SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

TOPIC

THE PERCEPTION OF HERBAL MEDICINE USAGE AMONG PREGNANT WOMEN ATTENDING ANC IN NALERIGU, EAST MAMPRUSI DISTRICT

BY

ABDUL-RAHAMAN NURIDEEN ANDANI

(10250023)

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DECLARATION

I, Abdul-Rahaman Nurideen Andani, a student of the University of Ghana at the School of Public Health declare that this study is my own work and that no part of it has been submitted for any academic purpose or otherwise.

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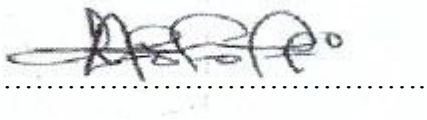
ABDUL-RAHAMAN NURIDEEN ANDANI DATE

STUDENT



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PROFESSOR PHILIP BABA ADONGO DATE

SUPERVISOR

ABSTRACT

Herbal medicine usage has become a global phenomenon especially among pregnant women in Africa and other parts of the globe due to the perception of its efficacy and safety and it has become a competitive alternative to orthodox medicine.

Pregnant women in Nalerigu use herbal medicine because they feel it is effective, affordable and easily accessible without knowledge of its content and the effects it may have on them.

The main objective of the study is to investigate the use of herbal medications among pregnant women in the Nalerigu community of the East Mamprusi district. This study is to further determine the prevalence of herbal medication use among pregnant women in Nalerigu, assess the side effects of herbal medicine and also assess the perceptions about the effectiveness of herbal medications among pregnant women in Nalerigu.

This study was a cross-sectional design which employs quantitative data collection approach through the use of an easily-understood, straight-forward structured questionnaire. The respondents who were purposively selected/sampled were mainly pregnant women between 16-49 years of age from Nalerigu and attend ANC at the Baptist Medical Center (BMC).

The data was analyzed using SPSS version 20 soft-ware and a Chi-Square Pearson analysis was done to determine the effectiveness of herbal medicine as against orthodox medicine.

The study revealed a 34.1% incidence or prevalence out of 177 pregnant women attending ANC at BMC in Nalerigu, East Mamprusi district with 61.5% believing that herbal medicine is effective in the treatment of illnesses /diseases.

A Chi-Square analysis indicated a significant figure of 0.00. thus X^2 (1, N=177) =80.92, P<0.001 when comparing the efficacy of herbal medicine with orthodox medicine. Implying pregnant

women believe orthodox medicine is more efficacious than herbal medicine although some of them still patronize herbal medicine. The study concluded that 34.1% of pregnant women attending and pregnant women who used herbal medicine in Nalerigu experienced various side effects such as vomiting (60.5%), headache (5.3%), dizziness (2.6%), skin rashes (5.3%) and diarrhea (26.3%).

Formal training of herbal medicine practitioners by the ministry of health and other stake holders to ensure safety and efficacy of herbal medicine use is necessary as recommended by respondents (58.0%).

ACKNOWLEDGEMENT

First of all, I will want to express my sincere gratitude to my supervisor, Professor Philip Baba Adongo for his support, patience, mentorship and guidance for making this piece of work a success. Also, my gratitude goes to my cousin, Mr. Abudu Sumaila Ewuntomah for his continuous support and guidance over the years. My final appreciation and sincerity goes to the Almighty Allah for granting me life, energy and patience to be able to see this work to a successful completion.

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LIST OF ABREVIATIONS

ANC	Antenatal clinic
BMC	Baptist Medical Center
HB	Herbal Medicine
TM	Traditional Medicine
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Research findings across the world confirm sudden increase in the use of herbal and alternative medicine. Most of the pregnant women are convinced that, these medications are safe as compared to allopathic medicine as they have natural contents. Also, herbal medications are used to treat medical conditions and to improve the health status of pregnant women in many rural communities. There are limited findings on their safety, side effects and purity of content (Khadivzadeh & Ghabel, 2010).

Herbal medicines use is a common practice in rural communities of the world (developing and developed countries). This is as a result of a long standing history associated with its use in different countries. Mawoza T et al., (2019), reported a high patronage of herbal medicine use among pregnant women and during and after labor in some rural areas in Zimbawe.

Most pregnant women in Africa use herbal medications because of its cost effectiveness, convenience and access. An estimate of 80% of the population in Ethiopia use herbal medicine and almost 90% of all births is managed by traditional birth attendants or relatives. Nonetheless, data pertaining the patronage of herbal medications among pregnant women in Ethiopia is limited. The most important aspect is the lack of awareness about potential effects of herbal medication use on pregnant women. Some herbal products may have teratogenic effects on human and animals (Kassaye, Amberbir, Getachew & Mussema, 2009).

Pregnancy is a condition which comes with huge physiological alterations that result in many pregnancy-associated problems including, constipation, pyrosis, nausea and vomiting. These conditions usually compel pregnant women to engage in self-medication and patronizing

orthodox medications, herbal medications or over the counter medications (Lindzon, Sadry & Sharp, 2011).

Herbal medicine studies relating to the health of pregnant women (maternal health), which is important to public health practitioners in many developing nations is very limited. The use of herbal medications which is an important aspect of the public health system is relatively higher in African countries. The World Health Organization (WHO) has reported a high prevalence (80%) of herbal medicine use in the world's population. Herbal medicine use is rapidly growing and the industry generates lots of money annually in regions such as Europe and China (WHO, 2010, 2018)

A study in North Iran shows that, 19.6% of pregnant women used herbal medications during their pregnancy. The common herbal medications used were cinnamon and mint. The most common conditions which occurred as a result of the consumption of the herbs were gastrointestinal infections and cold. Herbal consumptions during pregnancy was related to the level of education, however, there were no relationship between age, employment and herbal medicine use (Biazar et al., 2017).

Herbal medicine has played a very significant role in the healthcare system. The WHO, (2017) estimated that, over four billion people (80%) of the world's population used herbal medications in one way or the other to enhance their health. In addition, an estimated 80% of Africans in developing countries rely on herbal medications to meet their primary health care needs (Darko, 2009; Okigbo & Mmeka, 2014; WHO, 2009, 2017; Abbiw, Agbovie, Akuetteh, Amponsah, Dennis, Ekpeh, Gillet, Ofosuhene-Djan & Owusu-Afriyie, 2012).

The yearly global sales for herbal medications currently stands at a little over Sixty billion US dollars and it is still growing at a rate of fifteen to twenty five percent (WHO, 2009, 2017).

Countries such as China, India and others have achieved enormous success in developing their herbal industries. Herbal medications are properly developed, properly documented, and practiced not only at the family level, community or primary healthcare levels, but also in healthcare facilities where they provide advanced medical care in these countries. Again, herbal medical practices and services in these countries are delivered on systematic knowledge, appropriate methodology and good clinical practices (Verma & Singh, 2010; Twumasi, 2012).

Medications (herbs, supplements, orthodox) must be used cautiously during pregnancy since they can result in dangerous outcomes for the fetus and mother. The use of herbal medications during pregnancy poses great difficulty for healthcare workers as most of them are not usually informed about their use in most cases. Herbal medications can be very safe, with little or no life-threatening events if it is appropriately prescribed with the right dosage and measurement. It can equally be dangerous if it is inappropriately used or interacts with other medications and can have unknown consequences or cause serious complications to the fetus (Holst, Nordeng & Haavik, 2018).

The study of the use of herbal medicine or alternative medicine widens the scope of public health dimensions on factors that are essential to maternal health outcomes, the healthcare systems and the possible areas for interventions in developed and developing countries (Silenzio, 2012).

For instance, studies have shown that though about three thousand herbal medications have been documented as being effective for the treatment of various conditions in Ghana, out of which over six hundred are used within the population, only a few of them (a little over 60) have undergone phyto-chemical evaluations and safety test at the Center for Scientific Research into Plant Medicine, a mandatory research and development institute for plant medicine, which assesses and approves the efficacy, safety of herbal medications and does clinical monitoring of

all herbal medications in Ghana (Darko, 2009; Abbiw *et al.*, 2012, Brown, 2011). This implies that, policy-makers, the well-educated and orthodox health professionals will continue to doubt the quality, efficacy and safety of herbal medicine.

It is against this backdrop that this research explores the place and utility of herbal medicine as a vehicle to effective, affordable and accessible health care in Ghana, as well as its possible main streaming into modern health care system.

1.2 Problem Statement

It is common knowledge that, most developing countries, like Ghana is striving to provide the healthcare needs of its citizens through the provision of quality, accessible and efficient health care. The current healthcare system is predominantly reliable on orthodox approach and it is struggling to provide the essential healthcare needs of the people, paticularly for basic ailments such as malaria, diarrhoea, ulcers, diabetes, stroke and other cardiovascular conditions with the vulnerable being severely affected (WHO, 2010,2017; Baidoo, 2009; Darko, 2009; Kofi, 2015; GHS, 2011)

Nordeng & Havnen, (2014), in their study, revealed that, 36% of pregnant women had consumed herbal medications during their pregnancies with an average of 1.7 products per woman. The proportion of women using herbal medications had risen considerably throughout the first to the last trimester of pregnancy. Ginger, echinacea, chamomile and others were the most common herbs used. Among the pregnant women who used various herbal medications during their pregnancy, 39% used herbal medications that contained possible harmful content or information about the safety of herbs in pregnancy were missing. Herbal drugs used in pregnancy had usually been proposed by family or friends to pregnant women.

Herbal medicines can be adversely contaminated, and herbal medications without established efficacy, may mistakenly be replaced with medications that have confirmed efficacy. This may be needed to help determine a comprehensive and a more effective and reliable response to the healthcare needs and threats to the citizens. According to the East Mampurusi health directorate 2017 annual health report, 46% of persons who seek for medical care within the district have used alternative medicine or herbal medicine to treat their ailments or diseases without knowing its content and effects. The report however, was silent on the use of herbal medications among pregnant women within the district and the effects and perceptions pregnant women within the district hold about herbal medicine. It is this lack of evidence about the use of herbal medicine, perceptions and effects among pregnant women in Nalerigu that motivated the researcher to carry out this study to determine the prevalence of herbal medicine use and the perceptions held by pregnant women attending ANC at BMC in Nalerigu.

1.3 General objective

To investigate the use of herbal medications among pregnant women in the Nalerigu community of the East Mamprusi district.

1.4 Specific objectives

1. To determine the prevalence of herbal medication use among pregnant women in Nalerigu
2. To assess the side effects of herbal medicine
3. To assess the perceptions about the effectiveness of herbal medications among pregnant women in Nalerigu.

1.5 Research questions

1. To what extent do pregnant women in Nalerigu patronize herbal medicine?

2. Are there any side effects with the use of herbal medications?

3. What is the perception about the efficacy of herbal medicine in relation to orthodox medicine?

1.6 Justification of the study

The study is important because it motivates the researcher to determine exactly the incidence of herbal medications use among pregnant women in the Nalerigu community of the East Mampurusi district. This will give an opportunity to stakeholders such as the World Health Organization, the Ministry of Health, The Ghana Health Service and the East Mampurusi District Health Directorate to develop appropriate interventions on herbal medicine use among pregnant women in the country (Ghana) to ensure that herbal medications use do not pose serious danger on the pregnant woman and the fetus.

Also, the study would serve as source of information or knowledge to researchers and readers who intend to undertake studies in herbal medicine in Ghana. Research in this area of study has become very essential since it will provide an opportunity ascertain the factors that influence pregnant women's choices of healthcare services within the district.

Again, the study aims at suggesting possible ways by which herbal medicine consumption can be minimized within the Nalerigu community and the district as a whole.

The research is also intended to expose the possible reasons why pregnant women in the Nalerigu community engage in herbal medicine consumption as against the orthodox medicine/allopathic medicine.

Moreover, the research will inform the district health directorate on the reasons why pregnant women delay to go for ANC during the first two months of pregnancy and the appropriate intervention needed to address it.

Lastly, the research would provide an insight into why the pregnant women within the community prefer herbal medicine to that of orthodox medicine.

1.7 The conceptual framework

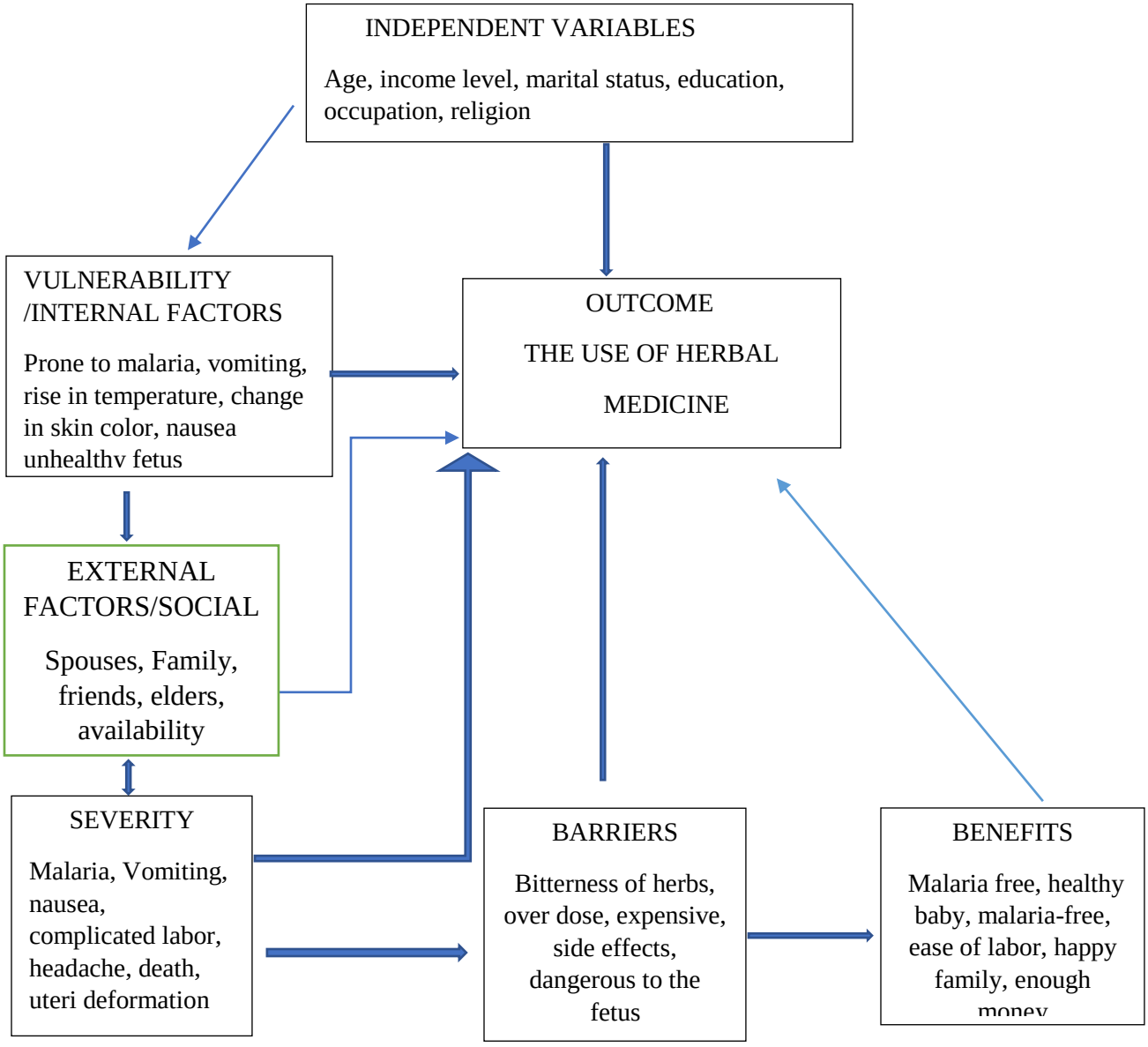

Figure 1: Conceptual Framework

The framework is made up of seven constructs. There is perceived vulnerability to disease which is an internal factor; perceived vulnerability; there are also external/social factors, perceived severity, perceived barriers and benefits. The Health Believe Model (HBM) operates on some claims. For example, it relies on the claims that pregnant woman will definitely take a health

action or reactions (i.e., Use herbal medicine) if she encounters a health problem or threat such as malaria, vomiting, nausea, headache etc. She feels or believes that taking herbal medicine can help reduce the negative health conditions or the threat and makes her feel better or healthy (benefits)

Perceived vulnerability tells if one feels she is exposed to a health problem. For this study, perceived susceptibility refers to the perceived exposure to or risk of malaria, vomiting, nausea, headache, unhealthy fetal and uterine growth are essential factors causing the use or disuse of herbal medications by pregnant women. The absence of perceived vulnerability (exposure to malaria, vomiting, nausea, headache and unhealthy fetal growth) may cause risky behaviour of not taking herbal medications. Aside perceived vulnerability, the pregnant woman is also exposed to external pressure form spouses, family members and friends who introduce them to herbal medicine. Perceived Severity talks about the feelings associated with the seriousness of the illnesses, including factors relating to social and medical effects. With this study, is the pregnant woman convinced that the effects of not using herbal medicine would lead to vomiting, nausea, headache, miscarriage and the unhealthy fetal development enough reasons to use herbal medicines? For instance, the fear of headache, vomiting, nausea, unhealthy fetal growth, miscarriage and death would influence the use of herbal medications. Perceived Barriers constitute the potential negative effects that result from taking a particular health action(s) that include physical, social, environmental, psychological and financial factors. With this study, the perceived barriers dwell on the pregnant woman's ability to realize personal barriers to the use of herbal medications taking into consideration their side effects, bitterness or money to afford the services of herbal practitioner/healer and finding ways to reduce them (i.e. the pregnant woman knows about the availability, efficacy and affordability of various herbal medications and their

side effects are very low). Perceived Benefits are the effectiveness of the interventions put in place to minimize the threat of illness. In this case, perceived benefits tell if the pregnant woman believes that using herbal medicines would protect her against malaria, headache, vomiting, miscarriage etc. For example, does the pregnant woman believe in the effectiveness of herbal medicine? Again, does she believe that the use of herbal medications would promote healthy fetal development and prevent her from malaria, vomiting, headache, etc?

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter, efforts are made to review and understand literature on herbal medicine, patronage of herbal medicine and its position in overall healthcare delivery. It will review; discuss opinions expressed by other researchers. It will include factors influencing herbal medicine use and its side effects. This chapter is about current publications and researches. The literature review will also seek to identify gaps in existing literature which can be used in other researches.

2.2 The prevalence of herbal medicine use among pregnant women across the globe

First, looking at incidence and prevalence of herbal medicine use among pregnant women across world. Studies in Ausralia, Canada, USA, Nigeria, South Africa and other developed and developing countries analyzed how herbal medications have almost become the main source of healthcare for many pregnant women**.** The global prevalence of herbal medications use among pregnant women stays between 7% to 96% (Fakeye, Adisa & Musa, 2009; , Denning, Forster, Elizabeth & Bolger, 2011).

In relation to South Africa and other parts of Africa, Malan and Neuba, (2011) reported high prevalence herbal medicine use during pregnancy citing various factors such as safety, affordability, accessibility, cultural compatibility and comfortability as reasons for the usage apart from to manage malaria, promote fetal growth, prevent miscarriage, reduce labor pains and to have good-looking babies. All these studies confirmed high incidence of herbal medications use among pregnant women with higher rate of incidence in developing countries (WHO, 2014, 2017).

According to the WHO, herbal medication is described as "health practices, approaches, knowledge and beliefs incorporating plants medicine or products applied singularly or in combination to treat, diagnose and prevent illnesses and maintain well-being"

Among the traditional medical practices, herbal medicines use which is explained as plant-driven formulations is said to have strong therapeutic advantages and it is popular and most commonly used by the general population including pregnant women in the globe (Makuria et al., 2017)

It is a common knowledge that, the use of herbal medicines is a common practice in developed and developing countries and the reason is because of the long standing history associated with its use in these countries. In a study by Mawoza T et al., (2019) to ascertain the prevalence of traditional medicine use, indicates that various herbal medicines are used during pregnancy, during labor and for post-partum care by women in the rural areas in Zimbabwe.

A study in North Iran, show that 19.6% of the pregnant women used herbal products. The commonly used herbal products included mint and cinnamon. The most common conditions which resulted from the consumption of herbal products were gastrointestinal infections and catarrh. The rate of herbal medications consumption during pregnancy was relatively associated to level of education; however, there were no relationship found between age, employment and herbal medicine use (Biazar et al., 2017).

Herbs are usually used during the antenatal care to manage various illnesses in Africa. In Uganda, plants are used for both food and medicine to treat common pregnancy-related conditions such as vomiting, nausea, headache and malaria. An ethnobotanical survey in Iganga district in Eastern Uganda where seven TBAs and mothers (46) were sampled and interviewed

using questionnaires revealed that, about 33 plant species which belonged to some families (23) were identified and documented. Of the 33 plant species, the pregnant women had used 45.5 % of plants as food and medicine. The most frequently used plants were in the form of herbs (58.8%). The leaves were the commonly used parts (59%). Most of the plants (58.8%) were grown in crop fields and backyard gardens. Most of the plants were used to manage and treat conditions such as anaemia, enhance healthy fetal growth and good health among the pregnant women (Nalumansi et al., 2017)

The WHO estimated that, 60% of the population of the world relies on herbal medications, with up to 80% of Africa's population using herbal medications and related products to complement or meet their daily healthcare needs. Robinson in his study estimated that these rates could be as high as 95% (Mawoza T et al., 2019).

In another study, 48.6% of women used herbal medications during current pregnancy out of 364 respondents. Ginger (40.7%) and garlic (19%) were the frequently used herbs in pregnancy. The herbs mostly were used to manage common cold (66%) and inflammation (31.6%). A significant number of herbal medication users (89.8%) never consulted their doctors on the use of the herbal medications (Mekuria et al., 2017)

According to the findings from a study by Makuria et al., (2017) on pregnant women who visit the University of Gondar teaching hospital in Northwest Ethiopia for ANC, 48.6% of them used herbal medications in their current pregnancies, with two thirds (68.4%) using it in the third trimester. These findings according to the researchers can be compared with findings from Western Ethiopia (50.4%) and Malaysia (51.4%).

In a similar study, 11,858 women were sampled from 12 African countries to investigate the incidence of herbal medications use. The prevalence of traditional medicine use among women in Africa was very high (80%). The most common traditional medicine used was herbal medications for reasons relating to management of pregnancy-related conditions. Frequent herbal medicine users were pregnant women with little or no formal education, low income levels and staying distant from public health facilities. Lack of access to the maternity care was the major determining factor for use of trdiitional medicine (Shewamene et al., 2017)

A study was conducted among women who gave birth at Bugando Medical Centre and Sekou Toure Hospital in Mwanza, north-western Tanzania through the use of questionnaires as data collection method where an association of the prevalence of herbs use influenced by various factors was done. A sample of 178 women were used for the study. The prevalence of herbs used was 23.0%. The use of herbal medications was significantly high in women who were married (Dika H et al., 2017). In the same study, history of herbs used during past deliveries was an indicator for recurrent use of herbal medications in subsequent pregnancies because it was observed that, of 26 women who used herbal medications and were giving birth for the second or more time, 21 (80.8%) had used herbal medications during previous deliveries compared with only 5 (4.7%) who did not use any herbal medications during past deliveries. The rate of herbal medications used was significantly higher (42.9%) among women with some knowledge about pregnancy-related problems as compared to those who completely did not have knowledge about any pregnancy-related poblems (19.2%) (Dika H. et al., 2019).

A study was conducted by Ayelyini B. et al., (2019) to assess the determinants of a particular herbal medication (Kaligu-tim) use, a known local substance (oxytocin) and its impact on maternal birth outcomes in deprived (rural) communities in Ghana, established that, 64.9% and

45.4% of the participants had used the local substance in their past and current pregnancies. 5.5% used it during the first trimester, 26.8% in the second trimester and 67.7% used it in the last trimester. The study established a significant association between the use of herbal medication and challenges in healthcare provision, maternal age, parity of the respondents and mothers' ethnicity.

Herbal medicine use in Ghana has become so rampant in rural communities despite the availability of modern antenatal services in most parts of the country. Herbs have always become the first point of call during pregnancy in most rural communities in Ghana (Pepra et al., 2019). The most commonly used herbal medicine among pregnant women includes; ginger, peppermint, aniseeds, green tea, echinacea among others.

In a study by Ameade, (2017) to assess herbal medicine use by pregnant women saw that, out of 370 pregnant women in 28 selected communities of the Tamale metropolis, the incidence of herbal medications use was 43.5% prior and 52.7% during pregnancy with most of the herbal preparation used prior and during pregnancy being packaged or wrapped.

Similar to current researches, a Malaysian study found that most women took one spoonful of liquid herbal medication daily in the form of brew. The research established that, most women had taken one kind of herbal medication throughout their pregnancies (45.36%), whiles a small number of them (1.54%) used herbal medications during labor (Abdollahi et al., 2018). The safety of herbs could depend on the dosage, frequency of use and ways of administration and this has to be considered in future studies (Kim Soul et al., Abdollahi et al., 2018)

2.3 Side Effects of herbal medicine

Many pregnant women have found herbal medicine use as very safe whiles others think that there are risks involved in herbal medicine consumption. Generally, medicinal plants contain bioactive compounds which indicate both intra- and inter-species differences in type and content. Some herbal plants are intrinsically toxic due to their constituents and can dangerous if inappropriately used (Mensah et al., 2017)

Herbal medicines may interact with orthodox medicines and some vitamins and minerals. For instance, ginkgo biloba, when taken with ibuprofen may cause spontaneous bleeding. Garlic when taken in high dose may also trigger the adverse effects of anticoagulant and anti-platelet drugs such as aspirin, enoxaparin and others (IUPAC, 2011)

Momordica charantia, a popular anti-diabetic and anti-malarial plant but used in Ghana as an arbortifacient is reported to have caused hypoglycemia in children (Agyrare C. et al., 2015; Andel T. et al., 2014; Mensah et al., 2017)

Again, inappropriate formulation of plant, adulteration of drugs and herbs with little understanding of their content and reactions may have serious consequences and sometimes can be life threatening (Elvin-Lewis., 2012, Mensah et al., 2017)

Tariku Laelago, (2017) reported that, the use of ginger may not be a safe herb during pregnancy. It could cause danger or abortions if consumed in high dosage. Higher doses of ginger could cause problems such as thinning of blood, stomach upsets and heartburns. In the same study, Tariku Laelago cautioned against excessive use of garlic during first weeks of pregnancy. Pregnant women who thyroid disorders are advised to avoid its use. Garlic must be avoided before surgery including caesarean since it could interfere with the clotting of the blood.

Herbs used during labor may have adverse effects to new-born(s) and their mothers because many of them could be poisonous and may cause problems to mothers and their new-borns (Veale et al., 1992; Dika et al., 2017)

It is reported also that, there is a possible risk of some congenital problems or malformations in the central nervous system, muscular and skeletal systems, some tissues and the eye when pregnant women consume herbal preparations especially in the first three weeks of pregnancy without knowing their content (Chaung C et al., 2006; Aljoher M et al., 2018).

Another study by Ahmed et al., (2018) revealed that, most common side effects of herbal medicine reported during pregnancy were dry mouth, nausea and vomiting, drowsiness, diarrhea and palpitation.

Similar to the above, a review of 74 published studies indicated that, certain herbal products could increase risks of pregnancy complications including preterm deliveries and caesarean deliveries (Amy Norton, 2019). The review also indicated that so little is known about the herbal medications in terms of their effectiveness, purity and safety.

Laboratory studies of animals show that utero cannabinoid exposure may disrupt normal brain development and functions which may result in brain malfunctioning or cause behaviour disorders (Champolongo p. et al., 2011; ACOAG, 2017)

The content of herbal medications may contain toxins that can lead to miscarriages, premature births, uterine problems or cause damages to the fetus (American Pregnancy Association). Most herbalists generally believe that herbs are often effective, less costly and safer than orthodox medicine. However, many health professionals or clinicians do not recommend herbal

medications or remedies for pregnant women since its safety has not been confirmed through deep research (APA).

Studies have also shown that though about three thousand herbal mediations have been documented as being effective and used for various conditions in Ghana, out of which over six hundred are in circulation as herbal medications. A little above sixty have passed phyto-chemical evaluations and safety test at the Centre for Scientific Research and Development for Plant Medicine at Mampong, which is a mandatory institution and undertakes research and development of plant medicine in Ghana. The institution assesses and approves the efficacy, safety and does clinical monitoring of herbal medications in Ghana (Darko, 2009; Abbiw et al., 2012).

Additionally, inappropriate formulations and lack of the understanding of herbal or plant medicine and orthodox drug interactions have resulted in adverse reactions that are usually dangerous and life threatening (Lucas, 2010; Elvin-Lewis, 2012). For instance, in 1996 over 50 people in Belgium had kidney failure after using herbal preparations which contained Aristolochiafangchi (a toxic plant) instead of Stephaniatetrandra or Magnolia officinalis (WHO, 2009).

2.4 Perceptions and beliefs about herbal medicine

Africans generally perceived the use of herbal medicine as very essential because it is believed to provide some form of protection to pregnant women and their unborn babies. This is so because herbal medicine use agrees with African indigenous practices and beliefs (Van der Geest & Theobald, 2010). It is a common believe in Africa that, ancestors have key roles to play during pregnancy and so prayers must be said to ancestors to signify their appreciation and protection is offered in return to the pregnant woman against witches and other evil spirits.

However, the perception in Africa is that, herbal medications belong to those woo seemingly cannot afford modern allopathic medicine (Fakeye et al., 2009). This perception was so much the case previously but people are appreciating its usefulness now and there is now official push by governments to encourage their use (Malan & Neuba, 2011).

There are various reasons why society thinks herbal medications belong to the poor. One of such reasons is that, herbal medications are mostly prepared and managed by non-professionals whose services and medications usually very cheap. Faith healers sometimes offer only prayers which is cheaper or easy to perform and can be acquired by poor people as well. The society literally sees the use of herbal medications as the worship of the gods, ancestors and fetish, especially during divination and consultation of herbal healers to ascertain any complication in the course of pregnancies and ultimately advert any of such occurrence if any through sacrifices to gods and ancestors (Tamuno, Omole-Ohonsi & Fadare, 2010).

Herbal medicine was forbidden during colonial administration because it was perceived by colonialist as primitive, superstitious and substandard and so measures were undertaken by the colonialists to prohibit indigenous practices, beliefs and oppress herbal medicine practices. Pregnant women are often prohibited by their husbands and families from going to market places and passing through routes suspected to be the abode of evil spirits (Twumasi, 2012). There are also taboos that prohibit pregnant women from consuming foods such as eggs, honey and corn which are believed to be the cause of prolonged and difficult labour (Fakeye *et al.*, 2009; Tamuno, Omole-Ohonsi & Fadare, 2010).

Nevertheless, herbal medicine continues to be very significant and trusted by many people despite its side effects and 'fetish nature' in the health care system. Herbal products with quinine properties helped are seen to relieve malaria symptoms. Many of modern medicine are said to

have its constituents from herbal products or plant products (Malan & Neuba, 2011). Others also believed that, the potency of herbal medications supersedes any other medication or factor and that people‘s derogatory comments and disregard must not be given attention (Sato, 2012). It is difficult defining spirituality in academia. There are varied responses or explanations to what spirituality is. According to Wane, (2012) spirituality to some extent can be explained in personal angles or views and cannot be siad in one solid definition. Also, Shahjahan, (2015) in his own views indicates that, spirituality is different from beliefs, practices, theories of religion and it i likely to be varied because in most cases the latter is expressed in sacred texts or scriptures. To a larger extent, our minds have been modified to accommodate the “self” as hidden in the Western fashion, fitness, and career and so spirituality in America and Canada is seen as a sin the educational system (Hemminki, Mantyranta, Malin & Koponen, 2010). Therefore, any new assumptions that suggests otherwise is deemed suspicious and equally holds this concern that, higher level of education has become so tolerant to Western economic issues but despises spirituality (Hemminki, Mantyranta, Malin & Koponen, 2011).

Herbal healers, witch doctors, diviners are usually engaged during pregnancy to provide protection against physical illness and spiritual attacks. Ghanaian women see spirituality as a significant factor during pregnancy as it dictates to them childbirth-related decisions in many cultures (Elvin-Lewis, 2012).

2.5 Factors Influencing Herbal Medicine Use

Herbs are used as the first resort during pregnancy. This is because herbs are readily available or accessible within communities. The availability and cheap nature of herbal medicine make it the first point of call before formal health visitation in clinics or hospitals (Pepra et al., 2019)

Another important factor for the use of herbal medicine in all age groups is the specific disease it can cure. In a study by Welz et al., (2018) participants mentioned a variety of illnesses for which they believe herbal remedies is the best and preferred treatment method for them. The participants believed that herbal medicine is the best solution for those ailments.

People consume herbal medicine because of the knowledge they have about them. A study demonstrated well-known Zingiber offinale, Andrographis panicular among others were used to relieve gastrointestinal distress, sore throat, edema from mild trauma, indigestion because the users knew about them and how effective they were in resolving those ailments (Satyapan et al., 2010)

In a similar study by Njuguna & Heather , (2010) to assess factors that influence the use of herbal medicine among HIV patients indicated that, use of herbal medicine among HIV patients was high due to their low socio-economic status. In the contrary, herbal medicine use was low among HIV patients visiting formal hospitals (18%).

It is observed that most pregnant women use herbal medicine for protection against evil. Pregnant women argue that using herbs from onset of pregnancy help avert any unforeseen spiritually induced illnesses (Pepra et al., 2019; Kennedy et al., 2013)

Personal determination of healthcare choices may compel pregnant women or nursing mothers to use complimentary herbal medicines to treat common conditions especially when they desire comprehensive health care or to prepare for natural childbirth (Bowman et al., 2018; Barnes et al., 2019)

Other decision around the use of herbal medications or complementary medicine during pregnancy is due to their personal beliefs and previous experiences because they have difficulties

in finding more information about other medicines (orthodox and others) (Hasting-Tolsma et al., 2013; Barnes et al., 2018)

Knowledge of medicinal plants and age has a positive correlation. Elders tend to have more knowledge about medicinal plants than their younger ones (Weckmuller et al., 2019; Bowman R. L, 2019; Davis et al., 2018). So, by implication the elder ones are likely to influence younger ones to use plant medicine during pregnancy because of their profound knowledge in plant medicines.

The majority of individuals who lack access to healthcare, and even places where healthcare services are available, the quality is usually substandard or compromised, are very much likely to patronize herbal medications. The circumstances could further be worsen by extreme financial constraints, high population growth, political discontinuity, high inflation rates, low incomes and poor growth rates (WHO, 2009). The modern healthcare system has always been insufficiently and poorly delivered in Africa due to financial constraints, high population growth, political instability and poor economic performance and environment (Sato, 2012). For example, the effort to ensuring equal access to modern healthcare has become almost impossible, as the gap between economic factors (demand and supply) continued to extend as a result of poor economic environment (UNESCO, 2014).

Alternative medicine continues to flourish in African societies, not because users are not satisfied with allopathic medicines or because they want to take control over their healthcare choices (Eggleston, 2010). The major deriving force is that, a large number of users appear to be convinced that the health of the body, the mind and spirit are connected to each other and that this must be taken seriously by people who care for their health (WHO, 2012).

It is worth noting that, even in modern-day rural African communities, there are no doubts about the effectiveness of herbal medications. Many rural Africans and the poor in urban areas, rely on herbal medicines when they are encountered with ill-health. Many rural or deprived communities in Africa still have areas where herbal medicine is the main and only means of healthcare available. Therefore, there is no doubt about the acceptability and efficacy of herbal medications within African societies (WHO, 2011).

However, herbal medicine is officially recognized in many developed countries. China, for instance, has been able to provide sufficient herbal medicine and continuously improving healthcare coverage for people in urban and rural communities purposely because it controls and improves on its herbal medicines (WIPO, 2013). The deficiency in developing herbal medicine in Africa is because it is refused to be given official recognition. The widespread use of TM in Africa is constantly influenced by its easy access and cheap nature. For example, the relative ratio of herbal healers to Africa's population is estimated at 1:500 whereas there is a huge deficit in the ratio of medical doctors to the population is 1:40000 (WHO, 2014). Native herbal healers remain the only healthcare providers for millions of people in rural areas in Africa (WHO, 2017).

In Zimbabwe, high fees for orthodox medications pushed most pregnant women to use herbal medicines. This indicates that poverty compels many pregnant women to use herbal medicine not because of its official recognition (Sato, 2012). It is also argued that pregnant women preferred herbal medicine over orthodox ones because they think their natural content make them more effective in managing some health conditions with little or no side effects (Tamuno, Omole-Ohensi & Fadare, 2010; WHO, 2017).

In Ghana, the Kwame Nkrumah University of Science and Technology has taken upon itself the mandate to train herbal medical practitioners. A directorate of the many directorates at the

Ministry of Health (MOH)(Herbal and Alternative Medicine ,TAM) has been established to take care of the herbal services within the health care system. Many other herbal medicine units have been established in some public health facilities to promote and provide herbal medicine services in Ghana (Sato, 2012).

In other parts of the world, especially in poor countries access to herbal medications is largely not restricted. In contrast to allopathic prescriptions and over the counter medications, herbal products are mostly marketed without going through clinical examinations (trials) to demosstrate its efficacy or safety. Besides, producers and sellers of herbal medications often make a broad range of efficacy or potecy claims to lure prospective clients to patronize them (Tamuno, Omole-Ohonsi & Fadare, 2010).

Although, some efforts have been made by government and other stakeholders to make modern health services accessible, affordable and acceptable to all people through established unites and institutions, most of these facilities are located far away from the communities they serve and poor road network of some of the communities to the health facilities keep worsening the inaccessibility factor, especially during the rains. These and many other factors make it difficult for people in rural communities to benefit from quality health care and certainly make herbal medications an ultimate choice for them (WHO, 2010).

2.6 Significance of Herbal Medicine

According to the World Health Organization the use of herbal medicine in the world outnumbers orthodox medicine by two to threefold (WHO, 2017; Kofi, 2015).

In developed countries like Germany, Canada, USA, , France and the likes, significant portions of their population(s) had used natural herbs or remedies at least once or more their lives and this

led to a number of medical doctors or practitioners undergoing some training in natural or herbal medicine practice (Sato, 2012; Kofi, 2015).

In most countries in Africa and other developing countries of the world, the marketing and sales of herbal medicines have doubled (US$ 3.1 billion to US$8.3 billion) over the years (2008 to 2012) (Sato, 2012; Kofi, 2015). The incidence and factors influencing herbal medicine use is largely not known, though it is believed to be broader. Clients and the general population have widely been engaged in self-herbal prescriptions for the maintenance of their health, for the treatment of various illnesses and also for protracted illnesses (Fakeye, Rasa & Musa, 2009; Kofi, 2015)

In Africa pregnant women engage in herbal medicine use for so many reasons including prevention from evil spirit, healthy development of the fetus, to facilitate childbirth, to reduce pain during labor, to cure malaria and to reduce uncomfortable signs during early pregnancy (Malan and Neuba, 2011; Kofi, 2015).

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This section of the study looks at how the study is going to be conducted. It will look at the design used, the study setting, the population and the sampling method used in getting the participants for the study. Also, the tools used in collecting the data and the method in analyzing and interpreting the data.

3.2 Research Design

It is a cross-sectional design and employs quantitative data gathering methods. The quantitative design facilitates the collection of accurate and tangible data.

3.3 Study area

The study area is the Nalerigu community which is the capital of the North East Region, Ghana.

Nalerigu is the capital of North-East Region which is located in the northern part of the country and was esterblished by law in December 2018 through a referendum to separate it from the Northern region. Nalerigu is the largest town in the East Mamprusi Municipality, North- East Region. It is also the traditional capital of the Mamprusi people thus the traditional seat of the king (Nayiri) of Mamprugu. It has an estimated population of about 14,927 (population census,2010). It is predominantly a Mamprusi community. Other ethnic groups include; the Kusasis, Konkombas, Bimobas, Mossis, Chokosis and Bisa. The religious groups also include; Islam, Christianity and African Traditional religion.

The North- East Region is one of the sixteen regions of Ghana. The East Mampurusi District has one health center at Gambaga and a mission hospital owned and managed by the Baptist Church and supposed to be the biggest health facility within the district with 123-bed serving tens of

thousands of patients annually. It has 3 other health posts located at Langbinsi, Sakogu and Gbintiri. The Baptist medical Center is the major referral center in the district.

The District has three large markets at Nalerigu, Langbinsi and Gbintiri which help the District Assembly to gather resources for development. The main means of transportation for the people are motor bikes, bicycles as well as commercial vehicles. The major economic activity in the area is farming and trading in farm produce. Other economic activities includes; petty trading and sales of provisions.

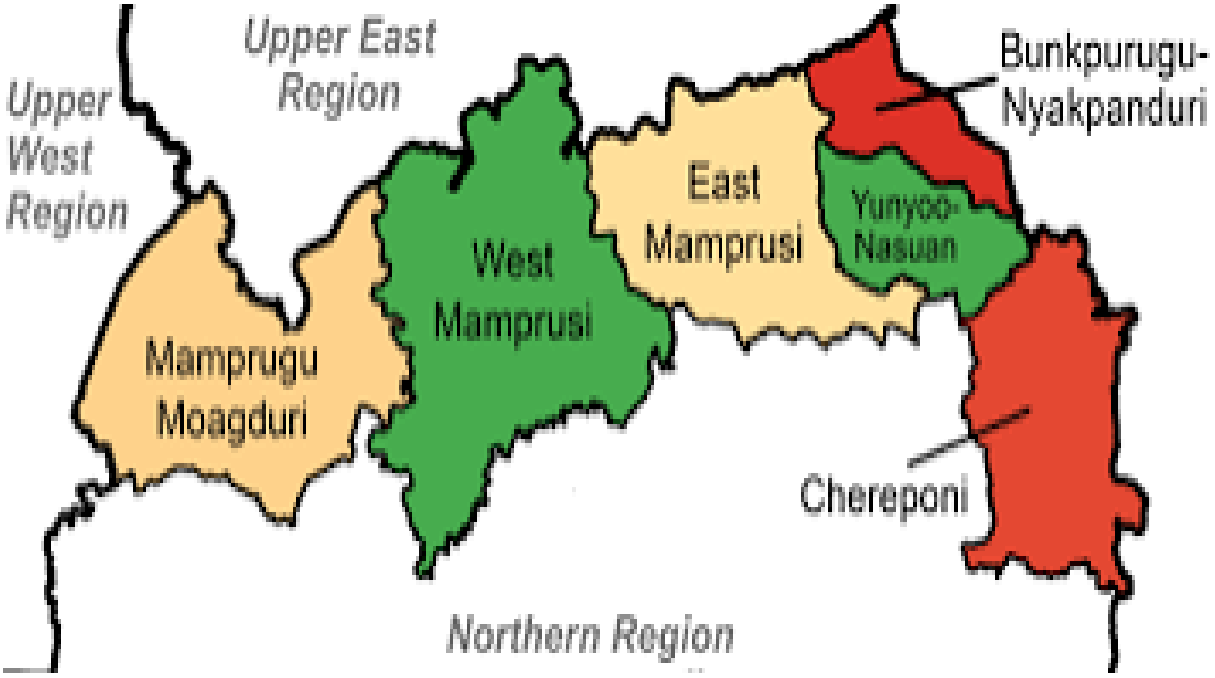

Figure 2: Google Map of North East region/East Mamprusi District

3.4 Study population

The study included every pregnant women of reproductive age who live within Nalerigu and attends ANC at BMC, Nalerigu. The population is a single sample population. The population will only contain women who are pregnant. It included all pregnant women from age 16-49 years of age within and around Nalerigu community. Consent was sought from the parents and husbands of pregnant women who were below 18 years of age but satisfy the inclusion criteria.

3.5 Inclusion and exclusion criterion

Inclusion criteria

1. The study included all pregnant women of reproductive age of 16 to 49 years.
2. It included all pregnant women attending ANC at BMC only and lives within and around the Nalerigu community.

Exclusion criteria

1. The study excluded pregnant women below the age of 16.
2. It excluded pregnant women who do not attend ANC at the Baptist Medical Center in Nalerigu.
3. It excluded pregnant women who were mentally retarded/ill
4. It excluded also pregnant women who were severely ill

3.6 Sample size

Sample size will contain pregnant women at their reproductive age attending ANC at Baptist Medical Centre in Nalerigu. The Yamane's formula was used to calculate the sample size.

n = N / (1 + Ne^2) Where

n= corrected sample size,

N = population size, and

e = Margin of error (MoE), e = 0.05 at 95% confidence level based on the research condition.

An estimated population of pregnant women attending ANC at BMC in Nalerigu=315. The 315 pregnant women were the total number of pregnant women attending ANC at BMC made available to the researcher upon request from the management of the ANC.

n=315/(1+315)(0.05×0.05)

n=315/1+315×0.0025

n=315/1+0.7875

n=315/1.7875

n=176.223

n=177

177 participants from 315 pregnant women attending ANC at BMC was used for the study. The sample size fairly represents the views of all pregnant women in Nalerigu attending ANC at BMC.

3.7 Sampling technique

The respondents were purposively selected based on the inclusion criteria and the sample size determined (n=177). And also, due to Covid-19 protocols at the BMC's ANC, the pregnant women were put into groups of 20 and scheduled for ANC visits on Mondays and Wednesdays.

This helped in selecting pregnant women fairly from the study area so that the results of the study would represent fairly that of the views of all pregnant women in Nalerigu community.

3.8 Variables

Independent variables

Age, marital status, income level, occupation, education, religion.

These variables were collected based on participants responses on the questionnaire.

Dependent variable

Use of herbal medicine

The 'use of herbal medicine' was measured using the total 'yes' responses from the respondents and measured against the independent variables(age, marital status, income level, occupation, education, religion)

3.9 Instruments for data collection

Structured questionnaires were used to gather the data from the participants from the study area. The questionnaire was designed in English. The questions were interpreted in the local languages such as Mampuruli, Kusal, Moar and Bisa for participants who do not have any formal education.

3.10 Analysis of data

The data obtained was analyzed using Statistical Software for Social Sciences (SPSS) Version 20.the SPSS version 20 is used to quantify variables into summarized frequencies, percentages, charts and Chi-Square analysis is used to measure significant figures and actual results.

3.11 Ethical consideration

Permission was obtained from the Ghana Health Service Ethical Review Committee, the Eat-Mampurusi District Health Directorate and the Baptist Medical Centre and departments such as ANC to enable the researcher carry out this study without any kind of hindrance.

The details and objectives of the study were explained to all participants satisfactorily before obtaining informed consent from them. A written informed consent was presented to participants who could read and write. Consent was sought from the parents and husbands of pregnant women who were below 18 years of age but satisfy the inclusion criteria.The informed consent was translated to participants who could not read and write in Mampuruli, Kusal and Moar and consent was obtained thereafter.

Anonymity, privacy and confidentiality

Information obtained from respondents was held with strict confidentiality. Participants were assured that any information given out during the study would be used for the purpose of the research.

Privacy for each respondent during the interview was ensured. Names of respondents were omitted from the questionnaire

Voluntary participation and right to leave research

Participants had the rights to respond to the questionnaire or not. Participants who wished to stop or opt out during the study or interview had the right to do so without any hindrance.

Possible risks and discomforts

The study procedure did not involve any foreseeable physical, social and psychological risks to respondents or participants. However, there were inconveniencies due to length of time of responding to the questionnaire which was made very brief as possible.

Possible benefits

There was no direct benefits to participants from this study. However, their participation may help evaluate the knowledge and perception of the effectiveness of herbal medicine and risks factors in herbal medicine usage.

Cost

No cost was incurred by participants in this study since participants were interviewed at the hospital when they came for ANC visit.

Compensation

Participants were compensated with a token of washing powder for their participation and time in the study.

3.12 Pre-test

The questionnaire was pretested for sensitivity of questions, reliability, comprehensibility, and appropriateness of language. A 50 sample questionnaires were taken to the Sakogu community clinic and administered to test its reliability, comprehensibility and appropriateness. The questions that were not well-understood were re-shaped for clarity, comprehensibility and appropriateness.

CHAPTER FOUR

DATA ANALYSIS

4.0. Introduction

This chapter deals with the analysis of data collected. It contains the descriptive statistics and quantitative analysis of the data collected from respondents. The descriptive statistics and quantitative analysis will present data on tables and the data is explained making references to the figures contained in the tables.

4.1. Demographic characteristics of respondents

Variables	Frequency	Percentage (%)
Age		
16-19 years	18	10.3
20-29 years	93	53.1
30-39 years	61	34.9
40-49 years	3	1.7
Marital Status		
Single	3	1.8
Married	166	98.2
Level of Education		
No Education	57	32.6
Primary	13	7.4
Middle/JSS	31	17.7
O'level/SSS	34	19.4
Tertiary	40	22.9
Occupation		
Trader	35	20.8
Skilled Work	46	27.4
House Wife	61	36.3
Others (Specify)	26	15.5
Religion		
Christianity	55	32.9
Islam	112	67.1

Table 4. 1: Demographic Characteristics of Pregnant Women Attending Antenatal Care at Nalerigu

The table above (table 4.1) shows the demographic characteristics distribution of pregnant women attending ANC in Nalerigu. The Age distribution ranges from 13 – 49 years of

reproductive age within the Nalerigu community. From the age distribution, 18 pregnant women (10.3%) between the ages of 16 – 19 were pregnant, 20 – 29 (53.1%) making a frequency count of 93 pregnant women, 30 – 39 years (34.9%) making 61 pregnant women and only 3 pregnant women fall between 40 – 49 years (1.7%). Of the 177 pregnant women, 3 (1.8%) are single but pregnant whereas 166 (98.2%) are married.

Fifty seven (32.6%) pregnant women have no any form of formal education. 13 (7.4%) pregnant women had completed primary education whilst 31 (17.7% had completed middle /JSS. 40 (22.9%) pregnant women had completed tertiary education and 34 (19.4%) of them had secondary education. Fifty five (32.9%) were Christians and 112 (67.1%) were Muslims or were in the Islamic faith.

20.8% (35 pregnant women) are into petty trading. A total of 46 (27.4%) are skilled workers. 36.3% (61 pregnant women) are not into any occupation but stay in the house as house wives and 26 pregnant women are into other occupations.

There were non-response to some of the items in the questionnaire and that affect the total response rate in the data.

4.2. The Use of Herbal Medicine and its Practice

Variables	Frequency	Percentage (%)
Ever Heard of Herbal Medicine		
No	37	21.0
Yes	139	79.0
Herbal Medicine Use		
No	108	65.9
Yes	56	34.1
Reason for Herbal Medicine Use		
Closeness to me/Accessibility	5	6.5
Affordability	28	36.4
More Efficacious	41	53.2
In line with my religion	3	3.9
Not Using Herbal Medicine during pregnancy		
The side effects could be dangerous	107	68.2
It is not properly processed	50	31.8
Effectiveness of Herbal Medicine		
No	67	38.5
Yes	107	61.5
Comparing Effectiveness of Herbal and Orthodox Medicine		
Herbal Medicine	28	16.0
Orthodox Medicine	147	84.0
Rate the Safety of Herbal Medicine		
Very Safe	14	8.0
Safe	23	13.1
Somehow Safe	89	50.6
Very Unsafe	50	28.4
Side Effect (s) of Herbal Medicine		
No	123	84.8
Yes	23	15.2
What Type of Side Effect (s)		
Vomiting	23	60.5
Headache	2	5.3
Dizziness	1	2.6
Rashes	2	5.3
Diarrhea	10	26.3
Side Effect (s) with the use of Orthodox Medicine		
No	113	73.9
Yes	40	26.1
Herbal Medicine is Dangerous to Human Health		
Strongly Agree	35	20.7
Agree	88	52.1
Disagree	37	21.9

Strongly Disagree	9	5.3
Reason for using the Herbal Medicine		
Recommendation from friend/family	83	80.6
Recommendation by medical doctor	6	5.8
Decision by self to use herbs	14	13.6
Medical Care System Less Expensive		
Herbal Medicine	87	51.8
Orthodox Medicine	81	48.2
Formal Training for Herbal Practitioners		
No	73	42.0
Yes	101	58.0

Table 4. 2: The use of herbal medicine and its practice

Of the 177 pregnant women, 37 (21.0%) of them have never heard of herbal medicine whereas 139 (79.0%) have heard of herbal medicine. Out of 177 pregnant women, 108 (65.0%) have not used herbal medicine during and prior to their pregnancies. 34.1% (56 pregnant women) have used various herbal products prior and during their pregnancies. Of the 177 pregnant women, 41 (53.2%) use herbal medicine because it is more efficacious. 28 (36.4) agreed they used herbal medicine because it is affordable. 5 (6.5%) use herbal medicine because it is close to them or easily accessible and 3 (3.9%) pregnant women agreed they used herbal medicine because it is in-line with their religious. Of the 177 pregnant women interviewed, 107 (68.2%) would not use herbal medicine because they think the side effects may be dangerous to their health and 50 (31.8%) pregnant women feel they would not use herbal medicine because it is not properly processed.

Among the 177 participants, 67 (38.5%) of the pregnant women believe that herbal medicine is not effective whiles 107 (61.5%) of them believe that herbal medicine is very effective. It is however, clear in the data that, although, 61.5% of them believe in the efficacy of herbal medicine only a few (56 pregnant women) out of 177 engage in its use.

Of the 177 pregnant women, 147 (84.0%) believe that orthodox medicine is more effective in the treatment and management of diseases than herbal medicine whereas 28 (16.0%) pregnant women feel herbal medicine is more effective. Out of a total of 177 pregnant women, 89 (50.6%) feel that herbal medicine is somehow safe and 14 (8.0%) and 23 (13.1%) feel herbal medicine very safe and safe respectively. 50 (28.4%) feel herbal medicine is very unsafe. From the data, it is realized that most of the pregnant women found herbal medicine unsafe and that explains why only 34.1% of them out of the 177 respondents use herbal medicine during their pregnancies.

One hundred and twenty (84.8%) of pregnant women agreed that, herbal medicine has no effects on their health whiles 23 (15.2%) agreed herbal medicine has effects on health. Vomiting appears to be as the major side effect of herbal medicine use. 23 (60.5% of pregnant women experience vomiting and nausea when they use herbal medicine. 10 (26.3%) said they use herbal medicine whiles 2 (5.3%) experience headache. 1 (2.6%) pregnant complains of dizziness and 2 (5.3%) experience rashes. Of the 177 pregnant women, 113 (73.9%) believe orthodox medicine has no side effects whiles 40 (26.1) agree orthodox medicine has side effects.

Eighty eight (52.1%) of pregnant women agree herbal medicine is dangerous to human health. 35 (20.7) strongly agree that herbal medicine is dangerous to human health whiles 37 (21.9%) disagree and 9 (5.3%) strongly disagree that herbal medicine is dangerous to human health.

Eighty three (80.6%) said they used herbal medicine because it was recommended to them by friends/family. 6 (5.8%) said it was recommended by medical doctor whiles 14 (13.6%) said they took the decision to use herbal medicine by themselves.

Of the 177 pregnant women, 87 (51.8%) believe herbal medicine is less expensive as compared to orthodox medicine whiles 81 (48.2%) agree orthodox medicine is less expensive.

Seventy three (42.0%) pregnant women in Nalerigu do not support the training of herbal practitioners whiles 101 (58.0%) of pregnant women want or support the formal training of herbal practitioners. From the data it is realized that the total response rate is supposed to be 177 however, 3 responses are missing this may be due to non-response to the question.

4.3. Herbal medicine use, level of education, religion and occupation

Variables	Herbal Medicine Use	
	No	Yes
Level of Education		
No Education	31	21
Primary	6	6
Middle/JSS	18	11
O'level/SSS	24	6
Tertiary	29	11
Occupation		
Trader	19	8
Skilled Worker	34	11
House Wife	31	29
Others (Specify)	19	5
Religion		
Christianity	29	23
Islam	71	32

Table 4. 3: Herbal medicine, level of education, religion and occupation

The table above (table 4.3) gives statistics on level of education, occupation and religion and how it may influence herbal medications use among pregnant women in Nalerigu.

From the table (table 1.3), 21 pregnant women who have no education at all use herbal medicine whereas 31 of them do not use herbal medicine at all. Again, 6 of them who have primary education have used herbal medicine whilst 6 of them did not use herbal medicine. 24 of them who have attained Secondary/O' Level education have not used herbal medicine whiles 6 of them have used herbal medicine.

Also, 29 of them who have attained higher education (tertiary) have not used herbal medicine whiles 11 of those who have attained tertiary education have used herbal medicine.

Seventy one pregnant women who are Muslims have not used herbal medicine whiles 32 of them have used herbal medicine. Also, 29 pregnant women who are Christians have not used herbal medicine whiles 23 pregnant women who are Christians have used herbal medicine.

4.4 Association between sociodemographic variables and herbal medicine usage among women in Nalerigu.

Characteristics	Pearson Chi-Square Value	P-value
Age	4.561	0.207
Marital Status	1.629	0.202
Level of Education	5.904	0.206
Occupation	9.412	0.024
Religion	2.615	0.106

Table 4. 4: Association between sociodemographic variables and herbal medicine usage among women in Nalerigu.

The table above (table 4.4) indicates a Pearson Chi-Square analysis of the various demographic variables of pregnant women in Nalerigu to know if there is/are associations between those variables and the use of herbal medications among pregnant women in Nalerigu. The p-values in the table indicate that there are no statistically significant associations between those variables(age, marital status, level of education, occupation and religion) and the use of herbal medicine among pregnant women attending ANC in Nalerigu as their (p-values .207, .202, .206, .024, .106) are greater than 0.005($p>0.005$). This implies that pregnant women may or may not use herbal medicine regardless their age, marital status, level of education, occupation and religion.

4.5 Fisher's Exact test association between sociodemographic variables and herbal medicine usage among pregnant women in Nalerigu.

Characteristics	Fisher's Exact Test Value	P-value
Age	4.475	0.183
Marital Status		0.247
Level of Education	5.955	0.200
Occupation	9.018	0.028
Religion		0.113

Table 4. 5: Association between sociodemographic variables and herbal medicine usage among pregnant women in Nalerigu.

The table above (table 4.5) indicates a Pearson Chi-Square fisher's Exact Test analysis of the various demographic variables of pregnant women in Nalerigu to know if there is/are associations between those variables and the use of herbal medications among pregnant women in Nalerigu. The p-values in the table indicate that there are no statistically significant associations between those variables(age, marital status, level of education, occupation and religion) and the use of herbal medicine among pregnant women attending ANC in Nalerigu as their (p-values .207, .247, .200, .028, .113) are greater than 0.005 (p>0.005). This implies that pregnant women may or may not use herbal medicine regardless their age, marital status, level of education, occupation and religion.

4.6: Comparing effectiveness of herbal and orthodox medicine

	Observed N	Expected N	Residual
Herbal Medicine	28	87.5	-59.5
Orthodox Medicine	147	87.5	59.5
Total	175		

	Chi-Square	df	P-value
Comparing Herbal and Orthodox, which one is more effective?	80.920	1	0.000

Table 4. 6: Comparing effectiveness of herbal and orthodox medicine

The table above shows a chi-square goodness of fit test to determine the perception of the effectiveness of herbal medicine by pregnant women attending ANC in Nalerigu in relation to orthodox medicine. The effectiveness of herbal medicine in relation to orthodox medicine was statistically significant X^2 (1, N=177) =80.92, P<0.001. More pregnant women attending ANC in Nalerigu feel orthodox medicine is more effective than herbal medicine.

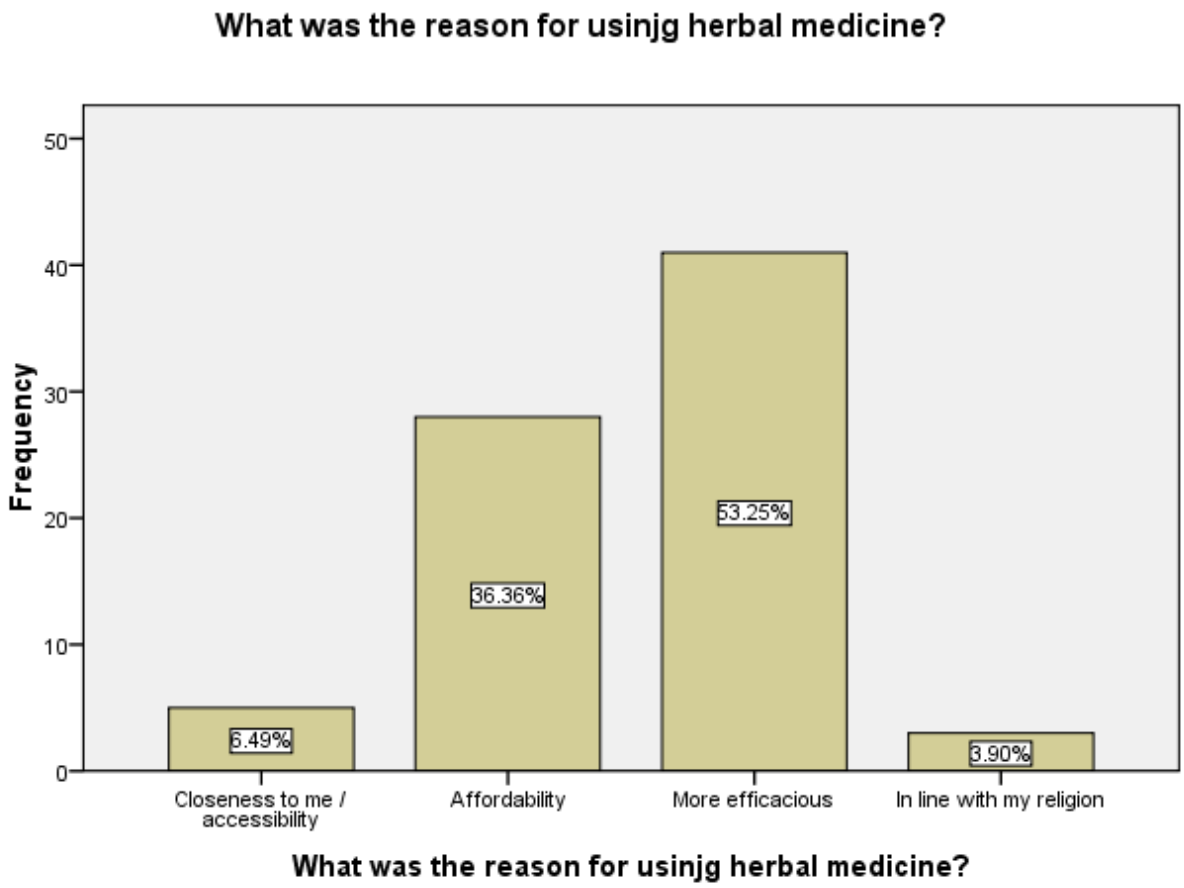

Figure 3: A Bar Chart of reasons for using herbal medicine

The bar chart indicates various reasons why pregnant attending ANC in Nalerigu will use herbal medicine. 53.2% of the respondents would use herbal medicine because they feel it more efficacious. 36.3% would use herbal medicine because it is affordable whiles 6.4% would use it

because it is easily accessible and 3.9% of the respondents would use herbal medicine because it is in line with their religion.

CHAPTER FIVE

DISCUSSION

5.0. Introduction

This chapter contains the discussions of the results and the how it answers the research questions and in relation to other researches/articles on herbal medicine use by pregnant women as well as the conclusion drawn based on the findings. The chapter will also discuss the objectives of the research in relation to the findings.

5.1. Discussion

The research was conducted in Nalerigu, a community and the regional capital of the North-East region which harbors the biggest hospital (Baptist Medical Center) within which the participants of the study were sampled. 177 participants were selected for the study. Among the respondents the highest reproductive age group in the community was 20-29 years making 53.1% of the total respondents/participants (table 1.1). 98.2% were married and living with their spouses whiles only 1.8% (3 women) of them were pregnant but single. The research reveals that 32.6% of the pregnant women attending ANC in Nalerigu were not educated or have not received some form of formal education but that did not account for their use of herbal medicine. Also 36.3% (61) of the respondents were not engage in any income generating activities (unemployed) but stay in the house as house-wives whiles 61.7% are in the Islamic faith and 32.9% are Christians(table 1.1).

To what extent do pregnant women in Nalerigu patronize herbal medicine?

The research reveals a prevalence of 34.1% of herbal medications use among pregnant women attending ANC in Nalerigu. This implies that out of the 177 pregnant women who responded to the questionnaire only 34.1% (56) of them has used or has ever used herbal medications during and before their pregnancies (table 1.2) with 53.2% thinking that herbal medicine is more efficacious, 36.3% felt herbal medicine is affordable, 9.4% used it because it is easily accessible whiles 3.9% used it because it is in line with their religion (table 1.2). This also means that although herbal medicine is being used by some of the pregnant women attending ANC in Nalerigu but a large number of them do not use herbal medicine. The above statistics (34.1%) determines the prevalence of herbal medications use among pregnant women in Nalerigu. This is in consonance with Mawuza T. et al., (2019) where they reported that herbal medications use is a common practice in developing countries and that pregnant women in Africa and other developing countries use herbal medications during pregnancy, at labor and during postpartum care in rural communities. Similarly, the WHO estimates that 60% of the population of the world rely on herbal medications, with up to about 80% of Africa's population using herbal medications to complement or meet their healthcare needs. A study by Robinson confirmed that these rates could be more (95%) (Mawuza T. et al., 2019). Again, Makuria et al., (2017) on pregnant women who attended ANC clinic at University of Gondar teaching hospital, northwest Ethiopia, 48.6% used herbal medications during current pregnancy, with two thirds (68.4%) reporting use during the last trimester. These findings according to the researchers are similar to reports from Western Ethiopia (50.4%) and in Malaysia (51.4%). Moreover, a study conducted by Ayelyini B. et al., (2019) to assess the determinants of herbal medications use and its impact on child-birth outcomes in rural districts in Ghana revealed 64.9% and 45.4% of the respondents

had used local herbal medication (oxytocin) in their past and current pregnancies. Herbal medicine use in Ghana has become so rampant in rural communities despite the antenatal care services availability in many areas in the country. Also, in a study by Ameade , (2017) to assess the of herbal medications use by pregnant women saw that, out of 370 self-confessed pregnant women in 28 randomly selected communities of Tamale metropolis, the level of patronage of herbal medication was 43.5% prior and 52.7% during pregnancy with most of the herbal preparation used prior and during pregnancy being packaged or wrapped. Herbs have become the first point of call during pregnancy in most rural communities in Ghana (Pepra et al., 2019). A 34.1% (56) out 177 pregnant women attending ANC in Nalerigu who responded to using herbal medication indicates the practice is a common phenomenon among pregnant women in Ghana and Africa.

Are there any side effects with the use of herbal medicine?

Of the 177 respondents 15.2% (23) agree that herbal medications have side effects and 84.8% (123) disagree that herbal medicine has side effects (table 1.2). This implies that a large number of the pregnant women attending ANC in Nalerigu feel that herbal medicine has no side effects whether they have used it or not used it. Again 52.1% (88) of the respondent agree that herbal medicine is dangerous to human health, 20.7% (35) strongly agree, 21.7% (37) disagree and only 5.3% (9) strongly disagree that herbal medicine is dangerous to human health (table 1.2). Moreover, the 34.1% of respondents who have used herbal medicine, have reported various side effects such as vomiting (60.5%) , headache (5.3%), dizziness (2.6%), skin rashes (5.3%) and diarrhea (26.3%). This implies that there are side effects associated with the use of herbal medications by pregnant women attending ANC in Nalerigu. Also, regarding the safety of herbal

medicine use only 8.0% (14) of the respondents feel that herbal medicine is very safe, 28.4% (50) feel it very unsafe and 50.6% (89) feel herbal medicine use is somehow safe (table 1.2).

Most pregnant women have found herbal medicine somehow safe whiles others feel that there are risks involved in herbal medicine consumption. Mensah et al., (2017) in their study on safety and effects of medicinal plants revealed that, medicinal plants contain bioactive compounds which indicate both intra- and inter-species differences in type and content. Some herbal plants are intrinsically toxic due to their constituents and can be dangerous if inappropriately used. Again, Herbal medicines may interact with orthodox medicines and some vitamins and minerals. For instance, ginkgo biloba, when taken with ibuprofen may cause spontaneous bleeding. Garlic when taken in high dose may also trigger the adverse effects of anticoagulant and anti-platelet drugs such as aspirin, enoxaparin and others (IUPAC, 2011).

Tariku Laelago, (2017) reported that ginger may not be a safe herb during pregnancy. He highlighted that, ginger could cause destruction or abortion with high doses of consumption. Higher doses of ginger could cause thinning of blood, stomach upsets and heartburns. In the same study, Tariku Laelago cautioned that, excessive use of garlic must be avoided in early pregnancy.

Additionally, adulteration or inappropriate or poor formulation, or lack of knowledge of plant and drug interactions could lead to adverse reactions that are sometimes dangerous and life threatening (Lucas, 2010; Elvin-Lewis, 2012).

Again, pregnant women with thyroid disorders must avoid it use. Also, a study by Ahmed et al, (2018) revealed that, most common side effects of herbal medications reported during pregnancy were dry mouth, nausea and vomiting, drowsiness, diarrhea and palpitation. These coincide with

the various side effects of herbal medications use among pregnant women in Nalerigu such as vomiting (60.5%), headache (5.3%), dizziness (2.6%), skin rashes (5.3%) and diarrhea (26.3%).

A review of 74 published studies found that a handful of certain herbal products could increase risks of pregnancy complications including preterm deliveries and caesarean deliveries (Amy Norton, 2019). The review also indicated that so little is known about the herbals in terms of effectiveness and safety. These undoubtedly, imply that herbal medicine use could certainly have dangerous effects on pregnant women and the unborn-babies.

What is the perception about the efficacy of herbal medicine in relation to orthodox medicine?

Interestingly, of the 177 respondents 61.5% (107) feel that herbal medication is effective in the treatment and management of diseases whiles 38.5% (67) believe that herbal medication is not effective in the treatment of diseases/illnesses (table 1.2). However, a Chi-Square Goodness of Fit analysis indicates a statically significant association less than 0.001, X^2 (1, N=177)=80.92, P<0.001 in comparing the effectiveness of herbal medicine with orthodox medicine, which means more pregnant women attending ANC in Nalerigu believe that orthodox medicine is more effective than herbal medicine (table 4.6) in the treatment of diseases/illnesses. This also implies that although some of the pregnant women who used herbal medications still believe that orthodox medicine is more effective in the treatment of diseases/illnesses than herbal medicine.

Africans perceived the use of herbal medications as necessary for the protection and safety of pregnant women and the unborn baby as it is in consonance with beliefs and cultural practices in Africa (Van der Geest & Theobald, 2010). This however, contradicts the findings of this study as

it indicates that pregnant women believe in the efficacy of orthodox medicine than herbal medicine although they still use herbal medicine for the treatment of various ailments.

Others also argued that the potency of herbal medicines supersedes other medicines or any other factor, so people's derogatory comments and disregard about herbal medications must not be regarded (Sato, 2012). However, this study contradict this assumption as results clearly show that 84% (147) (orthodox) as against 16% (28) (herbal) of respondents believe orthodox medicine is more effective than herbal medicine in the treatment of various ailments. Again, a significant association less than 0.001, X^2 (1, N=177) =80.92, P<0.001 in comparing the effectiveness of herbal medicine with orthodox medicine indicates that orthodox medicine is more effective than herbal medicine, which means more pregnant women attending ANC in Nalerigu believe that orthodox medicine is more effective than herbal medicine (table 4.6) in the treatment of diseases/illnesses.

Use of herbal medicine and its practice

Of the 177 pregnant women attending ANC in Naleigu, 37 (21.0%) of them have never heard of herbal medicine whereas 139 (79.0%) have heard of herbal medicine. Out of 177 pregnant women, 108 (65.0%) have not used herbal medicine during and prior to their pregnancies. 34.1% (56 pregnant women) have used various herbal products prior and during their pregnancies. Among the 177 participants, 67 (38.5%) of the pregnant women believe that herbal medicine is not effective whiles 107 (61.5%) of them believe that herbal medicine is very effective.

Of the 177 pregnant women, 147 (84.0%) believe that orthodox medicine is more effective in treating and managing illnesses than herbal medicine although some of them still use herbal medicine whereas 28 (16.0%) pregnant women feel herbal medicine is more effective. Out of a

total of 177 pregnant women, 89 (50.6%) feel that herbal medicine is somehow safe and 14 (8.0%) and 23 (13.1%) feel herbal medicine very safe and safe respectively. 50 (28.4%) feel herbal medicine is very unsafe.

A Pearson Chi-Square analysis of the various demographic variables of pregnant women in Nalerigu was computed to know if there is/are associations between those variables and the use of herbal medications among pregnant women in Nalerigu. The p-values in the table indicate that there are no statistically significant associations between those variables(age, marital status, level of education, occupation and religion) and the use of herbal medications among pregnant women attending ANC in Nalerigu as their (p-values .207, .202, .206, .024, .106) are greater than 0.005($p>0.005$). This implies that pregnant women may or may not use herbal medicine regardless their age, marital status, level of education, occupation and religion ((table 1.4). This is in consonance with a study by Biazar et al., (2017) where the rate of herbal medication consumption during pregnancy was related to education and resistance, however, there was no correlation with age and employment. This contradicts findings by Shewamene et al., (2017) where frequent herbal medicine use was rampant among pregnant women with no formal education, low income, and living far in distances to public health facilities.

A Pearson Chi-Square fisher's Exact Test analysis of the various demographic variables of pregnant women in Nalerigu was also computed to know if there is/are associations between those variables and the use of herbal medications among pregnant women in Nalerigu. The p-values in the table indicate that there are no statistically significant associations between those variables(age, marital status, level of education, occupation and religion) and the use of herbal medicine among pregnant women attending ANC in Nalerigu as their (p-values .207, .247, .200, .028, .113) are greater than 0.005 ($p>0.005$). This implies that pregnant women may or may not

use herbal medicine regardless their age, marital status, level of education, occupation and religion.

The bar chart analysis of the reasons for herbal medications use among pregnant women who attend ANC in Nalerigu indicates various reasons why pregnant women attending ANC in Nalerigu used herbal medicine. 53.2% of the respondents would use herbal medicine because they feel it more efficacious. 36.3% would use herbal medicine because it is affordable whiles 6.4% would use it because it is easily accessible and 3.9% of the respondents would use herbal medicine because it is in line with their religion. Similarly, Malan and Neuba, (2011) reported high incidence of herbal medications use during pregnancy highlighting its safety, accessibility, affordability, cultural compatibility and comfortability of use as the reasons for herbal medicine use aside to prevent malaria, promote healthy fetal growth, prevent miscarriage, ensure ease labor and to good-looking babies.

Formal training of herbal practitioners

One hundred and one (58.0%) of pregnant women in Naleigu want or support the formal training of herbal practitioners whiles 73 (42.0%) pregnant women in Nalerigu do not support the formal training of herbal practitioners. the majority of individuals in Africa lack access to healthcare, and even where healthcare services are available, the quality is poor or compromised. This circumstance is further deepened by extreme financial constraints, high population growth, political discontinuity, high inflation, low income levels and poor economic growth and environment (WHO, 2009). For this reason it is would prudent to train herbal practitioners to be able to meet certain standards that will help complement the already insufficient health system in most rural communities. Herbal medicine use has become so relevant in our medical system to the extent that, it is important to formally train its practitioners to augment the current orthodox

system. The Kwame Nkurumah University of Science and Technology (KNUST) in collaboration with the Ghana Dental/medical council have taken over the mantle to train and certify qualified herbal practitioners in Ghana although majority of them are still in practice without training and licenses.

5.2. Limitations

The major shortfalls of this study is that, the sample size is too small (177) and the findings may not be generalize to the entire district of East Mamprusi. In addition, the study was only limited to pregnant women who attend ANC in Nalerigu.

Again, the missing values were so much and may affect the validity or accuracy of the data. This was as a results of some of the respondents failing to respond to some of the questions on the questionnaire or could not understand the questions. The response rate has been affected because many of the questions on the questionnaire were not responded to by the respondents. This affected the total percentages of some of the data and has the possibility of affecting data accuracy.

Also, research assistants could not meet the respondents in large numbers at their regular visit to the ANC at the Baptist Medical Center due to the corona virus protocols. The pregnant women did not visit the ANC regularly due to corona virus pandemic and so the data collection process was staggering.

In addition, the study could not do laboratory analysis of the side effects of the use of herbal medications among pregnant women who attend ANC in Nalerigu. The effects were based on perceptions and experiences from respondents.

Moreover, acquiring the services of the research assistants and interpreters was a difficult task and the charges for their services was also difficult to meet.

Lastly, interpretation of the questionnaire in some local languages such as ‘Kusal’ and ‘Bimoba’ was a challenge and finding interpreters in those languages was a problem. That also accounted for the missing values in the data.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

5.1. Key Findings

The research was conducted in Nalerigu, a community and the regional capital of the North-East region which harbors the biggest hospital (Baptist Medical Center) within which the participants of the study were sampled. 177 participants were selected for the study. The key findings include:

1. The research reveals that a number of pregnant women attending ANC at BMC use herbal medicine in Nalerigu . a prevalence of 34.1%(56)
2. A significant number of the pregnant women attending ANC in Nalerigu disagrees that herbal medicine has side effects.
3. Again, most of the pregnant women (52.1%) who attend ANC in Nalerigu feel that herbal medications are dangerous to human health.
4. Also, the 34.1% of respondents who have used herbal medicine, have reported various side effects such as vomiting (60.5%), headache (5.3%), dizziness (2.6%), skin rashes (5.3%) and diarrhea (26.3%).
5. Of the 177 respondents 61.5% (107) feel that herbal medications are effective in the treating and managing diseases whiles 38.5% (67) believe that herbal medications are not effective in the treatment of diseases/illnesses.
6. Lastly, a significant number of the pregnant women attending ANC in Nalerigu believes orthodox medicine is more efficacious than herbal medicine. a Chi-Square Goodness of Fit analysis indicates a statically significant association less than 0.001,

X^2 (1, N=177) =80.92, P<0.001 in comparing the effectiveness of herbal medicine with orthodox medicine

5.2. Conclusion

From the analysis it can be concluded that, a number of pregnant women (34.1%) who attend ANC in Nalerigu use herbal mediciations. This means that, despite the side effects, health education and the orthodox medication given them at the ANC at the Baptist Medical center (BMC) the pregnant women still prefer to use herbal medicine. It also implies that some of the pregnant women still found herbal medicine very effective (61.5%) and somehow safe (50.6%) and may use it if need be. This could result in most pregnant women in the Nalerigu community delay in going for Antenatal services or default in antenatal attendance. Again, the use of herbal medications among pregnant women who attend ANC in Nalerigu could be influenced by the perception that herbal medications are effective in treating illness, it is affordable, easily accessible and less expensive as compared to orthodox medicine in the Nalerigu community.

5.3. Recommendations

First, the formal training of herbal medical practitioners is recommended. The training will equip the practitioners the requisite medical knowledge of determining the right dosage of herbal medication for prospective clients.

Secondly, the district health directorate or the Baptist Medical center must intensify health education within the Nalerigu community and its environs to sensitize pregnant women on the need to seek for antenatal services during pregnancy. They can educate the community on free maternal healthcare and available services within the ANCs of the various hospital in the East-Mamprusi district. This will help eliminate the delays and default in antenatal attendance in the community.

Lastly, the study should be expanded to cover the entire East Mamprusi district if it is to be repeated. The sample size must be increased to ensure generalization. This can be done by including other communities within the district or other districts within the North –East region.

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APPENDIX A: PARTICIPANTS INFORMATION SHEET

This information sheet provides information about the research for pregnant women at Nalerigu in the East Mamprusi District to make an informed decision of whether to participate in the study or not. It outlines the nature of the research, what the research involves, risks, benefits and compensation.

Title of Study: "the use of herbal medicine among pregnant women attending ANC in Nalerigu, East Mampurusi District".

Introduction: I am Abdul-rahaman Nurideen Andani a Master of Science in Applied Health Social Science student at the School of Public Health of the University of Ghana, Legon. My email address is abdulrahamanandani@yahoo.com and my telephone number is 0249182181. I am conducting a research on the topic: The use of herbal medicine among pregnant women in Nalerigu, East Mamprusi District, North East Region

Nature of research: This study is a quantitative research study, focusing on the use of herbal medicine among pregnant women in Nalerigu, East Mamprusi District, North East Region. I am interested in finding how pregnant women use herbal medicine in Nalerigu in East Mamprusi district I am using 177 pregnant women who attend ANC at the Baptist Medical Center.

Participants Involvement: I would like to invite you to participate in this study because you are a pregnant woman who is at least married or cohabiting and have visited this facility. I believe that you can help me by providing the appropriate responses.

Duration /what is involved: A questionnaire will be provided for pregnant women to answer in order to obtain information on their perception on the effectiveness of herbal medicine, factors influencing their use of herbal medicine and the side effects of herbal medicine. This information

will then be entered into a statistical software for analysis. If you are interested in participating in this study, you can go ahead and fill in a consent form. Well trained research assistance will be around to assist you if you need any clarifications. The questionnaire and interview will take atleast 25-30 minutes and 45 minutes-60 minutes at most.

Potential Risks: There would be no anticipated risk or harm from the study however there will be discomfort since some of the questions are sensitive. In view of this, the design of the interview guide is well structured to facilitate the discourse. The respondents will be informed about the general nature of the study and assured of no potential harm during the study.

Benefits: Though you may not have any immediate or direct benefits from the study, your responses would be helpful in policy planning and formulation of recommendations to appropriate authorities concerning men support when it comes to the issue of family planning.

Costs: Participation in this study will not cost you any money. You will also not receive any money/incentives for participating in this research.

Compensation: You will be given a token in the form of washing powder.

Declaration of Conflict of Interest: The researcher has no conflict of interest in this study.

Confidentiality: Your name and identity will not be taken in this study. However, the information you are going to provide will be coded and will be treated strictly confidential. You are assured of total confidentiality to the information you will give. Apart from the researcher and supervisor of this research, no one else will have access to information provided whether in part or whole. Data files would be kept for six months after which they will be destroyed or discarded.

Voluntary participation/withdrawal: Participation is voluntary. You are free to choose if you want to take part in this study. Also, you can withdraw your consent at any time without further explanation, and without any adverse consequences. For minors (pregnant women below the age of 18) consent will be sought from the guardian/parent/husband.

Outcome and Feedback: Data gathered will help to improve policy formulation on pregnant women use of herbal medicine.

Feedback to participant: No feedback will be given to you as an individual but a report will be given to the various stakeholders involved in formulating policies on herbal medicine use among pregnant women in Ghana (GHS, MOH etc).

Funding information: The principal investigator is funding this study.

Sharing of participants Information/Data: Data gathered will be kept in my possession and will not be shared with any other organization(s) or individuals. It will be solely mine.

Storage of samples: Data files would be kept for six months after which they will be destroyed or discarded. Clearance will be sought from the Ethics Review Committee before it would be used for any other purpose.

Provision of Information and Consent for participants: You will be given copy of the Information sheet and Consent after it has been signed or thumb-printed to keep.

Who to Contact for Further Clarification/Questions: If you have a concern about any aspect of this research, please contact Abdul-rahaman Nurideen Andani at the School of Public Health, Legon or speak to me on telephone number 0249182181. For further clarification on ethical

issues please contact Madam Abena Apadu, the administrator at the Ghana Health Service Ethics Review Committee on telephone 0503539896.

APPENDIX B: PARTICIPANTS' CONSENT FORM

Literate participants' consent form

I have read the foregoing information regarding this study and I fully understand the purpose of the study. The procedure and processes involved in the study, confidentiality and risk and benefits have been satisfactorily clarified and I have fully understood it. I hereby consent to voluntarily participate in the study.

Signature/thumbprint of participant: _____

Date: _____

Illiterate participants' consent form

The purpose of this study has been read and translated to me in a language that I understand and I have fully understood it. The procedures and processes involved in the conduct of the study, confidentiality and risk and benefits have also been explained and translated to me in my own language of understanding. All my concerns regarding the study have been satisfactorily clarified. I thus hereby consent voluntarily to participate in this study.

Signature/thumbprint of participant: _____

Date: _____

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and satisfactorily explained to me in a language I understand (English, ☐ Mampruli, ☐ Kusaal ☐). I fully understand the contents and any potential implications as well as my right to change my mind (ie withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name or Initials of Participant…….. ID Code ……..

Participants' Signature ……OR Thumb Print…… OR Mark (Please specify)…….

Date:…….

INTERPRETERS' STATEMENT (where applicable)

I interpreted the purpose and contents of the Participants' Information Sheet to the afore named participant to the best of my ability in the (English,☐ Mampruli, ☐ Kusaal, ☐) language to his proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…….. Date:……

Contact Details

STATEMENT OF WITNESS (where applicable)

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language, he/she understood (English, ☐ Mampruli, ☐ Kusaal, ☐)

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name: ……

Signature……. OR Thumb Print ……..... OR Mark (please specify) ……..

Date: ……

INVESTIGATOR'S STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name…….

Signature …….

Date…….

APPENDIX C: CONSENT FORM OF GUARDIAN/PARENT/HUSBAND OF PARTICIPANT BELOW 18 YEARS OF AGE

Literate parent/guardian consent form

I have read the foregoing information regarding this study and I fully understand the purpose of the study. The procedure and processes involved in the study, confidentiality and risk and benefits have been satisfactorily clarified and I have fully understood it. I hereby consent to voluntary participation of my ward/child/wife/daughter in this study.

Signature/thumbprint of participant: _____

Date: _____

Illiterate parent/guardian consent form

The purpose of this study has been read and translated to me in a language that I understand and I have fully understood it. The procedures and processes involved in the conduct of the study, confidentiality and risk and benefits have also been explained and translated to me in my own language of understanding. All my concerns regarding the study have been satisfactorily clarified. I hereby consent voluntary participation of my ward/child/wife/daughter in this study.

Signature/thumbprint of participant: _____

Date: _____

APP**ENDIX D: QUESTIONNAIRE**

TOPIC: THE USE OF HERBAL MEDICINE AMONG PREGNANT WOMEN ATTENDING ANC IN NALERIGU, EAST MAMPRUSI DISTRICT

The data of this questionnaire(s) is/are being collected by ABDUL-RAHAMAN NURIDEEN ANDANI a student from the University of Ghana at the school of public health. The data is for research purposes only. It is not part of any project of the government, political party or commercial enterprise. All information given will be kept confidential and for academic purposes only. Thank you for your cooperation.

SECTION A

Socio-Demographic Information of Respondent

1. Age of mother (in years). 16-19 { } 20-29 {} 30-39 {} 40-49 {}

2. What is your marital status? Single { } Married {} Divorced {} Others…….

3. Level of education? No education { } Primary { } Middle/JSS{ } O'level/SSS { } Tertiary { }

4. Occupation? Trader { } Skilled worker { } House wife { } Others(specify)….

5. Religion Christianity { } Islam { } Traditionalist { }

SECTION B:

Patronage/Use of Herbal Medicine

6. Have you ever heard of herbal medicine? Yes { } No { }

7. If yes (Q6), Have you used any herbal medicine during your pregnancy? Yes { } No { }

8. What was the reason for using herbal medicine? Closeness to me/accessibility { } Affordability { } More efficacious { } In line with my religion { }

9. Why do you not use herbal medicines during your pregnancy? The side effects could be dangerous {} It is not properly processed {} It is because of the spiritual rituals associated with it

SECTION C

Perception about the Efficacy of Herbal Medicine

10. Do you think herbal medicine is effective in the treatment of diseases/illnesses? Yes{} No{}

11. Comparing herbal medicine to orthodox medicine, which one do you consider more effective? Herbal Medicine { } Orthodox medicine { }

12. How would you rate the safety of herbal medicine? Very safe { } Safe { } Somehow safe { } Very unsafe { }

SECTION D

Side Effects of Herbal Medicine

13. Have you ever experienced any adverse side effect(s) with the use of herbal medicine? Yes { } No { }

14. What side effects have you experienced since you began using the herbal medicine? Vomiting { } Headache { } Dizziness { } Rashes { } Diarrhea ( )

15. Have you ever experienced any adverse side effect(s) with the use of orthodox medicine? Yes{ } No { }

16. It is popularly argued that the use of herbal medicine is dangerous to human health. How far do you agree with this statement? Strongly agree { } Agree { } Disagree { } Strongly Disagree { }

SECTION E

Factors influencing herbal Medicine Usage

17. What influenced your decision to use the herbal medicine? Recommendation from friend/family { } Recommendation by medical doctor { } Decision by self to use the herbs { }

18. Which medical care system do you find less expensive? Herbal medicine { } Orthodox Medicine { }

19. Do you support the formal training of herbal practitioners for the improvement of their practices? Yes { } No { }