HERBAL MEDICINE USE AMONG PREGNANT WOMEN IN MAKUENI COUNTY, KENYA.

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Q139/CTY/PT/21168/2012

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A research thesis submitted in partial fulfillment of the requirements for the award of the degree of Master of Public Health (Reproductive Health) in the School of Public Health and applied Human Sciences of Kenyatta University

July, 2020

DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

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DEDICATION

This work is dedicated to my wife, Jane Mulumba, my kids; Marion Mutanu, Kimberly Mwende, Grace Mumbe and Christian Muuo. You are all special to me!

ACKNOWLEDGEMENT

I would like to thank Almighty God for granting me good health and the motivation to pursue my studies. Special gratitude goes to my supervisors Dr. Titus Kahiga, and Dr. Daniel Muia for their immense support and advice throughout this study.

Special thanks to the medical officer of health Dr. Solomon Maundu and other health workers from the Makueni for their immense support in data collection. Lastly, I extend my gratitude to my research team for the great work and positive attitude they showed during the data collection period.

ABSTRACT

The use of herbal medicine is becoming increasingly popular worldwide with statistics showing 65% to 80% of the world's population using herbal medicines. In Kenya, more than two thirds of the Kenyan population is using herbal medicines for their essential health care needs. A cross-sectional survey was conducted on 384 purposively selected pregnant women between July and September 2015. The main objective of the study was to establish the patterns of herbal medicines use during pregnancy in Makueni Sub County. Specifically, the study aimed to establish the extend of herbal medicines use during pregnancy in Makueni Sub County; to establish the factors that influence use of herbal medicines during pregnancy; to describe the reasons for use of herbal medicines during pregnancy in Makueni sub county and to document some of the perceived adverse effects related to herbal medicines use during pregnancy. Quantitative data was collected using a self-administered questionnaire while qualitative data was collected using key informant interviews and focus group discussions. Quantitative data was analyzed using SPSS version 21. Logistic regression and Odds Ratio (OR) were used to establish strength of the associations of variables while qualitative data was analyzed using NVivo. The study revealed that 30.5% of women had used herbal medicines during pregnancy. Level of education, socioeconomic status and age were associated with herbal medicines use during pregnancy. It was found that women used herbal medicine during pregnancy to manage nausea/ vomiting, cough related ailments, prepare uterus for labour among others. Mothers in law, herbalists and traditional birth attendants were key recommenders. Diarrhea and abdominal discomforts/ pains were highlighted as the main undesired effects resulting from use of herbal medicines. Approximately a third of the women use herbal medicines during pregnancy for varied reasons. From this report, it is recommended that rigorous health education against indiscriminate use of herbal medicines is needed to alleviate any danger that could be posed to the mother and the feotus by unknown chemical constituents in the herbal medications.

LIST OF ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune-Deficiency Syndrome
ANC	Antenatal Care
CAM	Complementary and Alternative Medicine
HIV	Human Immunodeficiency Virus
HM	Herbal Medicine
SSA	Sub Saharan Africa
TM	Traditional Medicines
WHO	World Health Organization
TCAMs	Traditional, Complementary and Alternative Medicines
TBA	Traditional Birth Attendant
NCAPD	National Coordinating Agency for Population and Development

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CHAPTER ONE: INTRODUCTION

1.1 Background

Herbal medicines are defined as plant-derived material or preparations perceived to have therapeutic benefits; they often contain raw or processed ingredients from one or more plants (WHO, 2000). Herbal medicines include herbs, herbal materials, herbal preparations, and finished herbal products that contain parts of plants or other plant materials as active ingredients (WHO, 2008).

There is an increase in use of herbal medicine in both the third world and the developed countries. WHO Traditional Medicine Strategy: 2014-2023 notes that Traditional & Complementary Medicine (T & CM) is a significant and often undervalued part of health care. T&CM is an integral part of most cultures across the world and the demand for its services is growing". The strategy continues to implore that certified Traditional Medicines (TM) of high quality, safety, and efficacy, could contribute to universal health access to health care. Use of herbal medicines is thus exhibiting a spectacular geographical distribution ranging from 4.3% in Sweden to 66% in Russia **(**Deborah A *et al*. 2013). Other reports indicate that an average of between 65% and 80% of the world's population use herbal medicines (HM) for their primary health care needs (WHO, 2008). According to WHO fact sheet no. 134 (December 2008), the prevalence of Herbal Medicine (HM) use in Asia and Africa stood at 80%. According to WHO (2008, 2002) it is reported that in China, the use of traditional medicines (TM) stands at approximately forty percent for the health care needs while in the developed world, traditional medicines use was gaining acceptance with 75% in France having used Complementary and

Alternative Medicine (CAM) at least once, 38% in Belgium, 48% in Australia, 70% in Canada and 42% in USA

Africa is endowed with a very rich flora with over 4,000 plant species being used for medicinal purposes. The herbal medicines could be utilized in treatment of various ailments and conditions including the more serious ones like cancer, diabetes and hypertension.

The use of herbal medicines during pregnancy has not been extensively studied in Africa however, there exists a few studies documenting the levels of use of herbal medicines including the reasons why the women use them during pregnancy in Sub-Saharan Africa (SSA). In Nigeria, Fakeye, Rasaq and Ismail (2009), found out that 67.5% of pregnant women had used herbal medicines in crude or packaged form or even dietary or nutritional supplements. Most of the herbal medicine users believe that the herbal medicines are safe and could be also combined with the allopathic medicines to enhance their effect.

In SSA, inadequate healthcare facilities and high cost of modern treatment has contributed to the relevance of the traditional practitioners and in business as their services are considered affordable (WHO 2008, 2002). In Zimbabwe, a cross-sectional survey of pregnant women in health centers in Harare, Mureyi (2012) reported that fifty-two (52%) of the participants had used at least one traditional medicine intervention during the third trimester of their most recent pregnancy to induce labor, avoid perineal tearing and improve the safety of their delivery process. Steenkamp (2003) showed that a

significant number of South African women sought treatment from traditional medicine men/women for various complications associated with pregnancy and female reproductive system.

There is limited knowledge on potential side effects of many herbal medicines in pregnancy. Some constituents in some herbal products might have teratogenic effects in either or both human and animal models. Documentation on the extent of women's use of herbal medicines during pregnancy is insufficient especially in Sub-Saharan Africa (SSA), where the legislation for distribution and purchase of herbal medicines is weak as compared to that of conventional medicines.

An emergent number of Kenyans are increasingly using herbal products for preventive and therapeutic purposes. Reports indicate that, 75% to 90% of rural communities utilize herbal remedies for their daily health care needs, and this points to the importance of the herbal remedies (Kenya Policy Brief 2008). Mostly the ailments that are treated using herbal medicines include arthritis; bronchial diseases; highland malaria; peptic ulcers; sexually transmitted diseases, including gonorrhea and syphilis as well as HIV/AIDS; tuberculosis; and typhoid. According to Kiringe J. W. (2006), 73% of the Kenyan Maasa people from Kajiado South were using herbal medicines with around 98% of the respondents visiting health centers and clinics just as an alternative.

Most of the herbal medicines are derived from trees, shrubs and succulents which are readily available in most parts of Kenya. For most herbal medicines, preparation is done

by boiling or soaking the barks, roots and or leaves in water then taken orally. In many cases people might combine herbal medicine with conventional medicines especially when they are affected by chronic ailments like diabetes, cancer and HIV/ AIDS (Nagata *et al*, 2011). The reliance on plant remedies in most African populations is attributable to cultural and traditional beliefs and inadequacy in modern health care (WHO; 2002).

The use of herbal medicines in Makueni Sub County is of great concern because of the social cultural beliefs and ease of access to herbalists. The availability of herbal medicines from local producers and aggressive marketing is also influencing their continued use. Inadequate capacity of the health workforce, poor infrastructure, long distances to the few health facilities, availability of the herbal medicines and cultural beliefs could be some of the causative factors that have kept herbal medicines significant to people of Makueni Sub County.

Most people including pregnant women use these herbal medicines ignorant of the dangers this might pose to fetus and their own health. There are few studies that have tried to describe the patterns and use of herbal medicines in Kenya and actually no study has ever been conducted in Kenya on herbal medicine use during pregnancy. This study therefore aimed at establishing the status and determinants use of herbal medicines during pregnancy in Makueni Sub County, Kenya.

1.2 Problem Statement

According to WHO (2003), over 80% of the people living in developing countries are depended on herbal medicines for their primary health care needs. Besides, there is a growing trend of herbal medicines use globally and that the trade generates substantial billions of dollars yearly regions like China and Europe among others (Bodeker G & Kronenberg F, 2002; Nahin R L *et al*, 2009). However, there is limited data on the extent of herbal medicines use during pregnancy notwithstanding that the knowledge of the potential side effects of many of these herbal products is inadequate (WHO, 2008).

According to Okumu et al (2017), although there is no shortage in laws and policies aimed at controlling herbal medicine in Kenya, herbal medicines are still not subjected to the same scrutiny in terms of safety, efficacy and constituents as conventional medicines. Moreover, according to Onyambu et al (2019), Kenya has made great strides in policy development and regulation of herbal medicines, yet unregulated use is widespread in the country. Further studies reveal that unregulated herbal medicinal products that are available in diverse Kenyan markets exhibit poor microbial quality and exhibit contamination by pathogenic microorganisms (Onyambu et al., 2013). This phenomenon could increase the risk of infections and morbidities among the users. Many consumers particularly expectant women often do not notify their primary healthcare providers of their use of these herbal medicines for fear of scolding. There is inadequate data on the extent of women's use of herbal medicines during pregnancy, despite the fact that information on the potential benefits or harms of many of these products is sparse, especially with regard to their use in pregnancy.

Herbal medicines use during pregnancy may affect health outcomes especially reproductive health outcomes. With many healthcare providers unaware of herbal medicine use among their clients, making informed decisions about their health becomes impaired (Brodeker and Kronenberg, 2002). Use of herbal medicine besides affects health outcomes by influencing health-seeking behaviors of the user and potential for salient drug-herb interactions. Healthcare providers should be aware of the common herbs and herbal products used by women in particular during pregnancy as well as information concerning possible benefits or harm.

Unpublished reports from Makueni County indicated an increase in number of pregnant women who reported use of herbal medicines for varied reasons. No study had ever been done in Makueni Sub County to establish the extent of herbal medicine use during pregnancy and the associated factors, consequently there was a necessity to find out the extent of this problem. In this regard, this study therefore sought to assess the extent and the factors associated with the use of herbal medicine during pregnancy in Makueni Sub County, Makueni County in order to fill the apparent gap in literature.

1.3 Purpose of the study

Like in many other developing countries, the quality of healthcare in Kenya remains poor despite a huge investment through the Universal Health Coverage (UHC) and the devolution beginning to show nascent successes. Inadequate healthcare system coupled with poor emergency obstetric care obviously manifest in an increase in maternal and fetal mortality and morbidity. Some of these mortalities and morbidities result from overly preventable causes which could essentially be minimized just by health education.

The success of this can only be realized when these causes are well studied. The use of herbal medicine during pregnancy may be among the contributing causes to maternal and fetal morbidity and mortality.

This main aim of this study was to establish the extent of herbal medicines use during pregnancy and the associated factors to it. The findings obtained from this study will go a long way in supporting health education delivery in antenatal clinics, enlighten the health providers about the scale of use of herbal medicines in pregnancy so as to improve obstetric care. In addition, this information would be essential to healthcare providers to enable them to provide appropriate care to both the mother and foetus. Furthermore, the findings of this study will provide crucial information and influence public health conversation about the use of alternative systems of care in the presence of a conventional healthcare system. It will provide crucial information in policy development particularly in the discourse on integration of herbal medicines into the conventional healthcare.

1.4 Objective of the study

Broad objectives

To determine the extent and the factors associated with the use of herbal medicine during pregnancy in Makueni Sub County, Makueni County.

Specific objectives

1) To determine the extent of use of herbal medicines during pregnancy in Makueni Sub County.

2) To establish the factors that influence the use of herbal medicines during pregnancy in Makueni Sub County.
3) To establish the reasons for use of herbal medicines during pregnancy Makueni Sub County.
4) To establish the perceived effects resulting from use of herbal medicines during pregnancy

1.5 Research Questions

1) What is the extent of herbal medicines use during pregnancy in Makueni Sub County?
2) What are the factors that influence the use of herbal medicine during pregnancy in Makueni Sub County?
3) What are the reasons for use of herbal medicines during pregnancy in Makueni Sub County?
4) What are the perceived effects associated with use of herbal medicines during pregnancy?

1.6 Study Limitations

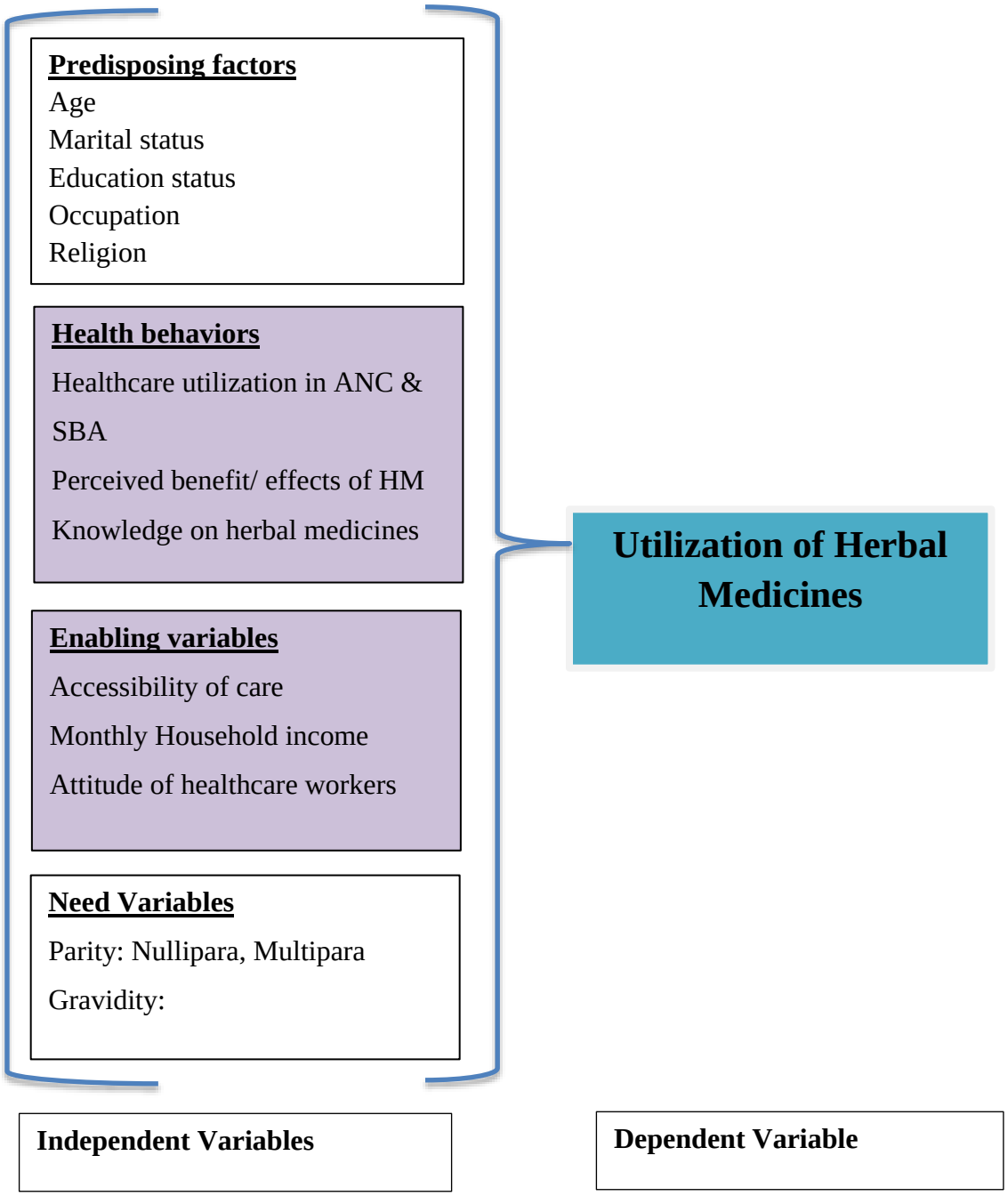
The study was restricted to investigating the use of herbal medicines during pregnancy and could have been affected by recall bias as the respondents were pregnant women. Nevertheless, the respondents were allowed time to juggle their memory to recall the necessary information for the study. This study did not indulge into characterization or identification of the various herbs used by women during pregnancy due to its design and financial limitation. The study only collected data from respondents from the health facility and thus didn't interview women in the community to get their responses.

1.7 Conceptual Framework

Mugenda and Mugenda, 2003 defined conceptual framework as a set of broad ideas and principles taken from relevant fields of enquiry and used to structure a subsequent presentation. It is a hypothesized model identifying the module under study and the relationship between the dependent and independent variable. This conceptual framework is adapted from Andersen's behavioral model which shows possible determinants of Healthcare utilization potential determinants of herbal medicines use concerned predisposing, enabling, and need and health behaviors variables. In Andersen's model use of herbal medicines depends on individual and contextual characteristics and on health behavior. The following components were measured: predisposing characteristics are existing conditions that predispose women to use herbal medicines. Need characteristics are conditions that the pregnant women recognize as requiring medical attention. Healthcare behaviors characteristics are behaviors on the part of the women that influence health status.

Predisposing variables included socio-demographic and belief factors comprising of age, religions, marital status, education level etc; enabling variables comprised of economic power, monthly income, need variables comprised of health status of the women including number of pregnancies and children one had and whether one had ever had a miscarriage. Health behavior variables consisted of questions around antenatal care and planned skilled birth delivery. This study did also include concomitance with conventional medicines.

Figure 1.1: Conceptual Framework; adapted from Andersen's behavioral model



1.8 Operational definition of terms

Herbal Medicines-any plant derivative or preparations with perceived therapeutic benefits and contain raw or processed constituents from one or more plants.

Traditional medicine is the sum total of knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve, or treat physical and mental illnesses" (WHO, 2003)

Women of Reproductive Age-women aged between 15-49 years

Infant- is typically applied to young children under one year of age

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Herbal medicines are described as plant derived material or preparations with therapeutic benefits and may contain raw or processed ingredients from one or more plants (WHO, 2008). The plant materials may include seeds, roots, berries, bark, leaves or flowers. The prevalence of herbal medicines in some Asian and African countries stood at over 80% of the populations (WHO, 2008). In several developed countries, between 70% and 80% of the population has had used some form of alternative or complementary medicine (WHO, 2002).

According to World Health Organization, Traditional Medicines (TMs) or complementary and alternative medicines (CAMs) include a variety of health practices, approaches, knowledge and beliefs about incorporating plant, animal and / or mineral based medicines, manual techniques, spiritual therapies and exercises applied alone or in composite to maintain wellbeing as well as to prevent, diagnose or treat illness. This chapter presents a literature review of the previous studies, research and work related to the current study. The chapter gives an in-depth description of the theoretical rationale of the subject under study as well as what data exists and how findings relate to the matter being studied. The chapter will also offer a conceptual framework and indicate the knowledge gap that the study intends to fill.

2.2 Herbal Medicines use in Pregnancy

The use of herbal medicines during pregnancy is a common phenomenon with prevalence recorded ranging between 7.0% and 55% (Tiran, 2003). The incorporation of herbal medicines in the description of Complementary and Alternative Medicines might have had an impression that they can be used without caution. Some herbs may well be beneficial, but some are highly poisonous, and many others have toxic constituents.

Several studies have recorded that most herbal medicine users are young women between the ages of 20-35 years and have had prior pregnancy (Kennedy et al., 2013). The use of herbal medicines plays a major role in the management of both minor and major ailments and has been majorly driven by patients' discontent with conventional allopathic medicines with regard to safety, effectiveness and satisfaction with therapeutic outcomes (WHO, 2002). Herbal medicines have been used during pregnancy for management of majorly pregnancy related symptoms including but not limited to nausea, vomiting, reflux, candida vaginal infections. Additionally, herbal medicines have been used to prepare for labor and 'ripen' the cervix for parturition; or may be other issues such as cold and respiratory illnesses or skin problems **(**Tiran, 2003).

In Taiwan, a population-based cohort study showed the use of Chinese herbal medicines during pregnancy and post-partum period stood at 33.6% and 87.7% respectively (Chuang et al., 2009). Other studies in Taiwan have shown that pregnant women who are older, with high education level and a positive knowledge and attitude towards traditional medicines or TCAM are more likely to use them (Chuang et al., 2007; Chuang et al.,

2009; Hsiao-Yun Yeh et al., 2011). In the USA and Canada, the use of herbal and other treatments has reportedly been on rise and its acceptance as alternative medicine is growing (Louik et al., 2010). In Australia, the prevalence of use of herbal medicine/TCHM during pregnancy is reported to be between 11% and 56% (Kennedy et al., 2013; Ried and Alfred, 2013) and the Turkish women (Edirne et al. 2010) use some herbal medicines to treat or improve their fertility. Herbal medicines could also be used to treat other chronic ailments including hypertension. According to Osamor and Owumi (2010), 29% of the sample had used herbs for hypertension in urban Nigeria.

In some sub-Saharan countries, namely, Nigeria, Ghana, Tanzania, Sierra Leone and Zimbabwe; scanty information regarding herbal remedies used during pregnancy exists. However, in South Africa few studies have focused on pregnancy and medicine related problems, especially where TCAMs have been used.

In Kenya, the situation is no different with a larger population depending on herbal medicines for their basic health care (NCAPD Policy Brief No. 1, 2008). The dependence on herbs is due to inaccessibility of modern medical services. Apart from shortages of health professionals, medical services are not always available though a majority of Kenyans (80 percent) live within WHO recommended 5 Km of health facilities. Many facilities especially the public facilities lack drugs, basic services and related other amenities while the cost of medicine is prohibitively high (NCAPD, 2005).

2.3 The Scope of use of Herbal Medicines in pregnancy

The use of herbal therapies is on the increase in almost all parts. Of critical importance is the increased rate of use of herbal medicines amongst pregnant women globally more than in any other group. In the Western countries for example, the prevalence of herbal medicine use ranges between 52% and 58% in Australia and the United Kingdom; 40-48% in Norway and Italy; 6-9% in Canada and the United States of America respectively. Frequently, herbal medicines have been used concurrently with conventional drugs rather than as an alternative. In the UK, 57.7% of the pregnant women interviewed in a cross-sectional survey admitted having used herbal medicines during pregnancy (Holst et al., 2009). In Tanzania, a cross sectional study noted that 55% of the respondents had used herbal medicines with 49.5% having used one type and 41.4% had used two types of herbal medicines (Godlove, 2011).

In Kenya, statistics reveal that 75 - 90 percent of rural communities rely on herbal remedies for their daily health care needs, and this indicates how much importance is attached to these resources (Obado & Odera, 1995). In many cases people might combine herbal medicine with conventional medicines especially when they are affected by chronic ailment like diabetes, cancer and HIV/ AIDS (Nagata et al., 2011; Matheka & Demaio, 2013). Other patients use herbal medicines for hypertension treatment (Osamor & Owumi, 2010).

2.4 Demographics of Women taking herbal medicines during pregnancy

Several sources have suggested that women who use complementary alternative medicine are categorized as aged between 31-40, with high scholarly achievements and high-income levels and used complementary alternative medicine in an erstwhile pregnancy (Tiran, 2003). Contrary to this, another study noted that women might take herbal supplements during pregnancy if they were primiparous and being less educated **(**Pinn & Pallet, 2002).

Generally, the women's age is not a substantial factor in herbal use during pregnancy apart from Western and Eastern Europe. In the western region, use of herbal remedies was less intense among women aged 20 years and less than those aged 21-30, whereas in Eastern Europe the vice versa was true. Other factors that were associated with herbal medicine usage were parity and level of education. Forster et al. (2005) revealed that herbal medicine users were more likely to be nulliparous and nulligravida (Mureyi et al., 2012).

Employment status has also been noted as a characteristic of interest across regions. In fact, in both Western and Eastern Europe parity and employment status were very significant determinants of herbal use during pregnancy as opposed to their influence to herbal medicine use in either North or South America or Australia. Additionally, herbal users in Europe and North America were more probable to continue consuming alcohol even when they were aware they were pregnant **(**Glover et al., 2003). These results might reflect a certain open or extravert lifestyle where both herbal medicine and alcohol

consumption use is common. With alcohol being a known teratogen and that there is no documented safe amount to consume for women when pregnant, this seems to negate the objective of using substances that are alleged to be safe that might be associated with the use of herbal medicines.

2.5 Reasons for use of herbal medicines during Pregnancy

Unfavorable symptoms commonly experienced during pregnancy often begin early during pregnancy and may vanish by the fourth or fifth month. However, due to individual variation some women may have an ill feeling during the entire pregnancy. Experiencing these symptoms may negatively impact the pregnant woman both psychologically and their physical wellness as well as the pregnancy outcomes. The commonly experienced symptoms during pregnancy include nausea and vomiting. Other experiences some women have comprise back pain, cramps, and leg edema. Some women have realized that during pregnancy and delivery, a range of complications could be encountered and, in an effort, to avert these from happening they may seek treatment from the onset of pregnancy **(**Boltman-Binkowski, 2016).

In a research study conducted in Machakos district by Kaingu et al (2011) on the practice by Traditional Birth Attendants (TBAs), it was found out that the majority of them used herbal preparations for the management of both pregnancy and post pregnancy complications as opposed to use for managing nausea and vomiting. Fifty percent of the TBAs used herbs to manage post term complications while 36% of them administered herbs for protracted labor.

Other uses of herbs were the management of postpartum Hemorrhage, removal of placenta, ejection of milk and management of threatened miscarriages. Management of pregnancy edema, nausea and vomiting were also common indications the TBA used herbs. Other reasons pregnant women could use herbal medicine are management of reflux and candidiasis (Henry and Crowther, 2000).

Most mothers in a study undertaken by Pinn and Pallet (2002) used herbal medicines during the last trimester only (79.6%), mainly to expedite labor. A smaller proportion of women, approximately 4.6%, were exposed to herbal medicines during the first trimester only as opposed to a 9.3% who were exposed to herbal medicines in both the first and third trimester. Usually, women who consumed herbal medicines before pregnancy continued to use even when they got pregnant mostly because most of the pregnancies were unplanned (Pinn and Pallet, 2002).

van der Kooi & Theobald (2006) found that in South Africa, native herbal medicines were most commonly consumed in the third trimester of pregnancy to counteract and treat labor strains and stimulate a smooth delivery. Glover et al (2003) reported that herbal medicines use was common in the first trimester and it was often before the woman learned she was pregnant. Mureyi et al (2012) also reported in a cross-sectional study that in Harare urban clinic women were using herbal remedies for labour induction, to accelerate labour, and to widen birth canal.

Gallo et al., (2003) revealed that 54.0% of women who were enrolled in a Motherisk Program at the Hospital for Sick Children in Toronto, Ontario had used herbal remedies known as *Echinacea* in their first trimester of pregnancy, while 8.0% used it in all three trimesters. The perception on the safety and efficacy of herbal medicines influences whether a woman might use them again in the next pregnancy. Approximately half (46.6%) of women still equated the 'traditional antenatal care' with the 'Western antenatal care' in securing a successful course of pregnancy.

2.6 Safety and efficacy of herbal medicines in pregnancy

Most of the herbal medicine users believe that the herbal products are safe and effective (Oreagba et al., 2011). Besides, there is inadequate scientific evidence from research done to assess the safety and effectiveness of traditional medicine products and practices (WHO, 2008). Unfavorable and negative reactions have been experienced when herbal medicines were used alone (Oshikoya et al., 2007) or even when used concurrently with conventional or orthodox medicines (Langlois-Klassen et al., 2007).

Consuming herbal medicines during the different trimesters of pregnancy may lead to varied effects. In their study, Pinn and Pallet (2000) notes that "exposure of foetus to herbal medicines during the first trimester may lead to congenital malformation, while taking herbal medicines during the second or third trimester may lead to fetotoxicity such as intrauterine growth retardation, fetal distress, fetal hypoxia and intrauterine death.

2.7 Cultural beliefs associated with the use of herbal medicines

Many pregnant women initiate the use of herbal products and alternative therapies without the guidance or advice of a healthcare professional. In fact, most of them never report the use of herbal medicine to their physicians for fear. African views of health as absence of illness reflect a belief in spiritual care, social care, community care, self-care and medical care as well as the past and the present. SteenKamp (2003) stated that traditional remedies are elements of the spiritual life and culture of the African people.

In Africa, both western medicine and spiritual appeasement are regarded as valuable in prevention and management of illness. Since it is believed that infants are susceptible to harm from evil spirits, acknowledgment of pregnancy is denied for as long as possible by a woman as far as disclosing it to others. Women are also hesitant to disclose early pregnancy in many traditional societies as a fear of witchcraft is common and they believe that the knowledge of their conception could be used by others to harm their unborn babies. Behavioral taboos, dietary limitations and the use of herbal medications have been traditionally imposed to prevent pregnancy complications as well as complications during labour. Peltzer et al., 2009 reported that most pregnant women consulted traditional health practitioners and traditional birth attendants whenever they felt lack of fetal movement, issues around a delayed delivery, fetal positioning and false labour. In addition to these, the pregnant women would consult the herbalists on morning sickness, abdominal pain constipation, heartburn, sexually transmitted infections and blood pressure issues.

Some women believed that treatment during the early stages of pregnancy is believed to prevent miscarriage and to ensure proper growth of the fetus and stability of the woman's health (Holst et al., 2008). Treatment at the later stages of pregnancy serves to ensure safe delivery with no complications after delivery. In Nigeria, women take native herbs and gin during pregnancy to ensure proper bleeding after delivery and that also allows the proper cleansing of the womb. The treatment is administered in various forms, such as burnt herbs that are blown into the pregnant woman's cervix by their female relatives or taken orally on a monthly basis to prevent hemorrhage, obstructed labour or retention of the placenta (Ojofeitimi and Tanimowo, 2002).

A qualitative study carried out in Cape Town found that the majority of their isiXhosa speaking participants follow indigenous health practices for both themselves and their babies because of the perceived need to "strengthen" the womb against witchcraft and to prevent childhood illnesses. They also followed indigenous practices to treat symptoms that the conventional medicine "cannot treat". In pregnancy, herbs and minerals are often used as a tonic to clean the womb, to ease delivery, to induce labour, and to protect the child from evil and have a healthy child, as well as for pain, sickness or discomfort. This is said to give the pregnant women a sense of security (Steenkamp, 2003). South African women use traditional herbal remedies as antenatal medicines or to induce labour/expel the placenta/prevent postpartum hemorrhage. Both Zulu and Xhosa women take 'isihlambezo' orally during the last trimester of pregnancy to ensure healthy fetal growth and the dose is increased towards the end of the pregnancy to ensure an easy and rapid delivery.

In former Transkei, a decoction of the roots of *Agapanthus africanus* and *typha sp* is taken from the third trimester to ensure an easy childbirth, to ensure that the child does not develop bowel trouble; and also, to ensure that the placenta was delivered without difficulty (van der Kooi & Theobald, 2006). Mpondo women drink this from the fourth or fifth month of pregnancy while the *Xhosao* take it in the last two months of pregnancy for the same reasons stated above

2.8 The gap that exists in the literature

From the literature, it is evident that there is paucity of information on herbal medicines used during pregnancy in rural population especially in Kenya. There are notable gaps that do exist in the understanding the possible factors that influence women and the reason for use of herbal medicines during pregnancy as well as their effects, either positive or negative. There is also a clear lack of information about the sources of the herbal medicines in Makueni Sub County however there seems to be growing evidence about herbal medicines gaining popularity across the country.

The conceptual framework highlights the independent variables; demographic, cultural, economic and health related factors and dependent variable; herbal medicine use. Knowledge on herbal medicine is the intermediate variable.

In this model, the Independent variables of the study included;

1. Socio demographic factors- refer to age, sex, educational level, occupation and marital status. It is presumed that these socio-demographics can influence maternal

health positively or negatively in the community. Women who are economically stable can afford to seek reproductive health care services including ANC as provided by well-trained personnel. Education level determines the knowledge of healthy practices among women and helps them to make informed decisions regarding their reproductive health.

2. The health facility factors- explain various aspects that determine the accessibility and provision of health services as required. These include good adequate working environment, effective referral systems, availability of funds, staffing, and comprehensive service delivery.
3. Individual factors- From the individual level, ANC attendance, health seeking behavior and availability of food through the pregnancy period.

Dependent variable of the study was use of herbal medicines

CHAPTER THREE: METHODOLOGY

3.1 Introduction

This Chapter presents the description of the methodological approach which was used in collecting and analyzing the data. The following sub-topics are covered in this chapter: research design, area of study, target population, sample size and sampling procedures, research instruments, data collection procedures and data processing and analysis.

3.2 Research design

Reliance on herbal medicines is relatively high among rural populations and is associated with a lack of access to public healthcare (WHO 2003). However, information on use of herbal medicines during pregnancy in Makueni Sub County was not clear as the subject had not been extensively studied before in the area. This study therefore employed exploratory research collecting primary information to better understand the intensity of herbal medicines use during pregnancy and document the associated factors. The study utilized a mixed method research design with both quantitative and qualitative research methods employed to explore the subject. The choice of this design was due to its advantage to facilitate the collection of original data necessary to adequately address the research objectives. It was useful in collecting primary data from the study subjects that was used to investigate the intensity of herbal medicines use during pregnancy and its associated factors, a problem which was not clearly defined in Makueni Sub County. Below is a description of the methodology;

3.2.1 Quantitative research

To establish the intensity of use of herbal medicines during pregnancy in Makueni Sub County and establish association among various variables, the study employed a cross-sectional research approach. The study utilized a structured self-administered questionnaire to collect quantitative data from the respondents (pregnant women) visiting Makueni County hospital in search of health care services.

3.2.2 Qualitative research

Qualitative data was explored through four thematic areas which included effects of herbal medicines during pregnancy; concomitance use with conventional medicine; reasons for use of herbal medicines and sources of information about herbal medicines during pregnancy. To adequately describe the situation of herbal medicines use during pregnancy and its associated factors, the study further employed qualitative research through;

a) ***Key informant interviews*** with (i) a medical doctor to establish whether pregnant women who used the health facility reported any use of herbal medicines to manage pregnancy related ailments in addition to establishing the facility's response to such cases. (ii) in-depth interviews with nurses to establish their understanding of the levels and reasons of use of herbal medicines by women during pregnancy (iii) additional in-depth interviews were conducted with traditional birth attendants and herbalists to establish the intensity of use of herbal medicines among women during pregnancy as well as their "services". The key informants were purposively selected based on their engagement and knowledge on herbal medicines.

b) ***Focused group discussions*** were conducted with pregnant women. Two groups with nine and eleven members were interviewed using an FGD guide that provided a set of open-ended questions of interest eliciting an in-depth understanding of the subject of study. This process elicited intense information on the reasons why women would use herbal medicines during pregnancy and the associated influencers as well as perceived effects.

3.3 Variables

The dependent variable of the study was 'use of herbal medicines' while the independent variables were: Socio-economic characteristics such as: age, economic status, occupation, education, knowledge on herbal medicines, marital status and parity status; Cultural factors including traditional practices & beliefs. Healthcare related factors; quality care, accessibility and healthcare workers' availability & attitudes.

3.4 Study location

The study was carried out in Makueni Sub County in Makueni County. Makueni Sub County is one of the six sub counties in Makueni County is made up of three administrative divisions namely Kaiti, Kee and Wote covering an area of approximately 666.5 square and hosts a population of approximately 193,802.

Use of herbal medicines is a common phenomenon in Makueni County with the Kamba community using different herbs to treat/ manage various ailments including skin diseases, non-communicable diseases and snake bites among others. The first Makueni County Integrated Development Plan (CIDP) had recorded a projected population of females at 210,307 in 2012 representing 21.3% of the total population and that the

population was likely to increase due to declining infant mortality as a result of improved healthcare and access to healthcare services. Maternal mortality rate had improved relative to the national average standing at 400 compared to 488 per 100,000 live births while utilization of antenatal care services was approximately 63.96% with a contrasting greater proportion of pregnant women (58.1%) delivering with assistance from a traditional birth attendant. In spite of these developments, data on use of herbal medicines during pregnancy in Makueni Sub County remained scanty and therefore this study was commissioned to establish the intensity of use and the factors that influence pregnant women to use the herbs. Makueni County Hospital serves mostly the community living in Makueni County with a greater proportion of its clients being residents of Makueni Sub County. At the time of data collection there was no established criteria to present and report on side effects of herbal medicines.

Figure 3.1: Map of Makueni County showing the study area; Makueni Sub County

3.5 Target Population

Since the study main objective was to establish the prevalence of herbal medicines' use during pregnancy and the associated factors, the research only targeted to collect data from only women aged 15-49 who were pregnant who were seeking antenatal care services at Makueni County Referral Hospital. There were no financial or material incentives offered.

3.6 Sample size calculation and Sampling Techniques

The study sample consisted of only pregnant women and had consented to participate in the study.

3.6.1 Sample size calculation

The sample size was estimated using Cochran's formula (1977); $n= Z^2pq/e^2$.

Where:

- *e* is the desired level of precision (i.e. the margin of error),
- *p* is the (estimated) proportion of the population which has the attribute in question,
- *q* is 1 – p.

Since there was no clear data on the intensity of use of herbal medicines during pregnancy in Makueni Sub County, it was therefore assumed that half of the women used herbal medicines during their pregnancy giving the study a maximum variability. So, p = 0.5. The study was conducted at 95% confidence level, and at least 5 percent—plus or minus—precision. A 95 % confidence level gave a Z value of 1.96, per the normal tables. So, the sample size is calculated as shown below

$1.96^2*0.5*0.5/ (0.05^2)$ = Sample size =384.

3.6.2 Sampling technique

This research was carried out using non-probability sampling techniques with Makueni County Referral Hospital being purposively sampled for primary data collection due to high volumes of clients it serves from Makueni Sub County and the county at large. For quantitative data collection, purposive sampling was used to identify the study respondents through an inclusion criteria that had been developed before the study that

allowed only pregnant women who were seeking health care services at the health facility to be interviewed.

At the hospital women coming for antenatal care services usually receive health education before proceeding with other services. The nurse(s) on duty usually gives them this vital health education. The principal investigator together with the research assistants utilized these sessions in collaboration with the nurse on duty to introduce the study. Later on, all the pregnant women were approached individually as they waited to be served.

All women who met the inclusion criteria and consented were interviewed. Data collection was done on Mondays, Wednesdays and Fridays, starting from nine in the morning until around 2pm when the clinics were closed. The process went on until the required number of three hundred and eighty-four women was reached. Data collection teams set up tents outside the facility for the exercise during the data collection days. The research assistants then explained to the women deeply about the study as well as the working definition of herbal medicines to the women. In this study, the women were considered as herbal medicine users if they took herbal medicines through either oral, intravaginal or topical routes.

Quantitative data was therefore collected using as a pre-tested self-administered structured questionnaire at the point of exiting the facility in tents that had been set up outside the hospital. The antenatal cards of the interviewees were marked with a mark pen on the right top edge to avoid double count.

Finally, respondents/ participants for qualitative research were purposively sampled and engaged through in-depth interviews and focus group discussions. A medical doctor and two nurses were sampled and interviewed from the facility while two herbalists and two traditional birth attendants were sampled based on their popularity in herbal remedies services they offer.

3.6.3 Inclusion criteria

Quantitative data was only collected from healthy pregnant women and consented to participate in the study.

3.6.4 Exclusion criteria

Data was not collected from women who refused to participate in the study as well those women who were severely ill.

3.7 Data collection techniques

The study employed both quantitative and qualitative data collection techniques as explained below.

a) Qualitative data collection tools

The researcher conducted two (2) focus group discussions (FGDs), seven key informant interviews (one medical officer, two TBAs, two herbalists and two Nurses), and 384 interviewer-administered questionnaires interviews which were administered to all consenting respondents by the research assistants.

i. Key Informant Interviews with Herbalists, traditional birth attendants and healthcare personnel

In-depth interviews were conducted herbalists (2) and traditional birth attendants (2) to understand whether pregnant women sought their services and the kind of services they were seeking. In addition, the research engaged and interviewed health care personnel including nurses (2) and a medical doctor to interrogate whether the formal health system was aware of the patterns of use of herbal medicines and whether pregnant women reported any use to the health care workers. Interview guides (Appendix III & IV) were developed and used. The main issues captured in the guide included the knowledge, attitudes and practice on herbal medicine utilization, herbs used, and ailments treated, and the factors associated with the use of herbal medicine. The principal investigator conducted the interviews with a research assistant taking notes. The KII guides had guiding questions that provided broader themes with sub questions that allowed for in-depth discussions to unravel the underlying issues around herbal medicines use during pregnancy.

i. Focused Group Discussions (FGDs) with pregnant women and women with infants

Focused group discussions were conducted by the principal investigator. Two sessions of nine and eleven eligible women were conducted in a structured discussion on matters pertaining herbal medicines use during pregnancy. An FGD guide (Appendix V) was developed and used with the principal investigator moderating the sessions. Additionally, the researcher explored their experiences and motivation for using herbal medicines. The first FGD (of nine) comprised of primigravidae women and were relatively younger while the second FGD comprised of multigravidas and relatively older women. The

researcher had a designed sitting arrangement that was curved to ensure optimum contact and proximity to each participant. The participants were then code-numbered from left – right for ease of reference (A1-A9 and B1-B11). The researcher conducted the FGDs assisted by a research assistant who was taking notes to augment recording and for reference and final analysis. The researcher explored all aspects of the subject (under the four thematic areas described in 3.2.2 above) until no new information was forthcoming from the participants. When all the thematic areas had been satisfactorily described, the FGD was ended.

b) Quantitative data collection using a structured questionnaire

To collect quantitative data the researcher used a self-administered structured questionnaire included social-demographic data, knowledge, attitudes and practices of pregnant women with regard to herbal medicine use during pregnancy as well as data on reasons for use and the perceived effects herbal medicines.

3.7.1 Pilot study/pretesting

A pilot study was conducted at Mbooni Sub County hospital to pre-test the research instruments. A total of 20 pregnant women were interviewed using a self-administered structured questionnaire. Generally, the questionnaire was well designed although some questions were ambiguous and proved to elicit varied reactions from the respondents as they understood the questions differently. Questions to explore effects of herbal medicines use were strengthened in order to get in-depth information. The questionnaire, it was found that it would take the respondents approximately 20-30 minutes to complete. This was within the anticipated period for completion of each questionnaire and optimize

data collection from the respondents. The qualitative research tools (KII and FGD guides) were also pre-tested with appropriate respondents. The probes were refined, and themes categorized to ensure in-depth discussions enabling the principal investigator to acquire deeper insights into the subject matter. Translation of the KII and FGD guides' probes/ discussions to Kiswahili and local Kamba language was preferred during the sessions.

3.7.2 Validity

To ensure that the results of the study were valid, pre-test was done after which appropriate corrective measures were addressed on the research tools. Irrelevant/ ambiguous questions were dropped from the list and reframing was done to capture relevant information. The researcher further consulted with the data analysts and study supervisors who advised on appropriate development of questions that met all the objectives of the study. This was to ensure accurate data that represented all the variables in the study.

3.7.3 Reliability

To ensure that there was consistency of the data, research assistants were passed through a comprehensive training where they were given a brief enlightenment on herbal medicines after which they went through the data collection tools. They were also involved in the pretesting so as to familiarize themselves with the study tools, the dependent variable under study and the health facility setting. Double checking was done to ensure all responses were entered correctly. The research assistants could translate the questions in the data collection tools to either Kiswahili or Kamba (the local language) to ensure they were clearly and correctly understood.

3.8 Ethical consideration

Approval to carry out the study was granted by the Kenyatta University graduate school. The principal investigator got ethical clearance from the Kenyatta University Ethical & Review Committee (KUERC). Further, permission to carry out the study was granted by the National Commission for Science, Technology & Innovation (NACOSTI). Permission was granted by the Makueni County Hospital to collect data within its environs. The respondents who were interviewed gave their consent to participate in the study and helped the research assistants to complete the questionnaires. Anonymity of the responses /questionnaires, privacy and confidentiality was assured and maintained throughout the data collection and analysis process.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the results of analysis of responses collected by use of questionnaires, KII and FGD guides administered to pregnant women respondents and herbalists, traditional birth attendants, nurses and a medical officer. The findings in this section are sequentially arranged in the order of study's specific objectives, that is, to establish the occurrence of use of herbal medicines during pregnancy, to determine the factors that promote/ hinder the use of herbal medicines, to establish the reasons why the pregnant women use the herbal medicine and finally to establish the perceived effects resulting from use of herbal medicines during pregnancy in Makueni Sub County.

4.2 Data Analysis and Presentation of Results

Quantitative data was entered into a Microsoft excel sheet, cleaned and uploaded to and then analyzed using SPSS version 21. Frequencies and summary statistics were used to analyze social-demographic data. The relationship between various social-demographic factors and determinants and the use of herbal medicines was analyzed using logistic regression by estimating the Odds Ratios and the 95% confidence intervals with the 'use of herbal medicines' as the outcome variable. Multivariate logistic regression modeling was used to assess the determinants of herbal medicines use.

For qualitative data, the interviews were digitally recorded. The digital files were transcribed, and the data coded using NVivo software. Braun and Clarke's (2006) six-phase process was used.

Thematic analysis plan as described in (Clarke, V., & Braun, V., 2017) was used. Summary notes were made from the key informant interviews and the focus group discussions and grouped according to four thematic areas that emerged during the process. These thematic areas included: - perceived effects of herbal medicines during pregnancy; concomitance use with conventional medicine; reasons for use of herbal medicines and sources of information about herbal medicines during pregnancy. Results from both qualitative and quantitative are presented in an integrated approach with results summaries from the qualitative data augmenting the quantitative results.

4.3 Social-demographic factors of herbal medicines users

Results in this study shows that the age of respondents ranged from 15 to 44, with a mean of 25.2 years. A majority (88.5%) of the study participants were married. Additionally, 92.7% of the participants had attained various levels of education; 8.3% primary school education, 65.9% secondary school education and 18.5% tertiary education respectively. A further 63.5% of the respondents had self-employment, 15.6% did not have any form of employment (Housewife), while 20.8% were employed**.** Approximately, 76.8% of the respondents had previously one delivery while 12.9% and 5.9% had two and three deliveries respectively in addition to 8.33% reported to have ever had a miscarriage or an abortion. The study also revealed the economic status of the population with most of the respondents, 69%, reporting a combined household income of between KES 10, 000 and KES 20, 000.

Table 4.1: Age distribution of the study participants.

	Frequency (N=384)	Percentage (%)
15-19yrs	3	0.78
20-24yrs	111	28.91
25-30yrs	153	39.84
31-34yrs	68	17.71
35-39yrs	39	10.15
40-44yrs	10	2.61
Totals	384	100

Table 4.2 Social- demographic characteristics of the study participants.

Variable	Frequency(N=384)	Percent (%)
Educational level		
None	28	7.29
Primary	32	8.33
Secondary	253	65.89
Tertiary/College	71	18.49
Marital status		
Singe	33	8.59
Married	340	88.54
Divorced	6	1.56
Separated	5	1.30
Occupation		
Housewife	60	15.63
Self employed	244	63.54
Employed	80	20.83
Religion		
Christian	381	99.22
Muslim	2	0.52
African tradition religion	1	0.26
Previous pregnancies		
0	14	3.65
1	295	76.82
2	48	12.50
3	23	5.99
4 and above	4	1.04
Age of the eldest son		
0-5yrs	156	40.63
6-11yrs	169	44.01
12-17yrs	46	11.98
>=18yrs	13	3.39
Previous Miscarriages/ Abortion		
Yes	32	8.33
No	352	91.67
House hold income		
1001-5000	40	10.42

4.4 Prevalence of herbal medicines use during pregnancy

Three hundred and eighty-four women aged between 15 and 44 years were interviewed. Out of these, ninety percent of them reported to have had knowledge of herbal medicine by the fact they could define them in line with operational definition which was guided by WHO definition. The study hence revealed that approximately a third of the respondents, 117 (30.5%) had used herbal medicines in at least one form during their pregnancy period.

4.4.1 Prevalence of herbal medicine use disaggregated by age

The study revealed that the majority (43.6%) of the women who reported to had used Herbal Medicine were aged between 25 and 30 years. A further 27.4% herbal medicine use was reported among the women aged between 20-24 years. It was worth noting that two out of three women aged between 15 and 19 had used herbal medicines.

Table 4.3: The use of herbal medicines disaggregated by age.

	Use of herbal medicine				
	No (N=267)	**Yes (N=117)**	**P-Value**	**O.R**	**95% C.I**
Age					
15-19yrs	1(0.4)	2(1.7)	0.154	8.0	0.46-139.29
20-24yrs	79(29.6)	32(27.4)	0.555	1.6	0.33-8.05
25-30yrs	102(38.2)	51(43.6)	0.392	2.0	0.41-9.76
31-34yrs	49(18.4)	19(16.2)	0.599	1.6	0.30-7.98
35-39yrs	28(10.5)	11(9.4)	0.602	1.6	0.29-8.60
40-45yrs	8(3.0)	2(1.7)		1	

4.4.2 Use of herbal medicine by marital status and level education.

The study established that majority of the women (53.8%) who used herbal medicines during pregnancy had secondary education followed by tertiary (28.2%) and primary education (10.3%). A small percentage (7.7%) of women who used herbal medicine did not have formal education. Herbal medicine use was common among the married women with approximately 76.1% compared to an average 17.1% among the single women. The least users (2.6 %.) of the herbal medicines were women who had separated with their spouses as they had now influence from spouses and in-laws.

Table 4.4: Herbal medicines versus education and marital Status of the respondents

	Use of herbal medicine				
	No (N=267)	**Yes (N=117)**	**P-Value**	**O.R**	**95% C.I**
Education level					
None	19(7.1)	9(7.7)	0.197	0.5	0.22-1.37
Primary	20(7.5)	12(10.3)	0.396	0.7	0.29-1.62
Secondary	190(71.2)	63(53.8)	0.001	0.4	0.22-0.66
Tertiary	38(14.2)	33(28.2)		1	
Marital status					
Single	13(4.9)	20(17.1)	0.979	1.0	0.15-7.00
Married	251(94.0)	89(76.1)	0.117	0.2	0.04-1.44
Divorced	1(0.4)	5(4.3)	0.398	3.3	0.20-54.53
Separated	2(0.7)	3(2.6)		1	

4.4.3 Use of herbal medicines versus occupation

A majority (53.8%) of herbal medicines users were self-employed in small scale family businesses with a smaller group at 19.7% being gainfully employed. It is worth

mentioning that 26.5% of herbal medicine users didn't have any form of occupation and that could have limited their purchasing power.

Table 4.5: Occupation of respondents

	Use of herbal medicine				
	No (N=267)	Yes (N=117)	P-Value	O.R	95% C.I
Occupation					
Housewife	29(10.9)	31(26.5)	0.006	2.6	1.31-5.34
self employed	181(67.8)	63(53.8)	0.607	0.9	0.49-1.51
Employed	57(21.30	23(19.7)		1	

4.4.4 Herbal medicines use and number of previous pregnancies

Based on the experiences with pregnancies, a majority 76.1% of the herbal medicine users reported to have used herbal medicines during their first pregnancy. However, the trend declines drastically as they progress to multi-gravid with use of herbal medicines in second and third pregnancies dropping to 9.2% and 2.6% respectively.

Table 4.6: Previous deliveries by consumption of herbal medicine

	Use of herbal medicine				
	No (N=267)	Yes (N=117)	P-Value	O.R	95% C.I
Previous deliveries					
None	9(3.4)	5(4.3)	0.608	0.6	0.06-5.24
One	206(77.2)	89(76.1)	0.405	0.4	0.06-3.12
Two	37(13.9)	11(9.4)	0.251	0.3	0.04-2.36
Three	13(4.9)	10(2.6)	0.809	0.8	0.09-6.45
Four and above	2(0.7)	2(1.7)	0.415	1	

4.4.5 Herbal medicines use and economic status of the users

According to analysis of the economic status of the respondents, a majority 72% of the respondents reported an income of between KES 10,000 and KES 20,000 per month with 10% earning more than KES 20,000. Only 10% of the respondents earned less than KES 5,000. On average 5 in every 10 people who earned more than KES 20,000 reported having used the herbal medicine while pregnant compared to 3 in every 10 people who earned less than KES 20,000 per month.

Table 4.7: Age of eldest child by consumption of herbal medicine

	Use of herbal medicine				
	No (N=267)	**Yes (N=117)**	**P-Value**	**O.R**	**95% C.I**
Age of the eldest child					
0-5yrs	107(40.1)	49(41.9)	0.534	1.5	0.40-5.79
6-11yrs	118(44.2)	51(43.6)	0.591	1.4	0.38-5.45
12-17yrs	32(12.0)	14(12.0)	0.606	1.5	0.35-6.12
>=18yrs	10(3.7)	3(2.6)		1	
Ever had miscarriage or abortion					
No	256(95.9)	96(82.1)	0.000	0.2	0.09-0.42
Yes	11(4.1)	21(17.9)		1	
Household income					
1001-5000	28(10.5)	12(10.3)	0.082	0.5	0.19-1.10
5001-10000	19(7.1)	8(6.8)	0.118	0.5	0.17-1.22
10001-20000	193(72.3)	72(61.5)	0.003	0.4	0.22-0.74
>20000	27(10.1)	25(21.4)	0.035	1	

Table 4.8: Multiple logistic regressions of factors associated with herbal medicine use

Variable	B	S.E	*P-Value*	A.O.R	Lower	Upper
education level						
None	-0.92	0.50	0.065	0.40	0.15	1.06
Primary	-0.57	0.46	0.216	0.56	0.23	1.40
Secondary	-1.21	0.30	0.000	0.30	0.17	0.54
Tertiary/College				1.00		
Occupation						
Housewife	0.81	0.38	0.033	2.26	1.07	4.77
Self employed	-0.27	0.31	0.381	0.76	0.42	1.39
Employed				1.00		
Ever had miscarriage or abortion						
No	-1.76	0.41	0.000	0.17	0.08	0.38
Yes				1.00		
House hold income						
1001-5000	-0.69	0.48	0.150	0.50	0.20	1.28
5001-10000	-0.61	0.54	0.265	0.55	0.19	1.58
10001-20000	-0.86	0.34	0.011	0.42	0.22	0.82
>20000				1		

The results in the table above shows that the odds of pregnant women using herbal medicine during pregnancy was 0.30 times less among the pregnant women who had secondary education as compared to those with tertiary/college education A.O. R=0.30; P<0.001. However, no significant differences were found between those who had tertiary education and those with primary education and below. The use of herbal medicine was 2.26 times higher among pregnant women who reported to be housewives as compared to women who had an employment. No significant differences in herbal medicine use among those who were employed and self-employed women. Additionally, the odds of use of herbal medicines was 0.17 times less among pregnant women who had never had

abortion/ miscarriage as compared to those who have had (i.e. 6 time more than those who had had miscarriage /abortion). Lastly, pregnant women who had house hold income of between 10,000-20,000 were 0.42 time less likely to use herbal medicines as compared to those who had over 20,000 of household income (i.e. about 2.4 times more likely to use herbal medicine as compared to those who had household income of 10, 000-20,000) no significant differences were found between those with more than 20,000 and those with 10000 and below of household income.

4.5 Concomitance & frequency of use of herbal medicines & conventional medicines

The study revealed that women who reported to have used herbal medicine during pregnancy, a majority (73%) had used them together with conventional medicines. From the qualitative interview, most respondents revealed that most of the women use both herbal medicines and conventional medicines ignorant of any adverse reactions. It was found that it's a common practice among the young women and especially those in their first pregnancy. Additionally, it was noted that once the women got the 'expected' outcome from a particular type herbal medicine, they used them throughout the pregnancy and even into the subsequent pregnancies. However, some (33%) women noted that they got unpleasant reactions and stopped using the herbal drugs with some visiting a health facility for medical attention.

The women during a focused group discussion revealed that they visited a health centre/ hospital after the 'undesirable effects' opened up to the health care workers of use of herbal medicines. Those who never reported the concomitance cited the fear of being reprimanded by the health workers. The discussions also revealed some dangerous practices that some women used very high concentrations of 'black tea' to trigger or cause abortion.

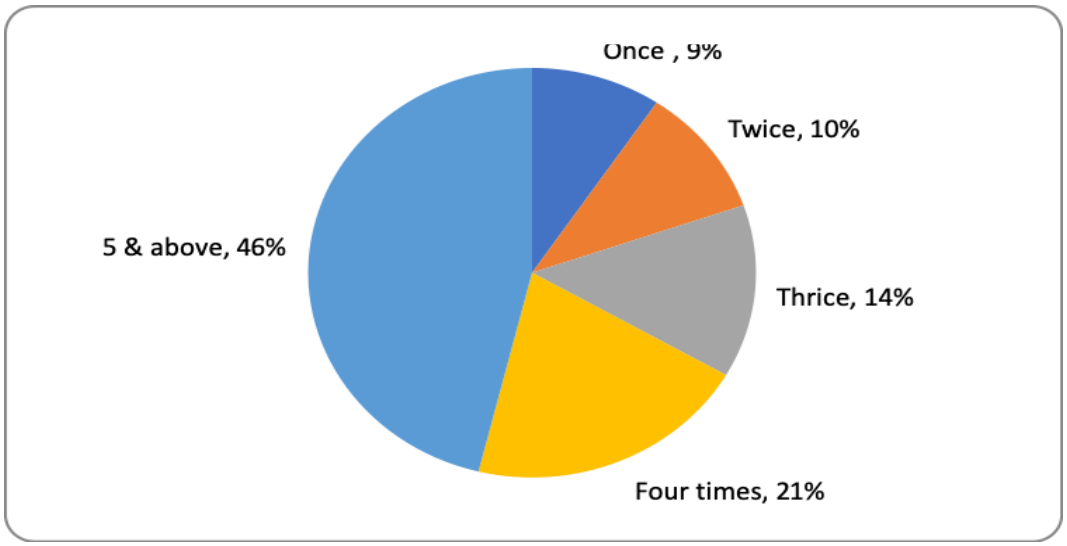
> *We use the herbal medicines together with the 'madawa za hospitali' to strengthen their effect e.g. like for the anti-nausea drugs, they are not very 'effective' and once you take the 'mitishamba' you feel even better……*
>
> Respondent1

> *The drugs given in the hospitals are good but most of them have side effects and therefore sometimes we use the herbs to reduce these effects. The herbal medicines are natural and do not cause any bad effects….*
>
> Respondent 3

The use of herbal medicines during pregnancy as noted from the study is a common phenomenon. The study revealed that women used herbal medicines more than once during their pregnancy. As a matter of fact, 46% of the women who used herbal medicines during their pregnancy did it for more than five times. Approximately nine percent of the herbal drug users only did it once and this could be due to some of them experiencing 'bad effects' which led to some of them stop any subsequent use. The qualitative study revealed that different herbs were used to 'treat' different ailments that mostly occur during pregnancy. During the first trimester, the study revealed women to have used herbal drugs to treat nausea and vomiting (26%) while in the last trimester thirteen percent of herbal medicines would prefer them to prepare them for parturition

and help alleviate the pain associated with it. The respondents reported that some women especially the primigravida were prone to use certain herbal drugs that are thought to reduce labor pains.

Figure 4.1: Herbal medicines use during pregnancy

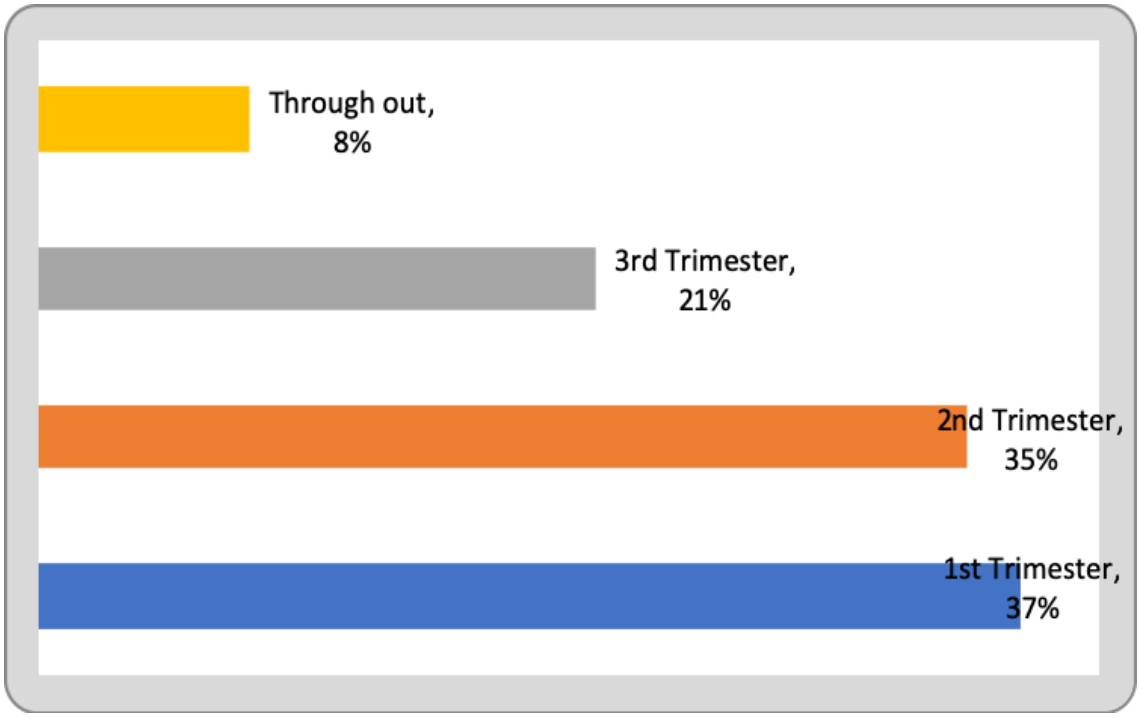


The study revealed that most of the respondents (37%) reported to have used herbal medicines during the first trimester followed by 35% of using herbal medicines during the second trimester. A smaller proportion (8%) of the women interviewed reported using herbs throughout the life of their pregnancy.

The qualitative data revealed that most women (37%) used the herbal during the first trimester to treat nausea and vomiting (26%) which is a great bother during the early days of the pregnancy. A smaller percentage (21%) of women reported to had used herbal drugs in the third trimester, something that was qualified by the qualitative study as this would help prepare the uterus and the cervix for childbirth and reduce the labor pains. Notably, some women were using the herbal drugs even beyond the pregnancy. The main

reasons cited for the post-delivery use of herbal drugs were; to quicken healing and recovery of the woman and to help in milk production.

Figure 4.2: Period of Pregnancy when used herbal medicine



4.6 Reasons for use of Herbal medicines during pregnancy;

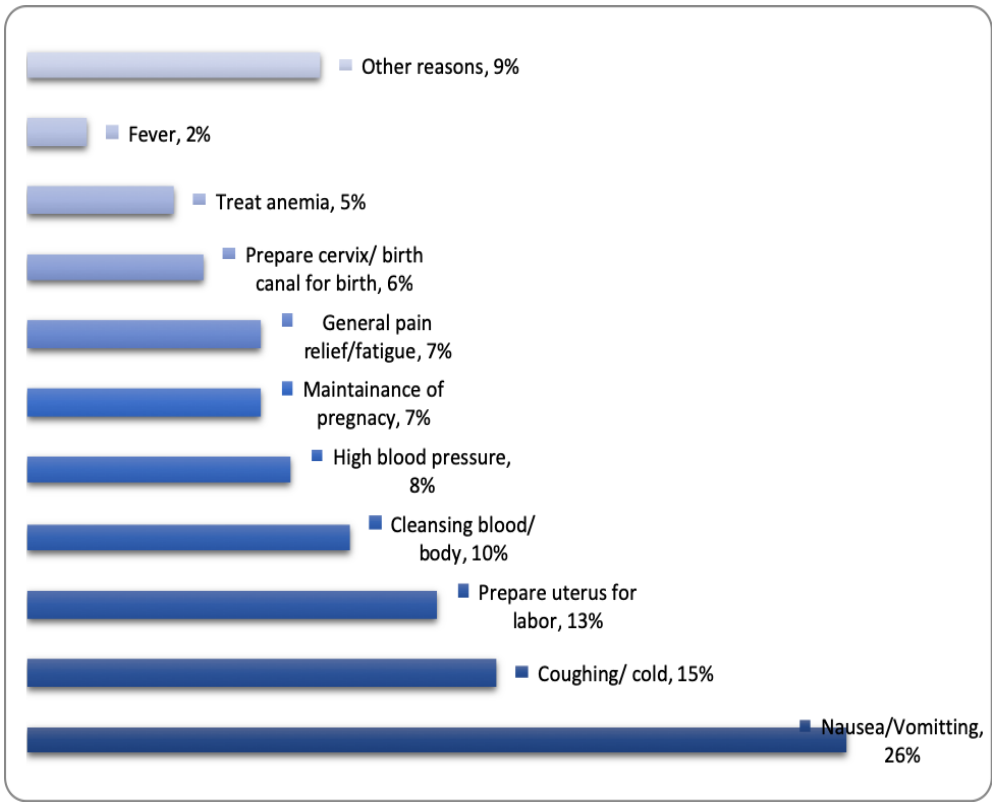
The study found out that most respondents (26%) used herbal medicines for management of nausea/ vomiting followed by 15% using them for treatment of common colds during pregnancy. This was notable in the first trimester. On the other hand, 13% of the herbal medicines' users reported to have used them to prepare the uterus and birth canal for childbirth and consequently reduce the level of pains during labor. A relatively similar proportion (10%) of herbal medicines users were reported to use some concoctions that are purported to be blood cleansers while 8% used herbal medicines for the management of high blood pressure associated with pregnancy.

The graph below represents the proportions of the herbal medicines user's vis a vis the

> *....people here like consulting me! Am their 'daktari' and am proud of that. I give pregnant women traditional medicines to treat vomiting and coughing. Also I give them drugs for alleviating pain during delivery and also to prepare the cervix for delivery……herbal medicine vendor*
>
> Key informant 2

ailments they use them for.

Figure 4.3: Reasons for using Herbal medicine during pregnancy



According to a medical practitioner from Makueni County hospital, women who sought formal medical care were also likely to have been using herbal medicines for treatment of

anemia, Urinary Tract Infection, immune boosters and "blood cleansing". He also acknowledged that most of them used processed products especially from local herbal clinics in addition to food supplements. Some women who are using the processed products and food supplements would report to the doctors that they are using the particular products when they are well probed.

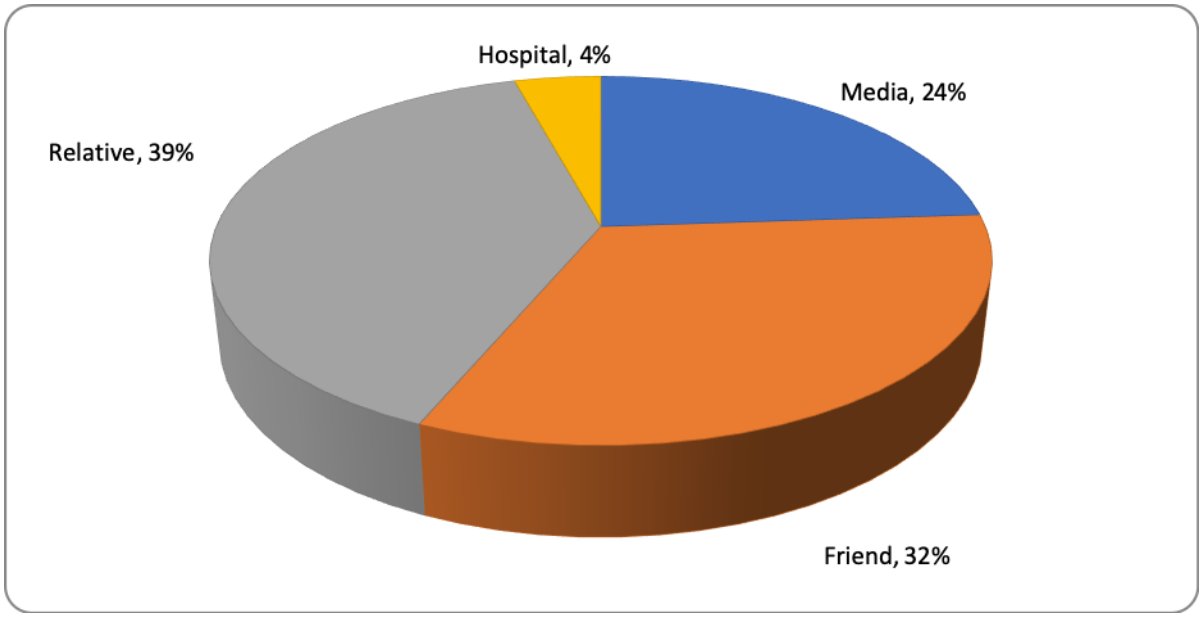
4.7 Sources of information on herbal medicines

The study participants noted that by a larger proportion (21%), close relatives were a major source of information as far as herbal medicines use was concerned. Approximately thirty two percent of the respondents noted that friends were also influential with the information about the herbal medicines. During the focused group discussions, it was deduced that there was a lot of peer influence when it comes to the use of the herbal medicines. One of the respondents in an FGD noted that during her first pregnancy, she was advised on which herb to take to reduce nausea and vomiting by her close friend who was also pregnant. Mass Media (Radios and Television) was also another source of information about herbal medicines whereby most of the respondent, 24%, mentioned that the programs ran by several herbal clinics on the radios and TVs were of great influence. During an In-depth interview with one of the Key Informant; a Nurse, mentioned that mass media was a key influence and a source of initial information and contacts for the women of reproductive age and population at large. In contrast, a

> *….the herbal clinics mushrooming around are a great menace. To make the matters worse, they run programs in radios and TV depicting herbal medicines as superior to the conventional medicines. That way most of our people have been hoodwinked to think that since it is in the media they have been vetted and they good for use…..*
>
> *Key informant*

very small proportion (4%) of the women reported to have gotten information about herbal medicines from a 'hospital'.

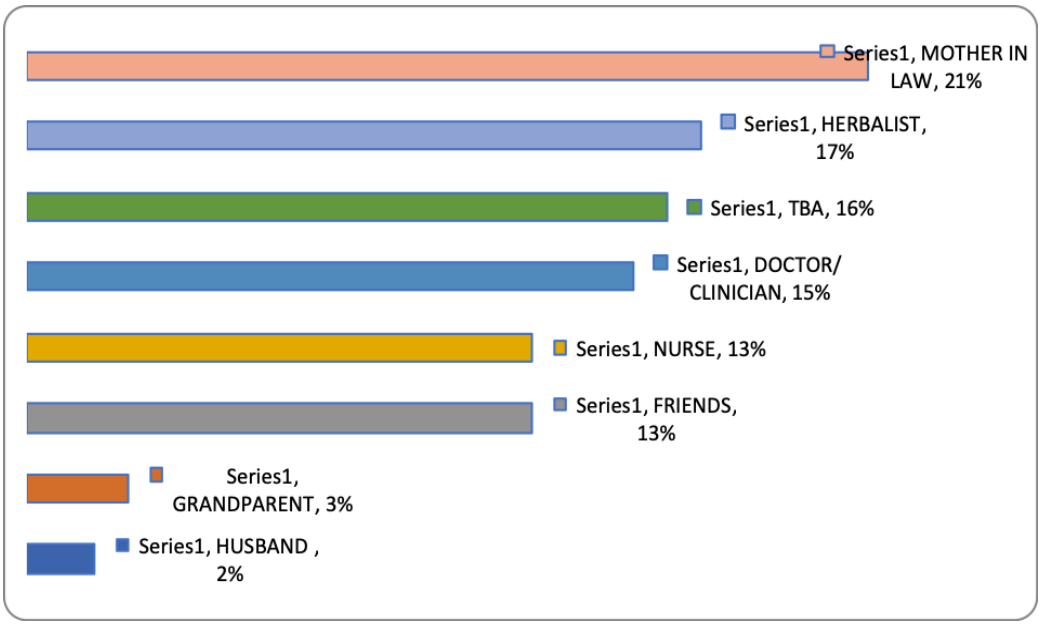
Figure 4.4: Source of Information on herbal medicine



4.8 Sources of information on herbal medicines

Mothers in law were the most influential in the recommendation of use of herbal medicine for pregnant women contributing 21% of all reported recommendations. Traditional Birth attendants, nurses, friends, herbalists and Doctors each recommended an average 15% of all recommendations. This is an indication that herbal medicines are being recommended by 15% of medical practitioners and therefore not considered as a competitor but rather as a complement to the formal medical and health systems. Very few women (2%) reported to have had herbal medicines recommended to them by their husbands.

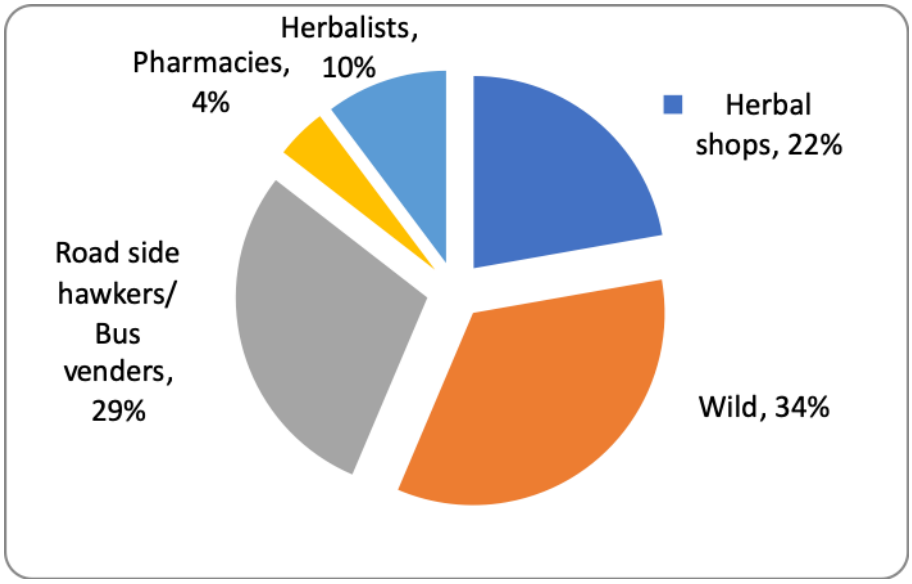
Figure 4.5: Source of recommendation on the use of herbal medicine during pregnancy



4.9 Sources of the herbal medicines

Most of the women reported to have gotten their herbs from the wild (34.2%). Some of the respondents (29.1%) reported to have had bought herbal medicines from hawkers and bus vendors who apparently were salespersons from local herbal clinics. It was also noted that about 22.2% of the women would source these herbal medicines from herbal shops/ clinics, with herbalists and pharmacies contributing to 10.3% and 4.3% respectively. Almost half of all the respondents reported purchasing the herbal medicines from shops, clinics and roadside hawkers. The entry of herbal medicine profiteers and a lack of an institutional framework to control the quality of the herbal medicines potent a health hazard especially to the pregnant woman and unborn child**.**

Figure 4.6: Source of Herbal Medicines for pregnant women



4.10 Effects of the herbal medicines

The study revealed that 58% respondents reported to had experienced 'desired effects' from herbal medicines. However, from quantitative data, pregnant women who reported undesired effects from the herbs were 33%. The undesired effect majorly reported was diarrhea at 32% with other significant "bad" effects being abdominal pains (23%), Fever/Sweating (19%) and headache (16%). Only 1% and 4% attributed the herbal medicines to the miscarriage/loss of baby and Bleeding. This was corroborated by the information from qualitative data that reported that herbal medicines users would experience undesired effects like diarrhea, abdominal pains, headache and sweating and as a result would stop using the particular herb/ medicine. It was also reported that some users would not get the expected results thus the decline in use in subsequent pregnancies.

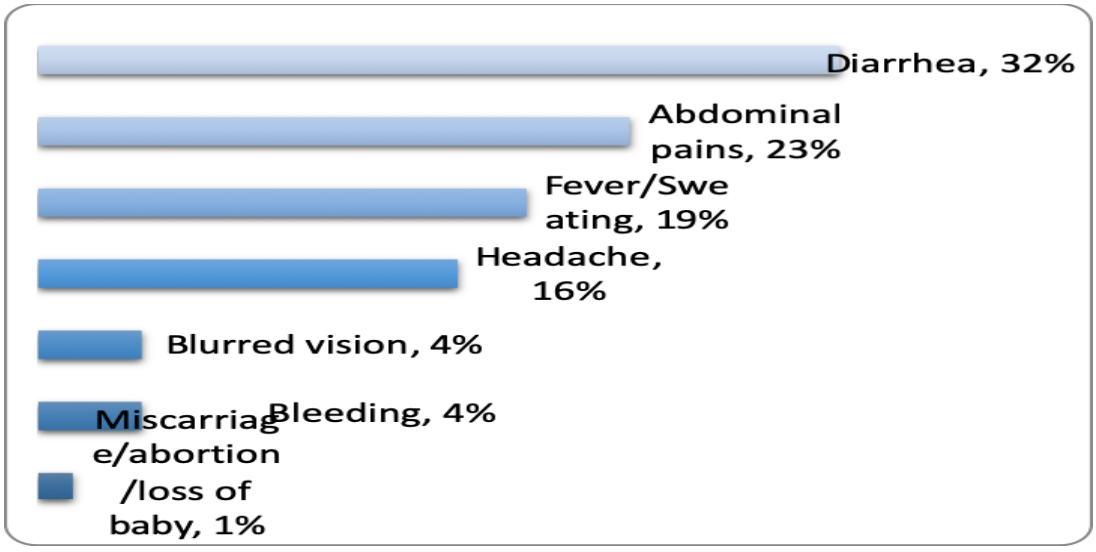
From qualitative interviews with the health care practitioners from the health facilities it was revealed that it was a common occurrence for pregnant women to come to the hospital with intestinal obstruction which could as a result of herbal medicines use.

Most of the herbal products have not been chemically analyzed and actually the chemical contents are not known. It was noted that since the chemical compositions are not well known, even the dosage of these products are not well documented and scientifically proven for the particular ailments they are purported to treat.

'…dawa zingine za miti za kienyenji hazileti yale matarajio yake. Zingine zaleta madhara na hapo ndipo wengi wetu wanaacha kuzitumia…..'

'…..some of the herbal medicines do not bring the desired effects. Others actually cause bad effects and consequently most of us stop using them….' *FGD respondent*

Figure 4.7: Undesirable side effects of herbal medicine among pregnant women



4.11 Discussion

Over 80% of people in the developing countries are reportedly reliant on traditional medicine for their healthcare needs. The use of herbal medicines by pregnant women is

thus unavoidable. Frequency of herbal medicines use across the world varies from region to region with reports indicating between 22.3% and 82.3% usage in the Middle East (John & Shantakumari , 2015) with Tiran (2003) reporting even a lower range of between 7% & to 55%. This report established 30.5% of the pregnant women using herbal medicine during pregnancy. This prevalence rate is almost similar to 31.4% and 36.8% reported by Tamuno et al., 2010 and Duru et al., 2016 in studies in Teaching hospitals in Nigeria. In addition, Foster *et al* 2006 also reported 36% prevalence in Australia while Nordeng and Havnen (2004) in a survey among 400 Norwegian women at Ulleval University Hospital in Oslo reported similar rate among pregnant women. Furthermore, a multi-country study in Europe, North and South America, and Australia revealed a 28.9% herbal medicine usage in pregnancy (Kennedy et al., 2013). Other studies closer in the Africa continent reveal prevalence in Egypt at 27.3% (Orief et al., 2014) and as low as 6.5% in Ghana (Adusi-Poku et al., 2015). However, other studies reported a marginally higher prevalence of 50.4% and 51.4% in Ethiopia and Malaysia respectively (Bayisa et al., 2014; Rahman et al., 2008). In Kenya, the result in this study is in contrast with another study by Mothupi, (2014) which reported 12% of pregnant women attending childcare clinic at Mbagathi District Hospital in Nairobi city had used HM during their index pregnancy while 41.4% reportedly had ever used HM, although this was done in an urban setting.

The characteristics of pregnant women who were more likely to take herbal medicines in this study were also consistent with other reports; women who were older, 25-34 years, had formal education (secondary education and above) and were housewives with a monthly household income were more likely to take HM (Foster et al., 2006; Tiran,

2003). The study revealed that women who reported to have used herbal medicine during pregnancy, a majority (73%) had used them together with conventional medicines contrary to the rate that Mothupi, (2014) reported in cross-sectional survey in Nairobi city.

This study reported just as other studies by Ameada et al., (2018) in Ghana and Bayisa et al., (2014) in Ethiopia, that the intensity of herbal medicines use during first trimester of pregnancy was more significant with dwindling intensity of use as the pregnancy grows. The study therefore revealed that most women (37%) used the herbal during the first trimester to treat nausea and vomiting (26%) which is a common condition during the early days of the pregnancy. This was in contrast to what was reported in Malaysia that showed more use during the third trimester (Rahman et al, 2008). It could be possible then that they were advised against use of drugs during pregnancy during antenatal care visits and that might justify the decline in usage of HM throughout the other trimesters. These results are also consisted with other studies that reported herbal medicines use during pregnancy was for management of nausea and vomiting while others used to shorten and reduce pain during labour (Henry and Crowther, 2000; Pinn and Pallet, 2002; Mureyi et al., 2012)

Herbal medicines were commonly perceived to be more effective, had fewer side effects, and as more available than conventional medicines that has to be prescribed by a doctor. Although they are considered safe, in reality it is known that the active ingredients in herbs that can cause serious adverse effects (Cuzzolin & Benoni, 2009). Most of pregnant women (58%) reported to have had experienced their desired effects while 32% reported

experiencing undesired effect with a greater proportion reporting diarrhea (32%) and abdominal pains (23%) as the main negative effects.

Family especially mothers in law as in other studies by John & Shantakumari, (2015) were the common sources of information/ recommendation for herbal medicines usage in this study. Traditional Birth attendants, nurses, friends, herbalists and Doctors were also other sources of information and had recommended HM to pregnant women on varying degree (Rahman et al., 2008; van der Kooi & Theobald, 2006) each recommended an average 15% of all recommendations. This is an indication that herbal medicines are being recommended by 15% of medical practitioners and therefore not considered as a competitor but rather as a complement to the formal medical and health systems. Very few women (2%) reported to have had herbal medicines recommended to them by their husbands.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Synopsis

The use of herbal medicine during pregnancy is an issue of great concern even as a supplement to mainstream maternal health care all over the world. It is an indicator of gaps that do or might be existing in the formal health care system that need urgent response. The use of herbal medicine is not a local issue but rather a trend that has greatly gained currency over the years. This study intended to establish the prevalence of herbal medicine use during pregnancy in Makueni Sub County; establish the social-demographic characteristics of women who use herbal medicines during pregnancy and the factors and reasons that influence them to use herbal medicines. Lastly the study established common adverse effects experienced after herbal medicine use.

5.2 Summary of findings

This study attempted to assess the prevalence of herbal medicine use and associated factors during pregnancy among pregnant women attending antenatal clinics in Makueni County hospital -Makueni sub county. The findings of this study do confirm the knowledge and active use of herbal medicines during pregnancy among women from Makueni Sub County. The study reveals that 30.5% (95% CI) of the pregnant use herbal medicines in pregnancy. The results are consistent with other studies from around the world which show that world over pregnant women do use herbal medicines for varied reasons.

Several factors like level of education, employment status and average monthly household income are strongly associated with use of herbal medicines. Availability of information especially through mass media and other channels influenced the use of the herbal medicine during pregnancy as women are in desperate need. Approximately 49% of women used herbal medicines during pregnancy to manage diverse ailments that are not necessarily associated with pregnancy. In Contrast, 26%, 13% and 6% of women would use herbal medicines to manage nausea and vomiting, prepare their uterus for labor and prepare the cervix parturition respectively. A few women used herbal medicines for management of cleansing blood/ body (10%), high blood pressure (8%), management of anemia (5%) and fever (2%) something the ministry/ department of health ought to be wary about as these are high risk symptoms in pregnancy.

The study established that majority of recommenders for use of herbal medicines during pregnancy were mother in laws (21%) followed by herbalists (17%) with traditional birth attendants (16%) still playing a significant role. The study in addition established that 67% of women reportedly received desired outcomes from the herbal medicines during pregnancy with a 33% reporting adverse effect and highlighting diarrhea (32%), abdominal pains (23%) and fever and sweating (19%) as the most common adverse effects.

5.3 Implication of the findings

5.3.1 The extent of herbal medicine use in Makueni Sub County.

One in every three women (30.5%) interviewed reported the use of herbal medicines in at least one form in pregnancy. This corroborated with other studies which reported near similar results (Tamuno et al., 2010, Orief et al., 2014). From this study the modal childbearing age of women in Makueni Sub County was between the age of 20 and 30 years who constituted 68% of the sample.

5.3.2 Social-demographic factors of herbal medicines users

Among herbal medicine users, a majority (75%) of women were aged between 20 and 39. Most women (37%) reported use of herbal medicines during the first trimester and this corroborated with the results about reasons women use herbal medicines for as 26% of the users reportedly used them to manage nausea and vomiting, a common phenomenon during the first trimester. Concomitance use of herbal medicines with conventional medicines during pregnancy is common phenomenon with 73% women reporting this pattern.

5.3.3 Factors that influence the use of herbal medicines during pregnancy in Makueni Sub County

The study established a relationship between age, education and use of herbal medicines. Women aged 25-30 reported as the highest users (43.6%). This also linked with the number of pregnancies that the respondents reported to have had. It is worth noting that the majority (88.5%) of the women were married and were sexually active for procreation.

Majority (76.1%) of the herbal medicines' users were reported to have been in their first pregnancy. The uncertainties associated with the first pregnancy could have influenced this result. Additionally, poor attitudes exhibited by the health care workers is noted from the qualitative data analysis as a precursor to use of herbal medicines as women feel disrespected thus resulting seeking alternative health care from mother in laws (21%), traditional birth attendants (17%) and herbalists(16%) as reported in this study. Through rigorous discussion with the respondents noted that some families/ communities were still stuck with traditional/ cultural beliefs that women who used conventional medicines and/ or delivered in a hospital were not strong and didn't deserve the attention of the husband.

The purchasing power of the herbal medicine users was evidenced by the fact that a majority (53.8%) of the respondents were under self-employment. This meant that they were able to afford especially the processed herbal medicines from the herbal clinics/ manufacturers. From qualitative interviews it was noted that pregnant women preferred processed herbal medicines as they were more 'believable' and thus could be safer. Marketing and distribution channels and activities of processed herbal medicines were quite intensive and convincing to the clients. The manufacturers packaged the herbal products as the ultimate solution to women's health issues with an appeal of total solution to all ailments and natural.

Most pregnant women (39%) got information about herbal medicines from very close family members. A key finding from this study shows that married women are three times more likely to consume herbal medicines than women who have no partners/

spouses (single, widowed or separated). This may imply the significant role that mothers and mother in laws play in pregnancy care even in the absence of the husband or male partner in the family. Due to cultural prescriptions for the women, it is also true that young married women have to respect their mothers' in-law and elder sisters' in-laws and more often than not whatever they are asked to take/ do they have to obey. Since most of these herbal medicines have not been tested to establish the active chemical components, their continued use even at times concomitantly with prescribed conventional medication potent a health hazard. The study revealed that 76% of women use herbal medicines as supplementary to the conventional medicines sourced from the formal health care system.

5.3.4 The perceived effects of herbal medicines

From the study, approximately 58% of the respondents reported to have experienced 'desired' effects constituted 33.3% with a further 8.55% percent not sure whether they got their 'desired' effects or not. A majority of the complications reported after use of herbal medicines in pregnancy include diarrhea and abdominal pains reported at 32% and 23% respectively. Majority of the herbal medicines are taken orally and therefore the first site of action is the gastrointestinal tract where reaction could be manifested in form of diarrhea, abdominal pain and sometimes bloating and vomiting. A slightly lower margin of 19% and 16% reported having fever/sweating and Headaches after taking the herbal medicine. Only 1% of the respondents believed the herbal medicines led to their miscarriage or abortion of the pregnancy. This is a worrying phenomenon that calls for immediate action and health education to the pregnant women to cease use of herbal medicines.

5.4 Conclusion

Herbal medicines still continue to play a significant role in health care of many rural populations in Makueni sub-county. A significant proportion of women (30.5%) preferred herbal medicines as source of health care during pregnancy in Makueni Sub County. However, they occasionally combine with conventional medicines for the same or different health conditions thus a possible interaction between herbal medicine and conventional medicine.

From the study on the recommenders of herbal medicine use, mother in laws, herbalists and traditional birth attendants had a remarkable influence on pregnant women using herbal medicine during pregnancy (Figure 4.5). The availability of herbalists and traditional birth attendants is one of the reasons for persistent reliance on herbal medicine. It was also established that close relatives, friends and media were the popular sources of information about herbal medicines while they primarily sourced the herbal medicines from the wild, hawkers, herbal shops/ merchandise and herbalists.

It was found that the most common undesired effects experienced by pregnant women when they use herbal medicines were diarrhea, abdominal pains and fever among others from the herbal medication.

5.5 Recommendations

There is a need for an intense health education and promotion campaign against indiscriminate use of herbal medicine during pregnancy to sensitize women/ general population of the dangers thereof.

5.6 Further research

From the findings of this survey, it is recommended further research be conducted to characterize herbs commonly used during pregnancy in Makueni Sub County.

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APPENDICES

APPENDIX I: INFORMED CONSENT

TITLE OF THE STUDY: Assessment of **Herbal medicines use among pregnant women in Makueni Sub County, Kenya.**

INVESTIGATOR AND INSTITUTIONAL AFFILIATION:

My name is Philip Mbithi Muia, a Master of Public Health student at Kenyatta University. I am working with my research assistants in the project named above. You are kindly requested to participate in this study because you meet the basic inclusion criteria for the study. We would like to collect information on prevalence and determinants of herbal medicines use by pregnant women during pregnancy.

Study location: Makueni Sub-County

Purpose of the study: This study aims to assess the occurrence and determinants of herbal medicines use during pregnancy in Makueni Sub County. The study will involve interviewing a total of 384 pregnant women attending antenatal care clinic in Makueni County referral hospital.

Procedure

If you understand the study as explained to you and agree to participate, we will ask you to sign a consent form. We will then ask you to fill a questionnaire regarding the use of herbal medicines during pregnancy. You are free to withdraw or refuse to answer any questions at any time without any consequences.

Potential benefits of the study

There are no direct benefits from the study; however, the results of this study will help us gain information that will help in policy formulations on herbal medicines use. The findings from this study will also help in giving feedback to the county and national government on state of use of herbal medicines.

Potential risks of the study

There are no risks associated with your participation in this study. The person interviewing you has been well trained. It will not cost you any money to participate in the study. We will spend about 20 minutes asking you questions. There is a possibility of you feeling uncomfortable in the middle of the interview due to the sensitivity of some of the questions. You are free not to answer any question that you feel is uncomfortable.

Data security and confidentiality

The information obtained from you was safely stored in lockable cabinets and password encoded computers only accessible to the study team. This information was stored until the final report has been written. There was no mention of names or identity of any study participants in any reports and publications resulting from this study. We will do our best to protect the information we collect from you. Information that identifies you was kept secure.

Contacts:

If you have any questions about this study, you should contact Philip Mbithi of Kenyatta University who is the Principal investigator at 0711175027, or write to the below address.

P.O BOX 61-90302, Kathonzweni.

For any questions pertaining to your rights as a research participant, the contact person is: The Secretary, KU Ethics Review Committee.

Basic of Participation

- You are being requested to participate in this study.
- Participation is entirely voluntary.
- You are free to withdraw the consent to participate in this study at any time.
- You are free to ask any questions regarding the study which may not be clear to you after the consent has been explained to you.

Statement of consent

I, the undersigned have understood the above information which has been read and explained to me by the researcher and I voluntarily consent to participate. I have had the opportunity to ask questions and all of my questions have been answered satisfactorily.

Name of Respondent …….. Date…….

Signature…….

I, the researcher/research assistant declare that the above has agreed to voluntarily participate in the study.

Name of the Investigator……..Date…….

Signature ……

Name of research assistant……Date……..

Signature……

APPENDIX II: QUESTIONNAIRE

This questionnaire is meant to collect information about you and your experience as a patient. This provides important feedback which was used to enhance the provision of better healthcare. Your responses were treated with utmost confidentiality. Kindly respond to all items with honesty. Thank you for your cooperation.

Date/time (dd/mm/yy) ___/___/___

SERIAL NUMBER:_____

PERSONAL INFORMATION

[Use a tick where applicable]

1. a) What is your age?

[1]15-19. [2] 20-24. [3] 25-30.

[4] 31-34. [5] 35-39. [6] 40-45.

[7] 46-49.

b) Which ward do you come from? (tick where appropriate)

i. Kathonzweni

ii. Wote

iii. Muvau/ Kikumini

iv. Mavindini

v. Kitise/ Kithuki

vi. Nzaui/ Kilili/ Kalamba

vii. Mbitini

2. What level of education did you complete?

[1] None [2] Primary

[3] Secondary [4] Tertiary/College.

3. What is your occupation?

[1] House wife [2] Self employed [3] Employed

4. What is your marital status?

[1] Single [2] Married [3] divorced [4] separated [5]

5. What is your religion?

1) Christian

2) Muslim

3) Hindu

4) African traditional religion

6 How many deliveries have you had?

[1]0 [2] 1 [3]2 [4]3 [5] ≥4

7. How old is your eldest child?

[1] 0-5yrs [2] 6-11yrs [3] 12-17 yrs [4] ≥18yrs

8. Have you ever had a miscarriage or an abortion?

[1] yes [2] no

9. What is your household income?-KSHs/Month

[1] 0-1,000 [2] 1,001-5,000 [3] 5,001-10,000 [4] 10,001-20,000

[5] ≥20,000

KNOWLEDGE ON HERBAL MEDICINES

1. Do you know herbal medicines?

[1] yes [2] no

2. Have you ever used herbal medicine during pregnancy?

[1] yes [2] no

3. Do you use herbal medicines together with conventional medicines?

[1] yes [2] no

4. If yes in question 2, how many times did you use during pregnancy?

[1] 1 [2]2 [3]3 [4]4 [5]5 and above

5. When did you use herbal medicine?

1) 0-3months

2) 4-6months

3) 7-9months

4) Throughout the pregnancy

6. If yes in question 2, what were you using it for?

1) Nausea/ Vomiting

2) Cleansing blood/ body

3) Coughing/ cold

4) Treat anemia

5) Maintenance of pregnancy

6) General pain relief/ fatigue

7) Prepare uterus for labor

8) Prepare cervix/birth canal for birth

9) High blood pressure

10) Fever

11) Other

7. Where did you get the information about herbal medicine use?

1) Media

2) Friend

3) Relative

4) Hospital

8. Who recommended herbal medicine to you?

1) Husband

2) Mother in-law

3) Friend

4) Nurse

5) Doctor/clinician

6) Traditional midwife

7) Herbalist

9. Did your spouse/husband influence you to take the herbs?

1) Yes

2) No

3) Don’t know

10. What state of herbal medicine did/do you take?

1) Raw

2) Processed

11. Which part of plants do you use?

1) Roots

2) Leaves

3) Bark

4) Flowers

5) Fruits

6) Combination

12. Where did you get the herbs from?

1) Herb Shops/clinics

2) Wild

3) Roadside Hawkers/ bus vendors

4) Pharmacies

5) Herbalists

13. After using the herbal medicines did you get the desired effects?

1) Yes

2) No

3) Don’t know

14. Did you get undesired effects?

1) Yes

2) No

3) Don’t know

15. What undesired effects did you get?

1) Headache

2) Fever/ sweating

3) Bleeding

4) Convulsions

5) Abdominal pains

6) Blurred vision

7) Miscarriage/abortion/ loss of baby

8) Diarrhea

9) NONE

16. Have you developed any of the following symptoms during pregnancy? (tick all that you have ever suffered from)

1) Abnormal vaginal discharge

2) Pelvic pain

3) Fever

4) Abnormal smell/foul odor of discharge

5) Delay in the size of uterus

6) NONE

7) ALL

17. If any of the above, did you seek treatment or help?

[1]. Yes [2]. No

18. If yes, from who?

[1]. A government Health center

[2]. Self-treatment

[3]. community member

[4]. Relative/sister/brother/husband

[5]. Private Clinic/Drug Shop/Pharmacy

[6]. Herbalist

[7]. Midwife/ traditional birth attendant (TBA)

[8]. Witch doctor

[9]. Other (Specify)…….

15. Did you go for antenatal care before delivery?

[1]Yes [2] No

16. If No, why?

[1] No money to pay for services [2] Not aware of such services [3] religious issues [4] Cultural beliefs/taboos [5] Hospitals are far [6] No vehicles/transport problems [7] Fear [8] Family issues e.g. husband/spouse had not been approved.

17. Are you attending antenatal clinics regularly (for the current pregnancy)?

1) Yes

2) No

18. Have ever told your doctor that you used herbal medicine during your pregnancy?

1) Yes

2) No

19. If yes, what was his/her reaction?

1) Worried

2) Surprised

3) Angry

4) Fine

5) Sad

20. Have you ever been tested for HIV?

1) Yes

2) No

21. Do you know your HIV status?

1) Yes

2) No

THANK YOU for your cooperation and time

APPENDIX III: KEY INFORMANT INTERVIEW GUIDE HERBALIST/ TRADITIONAL BIRTH ATTENDANTS

How are you? I am Philip Mbithi Muia, from Kenyatta University. This study seeks to determine factors associated with the use of herbal medicine during pregnancy among the women in Makueni sub-County. If there are any questions or clarifications regarding this study, please feel free to ask me.

1. What is your name (optional) and age?

2. What is your main occupation?

3. What is your highest level of education?

4. What religion/denomination do you belong to?

5. How long have you been a Traditional birth attendant/ Herbalist? (Exploratory questions: How do you acquire the skills? Are you registered or affiliated to any association?)

6. What do you treat? How do you get your patients? How many patients do you treat on a daily basis (average)? Do you keep record of your patients?

7. Do you sell medicinal herbs? Exploratory questions: Do you charge for your services? How do you arrive at your charges?

8. How many conditions do you manage on pregnant women? Can you list them?

9. How do you obtain your herbs? How do you administer your herbs?

10. Do you have your clients combine your herbs with other modern drugs?

11. What steps do you take if a patient does not respond to your medicines?

12. In your view explain why pregnant women seek herbal medicine?

Thank you very much for your cooperation.

APPENDIX IV: KEY INFORMANT INTERVIEW GUIDE-HEALTH CARE PROVIDERS

Introduction

How are you? I am Philip Mbithi Muia, from Kenyatta University. This study seeks to determine factors associated with the use of herbal medicine during pregnancy among the women in Makueni sub-County. If there are any questions or clarifications regarding this study, please feel free to ask me.

1. What is your name? (Optional) and your position in this hospital?

2. Do you have information about herbal medicine use among the pregnant women in this region?

3. Kindly give the common conditions pregnant women seek hospital care for in this facility

4. Do patients admit or inform the health workers if they had sought an alternative treatment before coming to the facility? (Elaborate)

5. Are there side effects presented in the hospital which may be related to utilization of herbal medicine?

6. In your view, explain, why do you think some patients seek herbal medicine?

7. What are your attitudes towards herbal medicine?

Thank you very much for your cooperation.

APPENDIX V: FOCUS GROUP DISCUSSION GUIDE: PREGNANT WOMEN

How are you? I am Philip Mbithi Muia, from Kenyatta University. This study seeks to determine factors associated with the use of herbal medicine during pregnancy among the women in Makueni sub-County. If there are any questions or clarifications regarding this study, please feel free to ask me.

1. Do you use herbal medicines during pregnancy? If yes/ no, why?

2. How many times in pregnancy do you use herbal medicines?

3. What conditions do manage with herbal medicines during pregnancy?

4. Once you use herbal medicines, do you seek care from the hospitals?

5. Do you report to the health care workers that you have used herbal medicines? If yes, what is their reaction?

6. Where do you source the herbal medicines from? What are their costs? How did you know of their existence?

7. What are the effects of herbal medicines? Exploratory questions: any desired or undesired effects?

Thank you very much for your cooperation.

GOVERNMENT OF MAKUENI COUNTY

DEPARTMENT OF HEALTH
MAKUENI SUB COUNTY
P.O. BOX 89-90300 MAKUENI
Website: makueni.go.ke Email: countyhealthmkn@gmail.com

4th June, 2015

Ref: MKN/ED/PH/012/15

TO WHOM IT MAY CONCERN

RE: RESEARCH AUTHORIZATION FOR PHILIP MBITHI MUIA REG NO. QTY/CTY/PT/21168/2012

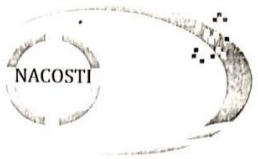
The above named person is a student from Kenyatta University undertaking a master's degree in public Health-Reproductive Health option.

Mr. Muia intends to carry out a study on herbal medicines use among pregnant women in Makueni Sub County. His study will target pregnant women visiting Makueni County Referral Hospital for antenatal clinics. Kindly accord him the necessary support to enable him to collect the data.

DR. MAUNDU SOLOMON,
SUB COUNTY MEDICAL OFFICER OF HEALTH
MAKUENI SUB COUNTY

CC

1. MCH/ANC
2. PUBLIC HEALTH
3. PHARMACY



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

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When replying please quote

9th Floor, Utalii House
Uhuru Highway
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No.

Date:
28th May, 2015

NACOSTI/P/15/9524/5844

Philip Mbithi Muia
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Herbal medicines use among pregnant women in Makueni County***, **Kenya,"** I am pleased to inform you that you have been authorized to undertake research in **Makueni County** for a period ending **4th September, 2015.**

You are advised to report to **the County Commissioner and the County Director of Education, Makueni County** before embarking on the research project.

On completion of the research, you are expected to submit **two hard copies and one soft copy in pdf** of the research report/thesis to our office.

DR. S. K. LANGAT, OGW
FOR: DIRECTOR GENERAL/CEO

Copy to:

The County Commissioner
Makueni County.

The County Director of Education
Makueni County.

THIS IS TO CERTIFY THAT:
MR. PHILIP MBITHI MUIA
of KENYATTA UNIVERSITY, 0-100
nairobi,has been permitted to conduct
research in *Makueni County*

on the topic: *HERBAL MEDICINES USE AMONG PREGNANT WOMEN IN MAKUENI COUNTY, KENYA.*

for the period ending:
4th September,2015

.....
Applicant's
Signature

Permit No : NACOSTI/P/15/9524/5844
Date Of Issue : 28th May,2015
Fee Recieved :Ksh. 1000

.....
Director General
National Commission for Science,
Technology & Innovation

CONDITIONS

1. You must report to the County Commissioner and the County Education Officer of the area before embarking on your research. Failure to do that may lead to the cancellation of your permit
2. Government Officers will not be interviewed without prior appointment.
3. No questionnaire will be used unless it has been approved.
4. Excavation, filming and collection of biological specimens are subject to further permission from the relevant Government Ministries.
5. You are required to submit at least two(2) hard copies and one(1) soft copy of your final report.
6. The Government of Kenya reserves the right to modify the conditions of this permit including its cancellation without notice

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH CLEARANCE PERMIT

Serial No. A

CONDITIONS: see back page