the hospitals.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Infertility is a disorder of the reproductive system as defined by the World Health Organization (WHO) and the International Committee for Monitoring Assisted Reproductive Technologies (ICMART). It is indicated by the inability to conceive a child after regular, unprotected sexual activities for a period of at least one year (Jaradat & Zaid, 2019; James et al., 2018). Infertility is regarded as one of the most significant public health problems in the world and as a persistent issue for the human race as a whole. With the severity of societal shame associated with infertility, and the expensive nature of orthodox treatment, many underprivileged patients and patients whose prior infertility treatments had failed, turn to herbal medicines for solution (Gerais & Rushwan, 2022). The WHO also projected that around 48.5 million couples worldwide were infertile. In addition, 10.5% of women who had already given birth failed to conceive after trying for five years (Zhang et al., 2020). The average rate of infertility in Africa is 10.1%; however, some countries and tribes have higher rates (Gerais & Rushwan, 2022). The incidence rate in sub-Saharan Africa varies a lot, with some writers stating rates so high as 21 to 30% in parts of the region (Ochako et al., 2015; Ombelet & Onofre 2019). In Ghana, estimates place the rate of infertility between 11.8% and 15.8% (Arhin et al., 2019; Laryea, 2012). As opposed to other regions in Ghana, the Greater Accra region has the lowest infertility rate of 3.2% (Arhin et al., 2019).

Herbals and other natural products, including their chemical derivatives, represent almost 50% of all currently used medicines all over the world (Jaradat & Zaid, 2019). Since the beginning of

time, people have used plants as a source of medicine to cure and prevent the onset of a variety of diseases (Jaradat & Zaid, 2019). Recently, herbal practice has become one of the most significant subspecialties of conventional medicine. These herbal medicines play a significant role in the global health care systems, notably in rural parts of industrialized and developing countries (Kashani & Akhondzadeh, 2017; Jaradat & Zaid, 2019). A crucial area of pharmacy and health is traditional medicine. In fact, the pharmaceutical industry views the plants employed in traditional medicine as key resource for the discovery of pharmacologically active medications (Jaradat & Zaid, 2019). Additionally, there is a global public interest in the usage of herbal medicine. Evidence shows that traditional medicine is used by about 80% of people in rural parts of developing countries because it is widely accessible, affordable, and has a number of health advantages (Lans, Taylor-Swanson & Westfall, 2018; Jaradat & Zaid, 2019).

Recently, both male and female infertility rates have increased, especially in developed nations, due to a vast array of reasons. These include the rising maternal age, greater use of contraception, alcohol and tobacco usage, genetics, chemicals, drugs, high abortion rates, and unstable economic conditions (WHO, 2000; Lans, Taylor-Swanson &Westfall, 2018; Jaradat & Zaid, 2019). Additionally, psychogenic factors, vascular disturbances, neurogenic illnesses, endocrine system disturbances, and pharmacological therapies could all contribute to an increase in male impotency (James et al., 2018a; Jaradat & Zaid, 2019). This worldwide issue came in fourth place among the world health issues (Jaradat & Zaid, 2019). As a result, the treatment of infertility has grown to be a significant pharmaceutical and medical industry concern, encompassing everything from the production and prescription of reproductive hormones and other medications to in vitro fertilization procedures (Bardaweel et al., 2013).

Worldwide, there are several infertility management programs, and assisted reproductive technology (ART) is a major infertility treatment utilized everywhere (Mouzon et al., 2020; Chambers et al., 2021). However, only between 9–28% of infertile patients who use ART for therapy are successful. Herbal medicine is thought to have a good probability of treating infertility, making it a substitute for conventional medicine. Herbal medicine by convention are alternative and complementary medicines which are utilized by people with fertility needs and in search of outcome (Miner et al., 2018).

Herbal treatments for infertility in Korea enhance women's entire physical and mental health. Herbal medication may improve blood flow to the endometrium and cervical mucus, promoting endometrial stability (Kim et al., 2022).

The study's overarching goal assessed the utilization of herbal medications for infertility treatment in Greater Accra Region. The researcher revealed the experiences of the herbal doctors in the treatment of infertility, the possible factors that facilitate the frequent use of herbal medicine and the barriers faced by patients using herbal medicine for infertility treatment in Greater Accra Region.

1.2 Problem Statement

Infertility is a historical public health problem that affects the entire world today. It is also regarded as one of the insoluble issues facing the entire human species (Arhin et al., 2019). In Ghana and other sub-Saharan African countries, infertility is a significant health issue with extremely high prevalence rates (Mascarenhas et al., 2012; Ombelet & Onofre, 2019).

The use of medically assisted reproductive technologies (ART) is growing steadily in Ghana, with more sophisticated possibilities being established in private owned healthcare facilities. The expensive nature of treatment has made many individuals who are economically vulnerable, those who have faith in alternative medicine and those whose prior fertility treatment had failed, seek herbal treatment to solve their problem (Jaradat & Zaid, 2019). The number of herbal clinics providing infertility treatments is also on the rise, particularly in Ghana's capital city, Accra, hence the choice of this site for the study.

Herbal medicine for infertility treatment have long been incorporated into medical practice worldwide and Ghana is not an exemption (Lee et al., 2019). In Ghana, herbal medicine forms an integral part of the health system and an increasing number of people resort to using herbal remedies in treating infertility. However, there is not enough empirical study in Ghana on the utilization of herbal medicines in the management of infertility. The purpose of this study is to bridge the knowledge gap on how patients with infertility problems use herbal medicine to achieve fertility and also outline the determining factors that influence and limit the utilization of herbal remedies for treating infertility.

1.3 Research Questions

The following research questions are addressed by this study:

i. What are the experiences of the herbal doctors in the treatment of infertility in Greater Accra Region?

ii. What factors facilitate the use of herbal medicine in treating infertility in Greater Accra Region?

iii. What are the barriers to utilization of herbal medicine for infertility treatment in Greater Accra Region?

1.4 Study Objectives

The objectives of this study are divided into general and specific objectives.

1.4.1 General objective

The study explores the utilization of herbal medicines or products in the treatment of infertility among individuals in Greater Accra Region.

1.4.2 Specific objectives

The specific objectives of this study are as follows:

i. To describe the experiences of the herbal doctors in the treatment of infertility in Greater Accra Region;
ii. To identify the factors that facilitate the use of herbal medicine among individuals seeking care for infertility in Greater Accra Region; and
iii. To identify the barriers faced by patients using herbal medicine for infertility treatment in Greater Accra Region.

1.5 Significance of the Study

Following a year of unprotected sex, approximately 10-15% of couples worldwide are unable to conceive naturally. Infertile couples make up a variety of populations around the world, although there is a general pattern of high prevalence in developing countries and low preponderance in the developed ones. The significant disparity in resources for prevention, diagnosis, and treatment of

infertility may be a contributing factor to the apparent difference in prevalence between industrialized and developing nations (Arhin et al., 2019).

According to Rouchou (2013), consequences of infertility typically fall in any of the three groups: social, psychological, or economic. Infertility results in social stigma in many developing nations. Women may be unable to join communal social clubs because they are only eligible to do so after giving birth. The negative effects of infertility, however, do not just affect women; they also affect their male counterparts. Men and women are likely to engage in risky sexual behavior, due to both sexes seeking out other partners to demonstrate that they are not the cause of the infertility, which results in contracting various STDs (Rouchou, 2013). When women are unable to conceive, they psychologically lose their "womanhood" and sense of gender identity; males are not regarded as "men" if they do not have children. Infertile couples mostly experience greater levels of guilt, humiliation, worthlessness, and depression if they are unable to conceive. Families may take away a woman's social security and any gifts or inheritance she may have gotten during marriage if she is unable to bear children. In addition, there is a financial burden of expensive treatment for infertile couples (Fledderjohann, 2012). Therefore, it is important to channel attention to the utilization of herbal medicine in treating infertility, fully exploring the factors facilitating the usage of herbal remedies for treating infertility as well as the barriers.

The findings of this study would be of particular importance to the management of herbal medicine firms and herbal medicine producers in Ghana as it would highlight the underlying reasons why the population adopt and use herbal medicine for infertility treatment. The study will also help policy makers (i.e., Traditional and Alternative Medicine Directorate (TAMD), Food and Drugs Authority (FDA)) to develop policies that would help manage the treatment of infertility with the

use of herbs. Furthermore, this study will add knowledge to the academic literature available on the underlying reasons for the use of herbal medicines in the treatment of infertility.

1.6 The Conceptual Framework

The Ecological Model (EM) is the theoretical model that was used to explain the utilization of herbal medicine in treating infertility. This model is suitable for the study because it recognizes multiple levels of influence on health seeking behaviors. It explains the relationship between, and the interdependence of, factors within and across all levels of a health problem. According to McLeroy et al., (1988), three levels of influence make up the health-related behaviors and conditions that is, intrapersonal/individual factors, interpersonal factors and the population level which encompasses three factors thus, institutional/ organizational factors, social capital factors and public policy factors. Individuals seeking care for infertility have various factors that influence or limit their decision on the usage of herbal medicine for infertility treatment.

Various factors displayed in Figure 1 either facilitate or limit the use of herbal medicine for infertility treatment. Evidence shows that herbal medicines form an integral part of health systems (Kashani & Akhondzadeh, 2017; Lee et al., 2019; Jaradat & Zaid, 2019). However, individual factors such as age, educational level, personal beliefs and perceptions may influence the use of herbal medicine for infertility treatment. Interpersonal factors such as peers, friends and family influences, as well as a person's social identity can have an effect on one's choice to opt for herbal infertility treatment or not. Also, a person's lack of trust in either western or herbal medicine due to failed treatments, as well as cultural beliefs also influences one's decision to use herbal medicine as infertility treatment. Institutional and public policies like integrating herbal medicine into

government hospitals, have facilitated the use of herbal medicine for infertility treatment. However, as herbal medications are not covered under the national health insurance scheme, this tends to limit the use of herbal medicines for infertility treatment.

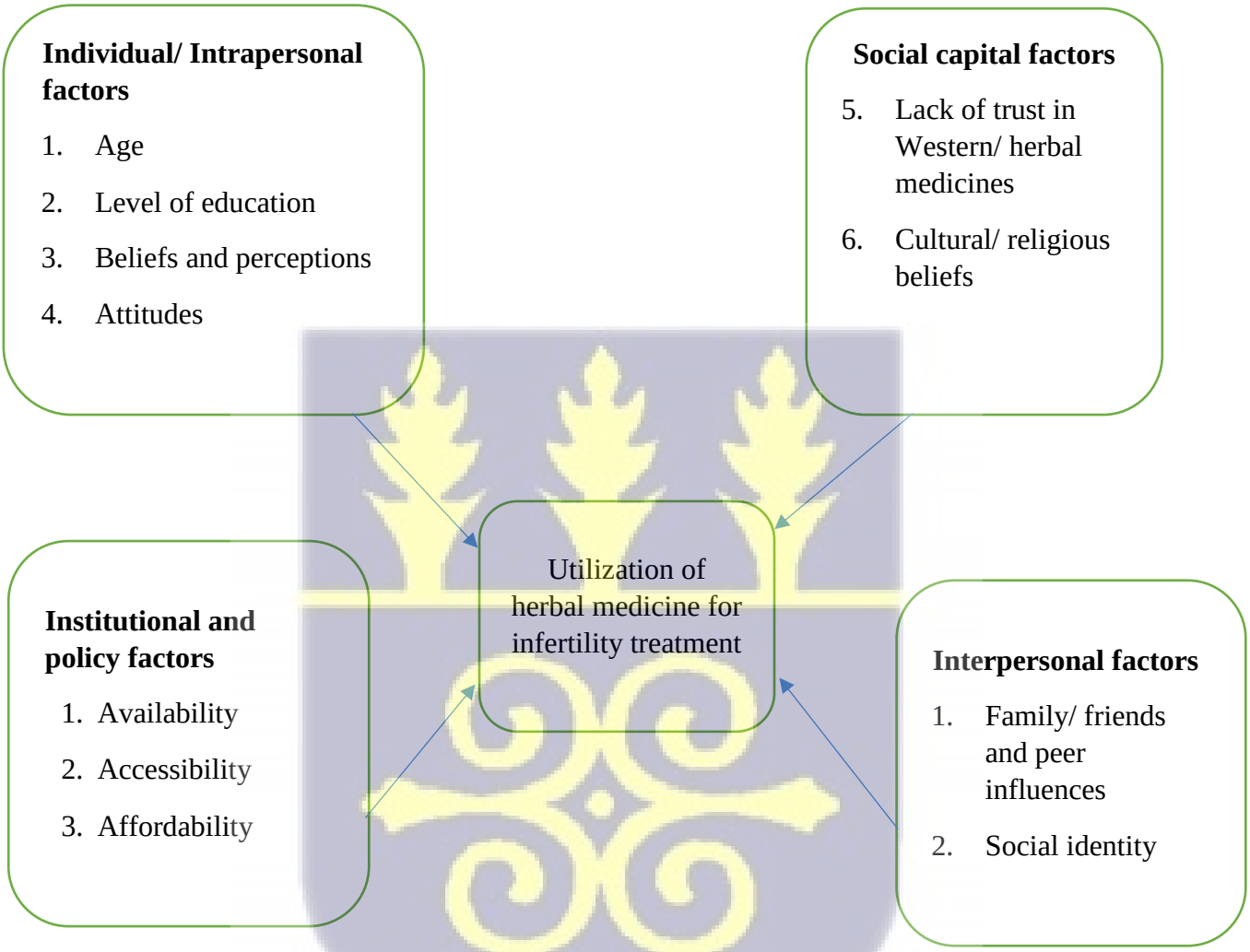


Figure 1: Conceptual Framework

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter highlights the epidemiology and aetiology of infertility, global burden of infertility and its treatments. Further, this section discussed the utilization of herbal medicines, the influencing and limiting factors of herbal medicine use.

2.1 Epidemiology of Infertility

According to the European Society for Human Reproduction and Embryology (ESHRE), infertility is defined as the inability to conceive during one (1) or two (2) years of regular cohabitation and it affects 10-15% of all couples (Datta et al., 2016). About 80% of couples aged 18 to 28 years conceive within the first year, and 10% others conceive within the second year. Infertility rates have been gradually rising globally mostly due to delayed childbirth, an increase in pelvic infections, and, in some countries, like China, decline in the quality of sperm (Jiang & Li, 2017; Zauner & Girardi, 2020)

The desire to have a child is almost universal, and many international conferences have acknowledged the freedom to reproduce as a core human right. Whether it's because of genetics, emotional needs, or social pressure, most individuals want to have a child at some point in their lives, and many assume they'll be able to do so through the traditional biological path (Greil, 2017). However, not everyone is successful in realizing this ideal. Infertility affects around 186 million couples in developing nations (excluding China). Infertility rates vary greatly from country to

country; in the worst-affected countries, up to 25% of couples may be unable to conceive (Zhang et al., 2020). While many of these couples may conceive without treatment, treatment will frequently speed up conception. Unexplained infertility is not a complete disorder, but rather a relative failure to conceive. The birth of a healthy child is the ultimate goal of all infertility treatments (Lee, Lee & Wang, 2019). Nearly 80% of infertile couples can now receive assistance in conceiving a child.

2.2 Aetiology of Infertility

Infertility can be caused by male or female factors, or a mix of the two or may be due to unidentified reasons, each accounting for about 25% of the condition (World Health Organization, 2020). There are numerous etiologies for infertility in many couples; however, in around 15–17% of couples, the infertility is classified as unexplained because no cause has been identified (Carson & Kallen, 2021). The selection, age, and, to some extent, the results of assessments of infertility all influences incidence.

According to infertility studies conducted in Atlanta, having children is something that a lot of people want, yet for a small proportion of people, it is difficult to achieve (Piotrowski, 2021). Genetic defects, viral or environmental agents, delayed childbirth, behavior, and some disorders can cause challenges to fertility (Beke, 2019). Human fertility can be limited by natural aging processes. According to American College of Obstetricians and Gynecologists Committee (2014), the reproductive windows of some people close earlier than expected, and in women, fertility drops gradually but considerably starting around age 32 and more quickly after age 37. The natural limits of fertility have recently come to light due to recent trends toward delaying the age of first

pregnancy, which has accelerated the development of and use of medical technologies to overcome them (Greil, 2017; Beke, 2019). Infertility can also be caused by treatment for other medical conditions including cancer, the treatment of which is frequently associated with infertility (Greil, 2017).

Male infertility was formerly mostly related to psychosexual and physiological problems, such as the anxiety of losing sexual ability, a tiny penis, lighter sperm, and infertility in a previous marriage (Zhang et al., 2020). Men with extremely active sex lives, frequent nocturnal emissions, and intense premarital masturbation were thought to be more susceptible to infertility (El Salam, 2018; Zhang et al., 2020). The most frequent reasons for male infertility are low sperm count or low sperm quality (Greil, 2017). It is believed that occupational and environmental hazards are causing human sperm quality to decline in industrialized nations (Kumar & Singh, 2022). In addition, tobacco use is associated with decreased ejaculate volume, sperm density, and spermatozoa morphology in men (Asare-Anane et al., 2016). Although the effects of obesity on male fertility are uncertain, it is connected to erectile dysfunction and decreased testosterone production in men (El Salam, 2018).

Around age 35, the rate of decline in female fertility starts to pick up, and by age 40, it is accelerating (Greil, 2017; Zhang et al., 2020; Delbaere et al., 2020). Furthermore, smoking and obesity are linked to irregular ovulation and hormonal imbalances is one of the the most common reasons for female infertility (Greil, 2017). Chlamydia and other STIs, as well as the use of contraception, may also make it challenging to get pregnant. Overeating, insulin resistance, and endocrine abnormalities that affect fertility in women with PCOS have come to light as a result of

the metabolic abnormality associated with the condition (Diamanti-Kandarakis & Dunaif, 2012). Deficits in nutrition may also reduce a woman's chances of getting pregnant. Additionally, smoking tobacco is associated with early menopause, fecundity (probability of conceiving within a month) and ovulatory dysfunction in women in a dose-dependent manner (Hkonsen et al., 2014).

2.3 Global Burden of Infertility

The global health community has made considerable strides toward improving mother and child health, in part by placing a strong emphasis on reproductive health (Mascarenhas et al., 2012). Infertility is a crucial aspect of reproductive health that is frequently overlooked yet the condition affects millions of people around the world who are of reproductive age. According to information now available, between 48 million couples and 186 million people worldwide struggle with infertility (WHO, 2022). An accurate assessment of infertility's prevalence, distribution, and trends is crucial for developing evidence-based therapies and policies that would lessen the impact of this underappreciated disability on the world's population (Mascarenhas et al., 2012).

Men and women feel pressured to prove their fertility due to a high social value put on having children, their fear of infertility may prevent them from using contraception. Frequent contraceptive-related health concerns including the belief that contraceptives change the menstrual flow, cause damage to women's reproductive organs and promote weight gain which could lead to infertility are some of the primary reasons deterring individuals from taking contraceptives (Boivin et al., 2020).

48.5 million people worldwide suffer from infertility, which has a prevalence of 3.5-16.7% in low- and middle-income (LMIC) nations and as high as 30-40% in Sub-Saharan Africa. The majority of these infertile people are unable to get assisted reproductive therapy services due to the exorbitant cost of treatments as well as obstacles posed by culture, religion, and the law. (Hiadzi & Woodward, 2019). Due to the severe effects of infertility and childlessness, particularly in LMICs, there is a great deal of interest in creating less expensive treatment options. (Hiadzi & Woodward, 2019). Unfortunately, there is a dearth of information regarding the safety, effectiveness, and capacity to duplicate procedures in various field circumstances, as well as how to incorporate more affordable ART options into current infrastructures. Therefore, in the establishment of infertility treatment programs and policies in LMIC health systems, there are large gaps and opportunities (Hiadzi & Woodward, 2019). Due to delayed childbearing in affluent nations, STIs, risky deliveries, and unsafe abortion in underdeveloped countries, the prevalence of infertility has grown recently (Mascarenhas et al., 2012).

Due to the expensive nature of infertility therapy, many infertile couples in many nations receive insufficient or no treatment. Because they either lack insurance for healthcare or the policies they have do not cover fertility, many of them must pay out of pocket for their medical care (Mascarenhas et al., 2012). There are few countries like the United Kingdom, Turkey and Singapore that have a legal mandate for infertility counseling and supportive care in reproductive health policies and programs. Furthermore, cultural and social factors such as cultural stigma labelling individuals as infertile, dissuade members from seeking infertility care, and language differences between physicians and patients in some localities present obstacles to obtaining infertility services from healthcare organizations. Lack of coverage of infertility services as

reproductive rights is a problem in several nations, including Ghana and the USA, where restricted and discriminatory policies continue to stand in the way of development (Greil, 2017). Therefore, ensuring full access to infertility services and establishing extensive programs are crucial measures that governments and health systems should put into place.

2.4 Burden of Infertility in Africa

Demographic information and a few epidemiological and clinical research serve as the foundation for the majority of current projections of the prevalence of infertility and pregnancy loss (Kashani & Akhondzadeh, 2017). In some sub-Saharan African nations, such as Sudan and Gabon, where efforts are being made to provide suitable services to prevent and treat the underlying causes of infertility, the issue of infertility would seem to be particularly serious. Based on the prevalence of the condition and how much importance society attaches to it, infertility as a public health issue varies greatly among different communities.

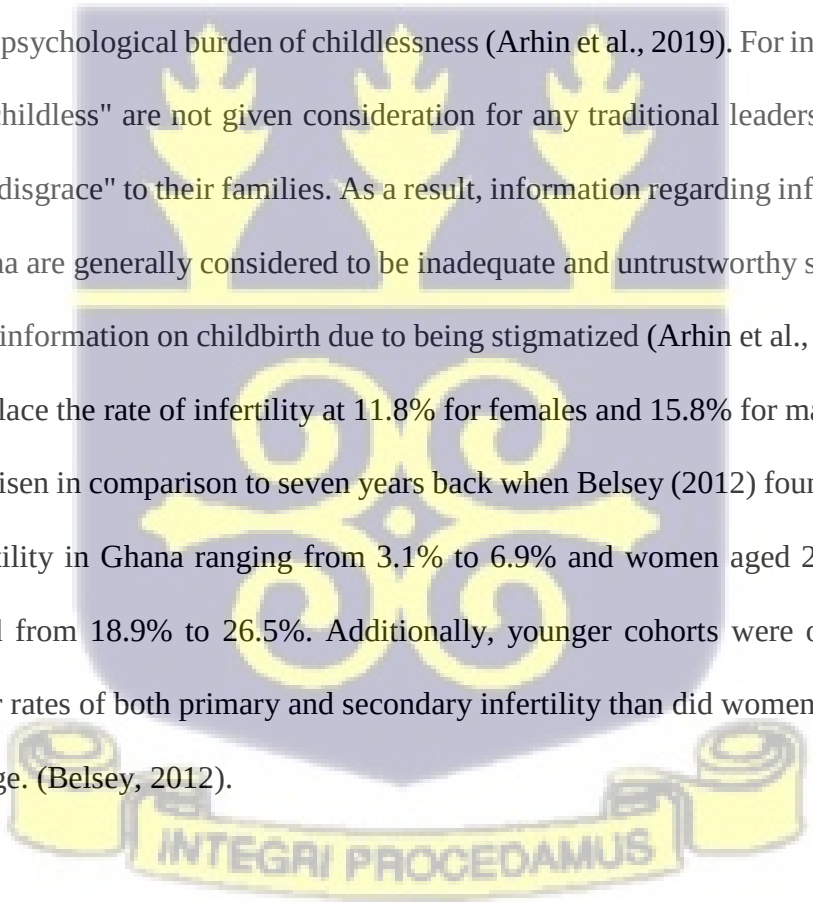
There is an increasing need for infertility therapies such IVF in LMICs but it is either unavailable or not accessible to most individuals in these countries due to its high cost. For instance, there is no insurance coverage and every IVF clinic in Ghana is privately run. Individuals who can afford ART treatment such as IVF have to pay out of pocket and most often have to undergo multiple cycles of ART. When families must pay enormous out-of-pocket costs to receive infertility treatment, it can also have a detrimental effect on the nation's economy (Teoh et al., 2014).

Most African societies view procreation as the main reason for marriage, thus if a woman has infertility shortly after getting married, she seeks assistance from traditional healers. African

women frequently turn to traditional medicine for help with issues related to their maternal and reproductive health. The results show a high frequency of herbal medicine usage in maternity care, which is consistent with the prevalence in the overall African populace, whereby herbal medicine is viewed as the main source of treatment for most rural people (Greil, 2017). Also, due to the prevalence of traditional birth attendants and herbalists in the majority of African villages, traditional health practitioners are more accessible than orthodox ones (El-dahiyat et al., 2020).

2.5 Burden of Infertility in Ghana

Infertility has socio-cultural and socio-economic repercussions in various Ghanaian communities in addition to the psychological burden of childlessness (Arhin et al., 2019). For instance, in Ghana, those who are "childless" are not given consideration for any traditional leadership position and are viewed as a "disgrace" to their families. As a result, information regarding infertility and being childless in Ghana are generally considered to be inadequate and untrustworthy since respondents tend to withhold information on childbirth due to being stigmatized (Arhin et al., 2019). In Ghana, 2019 estimates place the rate of infertility at 11.8% for females and 15.8% for males (Arhin et al., 2019). This has risen in comparison to seven years back when Belsey (2012) found the prevalence of primary infertility in Ghana ranging from 3.1% to 6.9% and women aged 20–44, secondary infertility ranged from 18.9% to 26.5%. Additionally, younger cohorts were observed to have somewhat higher rates of both primary and secondary infertility than did women in the 34- to 44-year-old age range. (Belsey, 2012).



According to the Ghana Demographic Health Survey, it is uncommon for people to choose not to have children. Due to negative psychosocial consequences such insecure marriages, abuse, and

shame, researches in sociological and anthropological fields undertaken in Ghana witness to the enormous suffering associated with involuntary childlessness (Tabong & Adongo, 2013). According to a study in Southern Ghana, the challenges and stigma of infertility faced by some infertile women have compelled them to employ their own coping mechanisms like not sharing their feelings, seeking advice from family and friends and beliving that waiting is the only solution whiles others also rely on their Christian religion to cope (Tabong & Adongo, 2013). In Ghana, infertility is a social and medical issue. Medically, there is to statistics, infertility is very common among couples without having access to treatment for infertility. Since motherhood and fatherhood are typically associated with woman- and manhood, respectively, in our societies, infertility is a social issue (Rouchou, 2013).

For treatment, a variety of therapy modalities are used in Ghana, from the use of CAM and orthodox medications to extremely advance assisted reproductive techniques. Many couples only have the option of using medication due to the high cost and a lack of assisted reproductive technologies, such as cryopreservation, in-vitro fertilization (IVF), surrogacy, and intracytoplasmic sperm injection (ICSI) (Arhin et al., 2019).

2.6 Treatment of Infertility

Every person is entitled to the best possible level of mental and physical well-being. Both for singles and for couples, deciding how many children to have, when to have them, and how often is a vital decision. In order to achieve every person's and couples' freedom to have a family, it is essential to resolve infertility (WHO, 2022). Many different people may need management of infertility and fertility care services, such as heterosexual couples, same-sex partners, older people,

people who aren't in sexual relationships, and people with specific medical conditions, like individuals who test positive for HIV and cancer survivors (WHO, 2022).

For ovulation induction, two oral medicines are employed as treatments interventions. The specific hormonal receptor modulator clomiphene citrate enhances the frequency of pituitary gonadotropin-releasing hormone (FSH) and luteinizing hormone (LH) synthesis, which in turn promote the development of ovarian follicles, by blocking the negative feedback effect of circulating estradiol. Letrozole inhibits aromatase, which lowers serum levels of estradiol and increases pituitary gonadotropin production. Letrozole is the initial course of therapy for PCOS-afflicted females experiencing ovulation induction, according to the Conception in Polycystic Ovary II Trial that shown that letrozole has an increased live birth rate than Clomiphene. Less than 10% of pregnancies are multiple involving both clomiphene citrate and aromatase inhibitors, and the majority of these are twin pregnancies (Legro et al., 2014; Carson & Kallen, 2021).

Individuals who are have problems conceiving naturally can be aided to do so using procedures referred to as assisted reproductive technologies (ART) are utilized as a help in getting pregnant (Jain & Singh, 2022). A fertility-related technique that alters eggs or embryos is referred to as assisted reproductive technology (ART) by the Centers for Disease Control (CDC). This idea does not include procedures like intrauterine inseminations, where just the sperm are changed. The criterion also excludes ovarian stimulation procedures performed without a plan for egg harvesting (Centers for Disease Control and Prevention, 2019). According to Ombelet and Onofre (2019), the diagnostic process and treatment of infertility adopting In-vitro fertilization (IVF) along with other assisted reproductive technologies (ART) can be made more affordable and economical using

many new breakthroughs and procedures. These include streamlined IVF culture techniques and automated smartphone-based diagnostics for semen analysis.

Surgical methods like tuboplasty, salpingectomy, and unilateral or bilateral salpingo-oophorectomy can be used for the treatment for some infertility causes, although outcomes are not always adequate. As a result, surgical correction is never recommended for women older than 35 and is rarely recommended for those who are younger than 35years. For women under the age of 35 with clear fallopian tubes, a diagnostic laparoscopy followed by operative laparoscopy is advised if there is enough proof based on history, lab testing and abnormal HSG indicative of tubal disease, or if there is another reason for laparoscopy such as severe dysmenorrhea or complex ovarian cysts (Jiang & Li, 2017).

In most nations, there is still a problem with the accessibility, quality, and availability of therapies to treat infertility. The detection, treatment, and prevention of infertility are rarely given top priority in national policy, and as a result, public health financing is sparingly allocated to them (WHO, 2022). Widespread availability of treatment for infertility is further hampered by the high cost of care, as well as a lack of workers with the necessary skills and equipment. Even though the use of ART has been in existence for over thirty years, it is still generally out of range for many people across the world (WHO, 2022). The underserved and marginalized populations, including the impoverished, single, illiterate, jobless, and others, also suffer from disparities in access to fertility care services (WHO, 2022). The cause, length of time, ages of the spouses, and personal preferences all factor into choice of infertility treatment. Treatment for infertility involves financial, physical and time commitment and the inability to treat some infertility causes should be communicated to the couple (WHO, 2020).

2.7 Herbal Medicine and its Utilization

Herbal medicine, often known as, botanical medicine or phytomedicine can be defined as the "use of plant`s seeds, berries, roots, leaves, bark, or flowers for medicinal purposes" (Tripathi et al., 2019). Herbal medicine and conventional healthcare were also defined by experts from the World Health Organization (WHO) as a collection of knowledge and practices, whether comprehensible or not, used in the diagnosis, prevention, and elimination of physical, mental, and social disparities and solely relying on practical experience and observation passed down from generation to generation, whether verbally or in writing (WHO, 2011). Conventional medicine can be summed up as the practices, measures, ingredients, and techniques of all kinds, whether physical or not, that have allowed Africans to prevent diseases, ease their suffering, and heal themselves since time immemorial (Ezekwesili-Ofili & Okaka, 2019).

Depending on where you are in the globe, different people use herbal remedies, and lately, their use has been more common (Bardaweel et al., 2013). In Arab countries, for illness management and prevention, about 80% of the population uses herbal remedies. Whereas 37% of the population in Egypt reported using herbal remedies, 73% of the population in Saudi Arabia reported using herbal remedies (Shewamene et al., 2017). Due to historical, cultural, and sociological considerations, herbal medicine has remained popular in Jordan. Research conducted in the Middle East and North Africa region by Shewamene et al., (2017) on the prevalence of Complementary and Alternative Medicine; in particular, Herbal Medicine has shown the region to house one of the fastest growing markets of Herbal Medicine or products in the world. However, research describes the use of herbal therapies among Middle-Eastern infertile patients as minimal (Bardaweel et al., 2013; Shewamene et al., 2017). On the other hand, increased acceptance and accessibility of

complementary and alternative medicine (CAM) in other developing nations, like Jordan, may be a factor in the comparatively high incidence of herbal treatments for infertility (Bardaweel et al., 2013).

According to a research by the World Health Organization, between 70 and 95 percent of people in underdeveloped nations practice traditional medicine (TM) (WHO, 2011). More than 80% of people in Africa practice traditional medicine. The majority of people only have access to herbal medicine as their primary form of healthcare, especially in rural communities in Africa. This continued use of traditional medicine in these contexts is probably due to the limited accessibility, availability, and affordability of modern medicine (Shewamene et al., 2017). In 18 quantitative investigations, the percentage of women who used TM to address issues with their reproductive and maternal health ranged from 12% to 79.9%. According to 11 of this research, between 20% and 79.9% of pregnant women reported using herbal medications (Shewamene et al., 2017).

Scientists have observed the use of the same or related plants for the same reasons by humans in many parts of the world across time. Prior to colonization, Ghanaians relied on herbal remedies to treat ailments, and these remedies are said to have essential components for the body's physical and spiritual wellbeing (Tripathi et al., 2019). Most herbalists are said to have supernatural insights into different plant species and their healing properties. Herbal medicine has been elevated to a new level where scientific research has been applied to enhance the healing capabilities of these plants in response to the increased expectations from orthodox medicine (Ezekwesili-Ofili & Okaka, 2019).

The mass manufacturing of herbal medicines in Ghana commenced in the late 1950s. Ghana has a robust herbal medicine industry that produces herbal medicine in significant quantities and attracts high patronages and capital investment. The sector is experiencing growth and development and moving away from the unregulated era to having government regulation. As a result of this development, herbal medicine is now being used as part of the healthcare delivery in several government health facilities in urban and rural areas in Ghana, and institutions like CPMR produce, research and conduct microbial and biological testing, as well as safety and efficacy test of herbal medicines (Boateng et al., 2016). Universities such as Kwame Nkrumah University of Science and Technology have developed academic curricular to train students and award them degrees in herbal medicine (Boateng et al., 2016).

Many households' resort to the use of herbal medicine in the management of afflictions in biomedical treatments (Ezekwesili-Ofili & Okaka, 2019). TRM has long influenced the interactions between health care providers and patients, not just in low- and middle-income regions but also in wealthy areas with advanced and widely recognized health systems (Boateng et al., 2016). TRM users today favor holistic medicinal procedures that aim to heal the entire human system. Localized folk remedy ideas among rural dwellers presented a significant challenge to preexisting cultural norms. According to academic studies by Adams et al. (2011), Gyasi (2015), and Venetis et al. (2020), people may be drawn to and partake in TRM because they have beliefs that are in line with TRM practice. The rise in the use of TRM is also largely attributable to socio-culturally specific health beliefs regarding disease causes and treatment outcomes (Gyasi, Mensah, & Siaw, 2015). According to studies, attitudes toward control and participation, perceptions of

sickness, belief in holistic medicine and natural remedies, as well as general life philosophies, all predict the usage of TRM (Gyasi et al., 2016).

2.8 Factors Associated with Herbal Medicine Use among Individuals Seeking Care for Infertility

In many nations throughout the world, the usage of herbal medicines has dramatically increased, with increased number of people now turning to these products for the treatment of a variety of health issues (El-dahiyat et al., 2020). Infertility, high blood pressure, dyslipidemia, diabetes, cancer, and inflammatory bowel illnesses are just a few of the chronic conditions that people claim to treat with herbal medication (Ghazeeri, Awwad, Alameddine, Younes & Naja, 2012). According to James et al. (2018), the most frequent justifications for using traditional herbal medicine are that it is less expensive, more closely aligns with patient beliefs, eliminates worries about the side effects of chemical medications, satisfies a need for more individualized health care, and enables a wider public access to health information.

A significant percentage of patients employed herbal remedies for infertility therapy, according to James et al.'s (2018) research. The most often employed herbal medicine methods by male and female patients, respectively, were "functional foods" and "spiritual healing." Use of herbal remedies is linked to lower household income, being a man, being diagnosed with infertility at a younger age, and receiving ART for infertility therapy. According to a study, Lebanese infertile patients used herbal medicine significantly more often than other treatment modalities. This, combined with the patients' inadequate disclosure of their use to doctors, points to the need for

doctors to start having conversations with their patients about herbal medicine use (Bardaweel et al., 2013).

The lack of perceived efficacy and encountering negative side effects with conventional treatment are the most frequently cited causes for the rise in the use of herbal therapy (Bardaweel et al., 2013). Herbal medicine use is frequently associated with cultural practices and beliefs that promote self-care, home remedies, or consultations with conventional and spiritual healers. The widespread use of herbal medicine in developing nations is also partially attributed to dissatisfaction with the results of conventional medicine and the seeming acceptance of herbal therapy's naturalness and safety (El-dahiyat et al., 2020).

Some factors, on the other hand, deter some people from taking herbal remedies, such as improper dosage, ignorant providers, substandard packaging and labeling, adulterated products, concern over harmful effects, and unreliable herbal service providers. Herbal medicines can have side effects that harm the skin, eyes, liver, kidneys, and gastrointestinal tract. This shows that it is untrue to say that herbal medicines have no adverse effects (Aziato & Antwi, 2016). A study conducted in the Ashanti Region of Ghana indicates that the bitterness of herbal medicine, the unfavorable working conditions of the sellers of herbal medicines, lack of expertise on the side of vendors, and the high price of herbal medication from reliable sources were some of the hurdles to its usage. It was also found that, herbal treatment are expensive and not covered under the National Health Insurance Scheme (NHIS) (Aziato & Antwi, 2016). The prices of herbal medicine from reliable sources are excessive. This raises serious concerns since participants may choose to patronize unqualified people instead since their prices may be lower.

Given that traditional medicine has a considerably longer history in Africa than Western medicine does, many Africans have a strong cultural faith in traditional medicine and traditional medicine practitioners (Shewamene et al., 2017). For example, women in rural Africa frequently choose traditional healthcare experts such as traditional birth attendants than biomedical healthcare specialists. Women who experience infertility shortly after marriage frequently seek guidance from traditional healers because most African societies consider marriage as primarily a method of procreation. African women frequently employ traditional medicine to treat issues with their reproductive and maternal health. The findings from studies conducted in twelve African countries indicate a high frequency of herbal medicine usage in maternity care consistent with the prevalence in the overall African population, where herbal medicine is viewed as the primary form of healthcare for most rural people (Shewamene et al., 2017). In addition, traditional healthcare providers are more accessible in these areas than Western healthcare professionals. In most African villages, for instance, it is easy to find traditional birth attendants and herbalists (Shewamene et al., 2017).

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter describes the research area, the study design, the population, the sample as well as the sampling procedure used in the study. Aside the research instruments, the procedures followed in collecting the data and the data analysis were discussed.

3.1 Study Design

This was a cross-sectional study employing a mixed method using both qualitative and quantitative research approaches. Mixed techniques research presents promising methods to respond to novel and difficult queries (Hansen et al., 2016). As defined by the term "mixed methods", this "involved the collection or analysis of both quantitative and qualitative data in a single study where the data are obtained concurrently or sequentially, are accorded priority and involve the integration of data at one or more stages in the process of research" (Tashakkori & Teddlie, 2021).

A mixed method was chosen as the methodology owing to the research questions and objectives set for the study. Research objectives to determine life experiences are better answered with qualitative methodology rather than quantitative methodology. This method was useful in gaining more of an in-depth understanding of the underlying opinions, motivations, and reasons as study participants are allowed to speak at large without being limited as seen in quantitative research (Tenny et al., 2021). The other objectives were better determined by quantitative methodology since it aided to measure and develop ideas and hypotheses (Tscholl et al., 2019). Further, the study adopted concurrent triangulation design, a type of mixed method approach where both

qualitative and quantitative data were collected at the same time, analysis were completed separately and the results were compared to each other. These findings were then triangulated to collectively address the main aim of the study. Questionnaires were used to collect data for the survey amongst the patients while in-depth interviews of the doctors were carried out using the interview guide.

3.2 Study Area

The study area was in the Greater Accra Region. The Greater Accra Region of Ghana as depicted in Figure 2 below is the second most populated and the smallest region in Ghana. The capital city of Greater Accra Region is Accra which is the same as the capital city of Ghana. The region is bordered on the north of the Eastern Region, on the east by the Volta Region, on the south by Gulf of Guinea and on the west by the Central Region. The current metro area population is 2,605,000. The main economic activities in the region are financial and government services, trade, communications, construction, transportation and agriculture (mostly fishing) Forson, et al., (2022). For the purpose of this study, the researcher selected government hospitals with herbal clinics in the Accra Municipality namely Weija-Gbawe Municipal Hospital, Police Hospital, Lekma Hospital, Shai-Osu Doku District Hospital (Dodowa) and Tema Polyclinic.

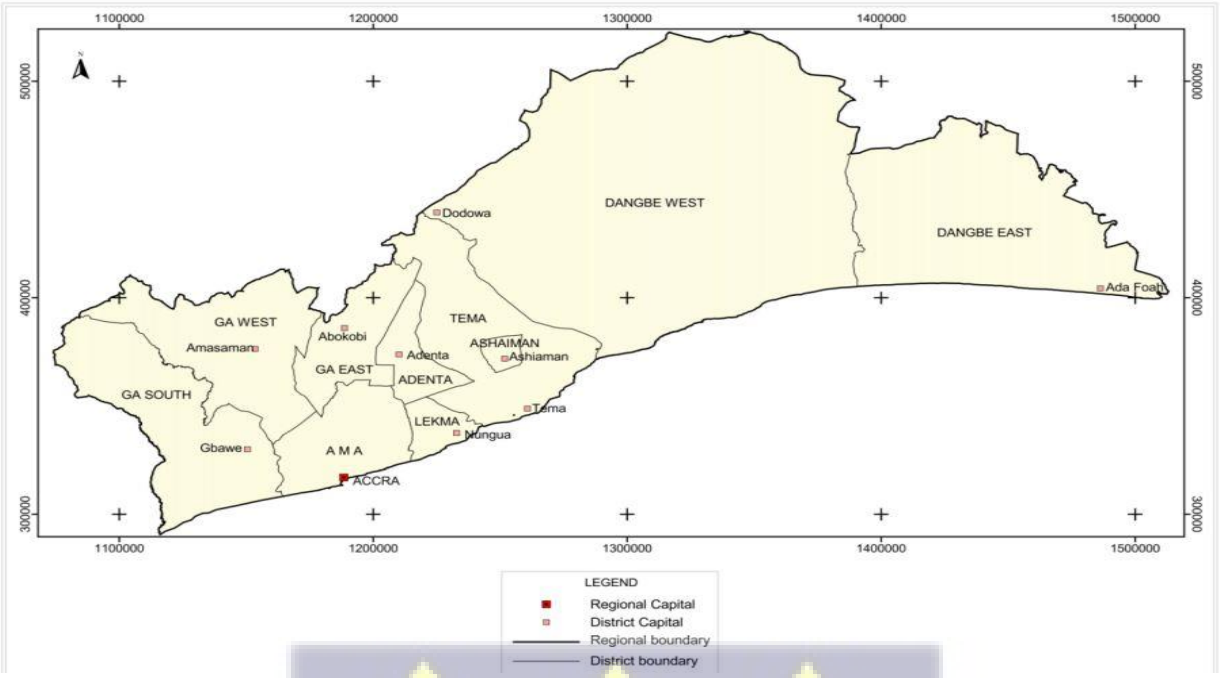


Fig 2: Map of the Study Area

3.3 Study Population

The study population included herbal doctors working in the herbal clinics of the selected government hospitals, as well as male and female patients who visited the herbal clinics at these hospitals for infertility treatments.

3.4 Inclusion and Exclusion Criteria

All individuals receiving treatment for infertility with herbal treatments were included in the study. Female and male respondents must be 18 years and above. In addition, this study included herbal doctors who had worked in these government institutions for at least two years in a clinical capacity.

The study also excluded herbal doctors who were not permanent staff of the health facilities and patients who were seeking treatment for other health conditions aside infertility.

3.5 Sampling Technique

Probability sampling technique was employed to sample the patients in the selected health facilities. Proportionally, 28 patients representing 32.9% were selected from LEKMA Hospital, 11 (12.9%) from Police Hospital, 14 (16.5%) from Dodowa Hospital, 20 (23.5%) from Weija-Gbawe Hospital and 12 (14.2%) from Tema Polyclinic. These patients were sampled in each of the facilities on a daily basis during the study for the quantitative study. The proportion calculation was based on the number of patients that visited the selected clinics for infertility and related treatments for the last three (3) months as presented in Table 1.

Table 1: Quantitative Sampling Technique

S/N	Hospitals	Hospital Attendance (Past three months)	Percentage (%)	Sample size (n=85)
1	Police Hospital	45	45/348*100=12.9%	12.9%*85=11
2	Dodowa Hospital	58	58/348*100=16.7%	16.7%*85=14
3	Lekma Hospital	114	114/348*100=32.7%	32.7%*85=28
4	Weija Gbawe Hospital	81	81/348*100=23.3%	23.3%*85=20
5	Tema Polyclinic	50	50/348*100=14.4%	14.4%*85=12

Total	348	100	85

For the qualitative study, convenience sampling procedures was also employed to sample the herbal doctors in the selected hospitals. Each of the hospitals had two (2) herbal doctors manning the herbal unit, and the five (5) doctors to be interviewed were purposefully selected for the study based on the inclusion criteria. This sampling technique was appropriate for the study because it allowed flexibility, and is less time consuming (Etikan et al., 2016).

3.6 Sample Size Determination

The sample size for the study was calculated using Cochran's formula because it allowed ideal sample size calculation given a desired level of precision and confidence level as well as the estimated proportion of the attribute present in the population.

$$n=\frac{Z^2\times(P)\times(1-P)}{e^2}$$

Where Z = 1.96 (z value of 1.96 of 90% confidence level)

e = 0.10 (margin of error)

P = 0.3 (estimated prevalence of infertility at the Cape Coast Teaching Hospital, Ghana as reported by Arhin et al., (2019))

Thus, $n = \frac{1.96^2\times0.3(1-0.3)}{0.10^2}$

$n = \frac{0.806736}{0.01}$

n = 80.67

n = 81

A non- response rate of 5% was added, therefore, a sample size of 85 respondents was used for the quantitative study.

For the qualitative study, five (5) participants were selected as the sample size for the IDIs. There was constant comparison of data during and after data collection till a point in the process when new information resulted in little to no modification to the code book. At this point, data saturation had been reached (Guest et al., 2016).

3.7 Study Variables

3.7.1 Dependent variable

Utilization of fertility herbal medication is the outcome variable for this study.

3.7.2 Independent variables

The predictor variables in the study are the individual or intrapersonal factors (age, level of education), social capital factors (social identity), institutional and policy factors (accessibility) and interpersonal factors (cultural and religious belief).

3.8 Data Collection Technique

For the quantitative method, structured questionnaires were used to collect data from patients from all four health facilities. The questionnaires were close-ended questions designed to elicit information regarding utilization of herbal medicine for infertility treatment. Each patient

completed one questionnaire. The principal investigator and research assistants administered questionnaires. Each filled questionnaire was checked for completeness of information.

Through in-depth interviews, the qualitative data for this study were gathered. The researcher conducted an in-depth interviews with the herbal doctors. The interviews were carried out in the hospital. Participants had the option to select a location within the facility that was convenient for them for the interview to take place. Once a place was identified, participants were made comfortable. With permission, in between the participant and the researcher a recorder was placed on a table. The interview was carried out in a conversational style so which allowed the participants the flexibility to discuss more, whiles the researcher delved deeper. Field notes were taken, facial expressions, gestures and how the participants reacted to questions posed were also noted and interpreted. It took between 30-45 minutes to complete each interview. Data were gathered over the course of three (3) weeks, and transcripts of each interview part were made.

3.9 Data Collection Tools

A comprehensive questionnaire was used to collect quantitative data from the patients. The questionnaires were divided into three sections: the first section collected information about the respondents' background; the second section investigated the factors that facilitate herbal medicine use among individuals seeking care for infertility; and the final section investigated the barriers to utilization of herbal medicine for infertility treatment.

The researcher used an interview guide consisting of fourteen (14) broad questions with probes as sub-questions for in-depth interviews with the herbal doctors. There were four sections in the

interview guide for the doctors: the first section collected the socio – demographics data of the doctors, the second section focused on the experiences of the herbal doctors in their practice of treating infertility; section three investigated the facilitators of herbal medicine use among individuals seeking care for infertility; and the final section addressed the barriers to using herbal medicine for infertility treatment. These interviews were conducted in February 2023.

3.10 Data Analysis

Microsoft Excel was used to prepare the quantitative data before exporting it to SPSS version 22 for analysis. The researcher adopted a descriptive data analysis approach (mean, standard deviation, frequencies and percentages) to describe the outcome of the data. Predictive validity tests and reliability tests were done to assess the degree to which the variables are associated.

The predictive validity test was carried out by testing the study instrument and then comparing the results obtained against the score of an accepted (Gold standard) instrument in the future. A high correlation of 0.35 was obtained. The consistency of the instrument was also measured by a reliability test. Thus, homogeneity was assessed by dividing the test into two comparable halves and the scores of the correlation of both halves were measured with a Cronbach's alpha of 0.75.

The data from the IDIs were transcribed into a Word document. The transcripts were imported into the NVIVO software and a thematic analysis was done based on the research's objectives. Familiarization with the transcribed data by reading over repeatedly to become immersed and familiar with its content and to generate initial themes was carried out to produce brief labels that

highlight significant data characteristics that might be useful in addressing the study objectives. Thematic analysis involved four steps;

- Creating a coding framework which is a set of categories, or codes that helped to organize the data by grouping similar concepts together.
- Coding of data which involved assigning the codes created to the data making categorizing and organizing data easier for analysis.
- Data analysis of the coded data by identifying patterns and themes in the data using NVIVO software.
- Interpretation of the patterns and themes in the data and making inferences to produce the results.

Single units of findings from individuals were discussed in relation to literature reviewed. Field notes taken were also analyzed and the information within placed under appropriate themes.

3.11 Ethical Considerations

The following activities were undertaken to ensure that ethical considerations with regards to the study were complied with.

3.11.1 Ethical approval

Approval of the study was sought from Ghana Health Service Ethics Review Committee (GHS-ERC). Following this, the medical directors of these government hospitals were consulted for permission before the study was initiated.

3.11.2 Informed Consent

Every participant was approached to express consent before participating. An informed consent form was given to each participant to read and sign and for those who cannot read had the information given to them in a language they could understand.

3.11.3 Confidentiality and anonymity

All respondents were assured that the data collected would be handled with strict confidentiality and that any information they submitted was only to be used for academic purposes. All records taken from the study participants were handled confidentially and anonymously, and was not discussed with anyone not directly involved in the research. Also, the respondents' names, addresses, and contact information were not asked for during the interview as well as on the questionnaires and finally, participants were addressed and identified with a unique identifier which ensured anonymity during the interview.

3.11.4 Right to refuse and withdrawal

Respondents had the right to refuse to be a part of the study. In addition, participants had the option to change their minds and leave the study at any time without being penalized.

3.11.5 Data storage and usage

Filled questionnaires were stored in a lockable filing cabinet. On a password-protected laptop, there were also electronic data files kept. Access was limited to only the principal investigator and research supervisor. The data collected would be discarded 2 years after the completion of the study.

3.11.6 Conflict of interest

There was no conflict of interest associated with this research.

3.11.7 Funding source

The research was funded solely by the researcher.

3.11.8 Dissemination of findings

Findings from the research were disseminated to the interested parties which included, University of Ghana, Legon through an oral presentation, the health facilities the herbal doctors were sampled from through a two-page summary report, and Ghana Health Service through a one page policy brief for further actions to be taken. The patients were also briefed on the findings through a poster presentation.

3.12 Quality Control

Research assistants (RAs) who spoke and understood the local language of the area and had been engaged in previous studies were recruited to assist the PI to collect data. A one-day training session was organized by the PI where the RAs were trained on the use of the data collection tools, as well as issues of privacy, confidentiality and consent seeking. Questionnaires were checked for mistakes and completeness. Dashboards were created to report day to day progress of the data collection to identify all errors or missing data. The researcher did member checking after initial themes from the qualitative data were developed.

A pilot test was conducted in January 2023 in the Ga West Municipal Hospital with two (2) herbal doctors and five (5) patients, which included both males and females with infertility issues. This

was done so that the effectiveness of the tools could be assessed for answerability, sequence and appropriateness for the main study. Any irregularities noted were addressed before the actual data collection commenced few weeks after.

CHAPTER FOUR

RESULTS

4.0 Introduction

The purpose of this chapter is to present the results of the analysis of the data collected and make meaningful conclusion. By using statistical analytical tools (SPSS VERSION 22) and the NVivo software, we can fully appreciate the utilization of herbal medicines in the treatment of infertility in selected health facilities in the Greater Accra Region. This chapter includes analysis of bio- data of the respondents, the experiences of herbal doctors in treating infertility, factors that influence the use of herbal medicine in the treatment of infertility, and challenges that patients face while accessing herbal treatment for infertility as well as qualitative analysis of interviews with some Doctors.

4.1 Socio-demographic Characteristics of Respondents

A total of eighty-eight (88) responses were received from the questionnaire administered to respondents. However, upon sorting, three (3) surveys seemed invalid due to non-compliance, leaving a total of eighty-five (85) legitimate questionnaires. This represents 97% retrieval rate, showing a very high response rate.

Table 2 shows the socio-demographic characteristics of the respondents. With regards to the gender distribution of the respondents, 71% of the respondents were females and 29% were males. Concerning the age grouping of the respondents, 26 (31%) of the respondents fall within the age group 20-30 years, 37 (44%) were within the age group 30-40 years, while 16 (19%), and 6 (7%)

were within the age group 40-50 years and 50+ years, respectively. This implies that the majority of respondents who seek herbal treatment for infertility fall within the age group 30-50 years (75%).

In terms of the respondents' marital status, 58% of the respondents were married whiles 12% and 31% were divorced and single, respectively; implying that more married couples seek treatment for infertility as compared to other categories. With regards to the educational qualification of the respondents, 16% of the respondents had no formal education, 22% completed JHS and SHS, 21% of the respondents completed Higher National Diploma in diverse disciplines, and 31% of the individuals had a first degree. The analysis further revealed that 7% and 2% of the respondents were Master's Degree and PhD degree holders, respectively.

Table 2: Socio-demographic Characteristics of Survey Participants

Variables	Frequency (n=85)	Percent (%)
Gender		
Female	60	71
Male	25	29
Age Grouping		
20- 30	26	31
30- 40	37	44
40- 50	16	19
50 +	6	7

Marital Status		
Divorced	10	12
Married	49	58
Single	26	31
Education		
No formal education	14	16
JHS and SHS	19	22
HND	18	21
Bachelor`s Degree	26	31
Masters	6	7
PhD	2	2

Table 3 shows the socio-demographic characteristics of the in depth interview participants. There were five study participants, two of whom were women and three of them were men. One Muslim and four Christians participated. There were two married participants, two single ones, and one in a split relationship. Three major themes: the experiences of the doctors, facilitators of herbal medicine use and barriers of herbal medicine use were identified with their corresponding sub-themes.

Table 3: Socio-demographic Characteristics of IDI Respondents

Interviewee	Sex	Age (years)	Religion	Marital status
1	Male	37	Christian	Single
2	Female	35	Christian	Divorced
3	Female	32	Christian	Married
4	Male	40	Muslim	Single
5	Male	43	Christian	Married

4.2 Experiences of the Herbal Doctors in the Treatment of Infertility

This objective highlights the experiences of herbal doctors in providing cure for infertility in both men and women in the health facilities. Sub-themes identified here include types and causes of infertility, care-seeking for infertility treatment (including gender dynamics), and herbal clinic utilization for treatment of infertility.

4.2.1 Types and causes of infertility.

The results revealed that herbal doctors attend to both primary and secondary infertilities in men and women. While it emerged that primary infertility is the most common type of infertility usually presented by patients, two participants explained why those with primary infertility visit more often. These opinions been rendered in the quotes below:

> *"Most of the people who usually come for treatment present with primary infertility and sometimes, not often, there are also some who present with secondary infertility."* [Interviewee 3, Female, 32 years]

"The thing is, those who have conceived and have had children before are usually in denial that there is a problem that needs medical attention when they are not achieving another pregnancy." [Interviewee 1, Male, 37 years]

The study revealed that there are several causes of infertility for which most people come to seek treatment and these include oligospermia, myomas, infections, azoospermia, PID, PCOS and erectile dysfunction. A participant added that sometimes the cause of this reproductive health problem is unknown. This may be related to the claim that some health issues may have a spiritual component. Hereunder are the quotes detailing the probable causes of infertility in both sexes as indicated by herbal doctors:

"The causes of infertility that people present varies from person to person but these are the most common- oligospermia, myomas. Sometimes or quite often, hmmm there is no known cause after various investigations like pelvic scans, semen analysis and hormonal assays have been carried out. I personally, in such a situation, inquire more about their faith and advise them to pray about it to whichever God they trust in." [Interviewee 5, Male, 43 years]

"Infertility cases that mostly come here are sometimes caused by infections especially sexually transmitted infections and myomas." [Interviewee 1, Male, 37 years]

"I believe that most of the infertility cases are caused by PID, PCOS, hormonal imbalance, oligospermia, oh and also azoospermia." [Interviewee 2, Female, 35 years]

4.2.2 Care-seeking for infertility treatment

The analysis revealed that when it comes to fertility problems, no particular category of people can be singled out as having these issues. It was unearthed that people in all social statuses and of varying age groups experience fertility problems. These points are captured in the following quotes:

> *"All kinds of people, rich, poor, young and old couples, people from various religious and tribal backgrounds do visit us here for infertility problems."* [Interviewee 5, Male, 43 years]

> *"Couples who are married for 4 years plus are those that mostly come here for infertility medications. You know after 4 years of marriage and there is no sign of pregnancy, the couple will definitely get frustrated so that is mostly the type of people that come for treatment."* [Interviewee 4, Male 40 years]

> *"For here mostly it is the elites who normally present with fertility problems and seek treatment here. I don't know why but most of them are of very high social class."* [Interviewee 2, Female, 35 years]

> *"Mostly, it is the locals, I will say it is the people that stay in this community that mostly visit our clinic for all their health problems so you see it is definitely the same locals who come for infertility treatments here."* [Interviewee 1, Male, 37 years]

The analysis also revealed the existing gender dimensions to treatment seeking for fertility problems. It emerged that women are those that mostly patronize herbal doctors' settings seeking for a remedy for fertility problems. This is most likely due to the Ghanaian sociocultural setting, where women are the most criticized when it comes to childless marriages, hence they desire to seek out remediation to avert public attacks. Stemming from this, one may be tempted to argue that it is society that pushes women particularly those who are married but having problems with childbearing to seek treatment more than men who may perhaps be the ones having the problem.

> "*I would say majority are women. 60% of those I attend to are females…from my experience over the years, mostly females come in to seek treatment for infertility due to societal pressure and mostly it turns out they are not even the cause of it but their partners get invited over to, you know, get screened and most don't even show up and amazingly those that show up too, it mostly happens that they have the problem."* [Interviewee 5, Male, 43 years]

> *"I will say the ratio of female and male seeking treatment is about 4:1 on an average. The men mostly claim they are busy with work so the partners come and even pick up their medications for them when need be."* [Interviewee 3, Female, 32 years]

The study revealed that some female clients are unable to get full support from their spouses which tends to impede treatment. Spouses are sometimes uncooperative and do not support clients financially. Statements below are quotes mirroring the state of spousal support in seeking treatment for infertility:

"Mostly, patients who come here face financial challenges. It will shock you that some spouses are not ready to support financially to get rid of their infertility problems. It is really bad." [Interviewee 1, Male, 37 years]

"Per all indications, spouses of some clients are uncooperative spouses. It appears they are not interested in helping the clients of the problem and some genuinely do have the funds to support treatment." [Interviewee 5, Male, 43 years]

4.2.3 Herbal clinic utilization for treatment of infertility

During the in-depth interviews, it emerged that the volume of client visits to herbal doctors varied considerably. Whilst some participants (herbal doctors) receive about 7 patients per week, others receive just a case in three weeks. The variations in attendance could be due to the popularity of some of the facilities over others and also the location of some the facilities.

"*I will say, averagely, I attend to seven new clients in a week."* [Interviewee 2, Female, 35 years]

"The clients with infertility do not come here too often but I would say one (client) every three weeks." [Interviewee 3, Female, 32 years]

Three distinct types of treatment are given to people living with infertility as evident in the interviews. Herbal preparations are given to clients, particularly males, to correct their hormonal imbalances as well as boost the quality of their sperm. Secondly, couples are counselled on their sexual life and the reproductive cycles. This would also involve educating them on when

pregnancy is imminent in a woman's menstrual cycle. Finally, clients are put on diets as well as asked to adopt certain lifestyles while dropping detrimental ones to help restore their reproductive systems thereby enabling procreation. These submissions are as indicated in the quotes below:

> *"I normally give them herbal preparations both capsule and decoction) for hormonal balance, sperm boost."* [Interviewee 5, Male, 43 years]

> *"We do a lot of non-therapeutic approach of treatment here, that involves couple counseling, sex education and the use of the menstrual cycle chart for the women to know when they are in their ovulation period and free period."* [Interviewee 5, Male, 43 years]

> *"I recommend to them some diets and educate them on lifestyle changes or management."* [Interviewee 5, Male, 43 years]

In depth interview participants revealed that there is no specific duration for treatment. However, it could span between three months and one year. One interviewee alluded to the fact that the duration of treatment boils down to the severity of the problem. It also emerged that duration of treatment is equally dependent on the treatment compliance. It is in this regard that patients are always advised not to miss out on medications. Some of the views expressed are captured in the narratives below:

> *"It is usually between 6 months and a year. It is based on long how the person has been suffering from the condition."* [Interviewee 1, Male, 37 years]

"I treat such problems within three months." [Interviewee 3, female, 32 years]

"*Client is mostly advised to be on the medication consistently for at least 3months."* [Interviewee 5, Male, 43 years]

Participants from the IDI revealed that adherence to treatment is one of issues that herbal doctors have to deal with while treating infertility. Treatment non-adherence as identified is due to inconsistency in uptake of medications stemming from financial constraints. This is suggestive that clients' treatment non-adherence is mainly due to financial challenges. It also emerged that sometimes high dosages and the number of medications to take cause clients to default on treatment. Despite all of these, the analysis revealed that clients always want their problems to be addressed within the shortest time possible, and expected positive results almost immediately after being diagnosed. These sentiments are expressed in the quotes below:

"There is also the issue of compliance in taking medications especially when they are given too many drugs to take." [Interviewee 3, Female, 32 years]

"Most of my clients stop the treatment midway because of lack of funds to complete treatments." [Interviewee 5, Male, 43 years]

"There are also some impatient clients who are looking for a 10 days wonder, it is as if they want to see results as soon as they come here and when they don't get the magic they drop out." [Interviewee 5, Male, 43 years]

The IDI participants claimed that the rate of success in the herbal treatment of infertility is above 50%. Since testimonials or success stories play a critical role in treatment seeking options, having a treatment success rate of more than 50% could influence patients' decisions to patronize the treatment option. Below are opinions on the success rate of treatment from the herbal doctors:

"*I can say that the success rate of my treatment is 70%."* [Interviewee 1, Male, 37 years]

"The rate of success in my treatment is 60 percent." [Interviewee 2, Female, 35 years]

".... The situation is not the same for everyone who comes here. You know, different patients come with different issues but what I can confidently say is that 3 out of 5 clients who I attend to, get results." [Interviewee 3, Female, 32 years].

4.3 Facilitators of Herbal Medicine Utilization in Infertility Treatment

Table 4 depicts the results of factors that positively influence treatment of infertility using herbal remedies. Respondents seeking treatment for infertility at the selected health centers were asked to rate the options provided. Majority of the respondents agree that they use herbal medicine for infertility treatment because they are readily available 79 (92.9%), affordable 75 (88.2%), other methods have failed 72 (84.7%), it's popularity as a result of historical, cultural, and psychosocial factors 70 (82.4%), desire to avoid adverse effects associated with the use of chemical (synthetic)

medicines 75 (88.2%) and acceptance of its naturalness 78 (91.8%). These factors recorded mean scores and standard deviations of (mean=1.4; SD=0.8), (mean=1.6; SD=0.9), (mean=1.5; SD=0.9), (mean=1.8; SD=1.0), and (mean=1.6; SD=0.8) respectively. Similarly, 76 (89.4%), 67 (78.8%) and 64 (75.3%) of the respondents indicated that they used herbal medicine because it satisfies a need for more personalized healthcare (mean=1.7; SD=1.0), is a home remedy (mean=1.8; SD=1.0), has consultation with traditional and religious healers (mean=1.8; SD=1.1) and does not cause harm (mean=1.9; SD=1.2) respectively.

Table 4: Factors that Influence the use of Herbal Medicine in the Treatment of Infertility

Statements	Agree		Neutral		Disagree		Mean	SD
	Frequency	Percent	Frequency	Percent	Frequency	Percent		
I use herbal medicine for infertility treatment because they are readily available	79	92.9	3	3.5	3	3.5	1.4	0.8
I use herbal medicine for infertility treatment because they are affordable	75	88.2	6	7.1	4	4.7	1.6	0.9
I use herbal medicine for infertility treatment because other methods failed	72	84.7	10	11.8	3	3.5	1.5	0.9
I use herbal medicine for infertility treatment because of its popularity, as a result of historical, cultural, and psychosocial factors	70	82.4	11	12.9	4	4.7	1.8	1.0
I use herbal medicine for infertility treatment because I want to avoid concerns about the adverse effects of chemical (synthetic) medicines	75	88.2	6	7.1	4	4.7	1.5	0.9

I use herbal medicine for infertility treatment because it satisfies a need for more personalized healthcare	76	89.4	1	1.2	8	9.4	1.7	1.0
I use herbal medicine because it is a home remedy	67	78.8	12	14.1	6	7.1	1.8	1.0
I use herbal medicine because it has a consultation with traditional and religious healers.	67	78.8	6	7.1	12	14.1	1.8	1.1
I use herbal medicine for infertility treatment because of its acceptance of naturalness	78	91.8	5	5.9	2	2.4	1.6	0.8
I use herbal medicine for infertility treatment because of its harmlessness	64	75.3	9	10.6	12	14.1	1.9	1.2

(1-2) Agree, (3) Neutral, (4-5) Disagree

4.4 Barriers to Utilization of Herbal Medicine for Infertility Treatment

Table 5 depicts the challenges respondents face when using herbal medicine to treat infertility. Majority of them indicated that there are negative perceptions and comments about herbal medicine 76 (89.4%), ignorance and deceit of vendors 69 (81.2%), high cost of products at credible herbal clinic 69 (81.2%), and inconsistency of its effectiveness 63 (74.1%). Furthermore, the medicines were not covered under the national health insurance scheme 68 (80.0%), had spirituality attached to its use 70 (82.4%) and there was uncertainty of exactly where to get authentic and regulated herbal medicine 77 (90.6%). These challenges recorded mean scores and standard deviations of (mean=1.5; SD=0.9), (mean=1.8; SD=1.1), (mean=1.8; SD=1.0), (mean=2.0; SD=1.2), (mean=1.6; SD=1.0), (mean=1.7; SD=1.0) and (mean=1.6; SD=0.9) respectively.

Table 5: Challenges of Utilizing Herbal Treatment for Infertility

Statement	Agree		Neutral		Disagree		Mean	SD
	Frequency	Percent	Frequency	Percent	Frequency	Percent		
The negative perceptions and comments about herbal medicine	76	89.4	4	4.7	5	5.9	1.5	0.9
The ignorance and deceit of vendors	69	81.2	5	5.9	11	12.9	1.8	1.1
High cost of products at credible herbal clinic	69	81.2	10	11.8	6	7.1	1.8	1.0
The inconsistency of its effectiveness	63	74.1	9	10.6	13	15.3	2.0	1.2
The fact that it is not covered under the national health insurance scheme	68	80.0	11	12.9	6	7.1	1.6	1.0
The spirituality attached to herbal medicine use	70	82.4	9	10.6	6	7.1	1.7	1.0

The uncertainty of exactly where to get authentic and regulated herbal medicine	77	90.6	2	2.4	6	7.1	1.6	0.9

(1-2) Agree, (3) Neutral, (4-5) Disagree

During the interviews, various challenges were identified with the use of herbal medicines for infertility treatment. Participants believed that many individuals associated herbal medicine with superstition and thus perceived it as dangerous. The data also suggests that the trades of herbal doctors are under attack due to the speculations that herbal medicines cause destruction to important internal organs such as the liver and kidneys. It emerged that patients sometimes become impatient because of long durations of treatment coupled with the high cost of treatment. In addition, some people also complain about the bitterness of herbal medicines and this prevents them from patronizing and using the medications. These sentiments are expressed in the following quotes:

> *"Some people say herbal medicine is dangerous so they don't take it."* [Interviewee 5, Male, 43 years]

> *"...the information out there is that herbal medicine will destroy their kidneys and liver and interestingly, these allegations are sometimes from some of our colleagues in the orthodox unit."* [Interviewee 4, Male 40 years]

> *"When close pals and family even got to know I am a herbal doctor they suddenly felt I had some powers or spirits I operate with."* [Interviewee 4, Male 40 years]

People were further discouraged from utilizing herbal medicine due to the high expense involved. Prescribers of herbal medicine believed that prices should be lowered so that more people could afford them from the right source rather than going to places where unqualified individuals attend to them. It was also believed that the cost of the herbal products is increased when they go through processing and packaging.

"I think that the cost should be a bit low to encourage a lot of people to use herbal medicine because there are people out there who would wish to come to the Herbal Clinic but because of the cost, they will visit the pharmacy shop instead and sometimes unqualified personnel there just give out medicines that may cause harm." [Interviewee 1, Male, 37 years]

"All the procedures and processes that the herbal drug passes through to become capsules or bottled and labelled so that it will resemble the western medicine, also contributes to the cost of the medicine." [Interviewee 5, Male, 43 years]

It was highlighted that health insurance does not cover herbal medicine, which further restricts access to herbal therapy for people who cannot afford it. This sometimes leads to some clients purchasing half of the herbal drug prescribed and then coming back for the rest at a later time. However, one participant was of the view that although herbal products are expensive, the price is worth it if they meet the needs of the clients.

"Health insurance does not cover herbal medicine and this makes it difficult for some people who cannot afford it to use herbal medicine." [Interviewee 2, Female, 35 years]

"Treatment can be expensive which spans from cost of transportation through to the cost of the medications itself because it is not covered under the NHIS and it also takes a longer time to see results." [Interviewee 1, Male, 37 years]

"They sometimes only buy half of the drugs since they do not have enough money to get all their prescriptions. Mostly they finish the half and come to get the remaining half so if health insurance should cover it, it would really help." [Interviewee 3, Female, 32 years]

"Herbal medicine is expensive but when you know you are paying for something that is worth your healing, then you sacrifice for it." [Interviewee 5, Male, 43 years]

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter interprets the results obtained and it offers in depth analysis of the study's findings, compares the outcome to previous research findings based on the research Objective. Thus, the experiences of the herbal doctors, influencing factors and limiting factors to the use of herbal medicines in treating infertility.

5.1 Experiences of Herbal Doctors with Infertility Treatment in the Greater Accra Region

This study gained a thorough understanding of the utilization of herbal medicine in the treatment of infertility with regards to the experiences of the herbal doctors in treating infertility. Some of the findings of this study were in line with earlier research findings. As proven by Carson & Kallen (2021), it was also discovered in this study that infertility might be brought on by both male and female variables, as well as occasionally by unidentified causes. This study showed that oligospermia, azoospermia, and infections were the most common male causes of infertility, which Greil (2017) verified as well. These conditions may be brought on by occupational and environmental risks, according to Kumar & Singh (2022). According to this study, myomas, PID, PCOS, and fibroids were the most common reasons for infertility in women. It is confirmed by Diamanti-Kandarakis & Dunaif (2012) that the metabolic problem connected to polycystic ovarian syndrome (PCOS) is the cause of infertility in women. Belsey (2012), revealed that secondary infertility was more common than primary infertility among younger women between

the ages of 20 and 44. In contrast, primary infertility in younger women between the ages of 20 and 40 was the type of infertility that the study's IDI participants were most familiar with.

According to the study's findings about care seeking, women are more likely to seek fertility treatment than men. This could be a result of Ghanaians' sociocultural setting, which Tabong and Adongo (2013) highlighted as subjecting women to mistreatment and blame in childless marriages. Additionally, in developing nations like Ghana where having children is highly prized, infertile couples especially women must deal with issues including overt rejection or divorce as well as more subtly veiled forms of societal stigma that cause isolation and emotional pain. The study further revealed these female clients are often not the only ones with the infertility problems, but their male counterparts too.

Herbal products, counseling, lifestyle changes, and nutritional supplements were all found to be part of the herbal doctors' infertility treatment plans for their patients. This is backed up by the study conducted by James et al., (2018) which stated that traditional remedies for infertility include herbal medicines, functional diets, and spiritual healing. Further with the experiences of the herbal doctors, it was revealed that the herbal doctors are perceived by close friends and family members to possess some sort of spiritual powers or charms which is untrue. This revelation is however explained differently in study findings by Ezekwesili-Ofili & Okaka (2019) which posit that most herbalists are said to have supernatural insights into different plant species and their healing properties. In recent times, herbal medicine has been elevated to a new level where scientific research has been applied to enhance the healing capabilities of these plants.

5.2 Facilitators of Herbal Treatment among Infertility Patients in Greater Accra Region

Several factors accounted for people having a preference for herbal fertility treatment instead of receiving care from the conventional healthcare system. According to this study, a sizable percentage of patients who experience reproductive issues frequently seek out herbal practitioners due to the holistic nature of their care giving. This corroborates the findings of Ghazeeri et al., (2012) that people resort to the use of herbal preparations because they satisfy several health care needs including disease prevention, and to cure chronic illnesses such as infertility, dyslipidemia, hypertension, diabetes, cancer, and inflammatory bowel diseases.

It was shown that people who sought out herbal treatments for infertility asserted their efficacy through successful treatment experiences shared among close friends and family, as well as recommendations from some healthcare professionals. The successful treatment rate of infertility using herbal medicines was claimed to be more than 50% in this study, which is responsible for convincing people to patronize the services. This is corroborated by findings from a study conducted by Bardaweel et al., (2013) that the rationale for the bloat in the usage of herbal remedies is rationalized by the lack of perceived inefficacy. This study also showed that the majority of individuals use herbal medicine for infertility treatment when other approaches have failed. Furthermore, naturalness of herbal medicine was also revealed to be a facilitator encouraging usage among infertility patients seeking care. These results are in agreement with El-dahiyat et al., (2020) whose study findings suggested that the use of herbal medicine is often attributed to dissatisfaction with the outcomes of conventional medicine, as well as the apparent acceptance of the naturalness and safety of herbal therapy and the experience of negative effects with conventional medicine. This implies that the discontentment associated with the use of

orthodox medicines provides an incentive for people with fertility issues to drift towards the use of local herbal products to remedy their problems.

Additionally, it was found that most people choose herbal fertility treatment due to the historical, cultural, and psychosocial factors associated with it. This finding is supported by a prior study by El-dahiyat et al., (2020) that posits that using herbal medicine is frequently associated with cultural practices and beliefs that encourage self-care, home remedies, or consultations with conventional and spiritual healers. Another element that the majority of the study's respondents indicated was important in determining their choice of therapy was the cost-effectiveness of herbal drugs for treating infertility when compared to conventional medications or surgical procedures. This finding lends credence to that highlighted by James et al., (2018) stating that the most common reasons for using traditional herbal medicine are that they are inexpensive.

5.3 Barriers to Herbal Treatment among Infertility Patients in Greater Accra Region

This study also detailed some of the factors that limit the use of herbal medicines for individuals seeking infertility care. It was revealed that the negative perception about herbal medications thus, the belief that herbal medicines have several side or adverse effects, including damage to important organs such as kidneys and liver as reported by both health workers and patients, discourages people from patronizing herbal doctors. This is consistent with research from Liu et al (2015) that argues for the naturalness of herbal remedies. Herbal medicines were thought to have little or no negative effects because of their natural makeup. In contrast, participants in this survey agreed that herbal medicine can be harmful if it is administered by an unqualified individual or if it is a counterfeit formulation. Despite the fact that herbal medication is natural,

consumers should be aware that there may be adverse effects on the skin, eye, liver, and kidney in addition to challenges like diarrhoea and vomiting, according to a study by Aziato and Antwi (2016). This demonstrates that the claim that herbal medications have no side effects or negative effects is incorrect, and consumers of herbal products should be aware of these negative effects.

Additionally, it was determined that one issue that needs to be resolved in order to promote or boost consumers' patronage of herbal doctors is the high cost of care. This result confirms the findings of James et al. (2018) and Aziato and Antwi (2016) that one barrier to the use of herbal medicine from reputable sources was its high cost. The cost of herbal medications is high, and the National Health Insurance Scheme (NHIS) does not provide coverage for it. Patients may be forced to forgo treatment or receive subpar care as a result, which could cause further complications. It is anticipated that the NHIS will cover the cost of herbal medicine or laboratory testing and scans to allow people who choose to use herbal medicine for therapy to obtain services from reputable providers. In a lower middle class income country like Ghana, people struggle financially, and the NHIS can provide much needed respite once it covers both necessary orthodox and herbal medications for infertility treatment.

The study also found that one major issue preventing herbal medicines from being used by people who have fertility issues is the bitterness of the drugs which deterred consumers from patronizing herbal clinics and finishing the treatment course. This is consistent with the research findings of Liu et al., (2015) who noted that one of their patrons' main complaint about herbal treatments was their bitterness. Therefore, it can be said that those seeking therapy for infertility may find it more difficult to take their medications as prescribed, which could result in a lengthy course of treatment or discontinuation of treatment. However, a study conducted by Aziato and Antwi

(2016) provided evidence that others believed that the herbal medicine's natural flavor could inform consumers of its authenticity. The preference here therefore is for manufacturers of herbal medicines not to alter the flavor of their products since participants in the study were not put off by the bitter taste but were more focused on the therapeutic outcome of the medication.

CHAPTER SIX

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This chapter summaries the findings of the research and give conclusions with regard to the study objectives. The researcher also outline recommendations to help manage the challenges identified in the research**.**

6.1 Summary of Findings

After the analysis the researcher elicited the following findings, which are outlined based on the study objectives.

With regards to the experiences of the herbal doctors in the treatment of infertility, it was revealed that herbal clinic clients were mostly women. In addition, individuals from all social class and varying age groups come for infertility treatment and they often expect to get results fast which leads to most of them not achieving the ultimate goal.

Factors that facilitate the use of herbal medicine among individuals seeking care for infertility include ready availability of herbal medicines at the treatment centers and at other vending shops where patients turn to use them. The affordability of the treatment products/medicine in comparison with the orthodox medicine also encouraged clients to seek for herbal treatment. The study also found that patients are concerned about the adverse effects of the orthodox medicines and others suggest that herbal products are natural, thus encouraging their preference for herbal medication.

Concerning the barriers faced by patients using herbal medicine for infertility treatment, the researcher found out that the negative perceptions and comments about herbal medicine is challenge patients encounter when seeking treatment for infertility. It was also found that ignorance and deceit of vendors as well as high cost of products at credible herbal clinics are barriers of seeking infertility treatment. Furthermore, the study found that since herbal medicine are not covered under the National Health Insurance Scheme it created a barrier for its patronage. In furtherance to this, the spirituality attached to herbal medicine use and the uncertainty of exactly where to get authentic and regulated herbal medicine were also identified as challenges.

6.2 Conclusion

Herbal medicines has been widely accepted and utilized for various health conditions by many since its integration into the health care system in Ghana. These medicines have become an alternative form of treatment for infertility. Most individuals see traditional treatments as efficacious, safe, economically effective and a feasible alternative to modern medicine which is positive for the herbal medicine industry. The herbal doctors highlighted that in addition to the herbal medication, they also offered counseling, advice on lifestyle changes, and nutritional supplements. Furthermore, they revealed that their clients were mostly women which is reflective of the socio-cultural environment of the study setting where childbearing expectations for women are high.

The findings of this study would be of particular importance to the management of herbal medicine. The study will also help policy makers like Traditional and Alternative Medicine

Directorate (TAMD), Food and Drugs Authority (FDA) and Ghana Health Service (GHS) to develop policies that would help manage the treatment of infertility with the use of herbs. Furthermore, this study will add knowledge to the academic literature available on the underlying reasons for the use of herbal medicines in the treatment of infertility. To ensure that any intervention put in place to encourage patronage of herbal medications for infertility treatment is successful, there are some issues that need to be resolved. Thus, the NHIS not covering herbal treatments, the bitter taste of herbal medications and the general negative perceptions about herbal medications needs to be addressed to facilitate patronage of the herbal units in the relevant hospitals.

6.2 Recommendations

6.2.1 Recommendations for policy

1. The government should put policies in place to alleviate if not all but some of the financial burdens of fertility treatment like the laboratory tests, scans and medications especially those produced at Centre for Plant Medicine Research (CPMR).
2. The National Health Insurance Authority should consider having key herbal medicines on the National Health Insurance Scheme to encourage patronage of the herbal units in the hospitals.
3. The Food and Drug Authority must enforce policies on the standardized dosages and preparations of herbal products.

6.2.2 Recommendations for practice

1. Female clients should be encouraged to come with their partners to ensure continuity of treatment as well as motivation to them. Furthermore, there should be a nationwide sensitization by medical personnel on the need for couple treatment with regards to infertility.
2. Traditional Medicine Practice Directorate in collaboration with Ministry of Health should carry out sensitization of the public as to where to access government facilities where integration of herbal medicine practice has been successful. In addition, in-depth education should be given to clients about the nature of treatment and the duration before the commencement of fertility treatment to avoid disappointment and undue pressure on herbal doctors.
3. Collaborative workshop programs and training sessions with medical doctors, allied health professionals and herbal doctors on the practice and effect of herbal medications should be organized to change the perception of herbal medications among health professionals to ensure herbal doctors and other health professionals work hand in hand as a cooperate body.

6.2.3 Recommendations for further research

1. In the future, researchers who are interested in the area of herbal medicine and infertility can carry out studies to assess the efficacy of herbal medication in the treatment of infertility.
2. Pharmaceutical research for herbal preparations to curb or mask their bitter and unpleasant taste will help in improving clients' experiences with taking herbal medicines.

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APPENDICES

Appendix A: INFORMED CONSENT FORM FOR HERBAL DOCTORS

General Information/Background

Hello! My name is SHARON OWUSU and I am a Masters student at University of Ghana. I am conducting research on "Utilization of herbal medicines in the treatment of infertility in selected health facilities in the Greater Accra Region".

Procedure

In-depth interviews would be conducted by the principal investigator and data from participants would be recorded. There would be four sections in the interview guide for the herbal doctors: the first section will collect data on the socio – demographics of the doctors, the second section will focus on the experiences of the herbal doctors in their practice of treating infertility; section three will seek to investigate the facilitators of herbal medicine use among individuals seeking care for infertility; and the final section will address the barriers to using herbal medicine for infertility treatment.

Risks and Discomforts

There is no physical and limited or no psychological risk because the questions to be asked are not overly traumatic. The time it takes for respondents to be interviewed might be inconvenient.

Benefits

There will be no direct benefits to respondents participating in this research but the knowledge gained from this study may benefit society as a whole.

Confidentiality and Anonymity

Information about participants would be protected to the best of our ability. All data collected will be handled with strict confidentiality and any information you submit will only be used for

academic purposes. Socio- demographics data collected would be kept confidential and each participant will be anonymized using a unique identifier. Data would be sent directly into a data base, which cannot be accessed by a third party other than my supervisor.

Right to Refuse or Withdraw

Before participating in the study, please understand that your participation is voluntary. You do not need to participate in the research if you do not want to. If you decide not to be part of this study, your decision will not affect your relationship with the staff of the Ghana Health Service in anyway. You will also not lose any benefits that you would have otherwise been entitled. If you agree to take part in the study, you can still withdraw from the study at any time and this will not /affect you in any way.

Further Information

This study has been reviewed and approved by the Ethical Review Committee of Ghana Health Service. If you would like to find out more about the study or if you have any concerns, you may contact any of the following persons: Dr. Adanna Nwameme (Academic Supervisor) on 0246168214 or Ms. Abena Kwaa Ansah Apatu, the Administrator of Ghana Health Service Ethics Review Committee on 0503539896 or Sharon Owusu (Principal Investigator) on 0546388994.

Are you willing to participate in the interview? 1. Yes [ ] 2. No [ ]

I have read the entire information given above and agreed to participate in this interview.

NAME OF RESPONDENT……..….

SIGNATURE: ..... DATE……..……..….

NAME OF RESEARCHER……..

SIGNATURE…… DATE…….…….

Appendix B: INFORMED CONSENT FORM FOR PATIENTS

General Information/Background

Hello! My name is SHARON OWUSU and I am a Masters student at University of Ghana. I am conducting research on ‘’Utilization of herbal medicines in the treatment of infertility in selected health facilities in the Greater Accra Region”.

Procedure

Questionnaires would be given out to participants by the principal investigator and research assistants. The questionnaires would be divided into three sections: the first section would collect information about the respondents' background; the second section would investigate the factors that facilitate herbal medicine use among individuals seeking care for infertility; and the final section would investigate the barriers to utilization of herbal medicine for infertility treatment.

Risks and Discomforts

There is no physical and limited or no psychological risk because the response options to the questions are not overly sensitive or traumatic. The time it takes for respondents to answer the questionnaires might be inconvenient.

Benefits

There will be no direct benefits to respondents participating in this research but the knowledge gained from this study may benefit society as a whole.

Confidentiality and Anonymity

Information about participants would be protected to the best of our ability. All data collected will be handled with strict confidentiality and any information you submit will only be used for academic purposes. Socio- demographics data collected would be kept confidential and each participant will be anonymized using a unique identifier. Data would be sent directly into a data base, which cannot be accessed by a third party other than my supervisor.

Right to Refuse or Withdraw

Before participating in the study, please understand that your participation is voluntary. You do not need to participate in the research if you do not want to. If you decide not to be part of this study, your decision will not affect your relationship with the staff of the Ghana Health Service in anyway. You will also not lose any benefits that you would have otherwise been entitled. If you agree to take part in the study, you can still withdraw from the study at any time and this will not /affect you in any way.

Further Information

This study has been reviewed and approved by the Ethical Review Committee of Ghana Health Service. If you would like to find out more about the study or if you have any concerns, you may contact any of the following persons: Dr. Adanna Nwameme (Academic Supervisor) on 0246168214 or Ms. Abena Kwaa Ansah Apatu, the Administrator of Ghana Health Service Ethics Review Committee on 0503539896 or Sharon Owusu (Principal Investigator) on 0546388994.

Are you willing to participate in the survey? 1. Yes [ ] 2. No [ ]

I have read the entire information given above and have agreed to participate in this study.

NAME OF PARTICIPANT……..……..

SIGNATURE: .....DATE……...….

NAME OF RESEARCHER……..……...…

SIGNATURE……..……..DATE……

Appendix C: INTERVIEW GUIDE FOR THE HERBAL DOCTORS

TITLE: UTILIZATION OF HERBAL MEDICINES IN THE TREATMENT OF INFERTILITY IN SELECTED HEALTH FACILLTIES IN THE GREATER ACCRA REGION

Introduction: This interview guide is to help collect data for academic purposes only. All information would be kept confidential.

Part One: What are the experiences of the herbal doctors in the treatment of infertility?

- How long have you been practicing as a herbal doctor in this hospital?
- How often do patients come in for infertility treatment?
- What is the ratio of men to women that often come in for infertility treatment?
- What type of infertility do you mostly managed?
- What are the common causes of infertility you treat in you consulting room?
- What type of treatments do you give?
- What are the success rates?
- What kind of people usually come in seeking treatment for infertility?
- How long does the treatment take?
- What are some of the challenges you face in treating infertility in the herbal unit?

Part Two: What factors influence the frequent use of herbal medicine in treating infertility?

- What do you think is influencing patients to seek herbal fertility care?
- What factors facilitate the utilization of herbal medicine for your patients?

Part Three: What are the limitations of using herbal medicine for infertility treatment?

- Is herbal the first choice of most people seeking care for infertility?
- What are the common complaints made by patients seeking treatment for infertility from the herbal units? (Probe: What other factors limit their use of herbal treatment for infertility?)

Appendix D: QUESTIONNAIRE FOR PATIENTS

TITLE: UTILIZATION OF HERBAL MEDICINES IN THE TREATMENT OF INFERTILITY IN SELECTED HEALTH FACILLTIES IN THE GREATER ACCRA REGION

GENERAL INFORMATION AND INSTRUCTIONS

This questionnaire is designed to assess the utilization of herbal medicines in the treatment of infertility in selected health facilities in the Greater Accra region. This survey is part of my final project work, and your kind support is crucial for the successful completion of this work. Please note that this survey is strictly for academic purpose and your responses will be anonymous. Your participation in the study is greatly appreciated.

The questionnaire consists of three major sections: A, B and, C. Section A examines the demographic data of respondents; Section B, factors facilitating the use of herbal medicine in treating infertility; and Section C, the barriers of herbal medicine utilization for infertility treatment.

SECTION A: RESPONDENTS' DEMOGRAPHIC CHARACTERISTICS

In this section, you are kindly requested to answer basic questions about your general background information.

Please tick [√] or fill the appropriate box or space.

1. What is your Gender? a. Male [ ] b. Female [ ]

2. What is your age group?

(a) 20- 30 [ ] (b) 30- 40 [ ] (c) 40- 50 [ ] (d) 50 + [ ]

3. What is your Marital Status?

(a). Single [ ] (b) Married [ ] (c) Divorced [ ] d. Others (Please Specify) ……

4. What is your highest qualification?

(a) JHS/SHS [ ] (b) Bachelor's degree [ ] (c) Masters/ PhD [ ] (d) [ ] (e) other [ ]

SECTION B

Please answer all items on the questionnaire by **circling** the appropriate number in your view that reflects the factors that influence your use of herbal medicine in seeking treatment for infertility.

Statements	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
I use herbal medicine for infertility treatment because they are readily available	1	2	3	4	5
I use herbal medicine for infertility treatment because they are affordable	1	2	3	4	5
I use herbal medicine for infertility treatment because other methods failed.	1	2	3	4	5

I use herbal medicine for infertility treatment because of its popularity, as a result of historical, cultural, and psychosocial factors	1	2	3	4	5
I use herbal medicine for infertility treatment because I want to avoid concerns about the adverse effects of chemical (synthetic) medicines.	1	2	3	4	5
I use herbal medicine for infertility treatment because it satisfies a need for more personalized health care.	1	2	3	4	5
I use herbal medicines because it is a home remedy	1	2	3	4	5
I use herbal medicines because it has consultation with traditional and religious healers.	1	2	3	4	5
I use herbal medicine for infertility treatment because of its acceptance of naturalness	1	2	3	4	5
I use herbal medicine for infertility treatment because of its harmlessness.	1	2	3	4	5

I use herbal medicine because it is regarded as the primary health care option for most rural communities	1	2	3	4	5

Others…….. …….

SECTION C

Please answer all items on the questionnaire by **circling** the appropriate number that determine the challenges you face while accessing herbal treatment for infertility

Statements	Strongly disagree	Disagree	Neutral	Strongly agree	Agree
The negative perceptions and comments about herbal medicine	1	2	3	4	5
The ignorance and deceit of vendors	1	2	3	4	5
High cost of products at credible herbal clinic	1	2	3	4	5
The inconsistency of its effectiveness	1	2	3	4	5

The fact that it is not covered under the national health insurance scheme	1	2	3	4	5
The spirituality attached to herbal medicine use	1	2	3	4	5
The uncertainty of exactly where to get authentic and regulated herbal medicine	1	2	3	4	5

Others ……..

Thank you