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FACTORS INFLUENCING THE USE OF KALIGU-TIM (HERBAL MEDICINE)

DURING PREGNANCY AND LABOUR AMONG POSTNATAL WOMEN IN

TOLON DISTRICT

BEATRICE A. AYELYINE

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BY

BEATRICE A. AYELYINE (BSC. NURSING)

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THESIS SUBMITTED TO THE DEPARTMENT OF PUBLIC HEALTH, SCHOOL OF ALLIED HEALTH SCIENCES, UNIVERSITY FOR DEVELOPMENT STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTERS OF SCIENCE DEGREE IN COMMUNITY HEALTH AND DEVELOPMENT

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Declaration

I, Beatrice A. Ayelyine, hereby declare that this thesis is my own work towards the partial fulfillment for the award of MSc. degree submitted to the University for Development Studies, School of Allied Health Sciences. This work has not been previously published by another person nor has it been accepted for the award of any other degree of the University or another and contains no material previously published except where due acknowledgement has been made in the text.

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Abstract

The increased use of herbal medicine and/or products is noticed all over the world. The safety of herbal drugs becomes particularly important in pregnant women and children. Despite the fact that available data are insufficient to justify herbal use during pregnancy, exposure to herbal products in unspecified quantities among pregnant women is of great concern. The study sought to assess the determinants of the use of kaligu-tim, a known local oxytocin and its impact on the maternal birth outcomes among women in the Tolon district of Ghana. The study design employed was a descriptive cross-sectional study which involved 339 women attending postnatal care and/or child welfare clinic across the district using quantitative methods of data collection. A structured questionnaire was used to collect quantitative data. The selection of the study participants was by systematic sampling and the main outcome variables were the proportion of mothers who used herbal medicine, determinants and effects on maternal birth outcomes. Quantitative data was coded and entered into SPSS version 22.0 database and later exported into STATA version 13 for analysis. The results showed that 64.9% and 45.4% of respondents used local oxytocin in their previous and current pregnancies respectively; 5.5% of respondents did so during the first trimester, 26.8% during the second trimester and 67.7% in the third trimester. The study found a significant relationship between herbal medication use and health service-related challenges, maternal age group (p<0.009), gestational term at delivery (p<0.019), parity of the respondents (p<0.015) and mothers' ethnicity (p<0.001). Previous and current use of Kaligu-tim reduced birth weight by 26g and 34.3g respectively, though these were not statistically significant. However, previous history of kaligu-tim was significantly associated with perinatal asphyxia, postpartum haemorrhage, obstructed labour and foetal distress in their subsequent deliveries. It can be concluded that the use of this Kaligu-tim posed a greater long term health challenge for mothers and their babies. Further studies are required to assess the overall health impact of kaligu-tim on the reproductive health of women using kaligu-tim during pregnancy.

Acknowledgement

I will like to thank the Most High God who gave me the strength, wisdom and patience to face the challenges in life, especially during the writing of this dissertation.

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Dedication

This piece of work is dedicated to God for his unconditional support and guidance throughout the study.

I also dedicate this book to my husband and children, my entire family and all those who contributed in diverse ideas to the successful end of this study

List of Abbreviations / Acronyms

ANC	Antenatal Care
CAM	Complementary and Alternative Medicines
CHPS	Community-based Health Planning and Services
MAS	Meconium Aspiration Syndrome
MoH	Ministry of Health
OTC	Over-the-Counter
PNC	Postnatal Care
SDG	Sustainable Development Goal
TBA	Traditional Birth Attendants
TH	Traditional Healers
UDS	University for Development Studies
WHO	World Health Organization

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Traditional medicines are mostly referred to as derivatives of nature, including herbs, animal and mineral products (Gichangi, 2014).These medicines are generally used to promote good health and to prevent or manage several diseases including treating morning sickness (early pregnancy symptoms) such as nausea and vomiting, induction of abortion, treatment of threatened abortion or labour (Gichangi, 2014). The number of these medicinal plants is not known since every population sub-group has different sets of herbal medicines for their population. Herbal medicines are purchased in bulk in the crude form or as refined pharmaceutical dosage forms such as capsules, tablets, concentrated extracts, teas, tinctures and decoctions. Titilayo, (2009) noted that the use of traditional medicine plays important role in managing both mild and severe illnesses and has shown to have been influenced by patient's dissatisfaction with conventional allopathic medicines in terms of effectiveness and/or safety, satisfaction with therapeutic outcome, and the perception of their inherent safety. These factors are fuelled by cultural and personal beliefs regarding life and health as well the comparison between the orthodox and the traditional medicines (Titilayo, 2009).

Herbal/traditional medicines are collectively classified under complementary and alternative medicines (CAMs) (Women's, 2013). Herbal medicines are said to be in use since the period of the pre-colonial era in Ghana. Adusi-Poku et al. (2015) stated that even though there are claims of the efficacy of some of these herbs, data on its usage and safety in pregnancy and breastfeeding is scanty. Again, there is no much information on

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the pharmacologic interactions of the combined effects of herbal and orthodox medicines (Adusi-Poku et al., 2015). They are products that are used based on traditional knowledge; this is why there is sometimes less scientific evidence available about their safety and effectiveness. A survey conducted by the National Prescribing Service revealed that 65% of Australians had used one or more complementary medicine in the previous 12 months (Titilayo, 2009). Herbal and traditional medicines are generally bought from shops such as pharmacies, supermarkets, and health food stores. While the majority of complementary medicines are used for the relief of symptoms of minor and self-limiting conditions, many are used for maintaining health and well-being, or the promotion or enhancement of health. (Adusi-Poku et al., 2015)

A study in Ghana showed that the use of some herbal medicines was associated with a 30% lower ongoing pregnancy and live birth rate during fertility treatment (Adusi-Poku et al., 2015). The use of herbal medicine has been on increase in many developing countries and industrialized countries. It is stated that between 65% and 80% of the world's population use herbal medicines as their form of health care (Titilayo, 2009)

There are several considerations with the use of herbal/traditional medicines, especially during pregnancy. This is because a lot of concerns have been expressed with the use of herbal medicine. Information about the safety and efficacy of herbal and traditional medicine use during pregnancy is limited. Some herbal and traditional medicines have active ingredients that may cross into the blood stream of the baby, and some herbal and traditional medicines are not regulated to ensure consistent quality (Women's, 2013). Although considered natural, no medicine is free of potential side effects. Use of certain herbal and traditional medicines without prior consultation with a health care professional

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may be harmful to mothers and their unborn babies. It is necessary for mothers and couples to seek medical advice before using any herbal or traditional medicine during pregnancy (Women's, 2013).

However, in the Tolon District as well as the Country as a whole, people have inadequate knowledge on herbal medicine, the usage, and the safety of herbal medicine. Coupled with these factors, are the weak policy regulation and standard prescriptions of these medicines to its users including vulnerable women such as pregnant women. Therefore, it is for this reason that this study seek to assess the factors influencing the use of herbal medicine (kaligu-tim) during pregnancy and labour among postnatal women in Tolon district.

Problem Statement

It is an established fact from the above that, the use of herbal medicine (kaligu-tim) among the Ghanaian population is alarming. In Tolon District, it is estimated that over 60% of the mothers seek medical attention from traditional healers for the prevention, diagnosis, and treatment of social, mental and physical illnesses. The majority of patients in Tolon district, including pregnant women, are suspected of using traditional herbal medicines (kaligu-tim) for a number of ailments, but the actual burden of use of herbal medicines (kaligu-tim) by women during pregnancy is still unknown. The increased patronage of kaligu-tim is believed to be a contributing factor to the poor maternal healthcare services (antenatal care (ANC) services and health facility delivery). This has led to some cases of maternal death, which currently at the ratio of 350 per 100,000 live

births (MOH Annual Report, 2008) and 80 per 1000 live births (Ghana Demographic and health Survey, 2008). The Northern Region and Ghana as a whole is unlikely to meet the sustainable development goal three (SDG 3) as a result of such health practices. For instance, whereas over 90% of pregnant women attend at least one ANC visit, only about 47% attend the World Health Organization (WHO) recommended four or more ANC visits during their pregnancy, and only 57% give birth in a health facility, suggesting possibility of resorting to alternative methods of health care, including use of herbal medicine (kaligu-tim), known as local oxytocin (Tolon District Health Directorate Annual Report, 2016).

Despite the consistent education on the dangers involved in the usage of Kaligu-Tim to enhance the progress of labor, there is still extreme increase in the patronage of kaligu-tim in Tolon district. The women only come to the health facility to deliver when there are complications such as a prolong labor, severe bleeding, fetal distress ruptured uterus among others as a result of using these local medicine. Some of the mothers at the end will have a live baby without a uterus for future conception, some will die and others will have a disability such as recto-vaginal fistula (Tolon District Health Directorate Annual Report, 2016).

Reproductive health of these vulnerable women who also form very important component of Ghanaian population, yet adequate information on the factors influencing the use of Kaligu-Tim is limited especially in the Northern region. It is in view of this that this study seeks to assess the prevalence, impact and factors influencing the use of Kaligu-Tim (herbal medicine) during pregnancy and labour among postnatal women in

Tolon District in Ghana. Findings from the study will serve as useful recommendations in improving maternal health in pregnancy and during labour.

1.3 Research Questions

1.3.1 Main Research Question

1. What are the factors influencing the use of kaligu-tim and its effects on pregnancy/birth outcomes among women in the Tolon District

1.3.1 Specific Research Questions

1. What proportion of mothers use kaligu-tim during pregnancy and labour?
2. At what period or trimester do women use Kaligu-tim?
3. What factors influencing the use of Kaligu-tim during pregnancy and labor?
4. What are the effects of the Kaligu-tim on pregnancy outcomes?

1.4 Objectives of the Study

The objectives of the study are categorized into two groups. These are general objective and specific objective.

1.4.1 Main objectives

To assess factors influencing the use of kaligu-tim (herbal medicines), a known local Oxytocin and its impact on pregnancy/birth outcomes among women in the Tolon District

1.4.2 Specific Objectives

1. To assess the proportion of mothers using Kaligu-tim during pregnancy and labor.

2. To determine the trimesters/periods in which the women use the herbal medicine

3. To ascertain the factors influencing the use of Kaligu-tim during pregnancy and labor

4. To determine the effects of Kaligu-Tim on pregnancy outcomes.

1.5 Conceptual Framework

Herbal medicines generally provide cheaper options of health care to poorer people in developing countries, and also health maintenance options to the well-to-do people in the developed countries (Smith-Hall, 2012). Current happenings in developing (population increase, poor coverage of western health care, accessibility of traditional medicines) and developed (aging populations) countries show that the consumption of herbal medicines and the benefits derived from these medicines will persist for a while (Smith-Hall, 2012). Regardless of the constraints to the development of a sound evidence base on safety and efficacy for herbal medicines and related products, there is the need for improved understanding of the main drivers of medicinal plant consumption. Information obtained from herbal medicine consumption will guide pluralistic health policies and improved the benefits for a wide range of people (Smith-Hall, 2012).

This unified conceptual framework offers a step towards establishing a comprehensive approach to understanding the dynamics of the use of herbal medicine in the Tolon District and also for the similar or related environment. The framework presented here fills in this knowledge gap by providing a structured approach to investigate changes in herbal medicine consumption based on changes in key factors (Smith-Hall, 2012).

At present, a systematic endeavor to fill the vast knowledge gaps in our understanding of medicinal plant consumption dynamics is needed to inform future health and natural

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resource management policies. Apart from increasing our conceptual understanding of medicinal plant consumption dynamics, the proposed framework can serve to guide research towards systematically pursuing this objective. Standardized international or national surveys do not presently include the concept of medicinal plant reliance, and in many cases only limited information on the main causal factors and linkages to medicinal plant consumption will be available at the country level, thus making it difficult to measure the central variables (assessing the strength of factors, linkages and their impacts on future consumption) (Smith-Hall, 2012).

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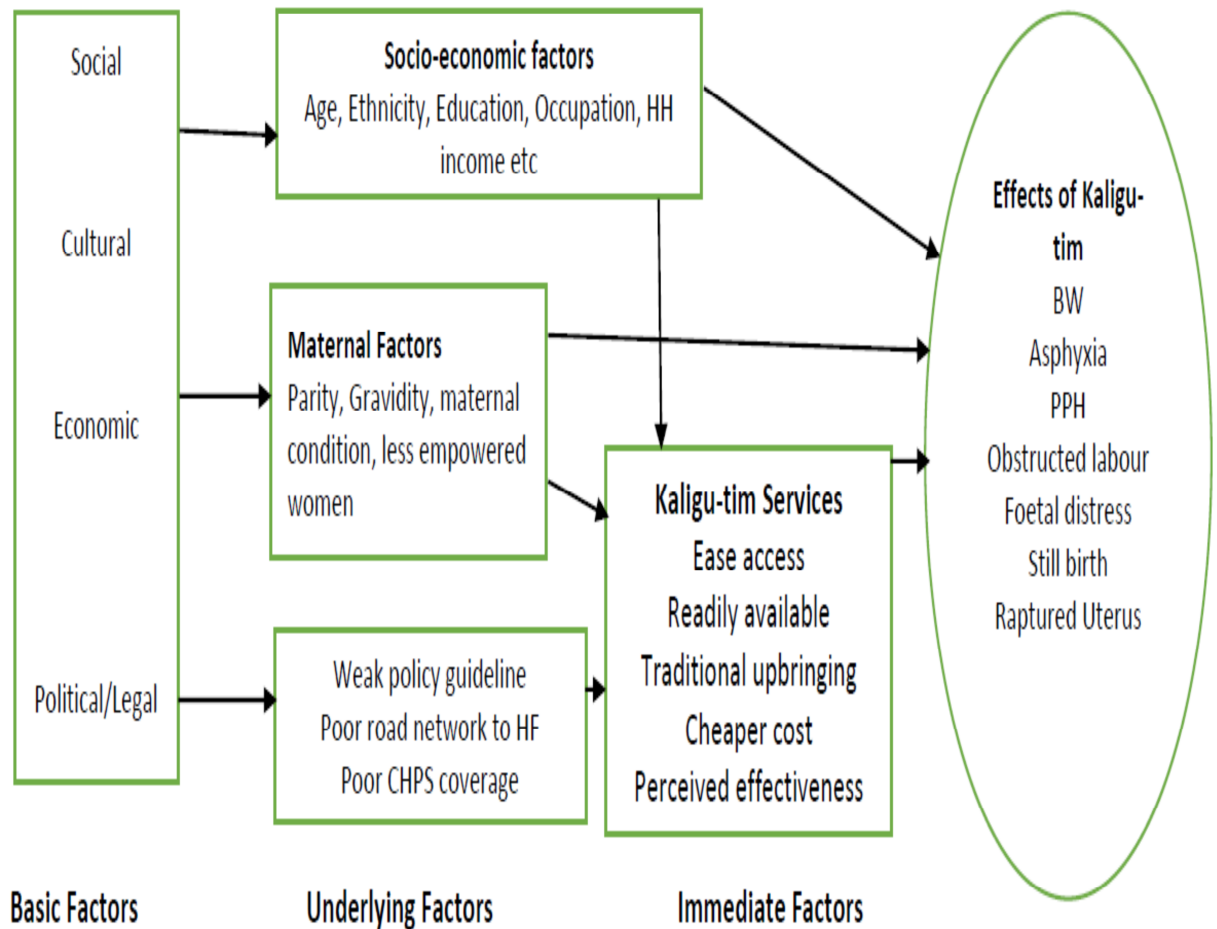
Figure 1: Conceptual Framework: Adopted and modified from Smith-Hall, 2012.

1.6 Significance of the Study

In developing countries, the quality of health service delivery remains poor. With poor health services and poor emergency obstetric care, the maternal and fetal mortality and morbidity have remained high. This study aimed at assessing the prevalence of herbal medicines during pregnancy and their associated factors. Results achieved will be used in health education delivery, Antenatal clinics and community durbars. This will also inform the health service providers on measures to improve obstetric care. It will also be

used as reference point for more researches concerning the use of herbal medicines in pregnancy and labour.

The study will also help to outline the reasons behind the use of herbal medicine so that health education can be targeted on the negative aspect to minimize the use of kaligu-tim (local oxytocin). The study will benefit mothers of reproductive age 15 – 49 by reducing maternal mortality and complications associated with the use of kaligu-tim known in enhancing labor and pregnancy issues. It will also help in achieving the sustainable development goals especially goal three if the maternal mortality is reduced.

1.7 Organization of the study

The study is categorized into six (6) chapters as shown below: Chapter one consist of introductory chapter and sub-sections; the background of the study, problem statement, relevance of the study, scope of the study, the research questions, the objectives of the study, the conceptual framework, the study variables and the organization of the study. Chapter two contains the literature review section of the research in which similar or related works by others authors will be researched into. Articles, journals, books, websites and the other sources of information that are relevant to the study will be cited Chapter three of the study focused on the research methodology and design. Sub-topics that will be covered here include the profile of the study area, study design and type, study population, sample size and technique, methods of data collection, ethical considerations and limitations of the study. Chapter four also comprised of data processing/analysis and the presentation of the results from the data, while chapter five will contain the discussion of the results. Lastly, chapter six captured the conclusion and

the recommendations from the study. References and other figures/tables will form the annexes.

1.8 Definitions of Concepts

Reproductive Women: Women within the ages of 15-49years who are capable to conceive and produce children.

Herbal Medicine: Herbs, herbal materials, herbal preparations and finished herbal products that contain as active ingredients parts of plants, or other plant materials, or combinations

Kaligu-tim   Known local oxytocin that is used by rural women in Tolon District of Ghana to hasten labour and also to help reduce other related conditions during pregnancy.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

The literature review discusses opinions and concerns expressed by other researchers. The literature review also seeks to point out whether there are gaps in existing literature for which further research is needed. The literature review covers topics like; current

prevalence of Traditional Medicine usage, factors influencing the traditional medicinal use, and the effects of traditional medicines on women and the pregnancy outcomes.

2.2 Prevalence of Traditional Medicine Usage

According to the WHO, herbal medicine is described as *"…herbs, herbal materials, herbal preparations and finished herbal products, that contain as active ingredients parts of plants, or other plant materials, or combinations"* (WHO, 2014). Herbal medicines can be in the form of liquids, powder, capsules, tablets or ointments which can either be pre-packaged while others are prepared when needed. Herbal medicines are used not only to cure illness but to maintain or boost one's health. The use of traditional medicine, of which herbal medicine is a significant part, for the diagnosis, prevention and treatment of illnesses, and for the improvement of general well-being is relatively high in Africa: The World Health Organization reported a prevalence of herbal medicine use of about 80% of the population which is on the rise across the world, especially amongst pregnant women as contained in (Mothupi, 2014). In Ghana the working definition of traditional medicine is diverse health practices of the people based on the traditional knowledge and beliefs incorporating plant, animal, mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or combination to maintain well-being, diagnose, treat or prevent illness or physical, mental, social and spiritual imbalances (Sato et al., 2015). According to the English oxford living dictionary, Labour is the process of childbirth from the start of uterine contractions to delivery.

Literature published showed the prevalence of herbal medicine used among women in the Middle East varied between 22.3–82.3%. More specifically, Azriani & Rahman, (2008) found out in study in Malaysia to determine prevalence and pattern of use of herbal

medicines during pregnancy in Tumpat District, Kelantan that 87.0% of the women sampled used at least one type of herbal medicines during pregnancy while 56.6% of them used this medication once in their entire pregnancy. The authors noted that the use of herbal medicine by the pregnant mothers were informed by the influence of 'important others'; parent-in-laws (63.9%), other family members (18.5%) and traditional midwives (10.2%). Also in Kazeroon, south of Iran in the Middle East (Tabatabaee, 2011) found 30.8% herbal drugs usage among pregnant women. The researcher observed that, among the various herbal drugs, women in the Kazeroon branch commonly used Ammi, Saatar and Sweet Basil as the main alternative herbal medications in their pregnancies.

In a multinational study to assess the use of herbal medicine in pregnancy, Deborah et al. (2013) revealed diverse rates of prevalence on the use of herbal medicine in pregnancy. For instance, the authors found out that even though the overall prevalence stood at 28.9%, there were wide variations across the different European Countries. According to the authors, Sweden reported a lower rate of 4.3% whiles Russia reported 69% prevalence rate on the use of herbal medication in pregnancy. The authors posit that women from Eastern Europe (51.8%) and Australia (43.8%) were twice as likely to use herbal medicine versus other regions (Deborah et al., 2013). Also, in a study in the obstetrics and gynecology unit in a tertiary hospital in Ghana, indicates that about 50% of patients had used herbal medicine prior to admission (Addo, 2007), implying a rising trend in the utilization of herbal medicine during pregnancy, yet little is known about their use and safety especially during pregnancy (Stanley, 2015). Over the past decade, a study has showed that 1 in every 5 Americans reported using an herb for the treatment of health conditions and/or for health promotion related purposes. According to the study

the 72% of those who used the herbs also used prescription medications, and 84% of those who used herbs also used an over-the-counter medication. The authors found that the majority of the adults used echinacea (41%), ginseng (25%), gingko (22%), and garlic (20%) for the treatment of illnesses such as head or chest cold (30%), musculoskeletal conditions (16%), and stomach or intestinal illness (11%) (Gardiner et al., 2007)

Also in a cross-sectional study to determine the prevalence and factors associated with traditional herbal medicine use among patients on highly active antiretroviral therapy in Uganda, Namuddu et al. (2011) found a prevalence rate of 33.7% among the patients sampled. In the same Uganda, Kaadaaga et al. (2014) found a higher prevalence rate of 76.2% among women in a fertility clinic. This prevalence was higher than the former probably because the study was conducted among women with a peculiar health need. In a most recent study among postnatal women in the Gulu District, Nyeko et al. (2016) rather found a much lower prevalence in Uganda. The authors found a prevalence rate of 20% of herbal medicines use during the current pregnancy of the women. Contrarily to Tabatabaee, (2011) in South Iran, Nyeko et al. (2016) rather found that among the women in the Uganda the use of herbal medicines were more common in the second 23% and third 21% trimesters as compared with first trimester as stated by Tabatabaee, (2011).

Similarly to the finding in Kenya, Ondicho et al. (2015) observed that 68.9% of patients attending herbal clinic preferred using herbal medicine. However, the authors reported that about 67.7% of the respondents occasionally visit conventional hospital for the same or different health conditions. Also, the study observed that all the patients interviewed had positive attitude toward herbal medicine. Other than pregnancy-related conditions these respondents mainly used herbal medicine for the treatment of gastro-intestinal

disorders (46.2%) and malaria (9.7%) (Ondicho et al., 2015). As indicated, women with special health needs are predisposed to using both traditional medicine alongside the orthodox medicine (Lisha, 2015). In related study to determine the type of herbal medicines use by pregnant women attending ante-natal clinic in Offinso North District, Ghana, Adusi-Poku et al. (2015) found out that 6.5% of these women use herbal medications during pregnancy. In a related study in Kenya, to determine the use of herbal medicine during pregnancy among women with access to public healthcare in Nairobi, Mothupi, (2014) found out that about 12% of these respondents used herbal medicine during pregnancy. This prevalence rate is about twice the prevalence rate as determined by Adusi-Poku, (2015) in Ghana.

Pregnancy is a condition associated with immense physiological alterations resulting in many pregnancy- related problems, including nausea, vomiting, constipation, and heartburn. These aliments usually result in pregnant women self-medicating using over-the-counter (OTC) medications, seeking prescribed medications, or using herbs (Lisha, 2015). Herbal products are preferred over prescription medications due to the belief that herbs are safer for the fetus than modern medicine. Despite the fact that evidence on the safety profile of herbal products is inadequate to substantiate their use in pregnancy, it is increasingly used by expectant mothers. The prevalence of herbal medicine utilization in pregnancy ranges between 7% and 55% in different geographical, social and cultural settings, and ethnic groups (Lisha, 2015). The use of herbal medicine was often complementary to medical care, depending on barriers to healthcare access, complications, and sociocultural beliefs. According to literature, use of herbal medicine

during pregnancy, labour or the postpartum period occurs at rates ranging from 30% to 70% in a healthcare setting in urban areas of sub-Saharan Africa (Mamothena, 2014).

2.3 Factors influencing the use of Herbal Medicines during Pregnancy

In Ghana, the entire population was reliant on traditional medicine until the introduction of modern medicines into the country by British medical officers during colonization (Twumasi, 1979). Ghana has incorporated the use of traditional medicines in the Health care delivery system and pregnant women were not left out. In 1999, the government of Ghana set up the Traditional Medicine Unit in the Ministry of Health (MoH) to streamline the use of traditional medicine alongside orthodox medicines (Farnes et al., 2011). About 70% of Ghanaians depend on traditional medicines for primary health care provided by about 45,000 Traditional Healers (TH) most of them have been licensed variously under the umbrella name of the Ghana Federation of Traditional Medicine Practitioners' Association (Farnes et al., 2011).

The use of the herbal products varied with the trimester and associated pregnancy-related problems. Although herbal products may offer a benefit, it is important to detect even small risks that would significantly affect the risk-benefit ratio in pregnancy. Some commonly used herbs includes: peppermint, ginger, thyme chamomile, green tea, garlic and common in Tolon district is the kaligu-Tim (taaga, doo, tipelizim, malegu, saayoni). It acts as a local oxytocin in hasten labour, inducing abortion and others. The Kaligu-tim is the local name of the mixture of some special selected leaves, and roots prepared and given to pregnant women to take with porridge or soup or insert into their private parts with the notion that it would facilitate safe delivery. The substance, which is normally mixed with porridge, tea or soup, is given to a pregnant woman in her third trimester to

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hasten delivery (Modern ghananews 2017). A meta-analysis reported that ginger is safe and efficacious in nausea and vomiting during pregnancy (Lisha, 2015).

There are various reasons for every use of herbal medicine, some related to access to health services (geographical and Economical) and the sociocultural environment of the respondents. Health service-related reasons included the cost, inaccessibility of health facilities at the time of illness, the distance to be travelled to access care, or lack of medication availability (Mothupi, 2014). Similarly, a study found that the high cost of conventional medical treatments, non-insured and poor health status of patients on adults on herbal therapy (Gardiner, 2007). Some pregnancy-related conditions for which herbal medicine was used included toothache, various types of pain, flu and stomach problems, malaria and respiratory tract infections, as well as swollen feet, back pain, and digestive problems (Mothupi, 2014). Mothupi, (2014) posit that herbal medicine use during pregnancy should not be considered in terms of pregnancy-related conditions, but also in other common illnesses. In his study, the author reported that women in Nairobi experienced some health service-related reasons for the use of herbal medicine during pregnancy and labour. According to the author the reasons enumerated included the high cost of western medications, inaccessibility of health facilities at the time of illness, the distance to be travelled to access care, or lack of medication availability at health facilities.

Most study found that family and friends were an important source of herbal medicine and users tended to trust the benefits of use if recommended by close acquaintances, this also served as a reason one would use herbal product especially in Northern Ghana. The majority of studies reported maximum use of herbs during the first trimester; probably

due to the higher incidence of pregnancy-related problems during this period/trimester (Malan & Neuba, 2011). The most common reasons for use for this trimester included the treatment of gastrointestinal disorders and cold and flu symptoms. Similarly, in another study the majority of women sampled for the study used these products during their first trimester, and did not reveal this information to their physician. And that most women were advised by family and friends to use herbal medicines and believed they were more effective and had fewer side effects than modern medicine especially during pregnancy (Mothupi, 2014, Deborah et al., 2013; and, Malan & Neuba, 2011). In Africa, the most reason given for the use of traditional medicine during pregnancy were protection from evil spirits to ensure good development of the foetus, to facilitate childbirth, to prevent or cure malaria, a very common disease in the first trimester and culturally acceptable, more accessible than conventional medicine and affordable (Malan & Neuba, 2011). Nyeko et al., (2016) in a study reported that the factors significantly associated with use of herbal medicines during pregnancy were found to be perception of the respondents, and previous history of herbal medicines during previous pregnancy.

Azriani & Rahman (2008) noted that the majority (79.6%) of the women who took herbal medication in their study did so during the third trimester, mainly to facilitate labour. According to the authors, about half (46.6%) of mothers placed much importance on the need for traditional forms of antenatal care as much as the orthodox form of antenatal care for the purposes of a successful course of pregnancy. Similarly, in a systematic literature review across different socio-cultural background, Ngoma and Siachapa, (2017) found that traditional herbs are actually used to induce labour by some women. Evidence from the study suggested that pregnant women used different herbs to induce labour.

Adusi-Poku et al. (2015) in a study in Ghana, found out women with "basic" and "no formal education" with a median age of 25 years used herbal medicine more than women with senior high and tertiary education. They also explained the use of herbal medicine was linked to ancestral practice. The authors found out that women in the Offinso District had more complex reasons for preference of herbal medicines, as it was associated with cultural and personal beliefs, philosophical views on life and health. Another reason perceived by the pregnant women included the supposed benefit of the well-being of the fetus (to improve on fetal outcome) and the easy labour and delivery of the foetus. Then again, Kaadaaga et al. (2014) revealed that primary and no education was found to be associated with less use of herbal medicine among infertile women in Uganda. Similarly, Mothupi, (2014) in his study in Nairobi, Kenya revealed that educational status of the Kenyan women was significantly associated with their use of herbal medicine during pregnancy (p<0.007). According to the study women with no formal or lower level of basic education used herbal medicine more than women with secondary or higher education. Conversely Deborah et al. (2013) revealed that higher education levels rather were found to have been associated with herbal medicine use and higher education was a significant determinant of herbal use in several regions in the survey results.

In a study to determine the prevalence and factors associated with use of herbal medicine among women attending an infertility clinic in Uganda, Kaadaaga et al. (2014) found that being married, never conceived and infertility for less than 3 years were independently associated with increased use of herbal medicine among infertile patients.

In a Multinational study Deborah et al. (2013) found that maternal age was not a significant determinant of herbal use during pregnancy apart from Western and Eastern

Europe. The authors posit that maternal age was less prevalent among women of 31-40 years of age and more common among younger women (less than 20 years). According to the authors there were also differences in the characteristics of herbal users with respect to parity and employment status across the regions. They noted that, while parity and employment status were not significant determinants of herbal use during pregnancy in either North or South America or Australia, they were so in both Western and Eastern Europe. One consistent characteristic across Europe and North America as noted by the authors was that herbal users continued to consume alcohol once they were aware they were pregnant (Deborah et al., 2013).

Conversely, Namuddu et al. (2011) found a significant association between maternal age and the use of herbal medicine in patients on highly active antiretroviral therapy in Uganda. The study revealed that older patients (≥39 years) were rather less likely to use traditional herbal medicine among the study patients. In the same Uganda, Kaadaaga et al. (2014) found an association between age and the use of herbal medicine among infertile women seeking treatment. However, rather maternal age of 30years or younger was found to be significant with the use of the herbal medicine among these respondents (Kaadaaga et al., 2014). However, Gardiner et al. (2007) reported that being 25-44 years old was a significant predictor of using herbal medicine in the United States of America among adults on herbal therapy. These studies shared similar characteristic different from the current study. Respondents in the studies suffered from some significant health problems that could not be treated with convention medicine (such as infertility, HIV/AIDS etc.), making these patients predisposed of seeking alternative treatment to their illnesses.

2.4 Effects of Herbal Medicines on Pregnancy Outcomes

The outcome of a medicine studied gave an idea as to the side effects/undesirable effects expected in people on the medication. A medication is withheld and not used (contraindicated) in individuals with certain disease condition and pregnancy if the side effects outweighed the desirable effects. About 2 to 3% of all birth defects result from drugs taken to treat a disorder or symptom in pregnancy. Medicines including herbal medicines taken by pregnant women get to the fetus by crossing the placenta, the same route used by oxygen and nutrients in the mother's blood needed for fetus's growth and development. Medicines that are harmful in pregnancy (especially in the first trimester) act through different ways. For instance, some affect the fetus indirectly by reducing the mother's blood pressure therefore reducing the flow of blood carrying oxygen and nutrients to the placenta. Again some medicines that are harmful in pregnancy act directly on the fetus, causing damage, abnormal development leading to birth defects, or death whiles others alter the placenta function by causing constriction (narrowing) of blood vessels thus reducing oxygen and nutrient supply. This results in underdeveloped and underweight babies or children with low birth weight accompanied by congenital defects

In a study in an obstetrics and gynaecology unit in a tertiary hospital in Ghana, it was found that use of herbal medicine was associated with low education and skill levels (Addo, 2007). Evidence on efficacy and safety in pregnancy for most of these herbs is limited. A study conducted indicates a high incidence of threaten miscarriages and preterm in the use of chamomile and licorice during pregnancy (Cuzzolin et al., 2010). Excess use of peppermint has been identified as a contraindicated in early pregnancy due

to its emmenagogue effects (Fleming et al., 2009). The wood betony plant (Stachysofficinalis) is an example of BP reducing medicine in pregnancy. The wormwood plant (Artemisia absinthum) when used during pregnancy may cause uterine contractions, miscarriage, and preterm labour (Bentil, 2015). Similarly, in Malaysia Azriani et al. (2008) noted that herbal medicines use during different trimesters of pregnancy were risk factors to different effects. The study indicated that when the fetus is exposed to herbal medicines during the first trimester may lead to congenital malformation, also the use herbal medicines during the second or third trimester may lead to fetotoxicity such as intrauterine growth retardation, fetal distress, fetal hypoxia and intrauterine death (Azriani & Rahman 2008).

Mills et al. (2006) found out a well-known herbal formula (Viburnum prunifolium, Leonuruscardiaca, and Mitchellarepens.) that prevents threatened abortion and also used to strengthen and tone the uterus during pregnancy, and by the Eclectics to calm uterine colic, for threatened miscarriage and painful uterine contractions. Some herbs help to prepare the uterus for delivery and reduce the pains of delivery. In addition to that, others were used as anti-hemorrhagic which provided some anti-microbial protection from puerperal fever, an important complication arising from infection contracted during or after labour that took the life of many new mothers. In rural Mindanao (the Philippines) women still use Kamias and other herbal preparations rather than use oral contraceptives. A study of Philippine medicinal plants identified over 60 plants used as abortifacients and over 130 plants used as emmenagogues. Among these plants were Kibataliablancoi and K. Gitingesis whose leaf and bark were found to have progesterone-like effects (Mills et al., 2006).

Mills et al. (2006) again, found that a traditional Chinese medicine (Angelica Sinensis) is also found to have supplemented blood, toned the uterus and often used during the period of pregnancy. However, this herbal formula has been labeled as an abortifacient and has been recommended as inappropriate in pregnancy by Western pharmacologists. In a randomized human study, a traditional Chinese medicinal herb, moxibustion is found to have increased fetal activity during treatment and cephalic presentation after treatment and at delivery. Also, in a study of recurrent spontaneous abortion using the traditional Chinese medicinal formula zhibaidihuang, with herbs to remove evil heat, dampness, replenish blood and activate circulation, altered anti-ABO group antibodies and yielded a high number of normal deliveries (Mills et al., 2006).

However, in a study to determine the effect of herbal medicine during pregnancy and on perinatal mortality in Tumpat District, Kelantan, Malaysia, Azriani &Rahman, (2008) found out that the use of unidentified "Orang Asli'' herbs and coconut oil during the third trimester of pregnancy were said to be protective factors against perinatal mortality. Though, the study generally agreed that the said protective factor was difficult to establish, contrarily to the notion that it helped to stimulate the cervices, thus promoting faster delivery and preventing complications, such as post-term pregnancy and prolonged labor (Azriani & Rahman, 2008). As also noted by Mills et al. (2006) upon the many benefits of herbal medicines, it is unfortunate that modern science has not maintained the pace in studying the mechanisms and relative benefit or potential harm of these plants. Because the use of medicinal plants to address infertility, maintain pregnancy, ease the birthing process, and aid in milk production or its cessation has been identified across

different cultures over the years, even though they have complex medical systems (Mills et al., 2006).

Azriani & Rahman, (2008) revealed that about 55.6% of mothers in Tumpat District in Malaysia who used herbal medicines during pregnancy and labour had meconium staining of amniotic fluid, which gave an indication of fetal distress. This is because traditional herbal medicines can lead to strong, continuous uterine contractions not corresponding to the slow dilatation of the cervix resulting in acidosis in the mother, followed by fetal distress. Meconium stained amniotic fluid is said to be associated with perinatal asphyxia and meconium aspiration syndrome (MAS). Meconium aspiration is one of the most common causes of perinatal mortality (Azriani & Rahman, 2008)

Again, Azriani & Rahman, (2008) found out that the use of unidentified herbs prepared by traditional midwives and other types of herbal medicines during the first trimester of pregnancy were risk factors for perinatal mortality. These herbs are said to contain chemical compounds which may be teratogenic. Exposure of the embryo to teratogens during the first trimester of pregnancy may cause congenital anomalies because fetal tissues and organ systems are developing rapidly during this period.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

This section covers the design of the research and the methods of sampling that were used. The study area, study type, study population, sampling techniques and size, study variables, data collection methods and instruments, data processing and analyses, ethical considerations and quality control measures are captured in this chapter.

3.2 Study Area/Settings

The Tolon district is one of the oldest districts in Northern Region, (formerly Tolon/Kumbungu) district. The district forms part of the twenty-six (26) districts of the Region: It is bounded on the North by West Mamprusi, East by Kumbungu, to the South by Central Gonja and to the West by North Gonja districts respectively.

It has a total population of Eighty-four thousand seven hundred and twenty-four (84,724) with an annual growth rate of 2.9% (Tolon District Data, 2017). There are 157 communities with 314 Community Based Surveillance (CBS) volunteers. It has four (4) main sub-districts, namely; Tolon, Nyankpala, Wantugu and Lingbunga/Zantani. It has twelve (12) health facilities, comprising three (3) health centers: Tolon, Nyankpala and Wantugu health centers, Afreakmed Community Hospital, UDS Clinic and seven (7) CHPS compounds (Yoggu, Kpendua, Gbrumani, Gbulahagu, Kasuyili, Lingbunga and Zantani CHPS).

The district has twenty-four (24) electoral areas with six (6) area councils. The area is predominantly Dagombas with a few other tribes from other parts of the country who are mostly government workers. Households are usually headed by males. The main

religious groupings are Muslims, Traditionalist, and some few Christians. The economic activity of the people is largely subsistent agriculture being the main occupation and some people also investing in animal rearing. Access to health services by the people of Tolon is very poor. They mostly resort to traditional medications and partly orthodox medicine when there are complications. Women generally turn out for ANC services very late or in the advance stages of their pregnancies. It is believed that the initial stages of pregnancy should not be disclosed to the other persons. Some traditional rituals must be performed between the sixth-seventh month before a person finally makes her pregnancy known to the entire family and other relatives. The people believed that if these rituals have not been performed the pregnancy cannot be carried to full term. During these early stages of the pregnancy, women resort to local medications to manage pregnancy-related conditions.

3.3 Study Design

This study was a facility-based descriptive cross-sectional study. The study covered two Health Centres, one Clinic, and three CHPS Compounds. These health facilities were randomly sampled to represent mix of peri-urban and rural populations, therefore ensuring that the distribution in social groups of the study population was assumed to be similar to the entire population of the Tolon District. A fairly mixed population is also necessary because of the effect of confounding among the population.

3.3.1 Study method

This research study used quantitative method of data collection. Structured questionnaire was used to gather data. Therefore, all the interpretations given to the data were done with regards to the quantitative variables

3.4 Study Population

The study population comprised of all postnatal mothers aged between 15 to 49years. However, for the purposes of measuring the outcome variables only women receiving their post-natal services were considered for the study.

3.5 Study Unit

Respondents who were included in the study were postnatal mothers who were receiving post-natal services from the Postnatal Clinics. To be included in the study, the respondents may have been delivered by health professionals and/or by Traditional Birth Attendants (TBA). It is known that some of the women may have used Kaligu-tim during the pregnancy or at the onset of labour before visiting the health facilities or before being attended to by the TBAs. Women who delivered recently were considered to elicit current and relevant information to serve the purpose of the study.

3.6 Sample Size Determination

The study used the formula proposed by Cochran, (1977) and the rate of herbal medication with ongoing pregnancy in Ghana as reported by Adusi-Poku et al. (2015). Sample size was calculated as follows:

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

Where N = sample size per group,

Z = the critical probability value for 95% confidence interval (1.96),

P = prevalence of herbal medication (30%), and

e = margin of error, (0.05).

Hence, Sample size e (N) is approximately 323. Moreover, 5% of the determined figure will be added to cater for attrition rate of the questionnaires. Therefore the study sampled a total of 339 respondents.

3.7 Sampling Technique (s)

This research was carried out using probability sampling technique, thus the study categorized the health facilities into clusters (Health Centres, Clinics, and CHPS Compounds). Due to large sample size as compared with the District population, the study considered all the health centers and the clinic. However, the Simple random technique was used to select three CHPS Compounds out of the seven Compounds for the study.

The three health centers were assigned quota sample size of 73 each per their service population for the four postnatal care days. On each of the postnatal care days, 19 respondents on a sampling interval of 1/3th were selected until the quota for that day was achieved. The only clinic in the district was assigned a quota of 60 respondents. Then again, 15 respondents were selected on the sampling interval of $1/4^{th}$ for the four postnatal care days at the clinic.

For the cluster of CHPS Compounds, 3 compounds were selected through simple random technique. However, due to the smaller populations at the community level, all PNC mothers accessing services at the three selected compounds were automatically included in the study. Each compound was assigned a quota of 20. Sample quota for each cluster

in the study was based on the proportion of postnatal mothers per the coverage zone for the health facilities.

3.8 Data Source

Data collected was from two main sources namely primary (that is, directly from the respondents through field interviews on maternal socio-economic characteristics) and secondary source (birth indicators from the maternal health record booklets).

3.8.1 Data Collection Tools

Data from the above respondents was gathered using three tools that are, a structured questionnaire containing both closed and open-ended questions were administered. A different interview guide was used to conduct in-depth interviews on 3 traditional healers to hear their views on the use of herbal medicine known as local oxytocin during pregnancy and labour and the last tool used was a Likert scale checklist administered midwives in the labour units at Tolon health center.

Data for the study was collected from women who have delivered and attending child welfare clinic and postnatal clinic for a primary source. Data from the above respondents was gathered using three tools that are, a structured questionnaire containing both closed and open-ended questions was administered. An interview guide was used to conduct in-depth interviews on 3 traditional healers to elicit their views on the use of herbal medicine known as local oxytocin during pregnancy and labour and the last tool to be used was a Likert scale checklist administered to midwives in the labour and maternity units at Tolon health center.

Aside from the primary source, data was also collected from secondary sources. Such sources include the district profile, reports of Tolon District Health Directorate and publications of similar studies around the world.

3.9 Data Collection Procedure

The study employed both key informant interview and personal interviews as the data collection procedures.

Interview: Data was solicited from respondents through personal interviews, using the questionnaire. Informed respondent' consent was sort from all the respondents. The respondents were asked to sign/thump print the consent form to indicate their willingness to participate in the study.

3.10 Data Analysis and Presentation of Results

Preliminary chi-square analysis was conducted to examine the association between the socioeconomic/demographic, and the outcome variables. Logistic regression analysis was used to estimate adjusted relative risk and their 95% confidence intervals for usage for kaligu-tim and the effects from the use of kaligu-tim. Chi-square analysis was also done to determine the association between categorical variables and use and effects of the kaligu-tim. All data analyses were generated using SPSS software (Verse 22). Results of the study will mainly be presented in tables, figures, and percentages.

3.11 Training and Pre-Testing

Training was conducted for all research assistants in the study. They will be taken through the process involved in administering questions. This enabled the research assistants to translate the questionnaire which was in the English into Dagbani. Care was

taken to ensure keywords and concepts in the framing of the questions were not lost during the translations.

The questionnaire was first piloted before the scale-up of the main study. This cleared any ambiguities and any wrong communications to the respondents. This was to ensure that the questionnaire elicited the right responses from the respondents. The challenges identified with the questionnaire were corrected to allow the scale up of the study.

3.12 Quality Control

The first step to the data quality was to ensure the researchers strictly select the right respondents to the study. Completed questionnaires were retrieved daily from the field for safe keeping. This measure was also taken to ensure the confidentiality of the respondents from other third parties.

3.13 Study Variables

This study was conducted using two variables, that is dependent and independent variables. Independents comprised of socioeconomics and socio-demographic data such as respondents' occupation, education status, marital status, religion, ethnicity, household income, and housing among others. The independent variables consist of numeric, categorical and ordinal variables. The study measured the use of Kaligu-tim as categorical variable, the reasons for use and the effects of Kaligu-tim also as numeric and, the stages in which the herb is used as scale variable. So the main dependent variables of the study were the kaligu-tim user status of respondents and the effects of the

use of the herb. Lastly, the trimesters/periods in which the respondents used the herb either in the pregnancy and/or during labour was also measured as an outcome.

3.14 Ethical Considerations

The consent of the respondents was sought through a written and an informed consent. The aim of the study was explained clearly in the consent form. Respondents were obliged to take part in the study voluntarily. Further consent was sought from the District Health Directorate and health facility in-charges before the beginning of the study. The data collectors read out or asked the respondents to read the contents of the consent form if they agree to participate in the study. Privacy and confidentiality of the actual source (s) of information obtain from the study was assured by not indicating the names of facilities and respondents who will be taking part in the study. Names were not provided on the data collection tools and therefore no indications will be provided for someone to trace the source of information.

CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic Characteristics of Respondents

The study employed a total of 339 postnatal mothers with an average age of 29.89±6.08 years. The youngest and oldest mothers in the study were 18 years and 45 years respectively. From the table 4.1 the majority (53.7%) of the respondents were within the ages of 25-30 years, 25.7% above 35 years and 20.6% below 24 years. Almost all of the respondents were Dagombas and only a few were Gonjas (3.8%) and other tribes (2.7%) all together. Again, almost all the mothers were married (97.1%) and just a few about 2.9% were singled or were not married. On the educational background of respondents, as high as 74% of the mothers had no formal education while 1.2% of the mothers received non-formal education and 24.8% of them received some forms of primary (16.5%), secondary (5.6%) and tertiary (2.7%) education prior to the study. The occupation of the mothers in the study was equally distributed among the various categories. Mothers in the study were housewives (34.2%), Small-scale traders (33.3%), Farmers (29.5%) and Formal Sector Workers (2.9%). Further on the occupation of the households of the mothers in the table 4.1, husbands of the mothers were Famers (58.7%), Small-scale traders (21.8%), Formal sector workers (14.7%) and about 4.7% of the husbands in the study respondents were Artisans. On the average, 66.4% of the households of mothers in the study earned household net annual income of less than

500.00ghc, 28.3% earned between 501.00-1000.00ghc and only 5.3% earned above 1000.00ghc.

Table 4.1: Socio-Demographic Characteristics of Respondents

SN	Variables	Frequency	Percent
1	Age Group Respondents		
	<24 years	70	20.6
	25-30 years	182	53.7
	>35 years	87	25.7
2	Mothers' Ethnicity		
	Gonjas	13	3.8
	Dagombas	317	93.5
	Others (Fulani etc.)	9	2.7
3	Marital Status of Respondents		
	Singled	10	2.9
	Married	329	97.1
4	Educational Level of Respondents		
	No Formal Education	251	74
	Non-formal Education	4	1.2
	Primary Education	56	16.5
	Secondary Education	19	5.6
	Tertiary Education	9	2.7
5	Occupations of Mothers		
	Housewives	116	34.2
	Farmers	100	29.5
	Small-scale Traders	113	33.3
	Formal Sector Workers	10	2.9
6	Occupation of Respondents' Husband		
	Artisans	16	4.7
	Farmers	199	58.7
	Small-scale Traders	74	21.8
	Formal Sector Workers	50	14.7
7	Household Estimated Net Annual Income		
	<500.00ghc	225	66.4
	501.00-1000.00ghc	96	28.3
	>1000.00ghc	18	5.3

(Source: Field survey, 2017)

4.2 Proportion of respondents using Kaligu-Tim (local oxytocin) during pregnancy and labour

From the Table 4.2, the results showed that the majority (85%) of the respondents had knowledge of herbal medicine been used in pregnancy for a wide range of reasons. Mothers who used the herbal medicine during previous pregnancies were 64.9% which reduced to 45.4% in their most recent pregnancy. These herbal medicines were combination of many different types of the herbal medicine; 31.2% of the mothers used a combination 2-3 types of the herbal medicine, 13% used a combination of greater than four different types of the herbal medicine and about 55.8% used only one type of the herbal medicine.

Table 4.2: Prevalence of Herbal Medication among Study Population

SN	Variables Names	Frequency	Percent
1.	Awareness/Knowledge on Herbal Medicine		
	Responded No	51	15
	Responded Yes	288	85
2.	Previous Use of Herbal Medicine by Respondents		
	No	119	35.1
	Yes	220	64.9
3.	Use of HM in Current Delivery		
	No	185	54.6
	Yes	154	45.4
4.	Combination of Herbal Medication Used		
	Only one type of HM	86	55.8
	2-3 types of HM	48	31.2
	>4 types of HM	20	13

(Source: Field Survey, 2017)

4.3 Factors and trimesters/periods of pregnancy during which Kaligu-tim is used

Also, 5.5% of the mothers used the herbal medicine during the first trimester, 26.8% during the second trimester and 67.7% also during the third trimester. Then again, 89.1% used the medication specifically for labour related reasons, 4.1% for postpartum period related concerns, and 4.4% in both labour and postpartum period for pregnancy related challenges.

From Chi-square analysis, the age group of the respondents (p<0.040), educational level of mothers (p<0.001), parity (p<0.015), ethnicity (p<0.001), gestational term at delivery (p<0.019), health-related challenge (p<0.018), distance to health facilities (p<0.001), and pregnancy related conditions (p<0.003) were all significant factors associated with the use local oxytocin among the mothers in the study. Univariate modeling analysis also showed a strong association between parity and current use of herbal medicine among respondents. The results showed that primed mothers had greater likelihood of using herbal as compared with parity 2+. However, marital status of the mothers, occupation, household net income, gravidity, maternal condition, religious connotation, and the perception of efficacy by the mothers revealed no significant association with the use of the local oxytocin.

Table 4.3a: Factors and trimesters/periods for Using Herbal Medicine

SN	Variables Names	Frequency	Percent	Previous Use P-value	Current Use P-value
1	Age Group of Respondents				
	<24 years	70	20.6		
	25-34 years	182	53.7	0.009	0.040
	>35 years	87	25.7		
2	Marital Status				
	Married	329	97.1	0.504	0.357*
	Singled	10	2.9		
3	Mothers' Ethnicity				
	Gonja	13	3.8		
	Dagombas	317	93.5	0.001	0.221
	Others	9	2.7		
4	Educational level				
	No Formal Education	251	74.0		
	Non-formal Education	4	1.2		
	Primary Education	56	16.5	0.001*	0.001
	Secondary Education	19	5.6		
	Tertiary Education	9	2.7		
5	Mothers' Occupation				
	Housewives	116	34.2	-	0.909
	Working Mothers	223	65.8		
6	Respondents' Husbands' Occupation				
	Artisans	16	4.7		
	Farmers	199	58.7		
	Small-scale Traders	74	21.8	0.151	0.291
	Formal Sector Workers	50	14.7		
7	Household Estimated Net Annual Income				
	<500.00ghc	225	66.4	0.565	0.209
	>501.00ghc	114	33.6		
8	Number of Pregnancies by Respondents				
	<3 pregnancies	200	59	0.419	0.223
	>4 pregnancies	139	41		
9	Parity of Respondents				
	Primed	65	19.2		

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			Frequency	Percent	Previous Use P-value	Current Use P-value
	2-4th Child		208	61.4	0.105	0.015
	>5th Child		66	19.5		
10	Gestational Term at Delivery					
	< 32 Weeks		25	7.4		
	33-37 Weeks		129	38.1	0.059	0.019
	> 38 Weeks		185	54.6		

(Source: Field Survey, 2017).

Table 4.3b   **Factors and trimesters/periods for Using Herbal Medicine**

SN	Variables Names	Frequency	Percent	Previous Use P-value	Current Use P-value
1	Gestational Term at Delivery				
	< 32 Weeks	25	7.4		
	33-37 Weeks	129	38.1	0.059	0.019
	> 38 Weeks	185	54.6		
2	Maternal Condition Experienced by Respondents				
	Hypertension	22	59.5		
	Diabetes	1	2.7		
	Haemorrhage	3	8.1	0.629	0.365
	Eclampsia	5	13.5		
	Other Conditions	6	16.2		
3	Health-related reasons for Using HM				
	Cost of Services at Health Facility	16	10.4		
	Inaccessibility of Health Service at the point illness	21	13.6	0.018	-
	Distance to Health Facilities	55	35.7		
	Lack of Medication at Health Facilities	62	40.3		
4	Distance to Nearest Health Facility				
	Very Short Distance (1km)	62	18.3		
	Short Distance (5km)	154	45.4	0.001	0.001
	Far Distance (6-10km)	94	27.7		
	Very Far Distance (>10km)	29	8.6		
5	Influence of Pregnancy-related Condition on the HM Usage				
	Toothache	3	0.9		
	Pains, Flu & Stomach Problems	230	67.8	0.003	-
	Malaria & RTI	10	2.9		
	Swollen Feet, Back Pains etc.	93	27.4		
	Digestive Problems	3	0.9		
6	Spiritual/Religious Connotation of Using HM				
	No	129	83.8		
	Yes	25	16.2	-	-
7	Family or Close Friends Influence on HM Use				

	No		26	16.9	
	Yes		128	83.1	-	-
8	Purpose of Using Herbal Medicine				
	To Induce Labour		93	60.4	
	To protect Baby		14	9.1	0.180	-
	To Augment Labour		44	28.6	
	To Induce Abortion		3	1.9	

(Source: Field Survey, 2017).

4.4 Effects of kaligu-tim on pregnancy and labour outcomes

From the table 4.4 the findings of the study revealed that 9.4% of the infants of the mothers in the study weighted below 2.5kg at birth (low birth weight), 21.2% were moderately asphyxiated, 16.5% of the mothers experienced postpartum haemorrhage, 9.1% obstructed labour at delivery, and 6.8% of the infants, experienced foetal distress and 1.8% also experienced still birth.

Table 4.4: Pregnancy Outcomes

SN	Variables	Frequency	Percent
1	Birth Weights of Infants		
	Low Birth Weight (<2500g)	32	9.4
	Normal Birth Weight (>2500g)	307	90.6
2	5 Minutes Apgar Scores of Infants		
	Moderate Birth Asphyxia (<7score)	72	21.2
	Normal Infants (>7score)	267	78.8
3	Post-partum Haemorrhage Status of Mothers		
	No	283	83.5
	Yes	56	16.5
4	Obstructed Labour in Delivery		
	No	308	90.9
	Yes	31	9.1
5	Fetal Distress Status of Infants		
	No	316	93.2
	Yes	23	6.8
6	Still Birth at Delivery		
	No	333	98.2
	Yes	6	1.8

(Source: Field Survey, 2017).

4.4.1 Effects of Kaligu-tim on Birth Weight

From the multiple logistic modeling maternal characteristics did not show statistically significant association with infants' birth weight of respondents in the study, with the exception of the parity of the respondents. The results showed that mothers of parity 5 and above are 13.6 times more likely to deliver infants with low birth weight than mothers of parity 2-3. Though the result was statistically significant but the association of parity with infants' birth weight was weak (p=0.049). However, from the univariate analysis, the result showed no significant association between parity and infants' birth weight of respondents. But the results showed that mothers of parity above 5 on the average had their infants weighed 74.5g, and 50g heavier than infants of primed and mothers of parity 2-3 respectively.

The use of Kaligu-tim in the previous pregnancies or delivery of the respondents did not show significant association (p=0.222) with the birth weight of the infants of the mothers. Moreover, the univariate modeling showed no association between the previous use of local oxytocin and infants' birth weight but mothers with previous use of the oxytocin had their infants weighed 26g heavier than infants of mothers with no previous history of local oxytocin (p=0.414). Also, the recent use of the local oxytocin had no significant association (p=0.915) with the birth weights of the respondents. Mothers with recent use of Kaligu-tim had an average infant birth weight of 2.695±0.275 kg as compared with 2.73±0.284 kg for infants' whose mothers had no current history of Kaligu-tim. The univariate modeling also showed that infants of mothers with recent history of Kaligu-tim weighed 34.3g lighter than infants whose mothers had no recent history of the local oxytocin, though the result was not statistically significant (p=0.263)

The multiple logistic modeling also showed that multiple use of the local oxytocin was not associated with the birth weights of the infants of the mothers in the study. For instance, mothers who used multiple combinations of 2-3 different types of the local oxytocin were 3.1 times more likely to deliver infants with low birth weight than mothers with the use a single oxytocin, though the results were not significant (p=0.255). However, the univariate modeling showed significant association between multiple combination of local oxytocin and infants' birth weights. This relationship however, was weaker but mothers with 2-3 herbal combinations had infants weighed 111.8g heavier than mothers who used a single herbal oxytocin. Also, mothers with ≥4 combinations had infants weighed 108.5g heavier than mothers who used a single herbal oxytocin.

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4.5a: Maternal Factors Influencing Infants' Birth weights

Variables Names	X	SD	Odds Ratio	CI		Coefficient	P-value
Age Groups of Respondents							
<24 years	2.693	0.363	0.5	-3.286	2.004	-0.641	0.635
>35 years	2.766	0.274	0.4	-3.66	2.173	-0.744	0.617
Educational Level of Respondents							
Primary Education	2.663	0.211	0.6	-3.661	2.831	-0.415	-
Occupations of Mothers							
Farmers	2.718	0.257	1.9	-1.42	3.406	0.993	0.420
Small-scale Traders	2.712	0.292	0	-1.729	2.438	0.355	0.739
Occupation of Respondents' Husband							
Small-scale Traders	2.715	0.242	2.4	-1.826	3.872	1.023	0.482
Household Estimated Net Annual Income							
500.00ghc	2.784	0.262	2.2	-1.957	3.069	0.556	0.665
Number of Pregnancies by Respondents							
>4 Pregnancies	2.734	0.296	0.6	-2.339	1.381	-0.479	0.614
Parity of Respondents							
Primed	2.685	0.281	0.3	-0.4	3.887	1.744	0.111
>5th child	2.759	0.303	13.6	0.015	8.088	4.051	0.049
Awareness Knowledge on Herbal Medicine							
Responded No	2.773	0.358	0.1	-6.524	1.396	-2.564	0.204
Previous Use of Herbal Medicine by Respondents							
Yes	2.705	0.273	0.5	-1.839	0.428	-0.706	0.222
10 Current Use of HM in Delivery							
Yes	2.695	0.275	1	-0.816	0.91	0.047	0.915
11 Combination of HM Used							
2-3 types of HM	2.758	0.327	3.1	-0.645	3.34	1.088	0.255
>4 types of HM	2.755	0.270	1	-3.482	3.283	0.278	0.858

Source: Field survey, 2017

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4.5b: Maternal Factors Influencing Infants' Birth weights

Variables Names	X	SD	OR	CI		Coefficient	P-value
Stages in Pregnancy Respondents Used HM							
Second Trimester	2.724	0.284	1.1	-3.712	4.003	0.145	0.941
Third Trimester	2.694	0.272	0.8	-3.623	3.5	-0.062	0.973
Specific Use of HM by Respondents							
Post-partum Period	2.66	0.253	0.1	-5.152	0.443	-2.354	0.099
Gestational Term at Delivery							
< 32 Weeks	2.436	0.187	1	-1077	316.8	-379.9	0.285
33-37 Weeks	2.564	0.159	2.3	-916.1	498.7	-208.7	0.563
Health-related reasons for Using HM							
Inaccessibility of Health Service at the point illness	2.681	0.278	1.3	-3.326	3.453	0.063	0.971
Distance to Health Facilities	2.658	0.292	1.1	-2.348	2.43	0.041	0.973
Lack of Medication at Health Facilities	2.742	0.266	4.9	-1.546	4.583	1.518	0.331
Distance to Nearest Health Facility							
Short Distance (5km)	2.703	0.244	0.7	-4.035	3.194	-0.42	0.820
Far Distance (6-10km)	2.686	0.271	1.6	-3.909	4.687	0.389	0.859
Very Far Distance (>10km)	2.703	0.304	0.3	-6.741	3.521	-1.61	0.539
Influence of Pregnancy-related Condition on the HM Usage							
Pains, Flu & Stomach Problems	2.688	0.266	2.2	-1.435	3.166	0.866	0.461
Malaria & RTI	2.671	0.269	2.7	-2.684	5.145	1.231	0.538
Spiritual/Religious Connotation of Using HM							
No	2.671	0.273	0.4	-3.777	2.155	-0.811	0.592
19 Family or Close Friends Influence on HM Use							
No	2.7	0.297	0.9	-2.712	2.213	-0.249	0.843
20 Purpose of Using Herbal Medicine							
To protect Baby	2.721	0.283	0.7	-3.737	3.414	-0.161	0.930
To Augment Labour	2.6	0.145	2.6	-1.902	3.493	0.796	0.563

Source: Field survey, 2017

4.4.2 Effects of Kaligu-tim on Infants' Apgar Score

Also from the multiple logistic modeling, age group of respondents, marital status, mothers' occupation, occupation of respondents' husband and household estimated net annual income were the maternal characteristics that significant influenced perinatal asphyxia in the study. The results showed that mothers less that 24years (p<0.024) and mothers greater than 35 years (0.015) were at higher risk of perinatal asphyxia than mothers within ages of 25-34years.   The results also indicated that infants of mothers outside formal marriages (single mothers) were at reduced risk of perinatal asphyxia, and that been married was a significant risk for perinatal asphyxia among the study population (p<0.035). Then again, mothers who engaged in an occupation were at reduced risk of perinatal asphyxia as compared with housewives (p<0.025). Similarly, households of respondents with an estimated net annual income of >501.00ghc were at reduced of perinatal asphyxia. The results showed that mothers who earned below 500.00ghc were at significant risk (p<0.021) of perinatal asphyxia. However, the univariate modeling did not show any significant association between the maternal socio-economic characteristics and the perinatal asphyxia.

The multiple logistic modeling showed also, that the parity of the respondents was a significant factors of perinatal asphyxia in the study group. Primed (p<0.087) and >5 parity mothers (p<0.029) were at reduced risk of delivering infants with perinatal asphyxia. Though the relationship of primed and perinatal asphyxia was weaker, but parity 5 was strongly associated with reduced likelihood of perinatal asphyxia among the respondents in the study. However, the univariate analysis showed no significant different in parity and infants' Apgar score. Generally, primed mothers had higher Apgar

score (7.34±1.16) than parity 2-3 mothers (7.28±1.04SD) and parity 5 mothers (7.23±1.25SD).

The use of local oxytocin in previous pregnancy or delivery was a significant risk factor (p<0.027) of perinatal asphyxia among the respondents. Mothers with previous use of local oxytocin were 2.4 times more likely to deliver babies with perinatal asphyxia in their subsequent delivery. Though the univariate analysis showed no significant different between previous local oxytocin use and perinatal asphyxia but the result revealed that infants of mothers with previous history of local oxytocin had 0.2 lower Apgar score than infants of mothers with no previous history (p<0.129). However, in the multiple logistic modeling, current use of local oxytocin showed no significant different (p<0.221) in the perinatal asphyxia status of infants of mothers in the study. But multiple combination of local oxytocin used was significantly associated with perinatal asphyxia. For instance, mothers with >4 multiple combination of local oxytocin use were at increased risk (p<0.051) of perinatal asphyxia. Then again, mothers who used the local oxytocin in the third trimester were at increased risk of perinatal asphyxia. The result revealed that the use of local oxytocin in the third trimester of pregnancy was a significant risk factor (p<0.014) for perinatal asphyxia

4.6a: Maternal Factors Influencing Asphyxia

Variables Names	X	SD	OR	CI		Coefficient	P-value
Age Groups of Respondents							
<24 years	7.257	1.138	624	0.844	12.044	6.444	0.024
>35 years	7.333	1.178	2052.8	1.506	13.75	7.627	0.015
Marital Status of Respondents							
Singled	7.3	1.567	0	-10.92	-0.406	-5.665	0.035
Educational Level of Respondents							
Primary Education	7.196	0.773	0	-7.457	1.27	-3.094	0.165
Secondary Education	7.684	1.057	0	-26.96	15.547	-5.706	0.599
Occupations of Mothers							
Working Mothers	7.265	1.064	0.1	-5.594	-0.379	-2.986	0.025
Occupation of Respondents' Husband							
Artisans	7.5	0.966	5.6	-4.681	8.143	1.731	0.597
Small-scale Traders	7.081	1.095	211.9	1.024	9.689	5.356	0.015
Formal Sector Workers	7.5	0.839	96.3	-2.459	11.594	4.568	0.203
Household Estimated Net Annual Income							
>501.00ghc	7.412	1.174	0	-6.776	-0.548	-3.662	0.021
Number of Pregnancies by Respondents							
>4 pregnancies	7.317	1.186	4.5	-0.86	3.886	1.513	0.211
Parity of Respondents							
Primed	7.338	1.163	0	-7.481	0.501	-3.49	0.087
>5th Child	7.227	1.250	0	-12.44	-0.668	-6.552	0.029
Awareness/Knowledge on Herbal Medicine							
Responded Yes	7.278	1.082	0.8	-1.01	0.603	-0.204	0.621
10 Previous Use of Herbal Medicine by Respondents							
Yes	7.35	1.081	2.4	0.103	1.65	0.877	0.027
11 Current Use of HM in Delivery							
Yes	7.279	1.094	0.6	-1.174	0.271	-0.451	0.221

Source: Field Survey, 2017

4.6b: Maternal Factors Influencing Asphyxia

Variables Names	X	SD	OR	CI		Coefficient	P-value
ombination of HM Used							
2-3 types of HM	7.458	1.110	0	-1.177	4.008	1.416	0.281
>4 types of HM	7.25	1.209	0	-0.021	8.107	4.043	0.051
tages in Pregnancy Respondents Used HM							
Second Trimester	7.492	1.357	221.4	-1.137	11.937	5.4	0.105
Third Trimester	7.262	0.933	14414.2	1.906	17.246	9.576	0.014
pecific Use of HM by Respondents							
Post-partum Period	7.2	1.373	0	-9.362	-1.565	-5.46	0.006
estational Term at Delivery							
< 32 Weeks	7.04	0.841	0.5	-3.776	2.324	-0.726	0.641
33-37 Weeks	6.922	1.115	0.1	-4.425	0.482	-1.971	0.115
laternal Condition Experienced by Respondents							
Hypertension	7.454	1.057	0.6	-4.043	2.95	-0.546	0.759
Other Conditions	7.333	1.211	2.2	-34.771	8.681	-13.045	0.239
ealth-related factors for Using HM							
Distance to Health Facilities	7.273	1.130	19.1	-0.42	6.318	2.949	0.086
Lack of Medication at Health Facilities	7.403	0.839	2	-2.932	4.345	0.706	0.704
istance to Nearest Health Facility							
Short Distance (5km)	7.195	0.977	1.7	-2.908	3.993	0.543	0.758
Far Distance (6-10km)	7.234	1.307	0.03	-7.453	0.51	-3.471	0.087
Very Far Distance (>10km)	7.414	1.150	2.3	-4.244	5.938	0.847	0.744
nfluence of Pregnancy-related Condition on the HM Usage							
Pains, Flu & Stomach Problems	7.295	1.082	0.7	-2.365	1.546	-0.41	0.681
Malaria & RTI	7.143	1.215	0.02	-8.562	0.927	-3.817	0.115
piritual/Religious Connotation of Using HM							
No	7.178	1.004	0	-11.61	-2.302	-6.953	2.373
amily/Close Friends Influence on HM Use							
Yes	7.266	1.046	0.1	-5.595	0.509	-2.543	0.102
urpose of Using Herbal Medicine							
To protect Baby	7	1.301	0.03	-7.143	0.164	-3.49	0.061
To Augment Labour	7.114	1.125	0.4	-3.39	1.618	-0.886	0.488
To Induce Abortion	8.333	0.577	0.02	-12.09	4.57	-3.76	0.376

Source: Field Survey, 2017

4.4.3 Effects of Kaligu-tim on Postpartum Haemorrhage

On maternal postpartum haemorrhage, the multiple logistic modeling showed that all the maternal socio-economic characteristics (age group, educational level, occupation, and household estimated net income) did not have a significant relationship (p>0.005) with maternal postpartum haemorrhage in the study. Gravidity, parity and gestation term at delivery did not also show significant association with maternal postpartum haemorrhage. The study results showed also that awareness of herbal medicine in pregnancy, use of local oxytocin in recent pregnancy and combination of local oxytocin used were not also associated with postpartum haemorrhage during labour. However, use of local oxytocin in previous pregnancy was associated with postpartum haemorrhage in subsequent delivery. The result showed that previous use of local oxytocin was a significant predictor (p<0.003) of postpartum haemorrhage in subsequent delivery. The results indicated that mother with the history previous use of local oxytocin were 4.4 times more likely to experience haemorrhage during delivery than the mothers with no local oxytocin history. Moreover, the univariate modeling also indicated that history of previous use of local oxytocin was still a significant risk factor for postpartum haemorrhage. The result found the trimester in which mothers used the local oxytocin did not influence their postpartum haemorrhage outcome in the study

4.7a: Maternal Factors Influencing Postpartum Haemorrhage

Variables Names	OR	CI		Coefficient	P-value
Age Groups of Respondents					
<24 years	0.2	-4.101	0.723	-1.689	0.170
>35 years	0.1	-4.885	0.4086	-2.238	0.097
Marital Status of Respondents					
Singled	1	-4.703	4.738	0.017	0.994
Educational Level of Respondents					
Primary Education	0.5	-3.759	2.188	-0.786	0.604
Occupations of Mothers					
Working Mothers	1	-1.312	1.362	0.025	0.971
Occupation of Respondents' Husband					
Artisans	3.6	-1.861	4.415	1.277	0.425
Small-scale Traders	1.5	-1.49	2.242	0.376	0.693
Household Estimated Net Annual Income					
>501.00ghc	0.7	-2.16	1.515	-0.322	0.731
Number of Pregnancies by Respondents					
>4 pregnancies	2.3	-0.675	2.375	0.85	0.274
Parity of Respondents					
Primed	1.1	-1.835	2.111	0.138	0.891
>5th Child	4.2	-0.991	3.858	1.434	0.246
Awareness/Knowledge on Herbal Medicine					
Responded No	2.5	-3.004	4.846	0.921	0.646
Previous Use of Herbal Medicine by Respondents					
Yes	4.4	0.498	2.48	1.489	0.003
Current Use of HM in Delivery					
Yes	1.4	-0.346	1.033	0.344	0.329

Source: Field survey, 2017

4.7b: Maternal Factors Influencing Postpartum Haemorrhage

Variables Names	OR	CI		Coefficient	P-value
Combination of HM Used					
2-3 types of HM	1.1	-1.232	1.432	0.1	0.883
>4 types of HM	0.4	-3.695	1.996	-0.849	0.559
Stages in Pregnancy Respondents Used HM					
Second Trimester	0.9	-1.881	1.745	-0.068	0.941
Gestational Term at Delivery					
< 32 Weeks	2.9	-1.268	3.408	1.07	0.37
33-37 Weeks	1	-1.283	1.239	-0.022	0.973
Maternal Condition Experienced by Respondents					
Hypertension	3.8	-0.683	3.337	1.327	0.196
Health-related reasons for Using HM					
Inaccessibility of Health Service at the point illness	0.7	-3.282	2.427	-0.427	0.216
Distance to Health Facilities	1.2	-2.443	2.741	0.149	0.426
Lack of Medication at Health Facilities	0.4	-3.742	1.816	-0.963	0.759
Distance to Nearest Health Facility					
Short Distance (5km)	0.2	-4.194	0.949	-1.622	0.216
Far Distance (6-10km)	0.4	-3.501	1.477	-1.012	0.426
Very Far Distance (>10km)	0.6	-3.278	2.392	-0.443	0.759
Influence of Pregnancy-related Condition on the HM Usage					
Pains, Flu & Stomach Problems	2	-0.614	2.012	0.699	0.297
Malaria & RTI	4.2	-1.353	4.228	1.438	0.313
Spiritual/Religious Connotation of Using HM					
No	0.5	-2.608	1.095	-0.757	0.423
Family/Close Friends Influence on HM Use					
Yes	1.5	-1.358	2.226	0.434	0.635
Purpose of Using Herbal Medicine					
To protect Baby	2.4	-1.301	3.087	0.893	0.425
To Augment Labour	1.3	-1.304	1.897	0.297	0.716

Source: Field survey, 2017

4.4.4 Effects of Kaligu-tim on Obstructed Labour in Delivery

Multiple logistic modeling on the effect of local oxytocin on obstructed labour showed that awareness of local oxytocin among respondents was not associated with labour obstruction during delivery. The use of local oxytocin in the recent delivery was not significantly associated with labour obstruction. However, previous history of local oxytocin was found to be significantly associated ($p<0.018$) with obstruction of labour during the subsequent delivery. The results showed that mothers who use local oxytocin in their previous pregnancies had reduced risk of labour obstruction in the recent or subsequent deliveries. Furthermore, from the univariate modeling analysis both previous use ($p<0.0018$) of local oxytocin and current use ($p<0.0251$) of the local medication were significantly associated with labour obstruction during delivery.

The results further indicated that the mothers with the history of multiple combinations (>4 different) of local oxytocin were at a lower risk of labour obstruction during delivery. This association was statistically significant at $P<0.033$. The use of the local oxytocin by trimesters in pregnancy was another significant factor associated with labour obstruction. For instance, mothers who used the oxytocin in the second trimester of their pregnancies were at significant ($p<0.016$) lower risk as compared with those who use it in the first and third trimesters.

Then again, working mothers ($p<0.008$), mothers with net household income >500.00ghc ($p<0.011$), nearest to delivery health facility ($p<0.020$), use of local oxytocin to protect baby ($p=0.026$) and to augment labour ($p<0.028$) were significantly at a lower risk of labour obstruction during delivery. Whereas family/close friends influence on the use of local oxytocin ($p<0.015$) pains & stomach problems with the use of local oxytocin

(p<0.006), inaccessibility to health facility (p<0.011) and maternal condition (hypertension) in pregnancy were risk factors for labour obstruction among respondents in the study.

4.8a: Maternal Factors Influencing Obstructed Labour

Variables Names	OR	CI		Coefficient	P-value
Age Groups of Respondents					
<24 years	1	-66.044	6.184	-29.93	0.104
>35 years	0	-23.046	6.632	-8.207	0.278
Occupations of Mothers					
Working Mothers	0	-10.279	-1.581	-5.93	0.008
Occupation of Respondents' Husband					
Small-scale Traders	2.5	-43.218	3.600	-19.809	0.097
Household Estimated Net Annual Income					
>501.00ghc	4.47	-21.798	-2.836	-12.317	0.011
Number of Pregnancies by Respondents					
>4 pregnancies	19.7	-3.019	8.982	2.982	0.330
Parity of Respondents					
Primed	1.5	7.357	90.100	48.728	0.021
>5th Child	0	-12.762	5.229	-3.766	0.412
Awareness/Knowledge on Herbal Medicine					
Responded No	7133	-646.796	664.541	8.872	0.979
Previous Use of Herbal Medicine by Respondents					
No	0.2	-2.954	-0.275	-1.615	0.018
Use of HM in Current Delivery					
No	0.9	-0.999	0.732	-0.134	0.762
Combination of HM Used					
2-3 types of HM	0	-27.219	7.473	-9.873	0.265
>4 types of HM	5.2	-40.983	-1.778	-21.381	0.033
11 Stages in Pregnancy Respondents Used HM					
Second Trimester	3.3	-52.206	-5.256	-28.731	0.016

(Source: Field survey, 2017)

.8b	Maternal Factors Influencing Obstructed Labour				
Variables Names	**OR**	**CI**		**Coefficient**	**P-value**
Gestational Term at Delivery					
< 32 Weeks	1.6	-0.725	1.695	0.485	0.432
33-37 Weeks	1.1	-0.765	0.872	0.054	0.898
Maternal Condition Experienced by Respondents					
Hypertension	4.1	1.640	38.023	19.8	0.033
Health-related reasons for Using HM					
Inaccessibility of Health Service at the point illness	1.5	3.854	29.232	16.543	0.011
Distance to Health Facilities	500.3	-1.240	13.671	6.215	0.102
Distance to Nearest Health Facility					
Short Distance (5km)	3.1	-41.441	-2.330	-21.885	0.028
Far Distance (6-10km)	3.7	-48.464	-4.159	-26.311	0.020
Very Far Distance (>10km)	0	-30.164	9.154	-10.505	0.295
Influence of Pregnancy-related Condition on the HM Usage					
Pains, Flu & Stomach Problems	14847.6	2.732	16.480	9.606	0.006
Malaria & RTI	0	-27.448	12.742	-7.353	0.473
Spiritual/Religious Connotation of Using HM					
No	1.6	-67.365	-5.356	-36.361	0.022
Family/Close Friends Influence on HM Use					
Yes	8.1	4.972	45.265	25.119	0.015
Purpose of Using Herbal Medicine					
To protect Baby	1.3	-47.225	-2.935	-25.08	0.026
To Augment Labour	0	-19.025	-1.073	-10.049	0.028

Source: Field survey, 2015

4.4.5 Effects of Kaligu-tim on Foetal Distress

Then again, almost all of the maternal socio-demographic and economic factors in the study showed no significant influence on foetal distress status of the infants of the respondents. Also, awareness of local oxytocin, use of local oxytocin in recent pregnancy/labour and the combinations of the local medication were not found to have influenced the status of infants with foetal distress. However, history of previous use of the local oxytocin and the trimesters in pregnancy with the use of the medication was significantly associated with foetal distress among infants of the respondents. For instance, mothers with previous history of local oxytocin had low risk of delivering infants with experience of foetal distress ($p<0.032$). Furthermore, the univariate modeling also showed that previous history ($p<0.0059$) of local oxytocin but not current use ($p<0.1242$) of it was a significant risk factor for foetal distress during delivery.

The trimester in which the mothers used the local medication was another significant factor ($p<0.035$) associated with the foetal distress of the infants of the respondents. Mothers with history of local oxytocin in the second trimester of their pregnancies were of a higher risk of delivering infants with experience of foetal distress as compared with infants of mothers with first and third trimester history of local oxytocin.

4.9a: Maternal Factors Influencing Foetal Distress

Variables Names	OR	CI		Coefficient	P-value
Age Groups of Respondents					
<24 years	2.4	-0.780	2.515	0.867	0.302
>35 years	0.9	-1.664	1.426	-0.119	0.880
Marital Status of Respondents					
Singled	0.3	-3.643	1.416	-1.114	0.388
Educational Level of Respondents					
Secondary Education	0.2	-3.580	0.551	-1.515	0.151
Occupations of Mothers					
Working Mothers	1	-0.986	0.965	-0.011	0.983
Occupation of Respondents' Husband					
Artisans	1.2	-2.144	2.485	0.170	0.885
Small-scale Traders	0.6	-1.808	0.660	-0.574	0.362
Formal Sector Workers	4.5	-0.960	3.976	1.508	0.231
Household Estimated Net Annual Income					
>501.00ghc	0.7	-1.384	0.562	-0.411	0.408
Number of Pregnancies by Respondents					
>501.00ghc	0.7	-1.384	0.562	-0.411	0.408
Parity of Respondents					
Primed	0.6	-1.895	0.945	-0.475	0.512
>5th Child	1.4	-1.338	2.062	0.362	0.676
Awareness/Knowledge on Herbal Medicine					
Responded No	1.3	-2.141	2.711	0.285	0.818
Previous Use of Herbal Medicine by Respondents					
Yes	0.1	-3.987	-0.181	-2.084	0.032
Current Use of HM in Delivery					
Yes	1.5	-0.559	1.322	0.382	0.427

Source: Field survey, 2017

e 4.9b: Maternal Factors Influencing Foetal Distress

Variables Names	OR	CI		Coefficient	P-value
Parity of Respondents					
Primed	0.6	-1.895	0.945	-0.475	0.512
>5th Child	1.4	-1.338	2.062	0.362	0.676
Combination of HM Used					
2-3 types of HM	1	-1.826	1.732	-0.047	0.959
tages in Pregnancy Respondents Used HM					
2-3 types of HM	1	-1.826	1.732	-0.047	0.959
Gestational Term at Delivery					
< 32 Weeks	0.4	-3.764	1.853	-0.955	0.505
33-37 Weeks	0.4	-3.044	0.955	-1.044	0.306
Maternal Condition Experienced by Respondents					
Hypertension	3.3	-1.120	3.510	1.195	0.312
Haemorrhage	0.2	-4.034	1.228	-1.403	0.296
Health-related factors for Using HM					
Inaccessibility of Health Service at the point illness	0.1	-8.604	2.925	-2.840	0.334
Distance to Health Facilities	0.3	-6.882	4.625	-1.128	0.701
Lack of Medication at Health Facilities	3.8	-4.085	6.737	1.326	0.631
Distance to Nearest Health Facility					
Short Distance (5km)	164	0.883	9.310	5.097	0.018
Far Distance (6-10km)	88.2	0.171	8.789	4.480	0.042
Influence of Pregnancy-related Condition on the HM Usage					
Pains, Flu & Stomach Problems	0.7	-1.995	1.330	-0.332	0.695
Spiritual/Religious Connotation of Using HM					
No	6.5	-1.047	4.794	1.874	0.209
Family/Close Friends Influence on HM Use					
Yes	0.5	-3.985	2.571	-0.707	0.672
Purpose of Using Herbal Medicine					
To protect Baby	8.7	-1.374	5.700	2.163	0.231
To Augment Labour	3.8	-1.024	3.689	1.330	0.268

Source: Field survey, 2017

4.4.6 Effects of Kaligu-tim on Still Birth

From table 4.10, the multiple logistic modeling did not reveal any significant association between awareness of local oxytocin, Previous and current use of local oxytocin, combination of local oxytocin, use of local oxytocin by trimesters and the incidence of still births among the respondents in the study.

4.10a: Maternal Factors Influencing Still Births

Variables Names	OR	CI		Coefficient	P-value
Age Groups of Respondents					
<24 years	1	-4.251	4.412	0.081	0.971
>35 years	1.5	-4.015	4.852	0.419	0.853
Educational Level of Respondents					
Primary Education	5.6	-5707.23	5673.83	-16.703	0.995
Secondary Education	4.7	-5546.69	5508.32	-19.187	0.995
Occupations of Mothers					
Working Mothers	1.2	-2.765	3.189	0.212	0.889
Occupation of Respondents' Husband					
Artisans	0.2	-5.879	2.282	-1.798	0.388
Small-scale Traders	-5.67	5.96	5705.1	14.568	0.996
Household Estimated Net Annual Income					
>501.00ghc	0.2	-4.231	1.284	-1.473	0.295
Number of Pregnancies by Respondents					
>4 pregnancies	0.7	-1.949	1.299	-0.325	0.695
Parity of Respondents					
Primed		-5511.838	5543.18	15.672	0.996
>5th Child	0	-9.207	2.318	-3.445	0.241
Previous Use of Herbal Medicine by Respondents					
Yes	0.8	-2.754	2.416	-0.169	0.898
Use of HM in Current Delivery					
Yes	1.3	-2.43	2.972	0.271	0.844
10 Combination of HM Used					
2-3 types of HM	0.4	-16982.24	16980.6	-0.849	1.000

Source: Field survey, 2017

4.10b: Maternal Factors Influencing Still Births

Variables Names	OR	CI		Coefficient	P-value
tages in Pregnancy Respondents Used HM					
Third Trimester	1.1	-2.671	2.85	0.089	0.949
Gestational Term at Delivery					
< 32 Weeks	0.6	-2.736	1.791	-0.472	0.683
33-37 Weeks	2.7	-1.209	3.23	1.008	0.373
Health-related reasons for Using HM					
Inaccessibility of Health Service at the point illness	8.2	-19129.74	19193.8	32.034	0.997
Distance to Health Facilities	1.9	-21936.85	22002.6	32.883	0.998
nfluence of Pregnancy-related Condition on the HM Usage					
Pains, Flu & Stomach Problems	1.1	-16498.3	16397.2	-50.529	0.995
piritual/Religious Connotation of Using HM					
Yes	8.9	-17777.21	17675.7	-50.773	0.996
urpose of Using Herbal Medicine					
To protect Baby	2.6	-7512.937	7473.39	-19.775	0.996
irth Weight of Infants					
LBW	9.3	-34196.74	34058.4	-69.155	0.997

: Field survey, 2017

CHAPTER FIVE

5.0 DISCUSSION

5.1 Proportion of mothers using Kaligu-Tim during pregnancy and labor.

The knowledge of respondents on herbal medication in pregnancy and/or during labour was revealed to be 85%. The study further revealed that 64.9% and 45.4% of the mothers used herbal medicine (local oxytocin) in their previous and current pregnancies respectively; 5.5% during the first trimester, 26.8% during the second trimester and 67.7% in the third trimester.

The prevalence rate of herbal medicine in pregnancy and/or labour has seen a steady decline over the past decade, from the 84% and 73% use of herbal medicine in the last and current pregnancies respectively, as contained in the 31st Annual Meeting of Allied Health Professional Association (AHPA) in 2003 (Bosu et al. 2003) to 6.5% rate indicated by Adusi-Poku, (2015). The steady reduction in the use of traditional medication in pregnancy could be attributed to the increasing access to primary health services at the community level through the Community-based health planning and services (CHPS) and midwife services by mothers. The finding of the current study was about twice the rate of a multinational study by Deborah et al. (2013) across the different European Countries but by far higher than 4.3% in Sweden and much closer to the 69% rate in Russia. Also, across the Middle East, the finding of the study was found within the wide range of 22.3-82.3% as reported by Azriani et al. (2008). In Sub-Saharan Africa also, the rate as contained in this current study was still found within the range of 30-70% as reported by (Mamothena, 2014). More specifically to the individual Sub-Saharan countries, the finding in the current study was more than double the rate of 20% in

Northern Uganda (Nyeko et al., 2016), 32% in Zambia, 23% in Tanzania, 12% in Nigeria (Ngoma&Siachapa, 2017), and 12% in Kenya (Mothupi, 2014) but almost the same as 52% in Zimbabwe and Malaysia 51.4% (Ngoma&Siachapa, 2017) and lower than 80% in Uganda (Ngoma & Siachapa, 2017) and 80% in Kelantan Malaysia (Azriani et al., 2008). However, the finding in the study is far more than seven times higher than the 6.5% rate indicated by Adusi-Poku, (2015) in Ghana.

On the combination of different types of herbal medication during pregnancy, 44.2% of the mothers used multiple combinations of the local oxytocin as against 87% in Kelantan Malaysia (Azriani et al., 2008). The similarity between all these studies is that, almost all of the studies were facility based cross-sectional surveys studies.

5.2 Factors associated with the use Kaligu-Tim during pregnancy and labour

Many factors influenced the ever increasing use of herbal medicine in pregnancy and/or during labour, related to challenges with access to health services, maternal factors and the socio-demographic environment of the respondents. Health service-related challenges included the cost, lack of access to health facilities at the point of need, distance to health care facilities, and unavailability of medication at health care facilities. Similarly, Mothupi, (2014) found health-related reasons to have promoted the use of herbal medicine in pregnancy among mothers in Nairobi, Kenya. As found in the current study, Malan and Neuba, (2011) also indicated that pregnancy-related conditions were a significant determinant of the use herbal medicine among pregnant women. Women with experiences of pregnancy-related conditions such as nausea, vomiting and the like probably do not often regard such as major health problem needing hospital attention and

often resort to local available medication for immediate relieve. This could also be attributed to the notion that local medication had negligible side effects on pregnancy and were more effective for the treatment of these pregnancy-related conditions, particularly during the first trimester (Malan & Neuba, 2011). The current study also found a significant relationship between respondents' age groups and the use of herbal medicine among the respondents. Respondents older than 35years were less likely to use herbal medicine as compared with pregnant mothers less than 24years. This could be as a result of the fact that most of the pregnant women within the later age category are primed and are often overwhelmed with sudden physiological changes and hence resort to multiple medications including the herbal medicine for the management of these pregnancy-related conditions. Similarly to this finding, Namuddu et al. (2011) found that older patients (≥39years) were less likely to use traditional herbal medicine but rather in HIV patients in Uganda. Contrarily to the finding in the current study, Gardiner et al. (2007) found older years to have influenced the use of herbal medicine among adults in the United States. Also, among infertile women in Uganda, patients older than 30 years were more likely to use herbal medicine (Kaadaaga et al., 2014). Contrarily to the finding of Deborah et al. (2013), the current study found a significant relationship between herbal medication use and maternal age both as a categorical and continuous variable. Gestational term at delivery, parity of the respondents and mothers' ethnicity were also significant determinants for the use of herbal medicine in the Tolon district among reproductive women. Primed mothers were of greater risk of using herbal medicine among the study group. Delivery of primed mothers often comes with some health challenges and these mothers are also docile to the influence of older mothers to use

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herbal medicine. And coupled with fear, these could be significant reasons for use of herbal medicine among the primed women.

Other studies findings also confirmed that educational status is a significant important factor in the use of herbal medicine among pregnant mothers (Tamuno et al., 2011; Mothupi, 2014; Adusi-Poku et al., 2015). Similarly Deborah et al. (2013) found a significant association between maternal education and the use of herbal medicine in pregnancy but indicated that rather higher maternal education was associated with the use of herbal medicine, as also reported by Gardiner et al. 2007 in the United States. However, in Uganda, Kaadaaga et al. (2014) found the use of herbal medicine to be associated with no education among women attending an infertility clinic. But unlike the current study the Ugandan Study was among women with already health challenge who were skewed towards alternative medicines for their health problems. This is basically due to the fact that issues of fertility go beyond orthodox medicine in Africa culture to include both the traditional herbal medicine and spirituality (Ondicho et al., 2015).

The finding of the study also indicated that parity of the respondents significantly determined the use of herbal medicine among the mothers in the study. This supported that of the finding in Western and Eastern Europe but not in North or South America and Australia (Deborah et al., 2013).

5.3 Effects of Kaligu-Tim on pregnancy outcome

There has been a general public concern on the safety of the use of herbal medicine and products, and more sacredly among pregnant women and children. Although there is insufficient scientific data on the impact of herbal products on birth outcomes and women

reproductive health but the local oxytocin (Kaligu-tim) which is often taken in unspecified quantities undoubtedly will have some health implications for both the mother and the baby. Though the current study did not find any significant association between both previous and current use of Kaligu-tim on the birth weight of infants, but the findings indicated that infants of mothers with history of previous and current use of Kaligu-tim weighed 26g and 34.3g lighter respectively than their counterparts. The findings did not also indicate any significant associated between the use of multiple combinations (≥1 types of herbal medicines) and birth weight of infants. As indicated also by Jo et al., (2016) the current author found that adverse maternal and birth outcomes associated with the use of herbal medicine during pregnancy were not readily available in most studies. There were therefore, very limited evidence available for direct comparison between the adverse maternal outcomes with the use of herbal medicine (Jo et al., 2016). Some authors reported a handful of mild adverse events which included pre-term birth but the study could not attribute the severe adverse events in the study to the use of the herbal medicine (Jo et al., 2016). Epidemiological studies in Finland also showed that the use of the herbal medicine "glycyrrhizin" was found to have reduced the birth weight of infants, though the result showed no statistical significance, as also the case of the current study (Journal et al., 2002). Again, ROCG, (2002) reported that some types of herbal medicines such as Cola (cola nitida) and Guarana (panlliniacupana) were reported to have potentially caused low birth weight among mothers who were exposed to the herbal medicine.

Previous history of local oxytocin (Kaligu-tim) affected the apgar score of infants in subsequent deliveries from the study finding. Infants of mothers with previous history of

local oxytocin had 2.4 times odds of perinatal asphyxia as compared with their other counterparts. Mothers who used multiple combinations of the herbal medicine as oxytocin to aid delivery were particularly at increased risk of birth asphyxia. Also, mothers who mostly used the oxytocin during the third trimester of their pregnancy were also at significant risk of perinatal asphyxia. However, the current use of the local oxytocin was not significantly associated with birth asphyxia. This could mean probably that the use of herbal medicine could be of limited impact on the interim but possess a greater health risk for the subsequent deliveries, and could also affect the overall reproductive health of the mothers. There is the need for continuous research in this area to assess the overall impact of herbal medication on the reproductive health of women. The harmful effect of herbal medicines with regards to perinatal asphyxia may be a problem with the placenta, which serves as a carrier for the exchange of nutrients between the mother and the foetus. Herbal medicine acts to reduce the mother's blood pressure or constrict (narrow) the blood vessels in the placenta, thereby reducing the supply of nutrients and oxygen to the foetus. This could result probably to adverse birth outcomes such as undeveloped and underweight babies, and asphyxia among others ("impact 4," n.d.)

Similarly, the use of the local oxytocin in previous pregnancies predisposed the mothers to a greater risk of postpartum haemorrhage, obstructed labour and their infants to foetal distress in their current deliveries. Mothers with previous history of the herbal medicine had fourth-fold chances of postpartum haemorrhage among the women in Tolon district whiles current use of the medication had immediate effect on the recent delivery. The efficacy of herbal medicine is one of the battle field in literature, whiles some herbal

medicine in China however, are showed to be effective in preventing blood lose after labour, Western pharmacologist consider them to be abortifacient (Millset al., 2006). Unlike Kaligu-tim in the current, Capsella bursa-pastoris, Cinnamomiumzeylanicum, and Geranium maculation among others are considered anti-haemorrhagics that helped to regulate uterine contraction and also served as anti-microbial agent against puerperal fever in China (Mills et al., 2006). In a related study in South Africa, the authors concluded that the use of herbal medicine during pregnancy could however lead to fetal distress (Ernest, 2002)

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Although, herbal medicine and products could be effective in treating certain ailments and easily accessible to pregnant women, particularly women in rural setting, but the possibility of over-dose and the general unhygienic condition in which they are prepared could affect the safety for pregnant women and babies at birth.

This was a cross-sectional study among 339 mothers in the Tolon district of the Northern Region of Ghana. The results showed that 64.9% and 45.4% of the mothers used herbal medicine (local oxytocin) in their previous and current pregnancies respectively; 5.5% of the mothers did so during the first trimester, 26.8% during the second trimester and 67.7% in the third trimester.

Health service-related challenges identified found to be factors influencing the use of herbal medicine among the pregnant women included the cost 10.4%, lack of access to health facilities at the point of need 13.6%, distance to health care facilities 35.7% and unavailability of medication at health care facilities 40.3%. Also, the study found a significant relationship between herbal medication use and maternal age, gestational term at delivery, parity of the respondents and mothers' ethnicity.

The findings indicated that infants of mothers with history of previous and current use of Kaligu-tim weighed 26g and 34.3g lighter respectively than their counterparts. Previous history of local oxytocin (Kaligu-tim) also affected the apgar score of infants in subsequent deliveries. Mothers who used multiple combinations of the herbal medicine as oxytocin to aid delivery were particularly at increased risk of birth asphyxia. Similarly, the use of the local oxytocin in previous pregnancies predisposed the mothers to a greater risk of postpartum haemorrhage, obstructed labour and their infants to foetal distress in their current deliveries.

It can be concluded that the use of this herbal medicine (Kaligu-tim) possess a greater long term health challenge for mothers and their babies. Community health officers and midwives in the Tolon district must therefore intensity their public health campaigns against the use of the Kaligu-tim during pregnancy.

6.2 Recommendations

- All community health officers working in the Tolon district together with the midwives who daily attend to these pregnant women should intensify their public health campaigns against the use of the Kaligu-tim during pregnancy.

- The GHS/DHA should ensure that all communities under Tolon district have CHPS zones and well equip with both human and material resources to meet the health needs of these pregnant mothers.

- Kaligu-tim undoubtedly has negative effects on birth outcomes, there is therefore the need for further research to assess the overall health impact of the local medicine on the reproductive health of the women by the GHS/DHA

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ANNEXES

1.1 Consent Form

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SCHOOLOF ALLIED HEALTHSCIENCES
DEPARTMENTOF COMMUNITY HEALTH

Research Tittle: Assessing the Factors Influencing the Use of Kaligu-Tim (Herbal Medicine) During Pregnancy and Labour among Postnatal Women in Tolon District

INTRODUCTION

This questionnaire is designed by MSC/MPHIL Community Health Development student from the University for Development Studies conducting a study on the above mentioned topic. You are kindly requested to answer the questions below. The information you give will be treated as highly confidential. Therefore, your name will not be required in this research. You have a right to refuse to participate in this research if you so wish, however, it will be very much appreciated if you participate. Thank You.

Signature/Thump print of respondent…………………

Date of data collection…………………..

For any information, kindly contact

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1.2 Questionnaire

Section A: Socio-demographic characteristics

---

1 Age of mother?........................

2 Mother's Ethnicity?

    a.   Gonja   [   ]

    b.   Dagomba   [   ]

    c.   Others; please specify…………   [   ]

3 Mother's Marital status

    a.   Single   [   ]

    b.   Married   [   ]

    c.   Others; specify……………   [   ]

4 Educational level of respondents in completed years in figures?

    a.   No formal education   […………..]

    b.   Non-formal education   […………..]

    c.   Primary education   […………..]

    d.   Secondary education   […………..]

    e.   Tertiary education   […………..]

5 Mother's Occupation?

    a.   Housewife   [   ]

    b.   Farmer   [   ]

    c.   Small-scale trader   [   ]

    d.   Formal sector worker   [   ]

6 What is your husband's occupation?

    a.   Artisan   [   ]

    b.   Farmer   [   ]

    c.   Small-scale trader   [   ]

    d.   Formal sector worker   [   ]

7 Mothers' household estimated net annual income (ghc)

    a.   >500ghc   [   ]

    b.   501-1000ghc   [   ]

    c.   >1000ghc   [   ]

Section B: Maternal factor

8 Multiple pregnancy
   a.   ≤ 3 pregnancies   [   ]
   b.   ≥4 pregnancies   [   ]

9 Parity of the respondent?
   a.   Primed   [   ]
   b.   2-4th child   [   ]
   c.   ≥5th child   [   ]

10 Maternal disease/Condition?
   a.   Hypertension   [   ]
   b.   Diabetes   [   ]
   c.   Haemorrhage   [   ]
   d.   Eclampsia   [   ]
   e.   Others, please specify………….   [   ]

Section C: Prevalence of kaligu-tim (Herbal medicine) in pregnancy

11 Are you aware of or have any knowledge of any kaligu-tim (herbal medicine) used in pregnancy or during labour?
   a.   Yes   [   ]
   b.   No   [   ]

12 Kindly name any of the herbal medicines you know?
…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………

13 Have you personally use any kaligu-tim (herbal medication) in pregnancy/labour?

   a.   Yes   [   ]
   b.   No   [   ]

14 At what trimester in your pregnancy did you start using kaligu-tim (herbal medicine)?

   a.   First trimester   [   ]
   b.   Second trimester   [   ]
   c.   Third trimester   [   ]

15
Did you use kaligu-tim (herbal medicine) in any of the following period?

    a.   During labour   [   ]

    b.   Postpartum period   [   ]

    c.   During labour and Postpartum period   [   ]

16
Did you specifically use kaligu-tim (herbal medicine) during labour in your recent delivery?

    a.   Yes   [   ]

    b.   No   [   ]

17
Kindly describe the major components of kaligu-tim (herbal medication)?

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

………………………………………………………………………………………………

18   How many types of the kaligu-tim herbal medicines did you use during the Previous pregnancy?

    a.   One   [   ]

    b.   Two   [   ]

    c.   Three   [   ]

    d.   More than three   [   ]

Section D: Reasons for the Usage of Kaligu-tim (Herbal Medicines) in Pregnancy and Related Issues

19   Did you experience any of the following health service-related reasons for your use of kaligu-tim (herbal medicine)?

    a.   Cost   [   ]

    b.   Inaccessibility of health facilities at the time of illness   [   ]

    c.   Distance to be travelled to access care   [   ]

    d.   Lack of medication   [   ]

20   What is the distance from your home to the health facility?

    a.   Very short distance (1 kilometre or less)   [   ]

    b.   Short distance (5 kilometres)   [   ]

    c.   Far distance (15-30 kilometres)   [   ]

    d.   Very far distance (above 30 kilometres)   [   ]

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21 Did any one of the following pregnancy-related conditions influence your use of kaligu-tim (herbal medicine)?

    a.   Toothache   [   ]

    b.   Various types of pain, flu and stomach problems   [   ]

    c.   malaria and respiratory tract infections   [   ]

    d.   Swollen feet, back pain etc.   [   ]

    e.   digestive problems   [   ]

22 Is there any spiritual/religious reason for using herbal medicine in pregnancy or during labour?

    a. Yes   [   ]

    b. No   [   ]

23 If yes to Q21 kindly state, the reason…………………….

24 Did your family/close friends have any influence on your herbal medicine usage in pregnancy?

    a.   Yes   [   ]

    b.   No   [   ]

25 If yes to Q24 who was this "important other"? ……………………………

26 What was the purpose of using herbal medicines in pregnancy?

    a.   To induce labor   [   ]

    b.   To protect the baby   [   ]

    c.   To augment labor   [   ]

    d.   To induce abortion   [   ]

Section E: Effects of Kaligu-tim (Herbal Medicines) on Pregnancy outcomes and the Reproductive health of the Woman

27 Birth weight of the baby?....................

28 Five minutes Birth Apgar score of the baby?.......

29 Mother experienced PPH?

    a.   Yes   [   ]

    b.   No   [   ]

30   Gestational term at delivery
    a.   ≤32 weeks   [   ]
    b.   32-37 weeks   [   ]
    c.   ≥ 38weeks   [   ]

31   Mother experienced obstructed labour?
    a.   Yes   [   ]
    b.   No   [   ]

32   Fetal distress?
    a.   Yes   [   ]
    b.   No   [   ]

33   Still birth?
    a.   Yes   [   ]
    b.   No   [   ]

34   If yes to question 33, was it ………….
    a.   Macerated stillbirth   [   ]
    b.   Fresh stillbirth   [   ]

35   Mother experienced Ruptured uterus in delivery?
    a.   Yes   [   ]
    b.   No   [   ]