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PERCEPTION AND PRACTICES OF PICA AMONG PREGNANT WOMEN IN THE LA NKWANTANANG- MADINA MUNICIPAL

BY

JOYCE HOMMEY

(10150454)

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DECLARATION

I, Hommey Joyce, hereby declare that, this is the result of my own hand work and that no previous submission for a degree done here or elsewhere. Also the work of others which served as reference has been duly acknowledged.

SIGNATURE: _____ DATE: _____

JOYCE HOMMEY

(STUDENT)

SIGNATURE: _____ DATE: _____

DR. PHYLLIS DAKO-GYEKE

(ACADEMIC SUPERVISOR)

DEDICATION

This research work is dedicated to my husband Mr. George Hommey and children Desmond, Ingrid and Georgette not forgetting my best friend Mrs. Anna Agyeiwaa Otokunor (late) for their love, care, directions and moral support in the course of my masters' program.

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ABSTRACT

Introduction

Research from several Western countries has revealed that most pregnant women are likely to engage in pica practice. Despite the dangers associated with pica and its prevalence in various communities across the world and particularly in Ghana, most pregnant women still engage in the practice.Investigation was conducted to assess perception and practices of pica among pregnant women in La Nkwantanang-Madina Municipal.

Methods

A descriptive cross –sectional design was used and data was collected quantitatively using structured questionnaire. A total number of 330 pregnant women were selected using a systematic random sampling technique from population of pregnant women who seek antenatal care from Pentecost Hospital and Madina Polyclinic (Kekele) maternity block. The data was analyzed statistically using SPSS software version 21. The association of consumption of non-food items and reasons for practicing pica were determined with the use of Chi square statistics.

Results

The results revealed that majority of the pregnant women (86.97%) had heard about pica practices from various sources (home, television, hospitals/clinics, churches, schools and markets). The results also revealed that 276 pregnant women (83.64%) practised pica and the most non-food items identified to be consumed were Pagophagia (ice, 61.52%), Geophagia (white clay, 52.12%) and charcoal (21.52%) and were mostly consume during first trimester (28.48%) and second trimester (28.79%). The proportion of pregnant

women who practised pica was observed to be 84% of the population. An association of consumption of non-food items and reasons for practicing pica showed that taste (P=0.003), smell (P=0.00), environmental factors (P=0.000), cravings for the non-food items (P=0.004), to control vomiting (P=0.040) and consumption for satisfaction (P=0.001) were significantly associated with pica practice. The results also revealed that some pregnancy symptoms such as vomiting (P=0.000), headaches (P=0.000), itching of skin (P=0.000), dizziness (P=0.015), spitting (P=0.00) were significantly associated with the practice of pica of the pregnant women. The analysis also showed a statistically significant association of pregnant women who have received education on the effects of pica practices and the consumption of the non-food items (P=0.045).

Conclusion

The study accentuates the need for intensive monitoring, education and counseling for pregnant women by healthcare professions on pica practices and its effects.

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LIST OF ACRONYMS

AMA	Accra Metropolitan Assembly
CBR	Crude Birth Rate
CHPS	Community Health Planning Services
DSM-IV-TR	Diagnostic and Statistical Manual of Mental Disorders Text Revision
FDA	Food and Drug Administration
GSS	Ghana Statistical Service
WHO	World Health Organisation

DEFINITION OF TERMS

Pica	A medical disorder identified with the pathological act of eating non-food items. It is also the repeated ingestion of items with no nutritive value over a continuous period of time.
Geophagia	A practice of compulsive eating of earth or soil.
Pagophagia	Compulsive eating of ice.
Trychophagia	Compulsive eating of hair,
Amylophagia	Compulsive eating of starch,
Papyrophagia	Compulsive eating of Paper
Roux-en-y patients	Patients that undergo surgery that involve stapling the stomach to leave a small pouch at the top, which is connected to the small intestine.

CHAPTER ONE

INTRODUCTION

1.1 Background

Pica according to Callahan (2003) is a medical disorder identified with the pathological act of eating non-food items. Generally, it is defined as the repeated ingestion of items with no nutritive value over a continuous period of time (Khoushabi et al., 2014). The craving for these non-food items is normally insatiable and leads to its compulsive consumption. The term pica itself originated from a Latin classification of a forage bird "magpie" that is well known to scavenge both edible and inedible items (Carter et al., 2004). Even though Pica may be practiced by both children and adults alike from all ethnic backgrounds, it is however commonly observed in individuals with certain developmental disabilities like autism and in pregnant women (Ali, 2001). According to Fairburn et al., (1992), abnormal craving for and intake of some food items, such as baking soda and corn starch, are also considered as pica.

Pica can be classified into many different forms depending on the type of non-food item ingested. Several different medical terms have been used over the years to represent the deviations in cravings for specific substances (Parry-Jones & Parry-Jones, 1992). Some forms of pica include geophagia (the compulsive eating of clay), pagophagia (compulsive eating of ice), trichophagia (eating of hair), amylophagia (compulsive eating of purified starch), plumbophagia (eating of lead), picacia, pseudorexia, hapsicoria, pellacia, and geomania among others (Parry-Jones & Parry-Jones, 1992).

The causes of pica are poorly understood though several proposals and theories have been made over the years. While one theory intimates that the intake of non-food substances helps reduce nausea and vomiting during pregnancy, another theory according Barton et al., (2010) stipulated that the deficiency of certain essential nutrient such as calcium or

iron in the body may result in the consumption of non-food items that may contain these nutrients. The replacement effect of non-food items consumed may result in decreased intake of nutritious foods leading to lack of essential nutrients in the body. Meanwhile, some pica substances may contain toxic compounds in quantities not tolerated by the body while some may interfere with the absorption of certain essential mineral elements such as iron.

During pregnancy, nutrition is very essential and cannot be overlooked due to the dependence mother and foetus place on it for their health and nutritional needs. The nutrition of a pregnant woman therefore determines the nutritional and health status of mother and foetus.

The negative health effects of pica for mother and foetus depend heavily on the sort of item consumed. According to Khoushabi et al., (2014) mother could suffer from dental injuries, intestinal obstructions, toxaemia, constipation, lead poisoning, parasitic infections and hyperkalaemia. They stipulated that the foetus on the other hand could suffer from decreased foetal head circumference, low birth weight, irritability and perinatal mortality.

1.2 Problem Statement

Pica in pregnant women is a health issue which is of a great concern since pregnant women must be able to practice good eating habits by consuming nutritious foods that will provide needed nutrients to foetus and mother. Despite this, the habit of consuming non-food items among pregnant women is very common and continues to exist in several countries. `

Documentations from several Western countries have revealed that most pregnant women are likely to engage in pica practice with studies from Canada and New York showing

about 38% prevalence of pica practice (Placek & Hagen, 2013). In sub-Saharan Africa, pica practice has been documented in several countries including Tanzania, Sierra Leone, Nigeria, and Ghana. Pica prevalence in some African countries such as Kenya reported to be as high as 74.0% (Ngozi, 2008) whiles 50% of pregnant women in Nigeria are likely to be practicing pica. In Ghana although information on pica is scanty, the few studies such as that conducted by Koryo-Dabrah et al., (2012) in Accra found 57% of her respondents practiced pica.

Recommendations from these studies indicates that more attention should be focused on nutrition education and intervention programs during pregnancy and also more studies should be conducted considering the complex nature of pica. The La Nkwantanang-Madina Municipal is one of the 16 Municipal Assemblies located in the Greater Accra Region with a population of 130,380 of which women constitute 49%. The issue of anaemia in the district is very problematic. In 2015 alone, about 3774 pregnant women suffered from low haemoglobin level or anaemia with several birth complications. In the 2000 edition of American Dietetic Association's manual of clinical dietetics, it is stated that pica is a psycho behavioural disorder which is of great concern since the non-food items consumed with the practice may not only be harmful to the pregnant women but also to the unborn child as it may replace nutritious foods needed by these pregnant women for a successful pregnancy outcome.

Despite the dangers associated with pica and its prevalence in various communities across the world and in Ghana, it is highly understudied with very little data in that regard. There is a strong evidence of a relationship between pica and anaemia in pregnant women (Young et al., 2010). The profound presence of anaemia in pregnant women in the La Nkwantanang-Madina Municipality and the fact that pica is rarely reported and normally misdiagnosed according to previous studies, even with its high prevalence, makes it

imperative for this research, to examine the perception and practice of pica in pregnant women in the municipality.

1.3 Justification

Despite the documented effects of pica from certain parts of the world and its known prevalence in this part of the world, there is still lack of documented information on the frequency, duration, causes, patterns, perceptions and practices of pica in pregnant women in Ghana.

Information gathered from this study based on the objectives will contribute to the information database of pica in pregnant women in Ghana. It will also help inform health workers on the prevalence of pica in pregnant women and help them to assist pregnant women to make informed choices on foods they consume during pregnancy. This study would also help inform policy makers in developing policies, projects and programs aimed at reducing and eliminating pica practice among pregnant women in Ghana.

1.4 General Objective

The general objective of the study is to examine the perception and practices of pica among pregnant women.

1.4.1 Specific Objectives

The following specific objectives include:

1) To assess pregnant women's knowledge and perceptions about pica.

2) To identify pica practices among pregnant women.

3) To investigate the causes of pica practice among pregnant women.

4) To find out the proportion of pregnant women in the district who practice pica.

1.5 Research Questions

Based on the research objectives, the following research questions will be answered.

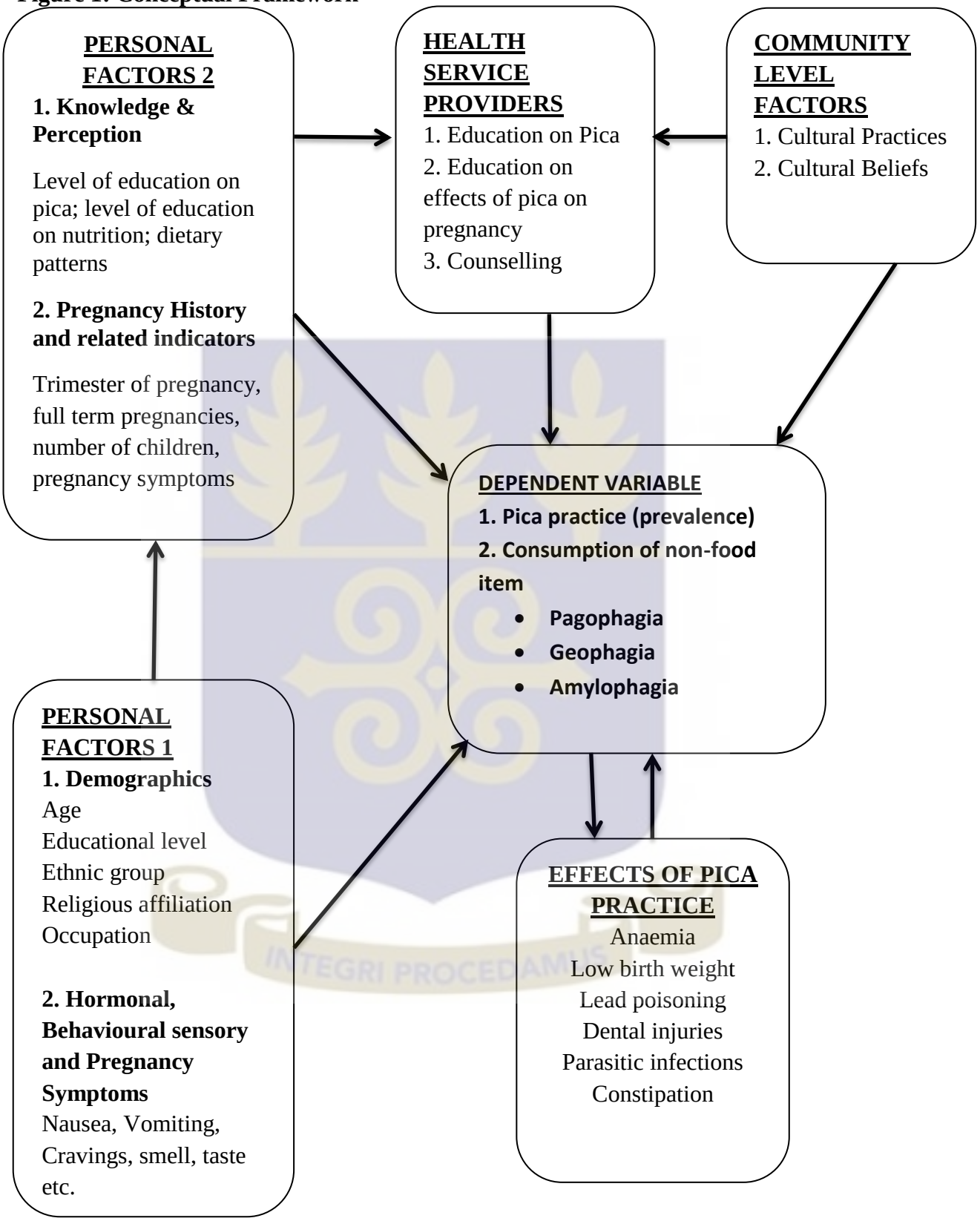
1. What is pregnant women's knowledge and perception about pica?

2. What are the pica practices that pregnant women indulge in?

3. What causes pregnant women to indulge in pica practice?

4 What proportion of pregnant women practice pica in the study area?.

Figure 1: Conceptual Framework



Source: Adapted from Ogallo, 2008

The conceptual framework consists of the outcome variable and independent variables. The outcome variable is the practice of pica and its prevalence in the study area. It would also identify forms of pica and finally the perceived effects on mother and unborn child. The independent variables are made up of the effects of personal, community and institutional actions and behaviours on the outcome variable. The study also sought to determine the relationship among the independent variables.

The personal variables are grouped into two. The first group is made up of demographical factors such as age, occupation, ethnicity, religious belief and internal factors such as hormonal, behavioural, sensory and pregnancy related symptoms. The second personal group consists of externally impacted factors such as acquired knowledge and perception, pregnancy history and related indicators. The impact of the two groups on each other and on the outcome variable would be determined.

The community related variables would determine the cultural practices and beliefs and their impact on the practice of pica in the municipality. The study would also determine the impact of institutional stakeholders like the Ghana Health Service, hospitals and clinics in the study area on the practice of pica.

The conceptual framework of the study is based on several theoretical approaches as described by (Ogallo, 2008). The theories are the sensory/ physiological, cultural / psychosocial, nutritional and neuropsychiatric theories. Nutritional theories claim specific deficiencies of minerals, such as iron and zinc in the body which causes pica. According to the nutritional theories the body causes these strange nutritional cravings as a response to a nutritional depletion or deficiency of some particular nutrients in the body (Ogallo, 2008). The cultural and psychosocial theory suggests that some cultural and religious norms encourage people to compulsively practice pica. This theory also stipulates that some

women actually believe that eating clay while pregnant would be of advantage to the unborn child by cleaning out its intestinal tract in order for it to be born clean (Ogallo, 2008).

The physiological and sensory theories are largely based on the fact that many pica patients report to enjoy the taste, smell or texture of the item they consume (Ogallo, 2008) This theory suggests that pica substances are eaten to curb nausea and vomiting during pregnancy.

The neuropsychiatric theory stipulates that patterns of brain disorders may be associated with pica since studies have shown enough evidence of abnormal eating behaviour being observed in laboratory animals with particular brain lesions (Ogallo, 2008). Pica is normally observed in individuals with brain abnormalities such as autism and mental retardation.

According to Nyaruhucha (2009) pica practice leads to anaemia, intoxication of some compounds like lead which some pica substances may contain in quantities not tolerated by the body, physical effects such as dental injury, parasitic infections and hyperkalaemia. And to the unborn child, low birth weight and exposure to chemicals such as lead.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature review of the study delves into the different literatures used by other researchers in analysing the phenomena and forms of pica, pregnancy symptoms and the prevalence of pica, causes, effects, test and diagnosis, as well as treatments for pica. Such discussions provided more insights into critical areas that contribute towards the achievement of the set objectives for this study.

2.2 PICA: The Phenomenon

Eating or ingestion is a basic part of human life which according to Carter et al., (2004) involves the consumption of foreign substances into the body. They intimated that it is a fundamental component of life whereby the consumed substance is absorbed by the body and utilized as a source of energy. Although babies are born with the ability to feel hunger and to even distinguish between tastes, this ability may not be enough to enable them choose between non-food and food items (Carter et al., 2004). They also added that distinguishing between food and non-food items, is a learned behaviour of the response class, which is developed over time to help individuals identify potential food items.

The ingestion of non-food items have been described in many different ways in various literatures. Pica is a medical disorder identified with the pathological act of eating non-food items (Callahan, 2003). Generally, it is defined as the repeated ingestion of non-food items which is normally insatiable and leads to its compulsive consumption (Ellis & Schlomer, 2009). According to Aparna et al., (2012) the term pica originated from a Latin classification of a forage bird “magpie” that is well known to scavenge on both edible and inedible items. Even though pica may be practised by both children and adults

alike from all ethnicity, it is however normally observed in individuals with certain developmental disabilities like autism and in pregnant women (Ali, 2001). According to Bateson & Lebroy (1978) certain patterns of brain disorders may be associated with pica since studies have shown enough evidence of abnormal eating behaviour being observed in laboratory animals with particular brain lesions.

Carter et al., (2004) indicated that although pica usually refers to the act of eating non-food items, the consumption of food items that are deemed inappropriate for ingestion is also pica. A food item is deemed inappropriate for consumption if it is undergoing decomposition, lacks preparation or may not have the right nutritional value to maintain health. Both humans and animals have been observed to eat non-food items (Carter et al., 2004).

Pica may either involve generalized items like sand, ice and discrete classes of items such as tobacco in tobaccophagia. Pica in humans has many different subgroups and each of these subgroups is defined by the substance ingested. Danford & Huber (1982) identified thirty-six (36) types of pica based on items consumed which consist of both non-food and food items. Some forms of pica classifications include amylophagia (starch), coprophagia (faeces), emetophagia (vomit), geomelophagia (raw potatoes), geophagia (dirt, soil, clay), hyalophagia (glass), lithophagia (stones), mucophagia (mucus), pagophagia (ice), trichophagia (hair), urophagia (urine) and xylophagia. Besides, pica according to other researchers include paint, hair, plaster, (Hakim-Larson et al., 1997) , live wasps, (Danford & Huber, 1982) chalk, vinegar, grass, (Parry-Jones & Parry-Jones, 1992) leather, baby powder, baking soda, chalk, cloth, coffee grounds, crayons, detergents, insects, newspaper, pencils, soap, string, and toilet tissue and many others.

2.3 Pregnancy Symptoms and Prevalence of Pica

World Health Organisation (WHO) defines pregnancy as the nine-month period where a mother carries an embryo in her womb and the embryo later develops into foetus. Due to technological advancements, a variety of means ranging from over-the counter urine tests to X-rays have been developed to confirm the condition of pregnancy. Even though this period usually signifies a period of happiness and fulfilment, the woman and the unborn child are prone to a number of unfavourable health conditions (WHO, 2016). According to Whitehouse (2010) a number of pregnancy symptoms may be observed; these symptoms may range from minor symptoms to more severe ones. Key symptoms of pregnancy include acid reflux (heartburn), constipation, haemorrhoids, depression, back pain, waist pain, head ache, carpal tunnel syndrome, vaginal discharge but not limited to nausea and vomiting among other symptoms.

A number of empirical investigations and studies have focused on changes in pregnancy symptoms and its severity in the course of the pregnancy. It is therefore not new that unique associations between trimesters and key pregnancy symptoms are drawn. Aslan et al., (2014) in an empirical investigation in Turkey established that depression and related factors are strongly related to the first trimester of pregnancy. Others including Lambert-messerlian et al., (2000) and Gonçalves et al., (2015) established a variety of dysfunctional, psychological and physiological disorder with the second and third trimester of pregnancies respectively. Lopez et al., (2012) established significant presence of pica practice in the first, second and third trimesters of pregnancy. A total of 33.9% started practicing pica in the first trimester, 31.5% in the second trimester and 39.0% in the third trimester.

Pica practice is a common condition globally. The practice has evolved into a global public health concern. Several studies in most Western countries have that pregnant women are likely to engage in pica practice; these include studies conducted in areas like Canada and India (Corbett et al., 2000); Placek & Hagen, 2013). These studies elaborate on the prevalence of pica on the global terrain. Corbett et al., (2003) empirically conducted an investigation among 128 pregnant women from two rural communities in Canada and found out the prevalence of pica to be thirty-eight (38%) with African- American women reported to be practicing pica frequently than other ethnicities (Placek & Hagen, 2013). In a study in New York on 491cases of lead poison in pregnant women within a period of 9 years found that most of the samples reported pica (Thihalolipavan, & Ehrlich J., 2013) . Furthermore, the pregnant women who reported pica showed higher peak levels of poisoning than those women who did not report pica.

In sub- Saharan Africa, Njiru, et al., (2011) reported that pica is common among pregnant women in many cultures in Africa. In Tanzania, a study of 204 pregnant and lactating women in 2009 revealed that the proportions of women with dietary cravings, aversions, and pica were 73.5%, 70.1% and 63.7% of all the women respectively. Most of the women (70.1%) were, however, found to experience both food cravings and aversions than either symptom alone. Another study conducted at the prenatal care clinic in Sudan among 396 pregnant women found out that 160 (40.4%) of them practiced pica. Furthermore, other Africa countries such as Kenya and Nigeria also reported higher prevalence of pica among pregnant women with the percentage of 73% and 50% respectively (Ahmed et al., 2012).

In Ghana, according to Mensah et al., (2010), pica is highly prevalent in pregnant women, with the predominant types being pagophagia and geophagia. In their study, “Pica practice among pregnant women in the Kumasi metropolis of Ghana” in 2010, found that 47% of pregnant women practised various forms of pica with pagophagia being the highest

(41.0%) and trichophagia being the lowest (3.7%). Meanwhile, a study by Tayie et al., (2013) on some 502 pregnant women showed that 48% of them had pica habit, of which 28.5% had cravings for clay. According to Tayie (2004), pica is widespread in Africa and is associated with medicinal treatment, spiritual and ceremonial behaviour as well as chronic hunger, folk medicine, traditional cultural activities and social customs.

2.4 Causes of Pica Practice

For many centuries, the causes of pica has eluded researchers due to the fact that it is rarely reported by those who practice it (Ogallo, 2008). According to Call et al., (2015), pica is usually linked to developmental disorders, depression, high stress levels and anxiety. Some causes of pica as listed by Parry-Jones & Parry-Jones (1992) include pregnancy, iron deficiency, sexual frustration, digestive disorders and cosmetic reasons. Danford & Huber (1982) related pica to aggression, level of mental retardation and certain factors such as seasonal changes and age (Edwards et al., 1994). Eligali et al. (2013) have also identified the main causes of iron deficiency to be inadequate consumption of bioavailable iron, heightened demand for iron in the bodies of pregnant women who experience rapid growth pregnancies, menstruation, and pathological infections which leads to excessive loss of blood. The most commonly cited causes of pica have been to be specific deficiencies of minerals, such as iron and zinc (Ogallo, 2008). Many studies indicated that patients with low iron and zinc levels who practised pica stopped or decreased the intake of non-food items when put on iron and zinc replacement treatments. The evidence for iron is however more convincing than that for zinc (Fisher et al., 1994).

It is also noted that the body causes these strange nutritional cravings as a response to a nutritional depletion or deficiency of some particular nutrients in the body (Ogallo, 2008).

Fisher et al., (1994), cited that red clay, stone and soil may be used as pica substances because they are high in iron. Nonetheless, several researches have shown clay to displace iron in the body and this can intensify the problem if a deficiency is the cause of the practice (Fisher et al., 1994). Not everyone who practices pica has been found to have a nutritional deficiency. Nonetheless it is still uncertain after many clinical studies, as to whether pica is a cause or effect of particular mineral or vitamin deficiency since items like clay displaces iron in the blood contributing to the development of a deficiency (Ogallo, 2008). He added that pica is also highly observed in areas where food is scarce and people will resort to eating non-food items to avoid hunger or starvation.

Some cultural and religious norms according to Simpson et al., (2000), encourage people to compulsively practice pica. In Mexico, some women were found to eat the Virgin of Guadalupe which was made from holy clay in order to be blessed. Some women actually believe that eating clay while pregnant would be good to the unborn child by cleaning out its intestinal tract in order for it to be born clean. Placek & Hagen (2013), stated that eating freezer frost have been claimed by some women to ease stress during pregnancy.

Cooksey (1995) concluded that olfactory cravings spiral during pregnancy. Heightened sensitivities of taste and odour have been reported in pregnant women in several countries. According to Young et al., (2010) craving of certain non-food items is very common during pregnancy. This unusual craving in some cases is triggered by insufficiency of certain nutrient such as iron and zinc. They also stated that some adults also crave for certain texture in their mouth which also leads to the practice of pica.

Ogallo (2008) stated that physiological and sensory causes of pica which he intimated were largely based on the fact that many pica patients claimed they enjoy the taste, smell or texture of the item they consumed. He added that, some people were reported to use

these non-food items to aid in weight loss programmes since they make them feel full pass through their system without being absorbed unlike food items which would be absorbed as calories and make them gain weight. Some pica patients have also reported that the items consumed helped to lesson nausea during pregnancy (Ogallo, 2008).

Continuous eating of non-food items cause it to become a compulsion since many people do not start eating these items compulsively until it turns into pica (Edwards et al., 1994). Pica craving can be compared to the craving for opium and alcohol. Ogallo (2008) suggested that addiction is one of the possible causes to blame for pica behaviour in some patients. He added that most people become addicted to the pica objects they consume and report "withdrawal" symptoms in the absence of the pica item.

A multidimensional model for pica explained by Carter et al., (2004) indicates that no single factor can account or can be held responsible for eating disorders. This model stipulated that both external and internal factors including biological, social and psychological factors can be associated with pica practice by working hand in hand to cause the eating disorder.

2.5 Effects of Pica on Pregnant Women and the Unborn Child

In the 2000 edition of American Dietetic Association's *manual of clinical dietetics*, pica is a psycho-behavioural disorder which is of great concern since the non-food items consumed with the practice may not only be harmful to the pregnant woman but also may replace nutritious foods needed by them. According to Rothenberg et al., (2001) the effects of pica on pregnant women include nutritional deprivation, inherent toxicity, dental injury, parasitic infections, constipation, interference with the absorption of mineral neurologic symptoms and dysfunctional labour due to physical impact. This may be as a result of eating substances that are low in calories but can fill the tummy easily; such item

include eating of clay instead of eating nutritious foods (Ogallo, 2008). A study by Ellis et al., (2009) indicated that association between pica and low maternal haemoglobin levels during child birth leads to iron deficiency.

Furthermore, nutritional iron deficiency occurs when individuals do not meet the required physiological iron absorption from their diet (Elgaili et al., 2013). In other words, the inadequate consumption of iron as a result of poor diet may result in anaemia, and this is termed iron deficiency anaemia. Moreover, iron deficiency may cause certain negative effects in mothers as well as infants (Elgaili et.al., 2013). They also reported that such negative effects include increased risk of sepsis, perinatal mortality, low birth weight and maternal mortality. According to them, what causes iron deficiency is the depletion of iron stores in individuals, and this happens when the body's iron absorption is unable to keep up with the iron levels required for metabolism in order to sustain growth as well as compensate for iron loss in the body (blood loss). Other effects of iron deficiency and anaemia are the reduction of learning ability as well as high rates of morbidity.

Neurological symptoms of pica are caused mainly by inherent toxaemia of substances such as lead and other heavy metals (Blinder, 2008). Symptoms may include lethargy, headache, irritability, nerve paralysis, seizure, coma and even death. Intoxication of metal may also cause gastrointestinal symptoms such as colic, constipation, diarrhoea and anorexia.

However, Aslan et al., (2014) found out in their research that some heavy metals in pica substances such as zinc, cobalt, manganese and lead can interfere with the iron intestinal absorption pathway. This is because iron deficiency is associated with lead intoxication which can lead to serious medical complication in children and pregnant women. Therefore lead is a dangerous source of element to iron metabolism. Furthermore, pica

substances which contain lead can interfere with a number of vital iron-dependent metabolic steps, for instance heme biosynthesis. Several parasitic infections can be borne from eating pica substances (Ogallo, 2008). He also indicated that soil borne parasitic infections like toxocaiasis can cause malaise, cough, retinal lesions, fever and even loss of vision in patients. According to Teplin et al., (1991) the toxic and parasitic components of some pica substances may also lead to poisoning of the foetus and may increase the risk of learning disabilities, impaired growth and even cause brain damage.

Eating of non-food items by a pregnant woman will deprive the unborn child of the necessary vitamins and minerals needed for proper development in the womb since pica interferes with healthy eating habits that results in deficiencies in the mother (Ogallo, 2008). Other possible effects on the foetus include prematurity, smaller head circumference and still birth (Rothenberg et al., 2001).

Underweight pregnant women suffering from iron deficiency and infectious diseases due to pica practice have higher risk of delivering low birth weight and premature infants who may also have higher risk of early childhood mortality (Steketee et al., 2001).

2.6 Test and Diagnosis of Pica

The test for pica, according to Williams & MacAdam (2012), must be based on the behaviour shown by the patron of the material. In testing for pica, serum lead level should be checked in persons who consume geophagia since soil or clay contains lead which is associated with soil-born parasitic infection. It is also advisable to check for serum mercury level in patients who consume paper as their pica since paper eating can cause mercury poisoning (Williams & McAdam, 2012).

It is established that most pica cases are associated with obtain serum haemoglobin, iron deficiency anaemia and haematocrit levels. These indicators must be watched for in patients who report cravings for non-food items. Pica related iron deficiency is a sign shown in both pregnant women and patients who are not pregnant. In a study involving 262 non-pregnant adults who showed signs of iron deficiency anaemia, 45% reported pica behaviour out of which 87.3% were found to eat ice (Williams & MacAdam, 2012).

DSM-IV-TR criteria for diagnosing pica in a person is that, the person must consume non-nutritive substances, which are unsuitable for the person's level of development and which do not form part of the persons culture, continually for one month (Rodgman & Winstead, 2013). They also intimated that in situations where pica occurs together with mental disorder a severe health condition could be created. Therefore further assessment would be needed for diagnoses. They also stated that diagnosis of pica in a patient must focus on history and some selective testing must be done. This means that pica can be diagnosed in a patient by investigating into the patient's historical background of pica and not only testing for pica in the laboratory. It is also stated that care givers should find out about pica behaviour or unusual cravings from persons who are in the venerable group such as pregnant women, children and people with developmental disabilities.

2.7 Treatment and Prevention of Pica

2.7.1Treatment of Pica

Pica may not yield to voluntary treatment resulting in the reported adoption of some very drastic measures in its treatment (Carter et al., 2004). They further added that unusual and out-dated treatments of pica include decapitation (to prevent others from practicing), physical beating and forced vomiting. The drastic nature of some of these treatments shows how resistant pica is to voluntary treatment. More approved and current treatments

which are known to be more efficient and effective include multiple environmental changes "pica proofing", iron supplements, increased activity level, discrimination training and self-monitoring (Carter et al., 2004).

According to Young et al., (2010), it is necessary to check for medical conditions such as lead poisoning, or the absence of certain nutrients in pica patients before commencing treatment. They also mentioned that pica treatment may take the form of a family educational approach, environmental approach and behavioural approach. Behavioural approach for instance associates a pica patient's behaviour with consequences such that the patient is either "rewarded" or "punished' according to whether he or she abstains from pica substances or not. In cases where pica practice is part of developmental disorder, certain medications may be able to cause a reduction in the incidence of pica behaviour (Young et al., 2010). Pica treatment may differ according to the specific behaviour a patient may present. Therefore, certain management approaches have been detected to be suitable for the treatment of pica. These include educational approach which aims at behavioural modifications and preventive approaches (Williams & McAdam, 2012).

2.7.2 Prevention of Pica

Primary care officers who provide care services to people with developmental disabilities according to Williams & McAdam (2012) may look out for pica occurrences and prevalence. They also stipulated that pica can also be detected by checking the stool of the patient and also by conducting a direct observation on the person. It is also necessary to check the patient's medical history and also interviewing their care givers who provide care for them. It is therefore indicated that in such patients, a pica safe environment should be created by training the staffs or care givers who work in the facility. This can be done

through conducting regular on-site monitoring to make sure that the environment is free from any dangerous object and also by developing procedures to guide staff behaviour such as wearing of rubber gloves (Williams & McAdam, 2012).

Another way of preventing pica is by using patient's behaviour modification (Williams & McAdam, 2012). They found out that behaviour based approach is an effective way of treating pica in patient with developmental abnormalities. Therefore it is advisable that primary care givers be aware of the nature of pica and makes it a point to actively and continuously seek information about the condition especially among people at high risk such as pregnant women and children. Applied behaviour analysis according to Williams & McAdam (2012) was found to be the most strongly empirical method in treating pica behaviour in pregnancy. This means that a patient who suffers from pica may be referred to an experienced behaviour specialist for further assessment and treatment. Behaviour therapy was found to reduce pica by 80% or more in a review of 26 studies done by (Williams & McAdam, 2012). Some examples of behavioural treatment include response reduction procedures alone, reinforcement procedures alone and the combination of reinforcement and response reduction procedures (Williams & McAdam, 2012). They also indicate that behaviour is shaped by using reinforcement approach, which is done by regulating the penalties of the behaviour using a blend of rewards and punishments. Hence, obstructing of every attempt to consume non-food items is a form of response blocking or response reduction. Furthermore, treatment of pica that involves a blend of reinforcement and response reduction also indicates good efficacy. An example of this form of approach is by stopping the patient from consuming non-nutritive food / items, whilst directing him or her to consume nutritive edible food at the same time (Williams & McAdam, 2012).

Another strategy, according to Rodgman & Winstead (2013), is behavioural intervention, which is also centred on positive reinforcement and punishment. Such a strategy has been proven to be effective by a report in which three children were successfully treated with either automatic reinforcement or social reinforcement or a combination of both.

Medication can also be used to treat pica. Although no FDA-approved medications for pica exists, certain medications such as Selective Serotonin Reuptake Inhibitors (SSRIs) (escitalopram), bupropion, a typical antipsychotics, buprenorphine, clomipramine and olanzapine have all produced desirable effects (Rodgman & Winstead, 2013; Williams & MacAdam, 2012). Also, drugs like methylphenidate is useful for the treatment of pica patients with attention –deficit / hyperactivity disorder. These drugs have been found effective in some patient but such cases are few and the proof of their effectiveness is inadequate (William & MacAdam 2012). Essentially, pica patients require simultaneous treatment with medications as well as behavioural intervention. Bhatia (2014) also proposed that in a situation where a pica patient requires medical emergency such as lead poisoning or surgical emergency such as intestinal obstruction, treatment must proceed accordingly. Current research, however, has shown that the drug for treating pica in patients can enhance dopaminergic activity which may prove to be useful selective serotonin reuptake inhibitors (SSRI) for the effective treatment of pica. The effectiveness of the medication was reported in a case after olanzapine was used in a patient who practice pica (Bhatia, 2014). In situations where the practices of pica are learnt from ones cultural background, cognitive behavioural therapy is recommended.

According to Blinder (2008) the cornerstone to any treatment programme is reduction exposure. This is captured by Ferrer & Wier (2006) as the behavioural treatment approach where observational examination and conditional consistent responses are applied by trained persons directed towards the modification of the pica behaviour. Therefore

clinicians are advised that once pica is identified, appropriate laboratory diagnosis must be undertaken coupled with the behaviour modification attempt aiming at treating the disease.

Williams & McAdam (2012) also stated that vitamins or nutrient supplementation may be used to treat pica in patients whose pica symptoms include a deficiency in these nutrients. Iron supplements for instance, have been seen to reduce and even sometimes eliminate pica in patients who were found to suffer from iron deficiency while practicing pica. They also found out that occasionally, the absence of certain minerals and vitamins like zinc and iron has been tested and laboratory test results of patients are normal. Therefore treatment must be based on the context of medical complications that will be diagnosed, for instance iron deficiency anaemia.

As a recommendation, Bhatia & Jaswinder (2014) suggested that supplementary programmes such as compulsory flour fortification should be expanded in order to improve iron supply to cover the entire population as well as to ensure safer pregnancies. Also, certain methods such as the use of brief restraints and aversive conditioning can be employed in cases involving infant and toddlers (Bhatia & Jaswinder, 2014).

It is also suggested that iron supplementations are administered for iron deficiency anaemia just as prophylaxis is recommended for iron deficiency anaemia in Roux-en-y patients (patients that undergo surgery that involve stapling the stomach to leave a small pouch at the top), which is connected to the small intestine (Rodgman & Winstead, 2013). They also recommended that attention must be paid to pica during pregnancy so as to ensure that patients acquire the necessary nutrition and do not consume substances that may be detrimental to their health and that of the foetus.

2.8 Conclusion

In conclusion, the reviewed literature indicates that there is the extensive knowledge on the phenomenon of pica, its prevalence, causes and effect on both mother and the unborn child, at least in certain parts of the world. In Ghana there is very little documented information on the perception, the prevalence, causes, effects, treatment as well as the practices of pica among pregnant women. Ultimately, the present study addresses this knowledge gap. It may be added that data gathered for the purpose of the present study adds to data area of study including the extent of prevalence of pica among pregnant women in Ghana.

This study adopts the use of a quantitative methodology in an attempt to carry out detailed scientific analysis on the issues concerning pica in the La Nkwantanang-Madina Municipality. This methodology provides a basis for comparing the results with outcomes from similar studies carried out in different parts of the world. As indicated in the literature review, studies in the area were predominantly conducted with the help of the quantitative methodological approach.

It is critical to mention that uncertainty about pica and anaemia among pregnant women has not been resolved. Even though the relationship between pica and anaemia in pregnant women has been established beyond doubt, it is not clear which causes the other. This is one knowledge gap future studies can address and this study can serve as a building block.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This section deals with the research design including the type of study, study location, study variables, study population, sampling technique, sample size, and key method in areas of data collection, quality control, data processing, data analysis, ethical consideration and pre-test or pilot study.

3.1 Research Design

The methodology adopted for this study was a descriptive cross-sectional design approach with the focus to describe the perception and practices of pica among pregnant women in the La Nkwantanang-Madina Municipality in Accra, Ghana. Quantitative methods used for data gathering offered room for more authoritative results in an objective and replicable manner. In addition, the quantitative methods used in the areas of data collection and analysis were essential to help the researcher generate statistics through the use of close-ended questions presented on a survey questionnaire. The questionnaire collected data on respondent's socio-demographic factors, pregnancy history, symptoms and period experienced general perception on pica practices by pregnant women, reasons for practicing pica and the perceived effect on them.

3.2 Study Location / Area

The study was conducted in the La Nkwantanang-Madina Municipal Assembly. The La Nkwantanang-Madina is one of the sixteen (16) municipalities in the Greater Accra Region in Ghana. Geographically, it is a small municipality, which lies in the north-eastern part of the Greater Accra Region. La Nkwantanang-Madina is sandwiched

between Adenta Municipality on the east, Accra Metropolitan Assembly (AMA) to the south, and Akwapim South District Assembly to the north. There are 23 communities in the municipality that are grouped under three sub-districts namely Madina, Danfa and Pantang which comprises of urban, peri-urban and rural areas.

Based on annual growth rate of 4.2%, according to the population and housing census conducted in the year 2000, the projected population for the year 2015 was 130,380 (GSS, 2014). This population consists of 51% male and 49% female, with an average household size of 6.2. A pictorial representation of the municipality is presented in Figure 3.1. There are about 23 settlements in the municipality with Madina as the capital. The population is concentrated mainly along the urban and peri-urban areas of the municipality.

The General Fertility Rate in the municipality is 71.7 births per 1000 women aged 15-49 years which is the second highest for the region whilst the Crude Birth Rate (CBR) is estimated at 22.5 per 1000 population (GSS, 2014). The main occupation of the people is sales and service which is about 35.5%. Besides, other occupational activities of the population in the district include craft and related trade accounting for 22% and professional technicians 10.5%.

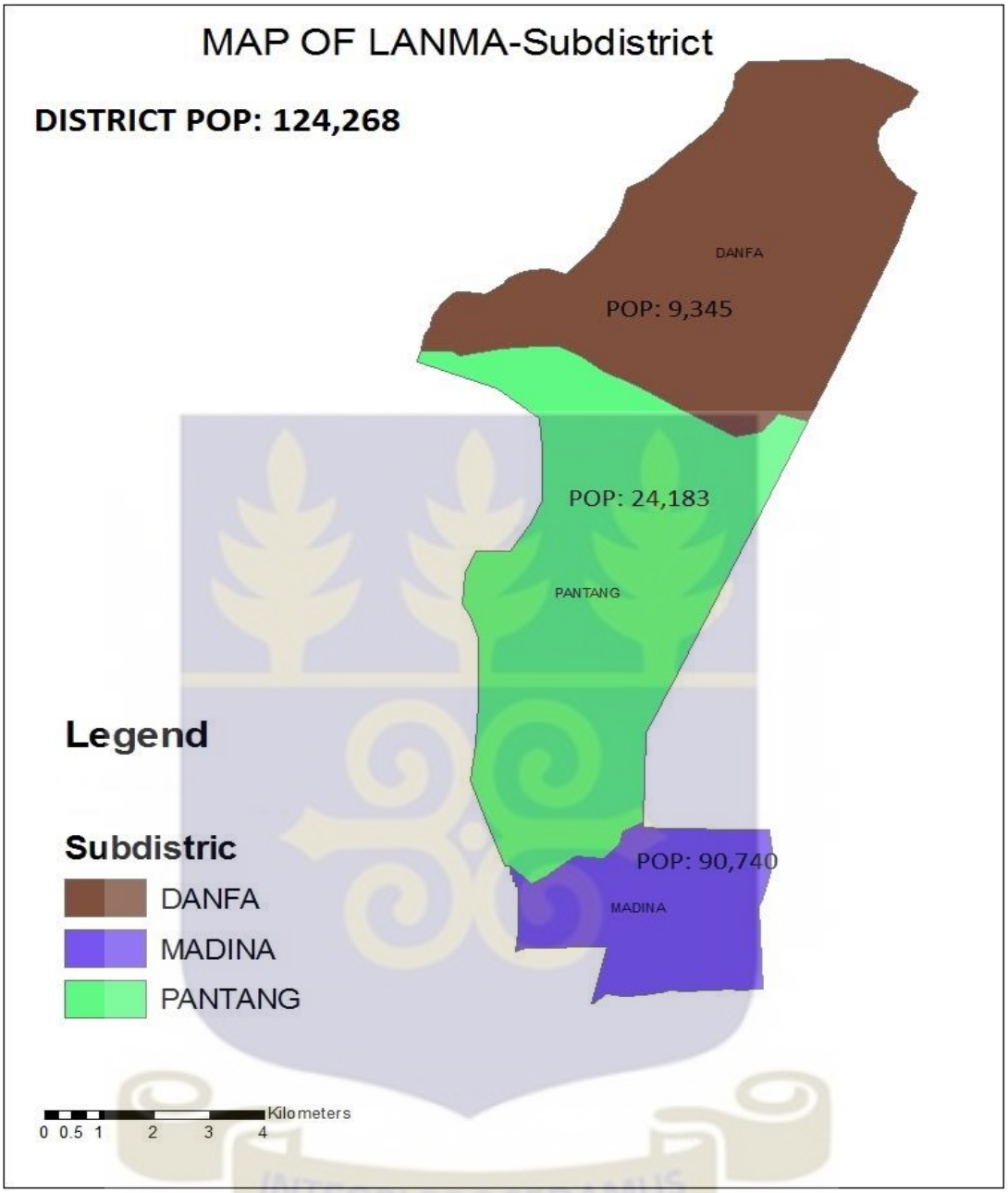


Figure 3.1: Map of La Nkwantanang-Madina Municipality.
Source: GSS (2014)

The Municipality has a total of twenty-two (22) health facilities, 4 being public and the remaining 18 being private. Out of the 22 facilities, there are two (2) government polyclinics, one (1) health centre and two functional urban Community Health Planning Services (CHPS) zones. 15 out of 22 health facilities offer antenatal and maternal services.

The polyclinics are Madina Polyclinic (Kekele) and its annex which is around Rawlings Circle. There is a specialized Psychiatrist Hospital at Pantang.

The Pentecost hospital which is one of the focus areas for the study is a mission facility at Madina with 40-bed capacity and currently serves as the municipal assembly hospital. Madina Polyclinic is also another focus area for the study. Both health facilities offer antenatal services to over 40% of the district population. They also render other services such as pre-pregnancy counselling, postnatal care, labour or delivery services, child welfare clinic, family planning and home visit. Madina Polyclinic (Kekele) does not have a theatre therefore scissoring cases are referred to the Pentecost Mission Hospital. In addition, cases that cannot be handled by both hospitals are also referred to the Korle-bu Teaching Hospital and other tertiary health facilities. Both hospitals provide ambulance services.

Records at these hospitals in the municipality show that 52,152 pregnant women were attended to in 2015; out of this number 3,774 suffered from low haemoglobin level or anaemia resulting into several birth complications, according to the Health Directorate (2015).

3.3 Variables

Dependent variable of the study is presented below

- The dependent variable of the study is the practice of pica among pregnant women (pica prevalence)
- Consumption of pica item (Pagophagia, Geophagia, Amylophagia etc.) and frequency of practicing pica.

Independent variable

- Demographic characteristics including age, marital status, highest level of education, religious affiliation, ethnic group and occupation.
- Pregnancy history and related indicators such as month of pregnancy, number of full term pregnancies, number of children, pregnancy symptoms and trimester related variables.
- Knowledge and perception on pica including whether respondents have heard about pica, the source of knowledge, knowledge on people who practice pica, knowledge on reasons why pregnant women practiced pica and knowledge on the effect (perceived effect).
- The extent to which behavioural, physiological, sensory, hormonal and cultural variables (craving, nausea, vomiting, smell, taste, norms and religious belief) contribute to pica practice.
- Contribution of nutritional factors such as dietary patterns, types and varieties of food intake of pregnant women (variety of food intake) on the practice of pica.
- Education on pica including effect of pica on pregnancy

3.4 Study Population

The population for the study consists of pregnant women who attend antenatal clinic in the Pentecost Hospital and the Madina Polyclinic (Kekele). The maternity units of these hospitals which provide antenatal and postnatal services to pregnant women in the La Nkwantanang- Madina Municipal were selected as the main focus of the study. The average daily attendance to the Pentecost Hospital is about 150 a day, whilst that of the Madina Polyclinic is about 110 pregnant women.

3.5 Sampling

3.5.1 Sample Size

The sample size was determined using the formula n= pq $[Z_{\alpha/2} / E]^2$ as proposed by Saunders et al., (2012); where n is estimated sample size; Z is the critical score based on the desired degree of confidence; p is the prevalence rate, q is the compliment of the proportion and E is the desired margin of error. A prevalence rate of 47% was chosen for prevalence from a previous study done by Faustian Mensah et al., (2010)

$n= pq [Z_{\alpha/2} / E]^2$

$n =0.47\times0.53[1.96/0.05]^2$

$n = 0.2491\times (39.2)^2$

$n = 0.2492 \times 1536.64$

$n =382.77$

The assumption was that the data was normally distributed. Based on this formula and the assumption, an approximate value of 383 was obtained. However, an error margin of 10% was allowed for non-responses of questionnaire as according to the rule of thumb the lowest margin of error to be allowed in research is 10%. The total sample size therefore is 330.

3.5.2 Sampling Method

Hospitals for the study were chosen based on the density of their antenatal population. The two hospitals (Pentecost Hospital and Madina Polyclinic-Kekele) were selected from a total number of 22 hospitals in the Municipality. Three hundred thirty (330) pregnant women were sampled from these two hospitals. With an average daily attendance of

pregnant women at the Pentecost Hospital being 150, the total attendance for the week represents 57% of the total respondent's population. Using systematic random sampling and an interval value of 5, every5th pregnant woman was selected to get an average of 36 women from the antenatal care unit of the Pentecost Hospital. In effect a sample size of about 180 was obtained over the five-day period.

The average daily attendance at the Madina Polyclinic is 110 pregnant women; the total attendance for a day represents 43% of the respondent population. Similarly, systematic random sampling was used to select 150 respondents, at an interval value of five (5). Every 5th pregnant woman from the antenatal care unit of the Madina Polyclinic was sampled to obtain an average daily sample of 30 women over the five-day period of data collection activity. The random sampling technique was essential to allow every member of our population to have an equal chance of being selected for the study.

3.6 Data Collection Techniques

Structured questionnaires made up mostly closed ended questions and a few open ended questions on the perceptions and practice of pica, demographics of respondents and other variables were administered to the respondents. For the purpose of this survey, a questionnaire was administered. Due to the large sample size, the researcher engaged the assistance of two interviewers in the data collection phase of the study. Data collection was carried out at the premises of the Pentecost Hospital and Madina Polyclinic where respondents attend maternity clinic appointments.

3.7 Data Processing

Data collected was entered onto Microsoft Office Excel 2010 and was very helpful and imported onto Statistical Package for Social Science (SPSS) Statistics version 21 software.

Data editing and formatting was done in order to ensure correctness of data. Data collected was explored for normality using skewness and kurtosis. It was originally intended that skewed data would be transformed before proceeding to analysis; however, all data was normally distributed.

3.8 Data Analysis

Data analysis was mainly descriptive, conducted with the help of frequency tables. This was essential to achieve the aims of the study such as to describe or assess pregnant women's knowledge and perceptions about pica. The test of association in the form of dependence was used in an attempt to add value and determine the inter-relationships between variables of the study. This was essential to empirically assess different aspects of the framework represented by solid lines, particularly with regards to the associations between the independent and dependent variables. Test for independence was conducted using Chi Square Test Statistic as this was deemed most appropriate.

3.9 Pretesting

Pretesting was conducted at the Achimota Hospital with pregnant women to test the validity, reliability and accuracy of the questionnaire. The responses proved very helpful as some adjustments were performed on the questionnaire. Adjustments ranged from the correction of typographical errors to adjustment of questions that were difficult to comprehend.

3.10 Ethical Considerations

Ethical clearance was sought from Ghana Health Services Ethical Review Committee. Permission letter and verbal consent was also obtained from the La Nkwantanang- Madina Municipal office, Pentecost Hospital and Madina Polyclinic (Kekele) prior to data collection in order to carry out the study. .

An informed consent form including all the ethical considerations was administered to each participant to seek for their approval before the data was collected. The consent form was read and explained to participants in the local language. An opportunity for questions and answers after this was provided before the signing of the form. Participants were urged to participate at their own will without any preconditions attached. All measure to maintain human rights including informed consent; the right to participate in the study, right to privacy and confidentiality and the right to protect against any harm were taken into consideration.

3.11 Quality Control

Questionnaire was created with particular reference to the objective and literature. Two assistants were trained to ensure that accurate and reliable data is collected. The questionnaire item was translated into Ga and Twi during interview.

The sections in the questionnaire were in four parts. The sections were; socio-demographic data, Pregnancy history and symptoms, knowledge and perception about pica, pica practice and factors associated with pica practices. All answered questionnaires were compiled and cross-checked for errors and omissions in order to get a correct data from the analysis.

3.12 Limitation

Based on the results presented, it was observed that due to lack of co-operation, unresponsive respondents, incomplete data and lack of interest in the study, a small anticipated sample size was realized from both Pentecost Mission Hospital and Madina Polyclinic (Kekele). Other reasons for the non-responsiveness of the sampled respondents were due to their health conditions at the time of the interview. The study was conducted within the antenatal section of the health facility with principal focus on women who were pregnant and were reporting for antenatal care. Also some respondents start the interview and stop half way to see the doctor after which they do not come back to complete the questionnaire.

CHAPTER FOUR

RESULTS OF THE STUDY

4.0 Introduction

This section elaborates on the results and analysis of the study. It presents the frequencies, percentages and other descriptive statistics of the data collected with the help of the questionnaire. The chapter is presented in accordance with key sections that pertained to the instrument and in line with the research questions originally established. Towards the final end of the chapter, key associations were conducted with the help of chi-square statistic. The associations are made based on the original framework of the study.

4.1 Socio-Demographic Characteristics of Respondents

The researcher in an attempt to collect data relevant to the study sampled 330 pregnant women. This amounts to a response rate of 86.2%. As a result, the analysis, the findings and the conclusions of the results were based on the 330 responses. A total of 180 pregnant women representing 54.55% were selected from Pentecost Hospital and 150 pregnant women representing 45.45% were selected from Madina Polyclinic (Kekele). Key demographics on which data was collected are presented in Table 4.1.

With reference to the age of respondents, majority (56.97%) were between the ages of

21-30 years, whilst only 1 person was between 41-49 years at the time of the interview. In addition, majority of the respondents representing 65.15% were married, 32.42% were single whilst the remaining 2.42% were divorced. The educational level of the respondents shows that (36.36%) had Junior High School education, (18.18%) had Senior High education, and (24.24%) had Primary education whilst (12.12%) did not have any formal education. Majority of the respondents professed mainly to the Christian faith representing

(65.15%) whilst 30% of the respondents were Moslems. Just a few respondents were Traditionalist (4.85%).

Regarding ethnicity, majority were Ewes (26.97%) whilst 25.15%, 13.03%, 20.0% and 14.85 % were Ga Adangbe, Akan, Fante and Northern tribes respectively. Most of the respondents were traders accounting for 43.03% whilst 23.03% were hairdressers; 15.15% were seamstress. Only 5.76%, 8.79% and 2.42% engage in formal employment such as teaching, nursing and secretary-ship respectively. Just a few respondents were unemployed representing 1.82% at the time of the interview.

Table 4.1: Demographic Characteristics of Studied Participants

Characteristic	Categories	Frequency (n)	Percent (%)
Name of hospital	Pentecost Mission Hospital	180	54.55
	Madina Polyclinic (Kekele)	150	45.45
Age	15-20yrs	17	5.15
	21-30yrs	188	56.97
	31-40yrs	124	37.58
	41-49yrs	1	0.30
Marital Status	Single	107	32.42
	Married	215	65.15
	Divorced	8	2.42
Highest Educational Level Completed	No formal education	40	12.12
	Primary	80	24.24
	JSS/Middle School	120	36.36
	SHS/O-Level/A' Level	60	18.18
	Tertiary	30	9.09
Religious affiliation	Christianity	215	65.15
	Islamic	99	30.00
	Traditionalist	16	4.85
Ethnic Group	Ga Adangbe	83	25.15
	Ewe	89	26.97
	Akan	43	13.03
	Fante	66	20.00
	Frafra	46	13.94
	Kotokoli	3	0.91
Occupation	Teaching	19	5.76
	Trading	142	43.03
	Nursing	29	8.79
	Secretary	8	2.42
	Seamstress	50	15.15
	Hairdressing	76	23.03
	Unemployed	6	1.82
	Total	330	100.00

4.2 Pregnancy History, Symptoms and Related Indicators

The relationship between pregnancy history, trimester and symptoms and the practice of pica is shown in table 4.2 below. The table also indicates the start of antenatal visits by respondents. The study showed that about 34.24% constituting the majority of the respondents began antenatal visit in the 5th month; 32.42% began in the 4th month; 21.21%

began in the 3rd month; 6.36% in the 2nd month; 3.33% in the 6th month and 2.42% began in the 7th month. In addition to this, majority of the respondents accounting for 37.27% had 2 full term pregnancies; on the other end, the least category of respondents had 5 full term pregnancies; this accounted for a total of 4.24% of respondents. It is important to add that 11.21% did not have full term pregnancy and this may be attributed to spontaneous abortion or pre-term birth.

The results also indicate that majority of respondents accounting for 36.36% had one child, 31.21% had two children, 13.64% had no children, 10.61% had four children, and 8.18% had 3 children only. Pregnant women reported pregnancy symptoms such as nausea (202; 61.2%), vomiting (173; 52.42%), headache (226; 68.48%), Skin itching (156; 47.27%), loss of appetite (161; 48.79%), dizziness (193; 58.48%), spitting (170; 51.52), and frequent urination (140; 42.42%).

The results also indicated that majority of the respondents were in their 3rd trimester (135; 40.91%) and was closely followed by respondents in their 2nd trimester (125; 37.88%). Only 70 respondents (21.21%) were in their 1st trimester. An attempt was made to further investigate the trimester within which the pregnant women had severest pregnancy symptoms. Results indicate that majority of them representing 176 respondents (53.33%) experienced the most sever pregnancy symptom during the 1st trimester,(46;13.94%), (65;19.70%), (43;13.03%) also experiencing the symptoms during the 2nd trimester, 3rd trimester and throughout the pregnancy respectively.

Table 4.2: Pregnancy History, Symptoms and Period Experienced

Characteristic	Categories	Frequency (n)	Percent (%)
Month antenatal visit started	2nd month	21	6.36
	3rd month	70	21.21
	4th month	107	32.42
	5th month	113	34.24
	6th month	11	3.33
	7th month	8	2.42
Number of previous full term pregnancies	1	77	23.33
	2	123	37.27
	3	43	13.03
	4	36	10.91
	5	14	4.24
	None	37	11.21
Number of Children	None	45	13.64
	1	120	36.36
	2	103	31.21
	3	27	8.18
	4	35	10.61
Pregnancy Symptoms (affirmative responses)			
	Nausea	202	61.21
	Vomiting	173	52.42
	Headache	226	68.48
	Skin Itch	156	47.27
	Loss of Appetite	161	48.79
	Dizziness	193	58.48
	Spitting	170	51.52
	Frequent Urination	140	42.42
Present trimester of pregnancy	First trimester	70	21.21
	2nd trimester	125	37.88
	Third trimester	135	40.91
Trimester with most severe pregnancy symptoms	first trimester	176	53.33
	2nd trimester	46	13.94
	Third trimester	65	19.70
	Throughout the trimester	43	13.03
	Total	330	100

4.3 Pregnant Women Knowledge and Perception about Pica Practice

The results revealed that 287 pregnant women representing 86.97% had heard about pica practices from various sources such as home, antenatal clinics, radio, television, markets and schools. In addition to the sources of pica knowledge, respondents were made to indicate which people they perceived practice pica. Most of the responses were in the direction that pregnant women only most often practiced pica (37.98%). 75 (26.13%) of the respondents indicated that pica is practised by pregnant women and children while 35 (12.19%) were of the view that pregnant women, adolescents and children practice pica. Forty-five (15.68%) responses showed that pregnant women and adolescents practise pica and 22 (8.02%) were of the view that pica is practiced by non-pregnant adult only.

Respondents were asked for key reasons why pregnant women practice pica. Out of a total respondent value of 287, 34.49% mentioned that taste is a reason to practice pica, smell (65.16%) environmental factors (49.48%) and 23.34% commented that it makes their tummy full, 16.72% however offered cultural reasons, 71.78% craved for non-food items, 6.27% attributed it to the texture and the remaining 2.09 % pica practice to reduce stress. Again, 214 respondents (64.85%) mentioned that pica affect pregnancy; 16 respondents (4.85%) mentioned that pica does not affect pregnancy; 57 respondents (17.27%) mentioned that they do not know that pica affects pregnancy.

Table 4.3 sought the perceived effects of pica. This question was based on those who answered ‘yes’ to ‘pica affects pregnancy’. On the specific effects of how pica affects pregnancy, anaemia ranked highest with 44 respondents (20.50%); this was followed by respondents who believed the babies would be born with clay covering all over the body, accounting for (18.69 %) of the total respondents under observation. The effects of pica in the form of baby shivering (tremor) when born (14.49%), constipation (13.08%), infertility

(12.63%), worm infestation (12.15%) and still birth (6.07%) of those who knew the effect of pica on pregnancy.

Table 4.3: Knowledge and Perception about Pica

Characteristic	Categories	Frequency (n)	Percent (%)
Heard About PICA	Yes	287	86.97
Total		330	100
People who normally practice Pica	Pregnant women only	109	37.98
	Pregnant women and children	75	26.13
	Pregnant women, Adolescents and children	35	12.19
	Pregnant women and Adolescents	45	15.68
	Non pregnant adults only	23	8.02
	Total	287	100
Reasons for Pica Practice			
	Taste	99	34.49
	Smell	187	65.16
	Environmental factors	142	49.48
	Makes Full	67	23.34
	Cultural reasons	48	16.72
	Crave for it	206	71.78
	Texture	18	6.27
	Reduce Stress	6	2.09
Pica Affect Pregnancy	Yes	214	64.85
	No	16	4.85
	Don't know	57	17.27
	Total	287	100
Perceived Effects of Pica	Anaemia	44	20.56
	Still birth	13	6.07
	Deformed baby	5	2.34
	Constipation	28	13.08
	Infertility	27	12.62
	Worm infestation	26	12.15
	Clay on the skin of baby	40	18.69
	Baby shiver from ice (tremor)	35	14.49
	Total	214	100

4.4 Identification of Pica Practice among Pregnant Women

The analysis of the results revealed that out of the 330 pregnant women interviewed a significant number (276) of them representing 83.64% practice pica or eat non-food items during their current pregnancies. This (approximately 84%) is the proportion of pregnant women who practice pica. The results also indicated that the most reported non-food items consumed by the pregnant women were white clay (52.12%), ice (61.52%) and charcoal (21.52%). The least reported consumed non-food items also include cola nut (8.18%), sand eating (8.48%), salt licking (9.70%) and red clay (5.15%).

Most women who practiced pica consumed ice; this represents a total of 133 respondents (40.30%) as the most frequently consumed non-food item considering the total sample under observation. In terms of the total number of respondents who answered to this question alone, the proportion of respondents who selected white clay amounted to 80 (24.24%).

It was also observed from the study that most of the pregnant women consume this non-food items during their first and second trimester as these are the periods which they experience significant pregnancy symptoms**;** this accounted for 28.48% and 28.79% for first trimester and second trimester respectively. The results show that the most predominant pica items consumed by the pregnant women were that of pagophagia (ice) and geophagia (white clay)

Table 4.4: Identification of Pica

Characteristic	Categories	Frequency (n)	Percentage (%)
Eat Any Non-food Item	Yes	276	83.64
Non-food Item Consumed (if Yes)			
White Clay		172	52.12
Ice		203	61.52
Red Clay		17	5.15
Salt		32	9.70
Charcoal		71	21.52
Cola Nut		27	8.18
Sand		28	8.48
Non-Food Item Consumed Frequently	white clay	80	24.24
	Ice	133	40.3
	Total	213	64.5
Trimester Pica is Practiced Most	First Trimester	94	28.48
	Second Trimester	95	28.79
	Third Trimester	4	1.52
	Throughout	81	24.55
	Don't know	2	0.72
	Total	276	84.24
Total		330	100

4.5 Reasons for practicing pica

The reasons for practicing pica is presented in Table 4.5; a total of 122 (33.94%) attributed the practice of pica to taste; 182 (55.15%) smell; 6 (1.82%) texture; none mentioned that they practiced pica because other women do; 139 (42.12%) indicated they practice pica because of nausea and vomiting; 176 (53.33%) craved for it; 132 (40.00%) for environmental reasons; 18 (5.45%) for cultural reasons; and 170 (51.52%) mentioned that they practiced pica because of satisfaction.

Table 4.5: Reasons for Practicing Pica

Characteristic	Frequency (n) n=276	Percentage (%)
Taste	112	33.94
Smell	182	55.15
Texture	6	1.82
Copy Other Women	0	0.00
Nausea & Vomiting	139	42.12
Crave for it	176	53.33
Environmental Reasons	132	40.00
Cultural Reasons	18	5.45
Satisfaction	170	51.52

4.6 Frequency of Pica, Dietary Pattern and Pica Education

Under this section, one last table was presented (Table 4.6). The table shows the frequency of pica practice. Most of the respondents (140, 50.72%) consumed pica more than once a day. Respondents also mentioned that consumption of pica was mainly in the afternoon 167 (60.51%) of the total respondents under observation. An attempt was also made to assess whether or not the women were practicing pica when they were not pregnant; most of them selected "no" 225 (81.20%) of all who answered this question. Those who were practicing pica when they were not pregnant indicate they were practicing it during adolescence 45 (88.24%). A few who were practicing pica when they were not pregnant were practicing during childhood; this accounted for only 6 (11.76%) of those who practiced pica whilst not pregnant.

A total of 56.44% of the respondents did not practise pica in their previous pregnancies while 43.56% were practicing in their previous pregnancies. The results also indicated that most of those who practised pica felt uncomfortable when they abstain (39.13% of observed cases). About 31.6% (86) felt nothing when they do not practise pica.

Dietary pattern measured based on variety of food intake revealed that most pregnant women always eat different types of food (28.18%); this was followed by those who were indifferent to food consumption when pregnant (22.42%) and those who consumed one type of food throughout the pregnancy (20.61%). The last aspect of the table sought data regarding whether the respondents received any education against pica, where they received this education, and whether they had been educated on the effect. A total of 83.94% of the total number of respondents mentioned that they have received some form of education on pica practices. Most of those who had received some education on pica received this education from antenatal clinics (43.33%). Those who have received education from both antenatal clinics and home represented 20.61% of the respondents. The final question on the questionnaire sought whether the pregnant women had been educated on the effect of pica on pregnancy; 73.94% of the total respondents had been educated on the effects of pica on pregnancy.

Table 4.6: Frequency of Pica, Dietary Pattern and Pica Education

Characteristic	Category	Frequency (n)	Percent (%)
Frequency of pica practice	Once a day	82	29.71
	more than once a day	140	50.72
	once a while in	54	19.57
	Total	276	100
Time of day practicing pica	Morning	40	14.49
	Afternoon	167	60.51
	Evening	25	9.06
	Night	16	5.80
	Throughout the day	28	10.14
	Total	276	100
Practicing pica when not pregnant	Yes	51	18.48
	No	225	81.20
	Total	276	100
When (If yes)	during childhood	6	11.76
	Adolescent	45	88.24
	Total	51	100
Practicing pica in previous pregnancy (If no)	Yes	98	43.56
	No	127	56.44
	Total	225	100
Feeling when not practice pica	Nothing	86	31.16
	Sick	15	5.43
	Hungry	2	0.72
	Uncomfortable	108	39.13
	nauseating and vomit	26	9.42
	Secrete Saliva	39	14.14
	Total	276	100
Variety of food intake	Consume one type of food	68	20.61
	One main type of food and few others	66	20.00
	No preference of food	74	22.42
	Different types of food	93	28.18
	Always want a new type of food	29	8.79
	Total	330	100

Table 4.7: Frequency of Pica, Dietary Pattern and Pica Education (cont'd)

education against pica practice	Yes	277	83.94
Where education was received	Antenatal clinics	143	43.33
	At home	8	2.42
	Antenatal clinics and home	68	20.61
	Antenatal clinics and school	44	13.33
	Antenatal clinics, home and school	14	4.24
	Total	277	83.94
Educated on effect of pica on pregnancy	Yes	244	73.94
	Total	330	100

4.7: Association between Non-food Items and Reasons for Practicing Pica

A cross tabulation was done to find the association between the consumption of non-food items and reasons for practicing pica. With regards to taste, texture and copying other pregnant women most of the respondents do not consume these items because of these factors except a few (4.7%) who consume red clay because of the taste. Majority of the respondents consume the non-food item because of smell, craving for and satisfaction. However, respondents do not consume red clay because of its smell. Most respondents cite reduction of nausea, vomiting and environmental factors as some of the reasons for consuming non-food items.

Further attempt was made to assess the significance of association in the form of interdependence with the help of chi-square. Some key associations were observed as significant. The consumption of white clay registered a significant association with smell and vomit; the respondents do not consume ice because of any of the reasons as none of them established dependence with ice consumption; red clay established a statistically significant association with taste, smell, vomit and satisfaction; salt was consumed because of smell as its test for dependence was significant; charcoal established a

significant association in the form of dependence with vomit, crave and environment; cola nut established a significant association with taste. Finally, the consumption of sand registered a statistically significant association with satisfaction.

Table 4.8: Association between Non-food Items and Reasons for Practicing Pica

	white clay		Ice		red clay	
	Chi-Sq.	p-value	Chi-Sq.	p-value	Chi-Sq.	p-value
Taste	0.312	0.576	0.068	0.794	9.000	0.003**
Smell	17.763	0.000**	3.357	0.067	16.592	0.000**
Texture	0.000	1.000	0.000	1.000	0.050	0.823
Copying	-	-	-	-	-	-
Vomit	4.205	0.040*	0.021	0.885	4.264	0.039*
Crave	0.031	0.860	0.320	0.572	1.171	0.279
Environ-ment	1.483	0.223	0.855	0.355	2.990	0.084
Culture	0.746	0.388	0.924	0.336	0.000	1.000
Satisfy	0.132	0.717	0.035	0.852	12.081	0.001**

Table 4.8: Association between Non-food Items and Reasons for Practicing Pica (cont'd)

	Salt		Charcoal		Cola nut		Sand	
	Chi-Sq.	p-value	Chi-Sq.	p-value	Chi-Sq.	p-value	Chi-Sq.	p-value
Taste	0.581	0.446	0.235	0.628	8.690	0.003**	1.862	0.172
Smell	4.587	0.032*	0.000	1.000	0.488	0.485	2.834	0.092
Texture	0.064	0.801	0.000	1.000	0.015	0.902	0.000	1.000
Copying	-	-	-	-	-	-	-	-
Vomit	0.728	0.394	5.500	0.019*	0.010	0.921	1.164	0.281
Crave	0.985	0.321	8.490	0.004**	0.456	0.500	0.000	1.000
Environ-ment	0.919	0.338	31.438	0.000	0.005	0.946	2.165	0.141
Culture	0.099	0.753	0.000	1.000	2.016	0.156	0.000	1.000
Satisfy	0.110	0.740	3.933	0.65	0.007	0.933	8.348	0*.004*

***Significant at P≤0.05**

****Significant at P≤0.01**

4.8 Association between Trimester Period and Pica Practices

The tabulation of non-food item with trimester of pregnancy revealed that all the affirmative responses for non-food items did not exceed 50% (Table 4.8); however, a number of statistically significant associations were established. Trimester of pregnant women established a statistically significant association with white clay, ice, red clay, and charcoal, cola nut with the exception of salt and sand consumption. All the significant associations were established at 0.01 significance level. Further test for significance and independence was conducted by matching trimester with most severe symptoms against practice of pica; the results indicated that responses on the trimester with severest pregnancy symptom are statistically significant with the practice of pica (Table 4.8.1).

Table 4.9: Cross-tabulation between Non-food Items and Trimester of Pregnancy

Trimester/Non-food item		White Clay	Ice	Red Clay	Salt	Charcoal	Cola nut	Sand
1st Trimester	N	45	36	1	9	21	12	4
	%	16.30	13.04	0.36	3.26	7.61	4.36	1.46
2nd Trimester	N	49	85	16	12	42	14	13
	%	17.75	30.80	5.80	4.35	15.22	5.09	4.74
3rd Trimester	N	78	82	0	11	8	1	11
	%	28.26	29.71	0.00	3.99	2.90	0.36	4.01

Table 4.8.1: Association between Trimester and Consumption of Non-food Items

Nonfood item	Chi Square value	P-value
White Clay	15.811	0.000**
Ice	9.436	0.009*
Red Clay	25.604	0.000**
Salt	1.378	0.502
Charcoal	37.603	0.000**
Cola nut	19.901	0.000**
Sand	1.400	0.497

*significant at P≤0.05

**significant at P≤0.0

4.9 Association between Demographics, Pregnancy Symptoms and Pica Practices

The chi-square test statistics was also used to determine if there is any significant association between the demographic characteristics and pica practices by the pregnant women. The analysis showed that pica practice was not significantly dependent on the age and marital status of the respondents ($p>0.05$). However, the practice of pica by the pregnant women was significantly dependent on the educational level, religious affiliation, ethnic group, occupation, number of full term pregnancies, and number of children of the pregnant women all at $p>0.01$. In addition to these demographics, the various pregnancy symptoms were matched against practice of pica by pregnant women. All pregnancy symptoms registered significance with the exception of nausea and loss of appetite. Table 4.9 below illustrates the chi-square test statistics of the association between the demographic characteristics and the pica practices by the respondents.

Table 4.10: Association between Demographics, Pregnancy Symptoms and Pica Practice by Pregnant Women

Variable	Chi Square value	p-value
Age	2.436	0.487
Marital status	5.218	0.074
Education level	30.575	0.000**
Religious affiliation	10.233	0.006**
Ethnic Group	47.501	0.000**
Occupation	21.745	0.001**
Full term pregnancies	39.569	0.000**
Number of Children	33.081	0.000**
Pregnancy Symptoms		
Nausea	2.281	0.131
Vomiting	26.236	0.000**
Headache	17.289	0.000**
Itching	37.431	0.000**
Loss of Appetite	0.243	0.622
Dizziness	5.956	0.015*
Spitting	60.767	0.000**
Frequent Urination	4.558	0.033*

*significant at P≤0.05

**significant at P≤0.01

4.10 Education and Pica Practice

The education received by the pregnant women was also matched against the practice of pica for association and independence. Table 4.10 presents a cross-tabulation of the results together with the chi-square results. Education was considered from the perspective of two main variables of (1) whether the pregnant women had received education on the practice of pica and (2) whether they had received education on the effects of pica on pregnancy (Table 4.10). The responses were mainly affirmative; the pregnant women had received education on the practice and effect of pica on pregnancy and yet practiced pica.

The test for independence also revealed that neither variables of (1) received education on pica and (2) received education on the effect of pica on pregnancy, had a statistically significant association with the practice of pica.

Table 4.11: Association between Education and Pica Practice

Variable	Freq.	(%)	p-value
Education against pica practice			0.346
Have education but practice it	234	70.91	
Have education but do not practice it	43	13.03	
Have not be educated but practice pica	42	12.72	
Have not been educated but do not practice pica	11	3.34	
Education on the effects of pica on pregnancy			0.045*
Have education but practice it	210	63.64	
Have education but do not practice it	34	10.30	
Have not be educated but practice pica	66	20.00	
Have not been educated but do not practice pica	20	6.06	
Total	330	100	

***Significant at p<0.05**

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This section presents the discussion of the study. The results of the study are discussed in line with main themes and factors that evolved in the course of the analysis. The discussion considers key themes and implication of results to theory and industry practice. Particular attention is directed at key theoretical and empirical literature that are in agreement or disagreement with the findings of the study.

Key symptoms of pregnancy including nausea, vomiting, headache, dizziness and spitting registered as most commonly reported pregnancy symptoms; the findings confirm the work of Whitehouse (2010) who reported nausea, vomiting, headache, back pain among others as key symptoms of pregnancy.

Aslan et al., (2014) established that depression and related factors are very severe in the first trimester of pregnancy. The findings of the present study also pointed in this direction that pregnancy symptoms are most severe in the first trimester. It is however critical to note that the second and third trimesters are not free of pregnancy symptoms. Lambert-Messerlian et al., (2000) and Gonçalves et al., (2015) established key pregnancy symptoms in the second and third trimesters respectively. In accordance with the present study, findings proved that symptoms occur in the second and third trimester with a few people experiencing the same level of severity throughout the pregnancy; however, these periods were secondary to the severity of symptoms in the first trimester.

5.1 Knowledge and Perception about Pica

The results indicated that most of the respondents have heard about pica mostly from the home and antenatal clinics. Respondents who mentioned that have heard of pica from the home emphasized that they have seen other people such as family, relatives, friends and other pregnant women practicing it. Some of these respondents mentioned that they have witnessed the impact of pica practices, usually in an undesirable outcome, and yet they practiced pica. Knowledge about pica practices was high but the urge to practice pica was also observed as high at this point. The findings is in consistence with the work of Ekwench et al., (2015) in Anambra State, Nigeria who reported that about 53% of women in childbearing age have the urge to eat non-food items and 23% and 29% had low awareness on the effects of pica on the mother and child respectively.

In an attempt to identify the main category of people who practice pica, pregnant women as a category came up as highest among the other categories; this was closely followed by pregnant women and children. Some of the women attested to the fact that children consumption of pica was popularly based on their mothers' pica practicing habits. Some adults, especially mothers practice pica and offered some of these non-food items to their children to consume. The findings support the work of Ali's (2001) who asserted that most children also practiced pica because of autism and mental disorder.

As part of the knowledge and perception about pica practices, majority of the respondents mentioned that pregnant women practiced pica because of cravings spiral during pregnancy. This was in line with Young et al., (2010) argument that craving occurs in event of pregnancy and this may be attributed to the certain nutritional deficiencies such as iron and zinc. The findings of the present study also pointed in the direction that aside from cravings being the highest perceived reason for pica practice among pregnant women, smell also had an overall positive feedback with a high percentage of the

respondents agreeing to the statement that pregnant women practice pica because of the smell (65.16% agreed whereas 34.84% disagreed). Smell as a reason for pica practice was supported by Cooksey (1995) who concluded that olfactory cravings spiral during pregnancy is a key reason for pica practice. All the other reasons received an overall negative feedback; in other words, the 'no' responses for all the other reasons exceeded the 'yes' with regards to reasons why pregnant women practices pica.

As opposed to perceived reasons why pregnant women practiced pica, the respondents were made to mention reasons why they themselves practiced pica. The results were much in line with the perceived reasons why pregnant women practiced pica; however, satisfaction also ranked as one of the most important reasons for practicing pica with an affirmative response of 51.52% of total respondents. It is important to add that no respondent practiced pica due to the copying of other women or persons.

These disagreements are not exactly in support of some literature on the area of the study. Young et al., (2010) and Ogallo (2008) in addition to other factors mentioned that texture is a major reason why pregnant women practiced pica; however, this was not in agreement with the findings of the present study. Even though data was collected on culture as supported by Simpson et al., (2000) that culture is one of the main reasons why pregnant women practiced pica, results were not entirely in agreement with this assertion; more women disagreed to this statement than those who agreed. In addition to this, Ogallo (2008) assertion that pica practice makes full was only agreed by 23.34% of the respondents, most of them disagreed. In addition, taste also evolved as a not highly recognized reason for pregnant women practice of pica; Ogallo (2008) assertion that taste induces pica practice was therefore not supported. Finally, Call et al., (2015) argument that pica is caused by high stress levels and anxiety is not exactly supported considering the findings of the present study.

It is important to mention that other factors that respondents highlighted include spiritual and habitual factors even though this was not captured in the previous chapter. According to Tayie (2004), spiritual factors have been associated with pica in areas like Africa; such associations include usage of non-food items for folk medicine, traditional cultural activities and other social customs.

The final aspect of the section elaborates on knowledge on the existence of effect of pica practices on pregnancy. Most of the women (close to 75%) in the present study agreed that there is an effect of pica on pregnancy. Even though the perceived and actual effect of pica on pregnancy continues to remain controversial with both positive and negative outcomes (Khoushabi et al., 2014; Fisher et al., 1994; Ogallo 2008), the results of the present study supports that most pregnant women are aware of the existence of the effects. According to the results, Anaemia evolved as the highest known effect of pica practice, in accordance with Elgaili et.al., (2013) argument that pica leads to anaemia.

Among the other well-known effects of pica practice based on analysis, clay patches on skin of baby and baby shivering from mother consumption of ice (tremor) evolved as two most highly ranked perceived effect of pica on pregnancy after anaemia.

5.2 Pica Practices among pregnant women

According to the results of the study, about 84% of the pregnant women interviewed practice pica; this rate of pica practice is significantly higher than that of the findings of Tayie et al., (2013) that 48% of women practiced pica, Mensah et al., (2010) findings that 47% of pregnant women practiced pica, and Koryo-Dabra et al., (2012) findings that 57% of pregnant women practice pica. Considering all of these studies were conducted in various parts of Ghana, the wide difference in proportion of pregnant women who practice pica may be attributed to methodological considerations. Even though detailed accounts of

the previous studies are not exactly available considering they were published in the forms of journal articles, the present study took steps to educate the respondents on the types of non-food items that constitute pica, the nature of effects, in addition to other insights on the subject area. The installation of this activity prior to the interview prompted increased responses and trust in the event of data collection. Other studies conducted in areas such as Canada such as Corbett et al., (2003) also realized a pica prevalence rate of 37% which is significantly lower than that realized in all the studies conducted in Ghana and presented above.

Studies have shown that pica prevalence among pregnant women in Sub-Saharan Africa, including Ghana, remained higher than the Western world average. This is evident in the findings of the present study together with others conducted in Sub-Saharan Africa such as Tayie et al., (2013), Mensah et al., (2010) and Koryo-Dabra et al., (2012) in Ghana, Ngozi, 2008 Nairobi, Kenya, and other studies in Sierra Leone, Tanzania and beyond (Njiru, et al., 2011; Ahmed et al., 2012). Studies in other parts of Sub-Saharan Africa have registered similar rates as established in the present study; Njiru, et al., (2011) for instance registered dietary cravings and pica at 73.5% and 63.7% respectively. Others including Ahmed et al., (2012) established prevalence at 73% in Kenya.

The most consumed non-food items based on the findings were ice followed by white clay; this is in support of Tayie et al., (2013) and Mensah et al., (2010) assertions that ice is the most consumed non-food item in event of pica practice during pregnancy. The authors also emphasized on the consumption of white clay as one of the most used non-food item in event of pica. The results of the present study indicated that the remaining non-food items including red clay, salt, charcoal, cola nut and sand were not frequently consumed as the other two non-food items.

Other data collected during the field data collection phase stipulated that ginger, chewing gum, pepper, toffees among other edible food items with little or no nutritive value, are consumed by some of the pregnant women to stop spitting, nausea and other pregnancy symptoms. Others were of the view that they do not consume the non-food item but rather sniff the non-food items for satisfaction. Some of the non-food items sniffed include wet sand, local gin "akpeteshi", petrol, palm wine and others. This data was not exactly captured in the quantitative analysis as conducted in the previous chapter but remains highly significant to the implication of the study to both theory and practice.

Trimester of pregnancy has also established some amount of association with pica practice. Lopez et al., (2012) in a recent investigation established that about 40% of pregnant women start practicing pica in the first trimester, a total of 71% of pregnant women who practice pica start either in the first or second trimester. The present study collected data on the severity of pica practice in the three trimesters of pregnancy; 33.81% of the pregnant women who practice pica mentioned that pica is severest in the first trimester; another 34.17% mentioned that pica is most severe in the second trimester, a combined percentage value of 67.98% for the first and second trimesters. The results of the present study in this area are therefore in line with that of Lopez et al., (2012) with regards to the onset of pica practice and severity of the practice.

5.3 Frequency of Pica, Dietary Pattern and Pica Education

Results of the study have shown that most of the pregnant women who practised pica, about 50.72%, consumed the non-food items more than once a day. It was also established that the time of consumption is mainly in the afternoons; this time of consumption in the day ranked 60.51% of those who consume pica. Lopez et al., (2012) established that there were about 53.6% of pregnant women practiced pica on a daily basis; a similar result as

established in the present investigation. When the respondents were asked whether they were practicing pica when they were not pregnant, the few who affirmed mentioned that they were practicing it only after they became adolescents. Many of those who did not affirm practicing pica were doing it in their previous pregnancies. Lopez et al., (2012) results also indicated that most of those practicing pica had a family history of pica. Moreover, most of the pregnant women practicing pica were practicing it before the pregnancy and during childhood (Lopez et al., 2012).

Withdrawal symptoms of pica in pregnancy have been registered in a few studies. Simpson et al., (1994) stipulated that women who become addicted to the pica items experience health conditions in event of withdrawal. Parry Jones & Parry Jones (1992) reported withdrawal symptoms in the areas of strong sense of emotional trauma that follow withdrawal from addiction. Others including Simpson et al., (1994) recorded withdrawal symptoms ranging from physiological conditions to behavioural disorders. These include a fall in blood pressure and sweating, nervousness and force to get access to the items they crave for (Simpson et al., 1994). The present study also indicated that most of the respondent feels uncomfortable in event of a conscious attempt to withdraw from the pica items (39.13%). However, about 31.6% do not feel any kind of discomfort in the event of withdrawal.

Pertaining to dietary pattern, the recent study measured this based on the variety of food items intake. Others including Ogallo (2008) had measured dietary pattern with the help of frequency of food intake. The present study established that those who eat different types of food when pregnant ranked highest among the other measures of variety of food intake (28.18% of total respondents), which ranges from those who eat only one food item throughout pregnancy and those who would want to eat something new all the time.

5.4 Association between Non-food Items and Reasons for Practicing Pica

Among other tests for association with the help of chi-square, the study matched the consumption of non-food items with the reasons why the pregnant women practiced pica. It may be observed that red clay established most association with the reasons why pregnant women practice pica; four out of nine reasons established association with red clay. Even though most of the pregnant women were affirmative that ice was the most consumed non-food item, this did not establish an association with any of the reasons why pregnant women practiced pica. Charcoal established association with three reasons (vomiting, craving and environment); white clay established association with only two items (smell and vomiting), and cola nut and sand established association with a single reason each, that is taste and satisfactory respectively. The findings support the work of Ogallo (2008) who stated that physiologic and sensory causes of pica which he intimated were hugely based on the fact that many pica patients claimed they enjoy the taste, smell or texture of the item they consumed.

5.5 Knowledge, Education and Pica Practice

The test for knowledge and pica practice revealed that many pregnant women practice pica even upon hearing of the practice of pica. Nonetheless, the test for independence with the help of chi square statistic revealed that the two variables of heard about pica and practice of pica are statistically significantly associated and had a weak negative association. This implies that as more people hear about pica, they reduce or stop the intake of non-food item. This association was negative but a weak one. A number of studies support this assertion that an increase in the number of pregnant women who hear and are educated about pica leads to a reduction in the practice of pica (Williams & McAdam, 2012). It is however important to mention that education on pica practices did not establish a

significant association with the consumption of non-food items, contrary to knowledge on pica in association with pica practices. It may also be added that in event where education focuses on the effect of pica on pregnant women, education did establish a small amount of statistically significant association with pica practice.

5.6 Implications of Findings in Relationship with Conceptual Framework

The findings of the study confirm the reported concepts in the conceptual framework that demographic characteristics such as educational level, ethnic group, religious affiliation and occupation are associated with pica practices. However it was observed that the age was not a factor that was significantly associated with pica practices as reported in the conceptual framework.

The findings of the study observed a significant relationship between dietary patterns and pregnancy symptoms. Nausea, vomiting, headaches, loss of appetite and spitting were the pregnancy symptoms that were significantly associated with the practice of pica as these symptoms cause pregnant women to eat various non-food items. The conceptual framework connotes that behavioral, hormonal, sensory and physiological symptoms are associated with pica practices and the findings of the study reveals that some behavioral, hormonal, sensory and physiological symptoms such as taste, smell, crave for vomiting, headache, itching of the body, dizziness and spitting were significantly associated with pica practice. Concerning pregnancy history and related indicators, trimester of pregnancy, full term pregnancies and the number of children were also statistically associated with pica practices as reported in the conceptual framework. With regards to education on pica practices, there was no significant association between those who have received education on pica and pica practice. However the findings revealed that there was a significant association between those who have received education on the effects of pica and pica

practice as reported in the conceptual framework. The study did not find a significant association between those who had no knowledge on pica and pica practice. The framework depicts that people with no knowledge on pica are prone to pica practice.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.0 Introduction

This section presents the conclusions and recommendations of the study. Key conclusions are established in accordance with the research objectives of the study. Recommendations are also offered to two main categories of stakeholders in the areas of (1) future researchers and (2) industry stakeholders.

6.1 Conclusion

Most of the pregnant women in La Nkwantanang-Madina Municipality have knowledge about pica practices. Most of them have heard about pica from multiple sources such as home, market, hospital/clinics, radio/television and churches. It is also concluded these women know why pregnant women generally practice pica; noting that this perceived reasons for pica practice by pregnant women was considered different from the reasons why the pregnant women themselves practiced pica.

Finally, pregnant women were also affirmative with regards to knowledge on to the effect of pica. It is also important to conclude that the practice of pica in the municipality depends on the knowledge of the pregnant women; a negative association exist between pica practice and knowledge in the community. Education on pica practices was not significantly associated with the practice of pica item. However education on the effects of pica significantly influences pica practice.

Findings established that, majority of pregnant women indulge in geophagia (eating of clay and sand), pagophagia (eating of ice), charcoal and salt. The predominant non-food item that is practiced was pagophagia (ice) and geophagia (white clay). All the non-food

items depend on key reasons that were collected for the study. It is concluded that the pregnant women eat white clay because of the smell and to reduce vomiting; they eat red clay because of the taste, smell, to reduce vomiting, and for satisfaction; they eat salt because of the smell; others take charcoal to control vomiting, because they crave for it, and other environmental factors; pregnant women take cola nut because of the taste; and finally, pregnant women take sand for satisfaction. All on food items established dependence on one or more reasons why the pregnant women practiced pica with the exception of ice. It is also important to conclude that consumption of all the non-food items respond to the trimester of the pregnancy with the exception of salt and sand. Factors which influence pregnant women to indulge in pica practices were mainly smell, craving and for satisfactory reasons. These reasons highly influence the eating of all the non-food items except ice. Reasons that make pregnant women in La Nkwantanang-Madina Municipality practice pica include taste, smell, to control vomiting, craving, environmental reasons and for satisfaction. Three reasons did not appear as related to pica practice; these include texture, copy other pregnant women and culture reasons.

The proportion of pregnant women who practice pica was observed to be 83.64%. Most pregnant women in the municipality practice pica in the first and second trimesters. The prevalence of pica by pregnant women in La Nkwantanang-Madina Municipality depends on the educational level of the women, ethnicity, occupation, religious affiliation, number of full term pregnancies and the number of children the women had. Some pregnancy symptoms such as vomiting, headache, dizziness, frequent urination, spitting and itching also make pregnant women practice pica.

6.2 Recommendations

Key recommendations are made to stakeholders on the outcome of the study and also to future researchers on dark areas of pica practice. The stakeholders are government institutions in the health sector that have the mandate to provide health to the inhabitants of the La Nkwantanang-Madina Municipality. These are the Ghana Health Service, and the two hospitals under observation (Madina Polyclinic and Pentecost Hospital) together with all other hospitals and clinics in La Nkwantanang-Madina Municipality with antenatal units.

6.2.1 Recommendations to Stakeholders

- **Ghana Health Service**

The outcome of the research showed that 83.94% of pregnant women who were educated on pica practice continue to practise it while 73.94% of those who were educated on the effects of pica practice continue to practise it. The drop from 83.94% to 73.94% shows that intensification of the pica education can make an impact. It is, therefore, recommended that the educational process be continued and intensified in the municipality. This could be done by sending health professionals to the various homes of the local communities to educate pregnant women as well as women in general. Health centres should distribute flyers and hold events including durbar on pica practices in order to inform the local communities about the practice and its effect.

It is also obvious that education alone is not sufficient to cause a considerable change in the habit of pica practice among pregnant women in the area. It is, therefore, recommended that the Ghana Health Service make the necessary budgetary allocations to antenatal units in the district to support counselling services in the hospitals and clinics.

Pica, being a form of addiction, requires psychological forms of treatment like counselling.

- **Hospitals and Clinics in La Nkwantanang-Madina Municipality**

It is also recommended that hospitals and clinics in the area liaise with the Ghana Health Service to recruit clinical psychologists to counsel pregnant women who practise pica to overcome the practice. It is also recommended that specialized pica units in the hospitals be created and dedicated to handle pregnant women with the habit especially those in critical and life threatening conditions.

- **Pregnant women in rural and urban centres**

It is recommended that pregnant women in rural and urban areas in Ghana and other developing countries, where the prevalence is highest, desist from the consumption of non-food items. This is based on the finding that pica consumption could cause anaemia, still birth, constipation, infertility, among other undesirable health implications.

6.2.2 Recommendations to Future Researchers

Future investigation on the area of study should attempt to build on the present study and adopt a more flexible mode of measurement for more complex and insightful set of analysis. Considering the mode of measurement in the present study, the use of predictive analysis such as linear regression could not be used. In addition, even though the logistic regression analysis was attempted for the productiveness of the various independent variables into pica prevalence, the fundamental assumptions of logistic regression could not be met after removing all outliers from the data.

It is also recommended that future investigations take a natural science perspective where the scientifically established effects of pica practice can be empirically established through experimentation. Maintaining all other environmental factors, the effect of pica on

pregnant women could be assessed with the help of a control group. Other laboratory investigations may be conducted to assess whether pica leads to effects such as anaemia or the inter-relationship is vice versa; this recommendation is based on the controversial literature on the inter-relationship.

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APPENDICES

Appendix A: Questionnaire

INTERVIEWER:
I am Joyce Hommey, a student from the School of Public Health, University of Ghana, Legon conducting a study on the perception and practices of pica among pregnant women in the La-Nkwantanang Madina Municipal. Your participation in this study will help us identify pregnant women who practice pica and its effects on them. Your participation in the study is completely voluntary. We would also like to assure you that all information collected in the course of this study is strictly for academic purposes and will remain confidential. The codes on the questionnaire will only help us to identify the respondent in case clarification is needed but your name will not appear on any document coming out of the study.

Thanks a lot for your participation. In case you have any questions, please let us know. Or call on this number 0244173135.

Health facilities attended; a) Pentecost Mission Hospital [1] b) Madina Polyclinic (Kekele) [2]

DEMOGRAPHIC BACKGROUND

Section A: Socio – Demographic Data

1. Age

a) 15-20 [1] b) 21-30 [2] c) 31- 40 [3]

d) 41-49[4] e) 50 and above [4]

2) Marital status?

a) Single [1] b) Married [2] c) Divorce [3]

d) Widow [4] e) others…… [888]

3) Highest level of education completed

a) None [1] b) primary [2] c) junior high/middle school [3]

d) Senior high/O-level/A-level [4] e) tertiary [5]

f) Others (specify) ……

4) Religious affiliation

a) None [1] b) Christianity [2] c) Islamic [3] d) Traditionalist [4]

e) Atheist [5] f) others (specify)……..[888]

5) Which ethnic group do you belong to?

a) Ga Adagme [1] b) Ewe [2] c)Akan [3]

e).others (specify)……[888]

6) What is your occupation?

a) Teaching [1] b) Trading (including petty trading) [2] c) Nursing [3]

d) Secretary [4] e) Accountant [5] f) Unemployed [6]

g) others (specify)……..[888]

7) In which month of your pregnancy did you begin antenatal visit?

Please specify…….

8) How many full term pregnancies have you had before this one?

Please specify…….

9) How many children do you have?

a) None [1] b) 1 [2] c) 2 [3] d) 3 [4] e) 4 [5]

f) 5 and above [5]

10) Which trimester are you in now?

a) 1st trimester [1] b) 2nd trimester [2] c) 3rd trimester

11) Which pregnancy symptoms are you having? (Tick all that apply)

a) None [1] b) Nausea [2] c) Vomiting [3] d) Headache [4]

e) Itching [5] f) Loss of appetite [6] g) Dizziness [7] h) Spitting [8]

i) Others (specify)……[888]

12) Which trimester of this pregnancy did you experience the most severe pregnancy symptoms? (Tick as applied)

a) 1st trimester [1] b) 2nd trimester [2] c) 3rd trimester [3]

d) Throughout the trimesters [4] e) don't know [5]

Section B: Knowledge and Perception about Pica

13) Have you ever heard about pica?

a) Yes [0] b) No [1]

14) If yes, where did you hear of it? (Tick as applied)

a) At home [1] b) Market [2] c) Radio, TV [3]

d) Hospital or clinic [4] e) Church [5] f) Others (Specify)…….. [888]

15) Which people usually practice Pica?

a) Pregnant women only [1] b) Pregnant women and Children [2]

c) Pregnant women, adolescents and children [3] d) Pregnant women and adolescent [4]

e)Non pregnant adult only[5] f) Others (Specify) …….[888]

16). Why do you think pregnant women practice pica? (Tick all the applied)

a) Because of the taste [1] b) Because of the smell [2]

c) Because of the texture [3] d) It makes them full easily [4]

e) To reduce stress [5] f) Cultural reasons [6]

f) Environmental reason [7] j) Others specify ……[888]

17) Do you think that pica has any negative effect on pregnancy?

a) Yes [0] b) No [1] c) Don't know [2]

18) If yes which effect do you know that pica causes?

a) Anaemia [1] b) still birth [2] c) Deformed baby [3]

d) Don't know [4] e) others…….

Section C: Identification of pica Practice, its associated factors and its implications on pregnant women in La Nkwantanang Madina Municipal.

19) Do you eat any non-food item?

a) Yes [0] b) No [1]

20) Which non-food item do you eat when you crave during pregnancy? (Tick as applied)

a) None [1] b) White clay [2] c) ice [3] d) charcoal [4]

e) Red clay [5] f) toothpaste [6] g) others specify…… (888)

21) Which of them do you eat frequently?

Specify…….

22) Which trimester do you practice pica most?

a) 1st trimester [1] b) 2nd trimester [2] c) 3rd trimester [3]

d) Throughout the trimesters [4] d) don't know [5]

23) What are your reason(s) for eating these non-food items (practicing pica)?

(Tick as many as apply).

a) Because of the taste [1] b) Because of the smell [2] c) Because of the texture [3]

d) Copy other pregnant women [4] e) Loneliness and lack of attention [5]

f) To reduce nausea and vomiting [6] g) Just Craving for [7]

h) don't know why [8] I) Cultural reasons[9] j) Environmental reasons [10] k) satisfactory[11]

l) Others specify…….[888]

24) How often do you consume the non-food substance?

a) Once a day [1] b) More than once a day [2] c) Once a week [3]

e) every other day [4] f) Others specify……[888]

25) What time during the day do you crave/consume these non-food items?

a) Morning [1] b) Afternoon [2] c) Evening [2]

d) Night e) Throughout the day f).others……

26) Were you practicing pica when you were not pregnant?

a) Yes [0] b) No [1]

27) If yes, when were you practicing pica?

a) During Childhood [1] b) Adolescent [2]

c) Previous pregnancy [3] d) Never [4]

28) If no, were you practicing pica in your previous pregnancies?

a) Yes [0] b) No [1]

29) What happens if you don't eat the pica substance?

a) Nothing [1] b) I feel sick [2] c) I get depressed [3]

d) Feel hungry [4] e) feel uncomfortable

f) Others specify…… [888]

30) To what extent do you vary your food intake?

a)I consume one type of food throughout the pregnancy[1]

b) I take one type of food and other foods item [2]

c) I do not really have any preference of food concerning what I eat [3]

d) I always eat different types of food when I am pregnant [4]

e) I always want a new type of food when I am pregnant [5]

31) Have you received any education against pica practices?

a) Yes[0] b) No[1]

32) If yes where did you receive the education?

a) Antenatal clinics [1] b) NGOs [2] C) District assembly [3]

d) At home [4] e) Others……[888]

33) Have you been educated on the effects of pica on the pregnancy?

a) Yes [0] b) No [1]

34) If yes what are the effects? Explain…….

Appendix B: Informed Consent Form

My name is Joyce Hommey, a student of University of Ghana Legon, School of Public Health from the department of Applied Health Social Science.

Purpose of the Study

I am conducting a research on the Perception and Practices of Pica among pregnant women in the La-Nkwantanang Madina District. Pica is the practice of craving substance with little or no nutritive value, e.g. eating of white clay, ice cubes etc. This study will assess pregnant women's perception and practices of pica, identify some pica items, the effects of pica on both the pregnant woman and the foetus and suggested ways of treating these disorders in the La-Nkwantanang Madina Municipal. This study is an academic research leading to the award of MSc in Applied Health Social Sciences.

Participant Role

The study involves answering a structured questionnaire on the Perception and Practices of Pica among pregnant women. You are been selected to participate in this research because your knowledge and experience in pregnancy will contribute immensely to our understanding of pica in pregnancy. There will be no costs for participating in the study neither will you paid for participating.

If you agree to take part in the study, we will take about 30mins of your time to answer some questions. You have the right to continue or to withdraw from the study at any time.

The outcomes of this study would help educate pregnant women about the effects of pica on both the pregnant woman and the foetus.

Confidentiality

You are assured of your privacy and confidentiality. The information you will share with us if you participate in this study will not be shared with any other person except the research team. All information will be coded; your name will be replaced with a serial number. Therefore no one will identify you by name.

Potential Risk / Benefit

This study is an academic work and there are no direct benefits for participating. However, findings from this research will serve as an important contribution to the various health sectors in the district for counselling pregnant women including you during antenatal. In addition, the researcher will ensure that your participating in the study incur no harm.

Voluntary Withdrawal

Participation in the study is completely voluntary therefore you are free to agree or not to agree to participate in the study. You can always withdraw at any point in time of the study even if you have agreed earlier to participate. You are also assured that non-participation in the study will not prevent you from getting access to the services offered in the hospital.

Compensation

The researcher will not provide any compensation to you in the research.

Data Storage and Usage

The data collected will be kept safe and stored at the researcher's private home library for 4 year under lock with key after which it will be destroyed. Findings from the research will be shared with Ghana Health Service and the school of public health at the end of the

research period. Complete data will be presented in summary form and your name will not be used in the report.

I am delighted to invite you to take part in this study. I will like you to read this consent form and decide whether you wish to take part in this study or not.

Respondents / participants only:

I…… have been thoroughly informed on the entire methodology and impact of the on-going research which is being conducted.

On my own accord, I hereby consent to be part of the study based on my understanding of what the study entails.

Name of Respondent: ……..

Signature /Thumbprint…….

Date…….

Name of Researchers: ……

Researcher's signature……

Date……..

In case you have any questions about this study, please contact Joyce Hommey (the researcher) at jhommey@hotmail.com or on mobile number 0244173135.

This study is to seek ethical clearance from the Ghana Health Service Ethical Review Board. In case of further information or question about this study, please contact:

Ghana Health Services Ethical Review Committee,

Research & Development Division,

Ghana Health Service,

Box MB 190,

Accra – Ghana.

Email: ghserc@gmail.com.

Madam Hannah Frimpong

Administrative secretary

Ghana Health Service Ethical Review Committee

Mobile number: 0507041223

GHANA HEALTH SERVICE ETHICS REVIEW COMMITTEE

In case of reply the number and date of this Letter should be quoted.

Research & Development Division
Ghana Health Service
P. O. Box MB 190
Accra
Tel: +233-302-681109
Fax + 233-302-685424
Email: Hannah. Frimpong@ghsmail.org

My Ref. GHS/RDD/ERC/Admin/App/16/
Your Ref. No.

Hommey Joyce
University of Ghana
School of Public Health
Legon, Accra

The Ghana Health Service Ethics Review Committee has reviewed and given approval for the implementation of your Study Protocol.

GHS-ERC Number	**GHS-ERC 99/12/15**
Project Title	"Perception and Practices of Pica among Pregnant Women in the La-Nkwantanang Madina District"
Approval Date	12th April, 2016
Expiry Date	11th April, 2017
GHS-ERC Decision	**Approved**

This approval requires the following from the Principal Investigator

- Submission of yearly progress report of the study to the Ethics Review Committee (ERC)
- Renewal of ethical approval if the study lasts for more than 12 months,
- Reporting of all serious adverse events related to this study to the ERC within three days verbally and seven days in writing.
- Submission of a final report **after completion** of the study
- Informing ERC if study cannot be implemented or is discontinued and reasons why
- Informing the ERC and your sponsor (where applicable) before any publication of the research findings.

Please note that any modification of the study without ERC approval of the amendment is invalid.

The ERC may observe or cause to be observed procedures and records of the study during and after implementation.

Kindly quote the protocol identification number in all future correspondence in relation to this approved protocol

SIGNED.....
DR. CYNTHIA BANNERMAN
(GHS-ERC CHAIRPERSON)

Cc: The Director, Research & Development Division, Ghana Health Service, Accra