UNIVERSITY OF CAPE COAST

COMPARISON OF MATERNAL HEALTH LITERACY BETWEEN RURAL AND URBAN WOMEN IN KOMENDA-EDINA-EGUAFO-ABREM DISTRICT OF GHANA

EMMANUEL EDUM-FOTWE

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BY

EMMANUEL EDUM-FOTWE

Thesis submitted to the Department of Health, Physical Education and Recreation of the Faculty of Education, University of Cape Coast, in partial fulfilment of the requirements for award of Master of Philosophy Degree in Health Education

JULY, 2010

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature: …… Date: ……

Name: Emmanuel Edum-Fotwe

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature: …… Date: ……..

Name: Dr. J. K. Ogah

Co-supervisor's Signature: …….. Date: ……

Name: Dr. B. I. Boateng

ABSTRACT

Maternal health literacy has been identified as key predictor of maternal healthcare service utilization. The purpose of this study was to determine the difference in maternal health literacy between women residing in rural and urban areas of the Komenda-Edina-Eguafo-Abrem district.

The study employed a cross-section correlational design. Respondents included 448 women of childbearing ages residing in rural and urban areas selected through compact segment sampling. Information on respondents' maternal health literacy and health behaviour was collected using a composite data collection instrument. Chi square test, the independent samples t-test, and correlation coefficient were used to analyse data.

Respondents resident in rural areas used community-based sources of maternal health information significantly more than did those resident in urban areas, χ^2 (4, n=399) = 51.5, p=.000. Residence in rural area was significantly associated to infrequent exposure to information. Respondents from rural areas exhibited significantly lower levels of maternal health literacy than did those from urban areas, χ^2(4, N=448) = 95.21, p =.000. Higher levels of maternal health literacy were positively related to number of routine visits to antenatal clinic, r = .65, n=392, p = .000 (one tailed); and to delivery at hospital, ρ = .69, n = 448, p = .000, (one tailed).

Maternal health literacy among respondents resident in rural areas was lower than that among women resident in urban areas. Educational programmes emphasizing development of knowledge, attitudes, behavioural skills, and confidence needed to access maternal healthcare services should be implemented.

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DEDICATION

To

Josephine, Nathaniel, Evangeline and Immanuel

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CHAPTER ONE

INTRODUCTION

Background to the Study

The concept of development has undergone considerable changes over recent years. Whereas in the 1960s the focus of advancing development in non-industrialised nations has rested on improvements in technology, infrastructural advancement, and technology transfer, in recent years the focus of development has shifted to an emphasis on human capital (Global Forum on Health Research, 2004). There has therefore been a gradual shift from projects for technological and infrastructural improvements to human development. Thus, the current targets of development include ensuring healthy living, adequate education, acceptable standards of living, and liberty to contribute to community development (UNDP, 2005). In this respect, human development is regarded to engender economic growth, and economic growth, in turn, enhancing further advances in human development. Concern for improving the health status of populations has consequently become the preoccupation of many economies of non-industrialised nations as well as development agencies. As health status of a population improves, life expectancy and quality of life increase, leading to increases in productivity and development (US Department of Health and Human Services, 2000). However, attaining

improved health status of the population has always been a daunting task to many governments of non-industrialised nations. With the exposure of individuals in the population to a diversity of risks to their health, the challenge and responsibility of governments have thus centred on reducing the risks to health as much as possible, in order to achieve a long and healthy life among the population.

The design and implementation of interventions for reducing risks to health in order to improve health status have been demonstrated to stem largely from perceptions of health and risks (World Health Report, 2002). Health is described as a state of complete well-being; that is, physical, social and psychological well-being (World Health Organization, 1948). However, other experts conceive health as the capacity of an individual to deal with stressful situations, maintain a strong social-support system, and be able to integrate himself/herself into the community (Travis & Ryan, 2004). It is deemed a state of equilibrium between a person and his/her physical, biological, social and cultural environment that enhances the person's ability to perform family, work and community roles; deal with physical, biological and social stress; and be free from the risk of disease and premature death (Scutchfield & Keck, 1997). Health also involves having a high morale and life satisfaction, and being psychologically and physically fit (Cinar, 2008).

From these perceptions of health, a three-dimensional approach to reducing risks to health towards attaining improved health status of a population could be delineated; namely, maintenance of health, restoration of health, and improvement of health (World Health Report, 2002). However, in all the dimensions, health behaviour of individuals stands out as the most

important process by which people could make use of the interventions prescribed for reducing the risks to health in order to attain improved health status. Health behaviour comprises a chain of actions taken by individuals to achieve, maintain, or regain good health and to prevent illness (The Free Dictionary, 2008). Thus, eating proper diet, and engaging in appropriate exercises are actions that individuals could undertake to achieve, maintain, restore or improve their health status. Formation of health behaviour is thus central to achieving improved health status among a population. Formation of health behaviour, however, involves interactions between the individual and factors such as socioeconomic status, level of education, income and income distribution, culture, and administrative factors (Glanz, Lewis &Rimer, 2002), with the key factor being health literacy (Kickbusch, 2001).

Health literacy, as defined by the United States Health and Human Services (2000) in the 'Healthy People 2010' document, is the extent to which individuals and communities have the competence to acquire, analyse and understand basic health information and services for appropriate health decisions and actions. Health literacy, therefore, means attaining the basic knowledge and skills that enhance an individual and his/her family's health in a way that favourably influences their attitudes and behaviour towards healthy living. It involves meeting the expectations, predispositions and skills of individuals and communities seeking health information towards improving, maintaining and promoting their health and arises from a unification of health education, health services, and social and cultural factors (Institute of Medicine, 2004). Just as education enables individuals to experience social and economic benefits, health literacy allows individuals to experience the

benefits of better health. Thus, health literacy is an essential element in all endeavours aimed at improving the health status of a population. It is critical to the use of health information for adopting healthy lifestyles and taking decisions and actions that reduce risks to health in the home, workplace, community, and society. In addition, health literacy is fundamental to the ability of community members, especially women and children, to access healthcare services to maximise their health state and engage in appropriate self-care and disease management practices. There is much evidence laying bare the fact that people's knowledge and skills about risks to health affect their ability to locate healthcare providers, use health facilities, comply to health intervention prescriptions, and/or act on important public health recommendations (World Health Report, 2002; Kutner, Greenberg, Jin, & Paulsen, 2006). Accordingly, the fifth policy direction of the New Partnership for Africa's Development (NEPAD) health strategy called for health ministries of member countries to scale up community involvement in health improvement through achieving high levels of health literacy among individuals in the community (NEPAD Health Strategy, 2001).

The importance of the health of women in every population cannot be overemphasised. The health of women has been demonstrated to impact positively on the health of their families and communities (WHO, 2007). Women have for a long time served as key agents for health improvements (United Nations, 1994). They have a propensity to invest in their children's health and tend to carry a higher family burden than men do. It is estimated that about 80% of women in most parts of the world have the greater decision-making responsibilities for health care in the family (Family and Community

Health, 2007). In Ghana, for instance, the role of women in raising healthy families and providing for the health needs of their families – nutritional needs, personal and environmental hygiene needs, reproductive health needs, and disease control and prevention needs – have been documented (Kwapong, 2008). Women's health, therefore, has a wide-ranging relevance and significance for endeavours aimed at improving the health status of populations. Countries that have improved the health of its female population through health literacy tend to have low infant mortality and long life expectancy (WHO, 2007).

In Ghana, in line with the international development target of attaining universal access to reproductive health services by 2015, one of the strategic objectives of the health sector is to empower communities and individuals especially priority groups such as women and children to improve their health status and gain increased access to basic health care (Ghana Ministry of Health, 2002). Health education services have consequently been strengthened to provide effective health education on healthy living, environmental and lifestyle related diseases, environmental sanitation, and proper utilization of health facilities and services at the community level (Ghana Ministry of Health, 2005). The Ministry of Health and Ghana Health Service have also expanded the health care service to the community level through the Community Health Planning and Services (CHPS) initiative in order to develop community action towards health improvement as well as empower women to make use of opportunities to improve and maintain their state of health (Ghana Health Service, 2007).

Improving the health status of women require the delivery of a safe and quality healthcare to every woman irrespective of socioeconomic status, socio-demographic characteristics and place of residence. This requires an apposite communication between the healthcare providers and the female consumers of the healthcare service that sustains understanding among the consumers. This kind of communication, thought to emanate from improved health literacy, enhances access to the healthcare services among women as well as improves their behavioural choices towards reducing risks to health at all levels of socioeconomic and socio-demographic categorization (The National Women's Health Resource Centre, 2004). Thus, as health literacy improves, health behavioural choices among women get better because of the improved thinking and decision-making processes accruing from the health literacy. The women consequently attain the adeptness to access the healthcare system as well as exhibit constructive health behavioural patterns that assure reductions in risks to health and, thereby, promote healthy life. It is imperative, therefore, to quantify health literacy especially among women who are the caregivers in most homes in both rural and urban areas in Ghana. Such a health literacy index could become a significant measure to evaluate health maintenance, promotion and prevention activities of the health service, and to determine the competence and capabilities of women to maintain, restore, and improve their health status.

Statement of the Problem

In Ghana, the proportion of women and children in the population is estimated at 53% of the total population (Ghana Statistical Service & Noguchi Memorial Institute for Medical Research [NMIMR], 2004). However, about

67% of the women have education not above the primary school level (Ghana Demographic Health Survey [GDHS], 2003). To improve the health of women in the country, therefore, the Ministry of Health and Ghana Health Service provide a package of healthcare maintenance and promotion services through a safe motherhood programme. Through this programme, which aims at improving the health of the women and reducing maternal morbidity and mortality, services such as antenatal care, supervised delivery, postnatal care, family planning, prevention and management of unsafe abortions as well as environmental and lifestyle diseases, and health education, are provided to all women at all levels of healthcare delivery.

Taking into consideration the safe motherhood programme, coupled with the proportion of women in the population, women tend to interact with the healthcare system and tend to receive health information more than men do. However, as high as 49% of pregnant women attend antenatal clinic for the first time at gestational ages above the first trimester and about 40% do not attain the standard of four visits before delivery. Supervised delivery coverage also stands at 44.5% (Ghana Health Service, 2006). Again, notwithstanding women's significant roles in inculcating health behaviours among members of their households, about 67% of households in the country do not have any standard hand washing facility and only 55% of children are exclusively breastfed. As high as 45% of women of childbearing age, and about 29% of pregnant women at first registration at antenatal clinic, are anaemic (GDHS, 2003; Ghana Health Service, 2006). In the Komenda-Edina-Eguafo-Abrem (KEEA) District of the Central Region, about 61% of pregnant women attended antenatal clinic for the first time at gestational ages above the first

trimester and about 37% of pregnant women did not attain the required four routine visits to the clinic before delivery (Reproductive and Child Health Unit, Central Region, 2007). About 19% of pregnancies occurred among adolescents aged between 10 years and 19 years and only 31% of deliveries were supervised.

Accessibility of maternal healthcare services has also been revealed to be an important determinant of utilization of the services in developing countries; especially in most rural areas where about one in three women live more than five kilometres away from the nearest healthcare delivery facility (World Bank, 1994). In the KEEA district, it is observed that most healthcare delivery facilities are urban-centred. Thus, while the dearth of healthcare delivery facilities in most rural areas serve as a barrier to the receipt of prenatal care in the first trimester, transportation and distance serve as barriers for delivery assistance by trained healthcare provider and institutional delivery (Gage, 2007).

These observed health inequities among women, especially in the KEEA District, although could partly be influenced by culture, location of healthcare facilities and societal characteristics, demonstrate a lack of adeptness among the women to adopt health behavioural patterns prescribed by the safe motherhood programme that serve to reduce risks to health and thereby improve women's health status. This apparent lack of aptitude to utilize the health communication from the programme could probably emanate from the state of health literacy among the women in the district. If health literacy among the women is inadequate, it is likely to impinge on the ability of the women to utilize the safe motherhood programme to improve their

health status irrespective of their ethnicity, customs, socioeconomic status and geographical location. In addition, inadequate health literacy is liable to amplify the disparities being observed in health status among the women through decreasing their compliance to health-behaviour-modification interventions and thereby increase their risk to ill health. These women are thus likely to refrain from utilizing health maintenance and promotion interventions prescribed by the safe motherhood programme, lack knowledge about the health conditions they suffer, have inadequate disease prevention and management skills, and have low rates of compliance to medication. In addition, these women are less likely to use health-screening services and have worse health outcomes and quality of life.

Knowledge about the levels of health literacy among the women in the district is thus pertinent to improving the health, and thereby, quality of life of the women. Accordingly, information on health literacy and its relationship to health behaviour among the women in the district is essential to directing improvements in health education to standards that ensure better health behavioural patterns and quality of life among the women. Therefore, levels of health literacy and health behavioural choices among women resident in the district will be ascertained in order to identify the state of health literacy among the women and the relationship between the level of health literacy and their health behaviour.

Purpose of the Study

Over the years, many health programmes have been carried out in the Central Region and, particularly, the KEEA District by the local government, Ministry of Health, Ghana Health Service and non-governmental

organizations towards improving access to health care and enhancing healthy living among the general public and especially women and children. Health programmes such as safe motherhood, which incorporates focused antenatal care and supervised deliveries, and baby friendly hospitals initiative have been implemented with the aim of improving the health status of the women in the district and enhancing their quality of life. In addition, many health education and promotion activities have also been carried out towards improving health literacy and modifying health behaviour to make the women in the district take advantage of the health programmes to enhance healthy living among themselves and, hence, their quality of life.

The purpose of the study was firstly to determine the type of maternal health information women in the KEEA District receive and assess the level of maternal health literacy among them. The second purpose of the study was to determine the differences in maternal health literacy between women resident in rural and urban areas in the district, examine associations between maternal health literacy and health behavioural patterns, and to attempt an explanation of the observed patterns of utilization of healthcare programmes prevailing between rural and urban women in the district.

Research Questions

The following research questions were answered in the study:

1. What is the difference in maternal health information received between women resident in rural and urban areas in the KEEA district?
2. What is the difference in maternal health literacy between women resident in rural and urban areas of the district?

3. How does the level of maternal health literacy between women resident in rural and urban areas influence their health behaviour?

The sub-research questions were:

a. From where do women resident in rural and urban areas obtain maternal health information?
b. What types of maternal health information do women resident in rural and urban areas receive?
c. How often are women resident in rural and urban areas exposed to the types of maternal health information?
d. What is the level of maternal health literacy between women resident in rural and urban areas?
e. What is the pattern of maternal healthcare services utilization between women resident in rural and urban areas?
f. What is the relationship between level of maternal health literacy and maternal healthcare services utilization in rural and urban areas?

Hypotheses

The following alternative hypotheses were tested in the study:

1. A greater proportion of women resident in rural areas use community-based sources of maternal health information than do those resident in urban areas.
2. Exposure to maternal health information is less frequent among women resident in rural areas than among those resident in urban areas.
3. Level of maternal health literacy is lower among women resident in rural areas than among those resident in urban areas.

4. Higher levels of maternal health literacy are associated with increased utilization of maternal healthcare services among women resident in both rural and urban areas.

The following null hypotheses were tested to ascertain likely differences existing between women resident in rural and urban areas in the district:

1. There is no significant difference in the use of community-based sources of maternal health information between women resident in rural and urban areas.
2. There is no significant difference in frequency of exposure to maternal health information between women resident in rural and urban areas.
3. There is no significant difference in the level of maternal health literacy between women resident in rural and urban areas.
4. There is no significant relationship between level of maternal health literacy and utilization of maternal healthcare services both in rural and urban areas.

Significance of the Study

Health communication is a ubiquitous activity of the health sector in Ghana. Every health professional in the health sector in the country is trained to provide some health information pertaining to his/her area of specialization. Thus, health communication forms an integral part of almost all healthcare programmes – health maintenance, restoration and improvement programmes. As a result, almost every consumer of the healthcare system is expected to have received some form of health information. However, despite the fact that there are many studies on health seeking and utilization behaviour of

individuals, there is a dearth of information on the relationship between the health communication that occurs in the health sector and the healthcare utilization behaviour of consumers of healthcare programmes. Relations between access to health information, health literacy and healthcare programme utilization have been identified as fundamental to the improvement of the health status of people, especially women (World Bank, 1994). Some studies have also demonstrated a strong correlation between health literacy and utilization of healthcare programmes (Kickbusch, 2001; Institute of Medicine, 2004; Kutner, et. al., 2006). Health literacy is therefore one of the foundations of quality health care and has special importance for the empowerment of women for health improvement. The result of this study may thus be a useful input to policy and decision-making at all levels of the healthcare delivery system in the Ministry of Health and Ghana Health Service in relation to improving utilization of healthcare programmes. Additionally, the results and recommendations of the study may be useful for designing pragmatic health education programmes aimed at improving the health behaviour of women, and, hence their health status. Finally, the study will create the opportunity for further research and serve as a reference material for other researches.

Delimitation

The definitions of health literacy denote an aptitude of individuals to obtain, process, and understand basic health information necessary to make appropriate health decisions. Health literacy, therefore, comprises a constellation of knowledge and skills that constitute the ability to perform basic appraisal tasks for functioning in the health care environment and acting

on health care communication relating to the gamut of health care; that is medical care, reproductive health, nutrition, disease control and prevention, environmental health, child health, and geriatric care. It would be futile for the study to attempt to assess the level of health literacy pertaining to the total range of health care. Such an attempt will be beyond the resources, time, financial, and material, available to and the scholastic prerequisites placed on the researcher. Consequently, the study was delimited to the assessment of maternal health literacy pertinent to three key maternal healthcare services; namely, antenatal, delivery and postnatal care.

Limitations

The general purposes of every study include production of new knowledge, enhancing understanding of existing knowledge, and providing predictions pertaining to phenomena. The dependability of every study, therefore, depends on what counts as generalizable knowledge. Notwithstanding the purposes and qualities of studies, certain facets of the research process places limitations on the generalizability of the results of the study (Marczyk, DeMatteo & Festinger, 2005). Two aspects of this study placed limitations on the generalizability of the results. Firstly, this study included only women who had a child aged between one and twelve months at the time of the study. Their experiences therefore might not reflect those of all women in fertility ages in the district. Secondly, due to the culture of non-acknowledgement of pregnancy during the first trimester being rife in many societies in Ghana, experiences during the first three months of gestation were difficult to capture, which might result in some information bias. Consequently, the generalizability of the result of the study will be difficult.

Definition of Terms

Antenatal care: healthcare services provided for the pregnant woman and aimed at improving and maintaining health during pregnancy; preparation for labour; and ensuring safe normal delivery and establishment of breast-feeding.

Grand multiparous: a state of a woman referring to having given birth seven or more times.

Health behaviour: a set of behaviours exhibited by individuals aimed at protecting, maintaining or promoting their health status.

Health information: information on health issues aimed at enhancing the knowledge and skills of consumers of healthcare services to use the services effectively to improve health status.

Health literacy: the cognitive and social capacity of individuals to gain access to, understand and use health information in ways that promote and maintain good health.

Healthcare services: a system of institutions, people, technologies, and resources designed to provide a composite and comprehensive health care with emphasis on prevention and early detection of disease, and continuity of care aimed at improving the health status of a population.

Ophthalmia neonatorum: an infection of the eye (conjunctivitis) of the newborn occurring within the first ten days of life.

Parity: a state of a woman referring to having ever given birth to either single or multiple live or dead babies.

Postnatal care: healthcare services provided the new mother aimed at improving and maintaining the physical, emotional and psychological health of mother and child.

Pre-eclampsia: a condition of developing hypertension as a result of being pregnant.

Primigravida: a state of a woman denoting being pregnant for the first time.

Puerperium: the period immediately following the delivering a baby to the return of the womb to its normal size. It usually extends over six weeks.

Supervised delivery: a delivery conducted by a trained healthcare provider such as an obstetrician, medical officer, or midwife.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The purpose of this review was to evaluate literature on the concept of maternal health literacy. It was aimed at establishing the veracity of the linkage between maternal health literacy and maternal healthcare services utilization and to provide direction to the conduct of this study. A number of studies on health literacy, maternal health literacy, and determinants of maternal healthcare services utilization were reviewed. The report is, however, presented under the following sub-headings to enhance readability: concept of health literacy, measuring health literacy, health literacy and health outcomes, maternal healthcare services in Ghana, foundations of maternal healthcare services utilization, rural-urban disparities in healthcare utilization, impact of health literacy on utilization of services, and prevalence of maternal health literacy.

Concept of Health Literacy

Literacy is universally considered as the ability to read and write at a designated level of proficiency. It is primarily considered as a set of technical skills that typically consist of reading, writing and calculating (UNESCO 2004). However, according to Hamilton (2006), literacy is more complex than reading, writing and calculating. It includes such wider range of skills that are

needed to make meaning and participate in society; and reflects the interactive processes involved in everyday information exchange as well as the dimensions involved in grasping the meaning of messages that are central to making critical judgement and decisions required for meeting the demands of life. Thus, literacy goes beyond the ability to use the dominant symbol systems of a culture (letters, numbers, visual icons, etc) to include the ability to understand and use the symbols for personal and community development (Centre for Literacy of Quebec, 2000). Literacy is therefore a learned human behaviour and important for the healthy development of individuals and societies (Hamilton, 2006).

Health literacy is a discrete form of literacy that evolved out of literacy and is important for social, economic and health development. In general, health literacy denotes the capacity of individuals to obtain, process, and understand basic health information and services needed to make appropriate health decisions (Ratzan & Parker, 2000). This involves understanding oral and written information provided by healthcare professionals and acting upon necessary procedures and directions to maintain and/or improve health. Accordingly, health literacy is defined by many authors to encompass the cognitive and social skills that determine the motivation and abilities of individuals to gain access to, understand and use health information in ways that promote and maintain good health (Kickbusch, 2001; Institute of Medicine, 2004; UNESCO, 2004; Rootman & Ronson, 2005; Hamilton, 2006).

The conception of health literacy as a combination of cognitive and social skills calls attention to a dual responsibility in ensuring the prevalence

of high-level health literacy rate. It also brings to the fore, the communication and information exchange skills expected to exist between the healthcare professionals and the public. This is in line with the perception of the Institute of Medicine (2004), United States of America, that health literacy is prevalent when the expectations, preferences, and skills of the people seeking health information and services meet the expectations of the healthcare professionals providing the information and services. In relation to this perception, Nutbeam, Rudd and Saan (2007) put forward that to be considered health literate, therefore, an individual must have both skills and ability to function within the health-care system. These skills and abilities are results emanating from empowerment of individuals and communities by the healthcare delivery system to take control over their personal health and care. Thus, health literacy is a complex concept that describes a range of outcomes resulting from health education and health communication activities of healthcare delivery systems. In line with this analysis, improving health literacy means more than transmitting information, and developing skills to be able to read documents on health issues and successfully make appointments to healthcare facilities. It also includes improving people's access to health information and their capacity to use the information effectively (Nutbeam, et al., 2007).

Measuring Health Literacy

According to UNESCO (2004), measurement of literacy in the general population is carried out in three key areas; namely, prose literacy (ability to read and understand texts), document literacy (ability to interpret forms, tables and maps), and quantitative literacy (ability to perform simple arithmetical calculations). However, Green (2007) reports of a fourth area, problem

solving and analytical reasoning, added by Australia's Adult Literacy and Life-skills Survey conducted in 2006. This fourth area assesses the role of literacy in daily decision-making.

Unlike literacy, measurement of health literacy in a population has principally centred on prose literacy. The three major instruments used to measure health literacy are, Rapid Estimate of Adult Literacy in Medicine (REALM), Test of Functional Health Literacy in Adults (TOFHLA), and Wide Range Achievement Test-Revised (WRAT-R). The REALM was designed to provide an objective measure of the reading ability of persons using healthcare services that would be appropriate for medical settings (Davis, et al., 1991). Words that are pronounced correctly or attempted but pronounced incorrectly are counted as right while words that are not pronounced correctly or not attempted are counted as wrong. The instrument, however, does not measure understanding; it only intimates that an individual with a reading disability has low literacy skills and should, therefore, be given additional verbal directions and instructions while moving through healthcare settings. Originally consisting of 125 words, the instrument was designed based on educational materials and intake forms used for patients in primary care clinics. However, upon piloting for three years in public health and primary care settings, physicians suggested shortening of the instrument in order to increase its practicality. Thus, the instrument was reduced to 66 items after item analysis was performed (Davis, et al., 1993; Bass III, Wilson & Griffith, 2001). The 66 items are grouped under three columns with 22 words in each column. The words are arranged by the number of syllables in the word and by level of difficulty. Validated versions of the instrument include

REALM-Revised (REALM-R) and REALM-Teen (REALM-T) – an adolescent version of the REALM.

Parker, Baker, Williams and Nurss (1995) developed the TOFHLA by using actual hospital medical texts as the source for instrument's numeracy and reading comprehension items. The instrument has 67 items assessing reading, comprehension and numeracy constructs. It measures the functional health literacy of individuals using healthcare facilities with real-life health care literature such as patient education information, prescription bottle labels, registration forms, and instructions for diagnostic tests. The reading and comprehension scale of the instrument is self-administered. It uses a method known as the 'Cloze-procedure' where the user of the healthcare service is presented with reading passages that have every fifth to seventh word missing. The person is expected to choose the correct missing word from a list of four possible answers taking into cognisance the grammar or the context of the sentence. The numeracy scale is, however, interviewer-administered. Adaptations of the TOFHLA validated for use include the Spanish (TOFHLA-S) and the Short (S-TOFHLA) versions.

The WRAT-R is a commonly used literacy assessment tool in educational settings in the United States (Friedenberg, 1995). The instrument is an individual achievement test used to assess skills in reading, spelling, and arithmetic. However, the reading subscale of the instrument has been widely applied in the medical field to measure health literacy (Kareken, Gur & Saykin, 1995). The instrument assesses word recognition by having a testee read aloud from a list of words. The test is concluded and a score derived when the testee mispronounces ten consecutive words. The instrument is,

however, appropriate for persons aged 5 years and above. Versions of the instrument include WRAT-3 and Expanded (WRAT-E).

These commonly used instruments however measure, primarily, word recognition without any assessment of the critical skills and abilities that enable people to use healthcare services. Commenting on these instruments, the United States Department of Health and Human Services (2003) pointed out that these health literacy measures over-emphasise the ability of the individual to use the written word disregarding other factors – such as healthcare professionals' skills in communication and use of technical language – that have relevance on an individual's understanding of health information. These limitations of the instruments seem to have been considered by a more recent instrument, the Newest Vital Sign (NVS), which incorporates elements of both comprehension and numeracy skills of patients in primary care settings. Nevertheless, a low score on the instrument, as noted by Davis, Kennen, Gazmararian, and Williams (2005), is only an indication of people's ability to understand health information and not an evidence of their keenness to take responsibility for their health and care. In a randomized controlled trial, Weiss, Francis, Senf, Heist, and Hargraves (2006) confirmed the limitation of the NVS, and asserted that the ability of a measurement that could result in improvements in communication between the healthcare delivery system, users of the system, and health outcomes is yet to be established.

Another area of health literacy measurement critically important in health care is health-related oral literacy (Baker, 2006). Health-related oral literacy deals with comprehension of spoken health information. According to

Baker (2006), while extensive literature on processing of oral information in education, communication studies, and cognitive psychology exist, little is known about people's ability to understand spoken health information and its relationship with development of skills and capacities to access healthcare services. Baker (2006), however, acknowledged that the Institute of Medicine (IOM) has already identified health-related oral literacy as a separate domain of health literacy. However, no standardized test to measure comprehension of spoken health information has been developed even though health-related oral literacy is consequential to the vocabulary and conceptual knowledge of both the health professional and consumer relating to the subject matter being discussed, and does not depend on the health consumer's reading fluency and/or numeracy skills. Nevertheless, the IOM (2004) maintained that the cognitive processes essential for understanding spoken health information are similar to those required to comprehend printed health information. As such, individuals identified as having limited health literacy on printed health information are likely to be equally limited on health-related oral literacy. It is, however, imperative that further research is carried out to determine whether the ability to understand spoken health information predicts knowledge, attitudes, behaviours, and health outcomes independently from health-related print literacy since comprehension of spoken health information depends greatly on cognitive capabilities – memory, and capacity to appreciate interrelationships between multiple pieces of spoken health information (Baker, 2006).

Since health literacy is determined by a multiplicity of factors, which include the characteristics of the individual receiving health information and

the individual's environment, it is easier to conceptualize than to measure directly. In this respect, David and Baker (2006) posited that appraisal of a person's health literacy requires relating the individuals' reading fluency, vocabulary and background knowledge to their oral and written communication demands. The evidence, heretofore, is that health literacy measurement requires a multifaceted approach and should incorporate measurements of the type of health information, frequency of exposure to the health information and people's ability to make decisions based on the health information they have been exposed to. Nutbeam, et al. (2007) suggested measurements in three areas; namely, functional, interactive and critical health literacy. Functional health literacy relates to the ability of the individual to read and/or understand health information. Interactive health literacy deals with the interactions that occur between healthcare professionals and the public during communication and exchanges of health information and directives. Critical health literacy involves empowerment of individuals to take control over their personal health. Nutbeam, et al. (2007) further suggested that a set of scales – such as Likert Summated Rating Method – could be developed for each area in order to be able to mark out broad health literacy levels and make comparisons between population groups possible. Based on the work of Nutbeam, et al. (2007), Junko, Mikako, and Fumie (2007) developed a hybrid model for measuring health literacy. Through a review of health literacy literature and participant observation of five health education classes for adults in health centre settings, Junko, et al. (2007) put up a scale comprising the three core categories of health literacy proposed by Nutbeam, et al. (2007). However, in this hybrid model, functional health

literacy measures “reading, writing and numeracy;” interactive health literacy covers "acquisition," "perception, recognition, and comprehension," "analysis, selection, and evaluation," and "utilization;" while critical health literacy assesses "application" and "offer to others." The model incorporates issues pertaining to communication of health information and implementation of health education programmes – goal setting, problem solving, and physical fitness testing and body measurement – and ensures agreement with health learning theories. Shohet (2007), therefore, proposed the use of protocols, which indicate preferences of users of healthcare services for acquisition of health information and/or learning of new skills. According to Shohet (2007), this would give healthcare service providers a sense of the literacy capacity and the learning preferences of the users of the service and would enhance assessment of people’s health literacy abilities. It is imperative, therefore, that measurement of health literacy should not only cover the ability to comprehend both written and oral health information, but should include the impact of the information on healthcare utilization behaviour.

Health Literacy and Health Outcomes

Healthcare is a public system that has become increasingly complex and therefore requires a wide range of knowledge and skills to use adequately for improvement in health, both curative and promotive health. Thus both healthcare and health literacy are dynamic concepts that have influence on the society’s ability to stay healthy. According to the Centre for Medicare Education (2000), the consequences of low health literacy is dismal for both adults and children as the costs of uninformed decisions go beyond the health care of the individuals making the choices to affect the health and long-term

care decisions of their spouses, children, or parents. Thus, choosing a healthy lifestyle, knowing how to seek medical care, and taking advantage of preventive measures require that people understand and use health information. Consequently, given the complexity of the healthcare system, persons with limited health literacy are more likely to experience poor health. A study undertaken by Baker, Parker, Williams, Clark and Nurss (1997) in two urban public hospitals in Georgia and California, respectively, examined the relationship between reading ability, self-reported health, and use of health care services. Administering the TOFHLA with 67 items to 2,659 patients with non-urgent medical conditions reporting to the Emergency Care Centres and Walk-in Clinics of the hospitals, Baker, et al identified that patients with inadequate functional health literacy were more likely to report their health as poor than were patients with adequate functional health literacy. When patients with high levels of education were compared to those with low levels, self-reported health was found to be weakly associated with length of schooling. Although in a univariate analyses age, gender, and socioeconomic factors were also found to be associated with self-reported poor health, a logistic regression adjusting for age, gender, and socioeconomic indicators established functional health literacy as a key predictor of self-reported poor health. More low health literate patients reported poor health as compared to patients with adequate health literacy. In conclusion, the researchers posited that low health literacy is strongly related with self-reported poor health and that health literacy is connected with self-reported health than length of schooling.

Several other studies have demonstrated that persons with limited health literacy are more likely to have chronic conditions and are less able to manage them effectively. These studies found that, persons with high blood pressure, diabetes, asthma, or HIV/AIDS who have limited health literacy have less knowledge of their illness and its management (Williams, Baker, Parker, & Nurss, 1998; Williams, Baker, Honig, Lee, & Nowlan, 1998; Kalichman, & Rompa, 2000; Schillinger, et al., 2002; Schillinger, et al., 2003). Likewise, Scott, Gazmararian, Williams, and Baker (2002), in a study on the use of preventive health services among Medicare enrolees noted that, persons with limited health literacy were more likely to skip important preventive measures such as mammography, Pap smear, and immunization. When compared to those with adequate health literacy, persons with limited health literacy enter the healthcare system with more complications of illnesses (Baker, et al., 2002). This link between limited health literacy and poor health outcomes among American adults is not surprising, as the National Centre for Educational Statistics (2006) reported that almost 9 out of 10 American adults lack the skills needed to manage their health and prevent diseases and 14% of the adults have health literacy below the basic level. These adults were more likely to report their health as poor, lack health insurance, and lack the ability to use healthcare systems than adults with proficient health literacy.

Although these studies were conducted in industrialised societies, where the healthcare systems have shifted from a paternalistic structure to a partnership model, with more emphasis on individual responsibility for prevention of illnesses, informed decision making and consent and self-management of chronic conditions, similar linkages between limited health

literacy and poor health outcomes have also been reported in non-industrialised societies. Bonjour, Montagne, Zambrano, Molina, and Lippuner (2008) report of late presentation for HIV diagnosis in Venezuela as a result of limited health literacy. In their study of 225 subjects diagnosed with HIV, 41% was found to have presented for diagnosis at a later disease stage, indicating a limited access to care. The main barriers to the HIV testing were low knowledge of HIV/AIDS, lack of awareness of the free HIV control program, and lack of perceived risk of HIV infection. In another study on health-risk behaviour in Croatia, Becue-Bertaut, Kern, Hernandez-Maldonado, Juresa and Vuletic (2008) found that persons with limited health literacy were more likely to report health-risk behaviours related to heavy alcohol and tobacco use, unhealthy diet, risky physical activity and non-use of the healthcare system. Similarly, a study on social costs of skilled attendance at birth in rural Ghana by Bazzano, Kirkwood, Tawiah-Agyemang, Owusu-Agyei and Adongo (2008) found that most women delivered at home, as home delivery was deemed to raise a woman's status in her community, while seeking skilled attendance lowered it. Limited health literacy is thus associated with an increase in preventable hospital visits and admissions and greater use of services designed to treat complications of diseases and less use of services designed to prevent complications in both industrialised and non-industrialised nations.

Maternal Healthcare Services in Ghana

It is estimated that in every minute, a woman dies from complications of pregnancy and childbirth and a minimum of 585,000 die every year (WHO, 2007). According to the WHO, nearly all maternal deaths (approximately

99%) occur in developing countries, with about 48% occurring in Africa alone and an estimated 50 million women experiencing pregnancy-related health problems during or after childbirth each year. Most of these maternal deaths are due to five main preventable causes; namely, haemorrhage, infection, unsafe abortion, hypertensive disorders of pregnancy, and obstructed labour. These causes could be effectively prevented with adequate access to good quality, affordable maternal healthcare services during pregnancy, childbirth, and the period after childbirth. In Ghana, maternal mortality ratio is estimated at 187 per 100,000 live births with rural areas accounting for 71% of the maternal deaths and haemorrhage being the single leading cause of death (GHS, 2006). Maternal healthcare services are offered to women of childbearing age and are customarily focused on reproductive needs, especially maternity care, of expectant women. Maternity care aims at ensuring that every expectant and nursing mother maintains good health, has normal delivery and bears healthy children. Maternal healthcare, therefore, begins from the time of conception and encompasses the prenatal, natal and postnatal care of the expectant mother (Bennett & Brown, 1993).

The prenatal care ensures the health of the expectant mother, especially through good nutrition and prevention or treatment of avoidable complications of pregnancy. Being a preventive healthcare, the prenatal care seeks to promote and maintain the physical, mental, and social health of the woman and her child; detect and treat high-risk conditions arising during pregnancy; ensure delivery of a full-term baby with minimal stress and/or injury to mother and baby; and prepare the woman for successful breastfeeding and puerperium. According to the Ghana National Reproductive Health Service

Protocols developed by the Ministry of Health (1999), every pregnant woman is expected to attend antenatal services once every month from conception to 28 weeks of pregnancy; once every two weeks from the 28th to the 36th week; and once every week from the 36th week until delivery. The antenatal services provided include a comprehensive history-taking, a cluster of examinations (general, physical, obstetric and vaginal examinations), laboratory investigations, administration of routine drugs (oral iron preparations, malaria prophylaxis and immunizations) and health education. The focus of the history taking and examinations is to assess the health of the woman and identify any problem that could adversely affect the health of the woman and the foetus. The health education service is aimed at improving the diet and nutrition of the pregnant woman, ensuring adequate rest and exercise, and improving personal hygiene practices. It is also geared toward making pregnant women aware of the physiological changes and events in pregnancy – changes in the breast, growth of the foetus, and onset of labour. Pregnant women are also taught to recognise danger signs during pregnancy; the effects of use and/or misuse of drugs, alcohol and tobacco; and the purposes of each visit to the antenatal service. During the visits to antenatal service, the risk level of the pregnant woman is assessed and classified into either of three categories; namely, categories 'A', 'B', and 'C'. A pregnant woman is classified Category 'A' when she is between 20 and 35 years old, parity 1 to 3, in good health with the current pregnancy, and had no complication with the previous pregnancy and delivery. A woman is classified Category 'B' when she is aged below 20 years or above 35 years, primigravida, parity 4 and above, or below 150 centimetres; or has mild pre-eclampsia, moderate anaemia, normal multiple

pregnancy, had previously assisted delivery or on treatment for tuberculosis. A woman is classified Category 'C' when she has a medical condition – severe anaemia, sickle cell disease, diabetes, renal disease, heart disease, or deformity of pelvis or lower back – with the current pregnancy and/or major obstetric risks such as grand multiparous, severe pre-eclampsia, eclampsia, previous stillbirth, repeated miscarriages, prolonged infertility, and mal-presentation. The level of care and attention is determined, to some extent, by the risk category. While the first risk category could be managed at the clinic level, risk category 'C' should always be managed at the hospital level where specialist obstetricians are located (Ghana Ministry of Health, 1999).

The natal care comprises care for the expectant mother during childbirth and is directed toward promoting the most positive outcome of the delivery. Natal care services ensure proper management of labour and identification and management of complications. As stated by the Ghana National Reproductive Health Service Protocols, natal care services cover routine management of the first, second, and third stages of labour and identification and management of complications at each stage. The first stage of labour covers the onset of contractions to complete dilatation of the cervix and lasts 15 hours; but can last up to 24 hours in primigravida. The care provided during this stage comprises medical and obstetric history-taking, physical assessment, and monitoring of labour. Physical assessment covers thorough physical abdominal and vaginal examinations, while monitoring of labour involves observation of the labour, foetus and the woman. Observation of the labour involves noting the frequency and duration of contractions, level of head of foetus and cervical effacement and dilatation. Observation of the

foetus involves monitoring the foetal heart and liquor. Observation of the woman entails checking the general condition of the woman, her temperature, pulse and blood pressure, fluid intake and output and contents of her urine. The risks identified during the first stage of labour include prolonged latent and active phases of labour, which are signs of failure of progress and may require inducement of labour. Management of the second stage of labour encompass actual conduction of the delivery of the baby. The risks identified during this stage include mal-presentation, foetal-pelvic disproportion, cephalopelvic disproportion, foetal distress, cord prolapse and ruptured uterus. These risks may require specialist intervention to protect the life of both mother and baby. The services provided during the third stage of labour involve management of the delivery of the placenta and they are designed to minimise the chance of post-partum haemorrhage. Retained placenta, post-partum haemorrhage and hypertensive disorders of pregnancy are the risks identified during this stage (Ghana Ministry of Health, 1999).

From the Ghana National Reproductive Health Service Protocols, postnatal care covers services provided mother and baby from end of delivery to six weeks after delivery. These services comprise comprehensive screening for detection and management of complications in mother and child, health education and counselling, and family planning counselling. The services involve comprehensive history-taking, examination of mother and child and laboratory investigations. Examination of the mother entails checking for signs of physical and psychological well-being of the mother. The risks to be identified include secondary post-partum haemorrhage, high blood pressure, puerperal pyrexia, sepsis or psychosis, perineal laceration, mastitis and breast

abscess. Examination of the child entails assessing for functional abnormalities, deformities and infections such as difficulty in breathing, talipes, tongue-tie, cleft lip, excessive vomiting, asphyxia, ophthalmia neonatorum, changes in skin colour, and jaundice. Health education during this period covers nutritional requirements for the woman's health and for breast-feeding, personal hygiene – especially care of the breasts and nipples – and infant feeding and care of the baby. Postnatal clients are also taught to recognise signs of complications and taken through some post-partum exercises (Ghana Ministry of Health, 1999).

The world over, different strategies are used to implement the packages of maternal healthcare services. The strategies range from complete hospital based to complete community based services (Say & Raine, 2007; WHO, 2007). However, one of the strategies widely employed, especially in Africa, is the Safe Motherhood Initiative, which focuses on having trained birth attendants present during delivery, improved access to midwifery care in the community, access to essential obstetric care, including emergency services, and a continuum of care with the goal of improving women's health in general, and reducing maternal and infant morbidity and mortality in particular (Program for Appropriate Technology in Health [PATH], 1998; Say & Raine, 2007; WHO, 2007). Established in 1987 by a coalition of international organizations, the Safe Motherhood Initiative intends to create circumstances within which a woman is empowered to make decisions about reproduction. Under such conditions, the woman is assured of receiving care for prevention and management of pregnancy-related complications, access to trained birth attendants and emergency obstetric care, and care after birth in

order to prevent death or disability due to complications of pregnancy and childbirth (GHS, 2006). The Safe Motherhood Initiative incorporates maternal healthcare services at all levels of the healthcare system in a district – community, health centre and district hospital (WHO, 2007).

In Ghana, the Safe Motherhood Initiative is the main strategy adopted for the delivery of maternal healthcare services (GHS, 2007). The strategy is implemented at the policy, supervisory and operational levels, corresponding to the national, regional and district levels, respectively. The main components are antenatal, labour, delivery and postnatal care, family planning, health education, and prevention and management of unsafe abortion. Thus, in accordance with the focus of the Safe Motherhood Initiative, the main implementation level of Ghana's maternal healthcare services is the district. Both public and private healthcare facilities are involved in the provision of the services. They include government, quasi-government and mission hospitals, health centres and clinics, CHPS zones, and maternity homes (GHS, 2007).

In the KEEA district, using the Primary Health Care approach, the safe motherhood strategy is implemented at three levels; namely, community, health centre and district hospital levels and involving a total of 11 healthcare facilities (Reproductive and Child Health [RCH] Unit, 2007). The facilities include one district hospital, 4 health centres, 5 maternal and child health centres, 2 specialised hospitals (leprosy and psychiatric hospitals), 1 prisons clinic, and 2 private maternity homes. The district is divided into 5 sub-districts to enhance geographical accessibility to the facilities. A network of roads, which are motorable throughout the year, further enhances accessibility

to the facilities. In addition to the healthcare facilities, a number of trained Traditional Birth Attendants (TBAs) participate in providing maternal healthcare services to the women in the district (RCH Unit, 2007).

Foundations of Maternal Healthcare Services Utilization

Notwithstanding the intentions of maternal healthcare services through the Safe Motherhood Initiative, utilization of maternal healthcare services has not been optimal in many developing countries (Say & Raine, 2007). Various conceptual models have been put forth to explain the complex and multi-dimensional issue of utilization of maternal healthcare services. These multi-factorial models offer some theoretical frameworks to the understanding of the use of maternal healthcare services, especially in developing countries. For the purpose of this review, the theoretical frameworks are grouped into two; namely, those that emphasise 'end point' explanation of healthcare service utilization – that is, health care seeking behaviour models; and those that emphasize 'process' explanation of healthcare service utilization – that is, health seeking behaviour models. Health care seeking behaviour models involve determinants, which lie between clients and the services and tend to fall under the divisions of personal, geographical, social, economic, cultural and organisational factors. Health seeking behaviour models thus involve factors which enable or prevent people from making 'healthy choices', in either their lifestyle behaviours or their use of health care services. Concerning the health care seeking behaviour models, Anderson, Buck, Danaher, and Fry (1977) opined, in their study on utilization of healthcare services, that three categories of factors mediate utilization of healthcare services. The categories of factors are client factors such as illness, knowledge, beliefs, experiences,

needs, and coping skills; social factors such as socio-demographic characteristics, family systems, and social support; and factors relating to the healthcare system, such as geographical location, distance, availability, accessibility, and costs. According to Anderson et al. (1977), users of healthcare services perceive themselves as less healthy with some of them attempting self-medication before reporting and more of them reporting personal problems and stress than non-users. In relation, Andersen and Laake (1987) developed a conceptual model – the behavioural model of utilization – to explain further the use of healthcare services. This model, which expands on the conception of Anderson et al. (1977), proposed that a person's use of healthcare services is a function of predisposing, enabling and need factors. Predisposing factors include marital status, educational level and occupation, as well as length of time in the community, and health beliefs. Health beliefs incorporate attitudes, values, and knowledge of the healthcare delivery system and are influenced by cultural values and health education. Enabling factors pertain to characteristics specific to the individual or the community and include income, social network, and access to regular source of care. The need factors reflect levels of ill health that require the use of the healthcare services. Needs are perceived by the individual and are influenced by cultural beliefs and values, perceived health status, disease severity, and limitation of activity, as well as health education. However, the predisposing and enabling factors seem to act as modulators of the individual's behavioural reactions towards the use of healthcare services (Purola, 1972) while the need factors seem to explain the number of contacts the individual would have with the healthcare

service (Kronenfeld, 1980). Nonetheless, this model conspicuously portrays the role of health education in utilization of healthcare services.

Several studies have confirmed the triadic inter-relationship of factors in Andersen and Laake's model in determining utilization of healthcare services. Tipping and Segall, (1995) reported of studies that corroborate the conception that the decision to use a particular healthcare service is influenced by a variety of socioeconomic variables including age and social status, nature of infirmity, access to the services and perceived quality of the service. These studies drew attention to the conception that utilization of maternal healthcare services is influenced by: (a) predisposing socio-demographic and health beliefs factors such as education, marital status, knowledge of the maternal healthcare delivery system, health attitudes (that is, perceived general health status and seriousness of pregnancy, delivery and puerperium), importance of maternal healthcare, benefits of using maternal healthcare services, and perceived barriers to obtaining maternal healthcare; (b) enabling factors such as level of income, residence, family size, integration in urban life, and social support, which may affect ability to access the healthcare system; and (c) need factors, which reflect the perceived need for maternal healthcare and self-assessment of health status. According to the Ghana Living Standards Survey (Ghana Statistical Service, 2000), while about 83% of pregnant women in Ghana seek pre- and postnatal care from trained healthcare delivery personnel in healthcare facilities, TBAs still remain the main source of delivery and childbirth services for most pregnant women and nursing mothers. Many infertile African women have a lowered sense of self, identity, and meaning and purpose of their lives with majority of them having little or no knowledge

about human reproduction and consequently do not seek help from healthcare facilities offering maternal healthcare services (Dyer, Abrahams, Hoffman, & van der Spuy, 2002; McCarthy, 2008). A related study to identify the factors that determine client initiation and retention within a modern healthcare system established that perceived competence of the healthcare system, household income, employment status, level of education, perception of type of ill-health and age determine initial visit to the healthcare system; and perception of quality of care during the initial visit, and confidence in the service provider determine continual use of the system (Mugisha, Bocar, Dong, Chepng'eno & Sauerborn, 2004). Health care seeking behaviour is, therefore, conceptualised as a "sequence of remedial actions" taken to rectify a perceived ill health (Ahmed, Adams, Chowdhury, & Bhuiya, 2000); and based on this conception, Bedri (2001) has developed a pathways-to-care model to map out the sequence of actions. In her work, she identified four pathways that women follow towards adoption of modern maternal healthcare services for maternity care, which span decisions on seeking care from modern maternal healthcare services immediately to complete ignoring of the need to seek health care. Accordingly, in order to optimise the pathways taken by women, Bedri suggested involvement of husbands in health education programmes (Bedri, 2001), as husbands are key in decisions related to maternal healthcare needs of women (Future Health Systems, 2008).

Regarding health seeking behaviour models, a number of social cognition models have been developed to predict possible behavioural patterns of users of healthcare services. These models are based on a mixture of demographic, social, emotional, and cognitive factors, as well as perceived

symptoms, access to care and personality (Conner & Norman, 1996). Conner and Norman consequently posit that health-seeking behaviour is best understood in terms of an individual's perception of his/her social environment. In this wise, one of the most widely applied health seeking behaviour model is the Health Belief Model (HBM). Applying the HBM to explain health-seeking behaviour, Sheeran and Abraham (1996) categorise health-seeking behaviours into three broad areas; namely, preventive health behaviours, sick role behaviours and health centre use. They posited that the HBM primarily focuses on two elements; namely, threat perception and behavioural evaluation. Threat perception is contingent on perceived susceptibility to illness and anticipated severity, while behavioural evaluation comprises beliefs regarding the benefits of a particular behaviour and the barriers to it (Sheeran and Abraham, 1996). Exploring the causes underlying the low utilization of maternal healthcare services in Bangladesh, Mitu (2005) reported that threat perception relating to pregnancy and childbirth among many women does not allow them to use maternal healthcare services. Mitu (2005) observed that many women in Bangladesh perceived pregnancy as a normal natural process provided every woman by a deity and therefore reliance on supernatural forces for care and support is more effective than on healthcare services. Moreover, older female members of the family, especially among female-headed households, perpetuated this perception. Similarly, a prospective population based study that examined a twelve-month utilization of healthcare services for management of hypertension subsequent to screening for hypertension, revealed a low threat perception among the adults in Dar es Salaam (Bovet, Gervasoni, Mkamba, Balampama, Lengeler &

Paccaud, 2008). Among 161 hypertensive persons who were followed after screening for hypertension, 115 did not visit the healthcare services for hypertension management because they did not experience any symptoms associated with raised blood pressure and, therefore, the importance of seeking health care. Thus, utilization of maternal healthcare services may be dependent on a woman's perception of her vulnerability to any ill health during pregnancy, delivery and puerperium; and the advantages that would accrue to her in using the healthcare services. It is, therefore, likely that most women may perceive pregnancy, delivery and childbirth as normal processes for every woman and may thereby refrain from seeking maternal healthcare services. As noted by Bazzano, et al. (2008), many women, especially those in rural settings, perceived giving birth at home a sign of strength and serves to raise a woman's status in the community while giving birth at a healthcare facility shows a sign of weakness and thus lowers a woman's status.

Rural-Urban Disparities in Healthcare Utilization

The United States Minority Health and Health Disparities Research and Education Act of 2000 describes health disparity among groups in populations to denote the existence of significant disproportions in the rate of disease incidence, prevalence, morbidity, mortality, or survival among sub-population groups of an area as compared to the health status of the general population (U.S. Department of Health and Human Services, 2003). Rural-urban health disparities denote a difference in the experience of the rates of disease incidence and prevalence, mortality and survival between the populations of these areas with the propensity of rural areas bearing disproportionately higher levels of disease burden, injury, premature death,

and disability. However, health disparities between rural and urban areas have been noted to result from a complex interplay of a myriad of factors with organization of healthcare services, health beliefs and access to healthcare services being paramount (U.S. Department of Health and Human Services, 2003). Furthermore, disparities in access to healthcare services between rural and urban areas are noted to result from key differences between the two areas, especially, differences in populations and environment (Dunkin, 2000). Dunkin (2000) asserted that, differences in access to healthcare services between rural and urban areas stem from three spheres – structural, socio-cultural (or personal) and financial – that form part of a complex web of factors influencing health seeking behaviours and healthcare service utilization. The structural sphere involves factors that influence physical accessibility to healthcare services, such as availability of primary care providers, medical specialists and other healthcare professionals; healthcare facilities and transportation; and distance and travel time to the facilities. The socio-cultural sphere includes cultural and spiritual beliefs, language, education, self-reliance, and concern about confidentiality. The financial sphere incorporates availability of adequate health insurance, income and/or financial resources to pay for healthcare services. These factors create barriers to healthcare services utilization in both in rural and urban areas.

Again, healthcare resources and healthcare services utilization have been noted to vary considerably through different levels of urbanization (Eberhardt, Ingram & Makus, 2001). Paucity of healthcare services (both facility- and community-based services) and healthcare professional shortages have been noted to significantly decrease access to healthcare services,

especially in rural areas (Bushy, 2000; Folland, Goodman & Stano, 2001). In addition, Folland, et al. point out that, because healthcare is a highly competitive industry, variables such as income, insurance, and societal preferences affect the demand and supply for healthcare services. Thus, due to lower population density, lower levels of income, lack of health insurance, and preference for informal care being rife in most rural areas, the demand for and supply of healthcare services are often lower as compared to urban areas (Bushy, 2000; Rosenberg & Wilson, 2000).

Several studies have established the disparities existing in maternal healthcare services utilization between rural and urban areas (Addai, 1998; Celik & Hotchkiss, 2000; Magadi, Diamond &Nascimento-Rodrigues, 2000; Hotchkiss, 2001; Navaneetham & Dharmalingam, 2002; Paul & Rumsey, 2002; Falkingham, 2003; Mekonnen & Mekonnen, 2003). In France, Challier, Meslans and Viel (2000), examining the relationship between inequality and attendance to cervical cancer screening, found that average net income and density of healthcare resources, especially physicians, nurses, and laboratories, were positively associated with rate of attendance in both rural and urban areas. Likewise, Green (2000) identified a paucity of maternal healthcare facilities in rural Tanzania and noted that despite the intentions of major public health reforms, market forces would still dictate the distribution of healthcare resources with negative consequences to rural communities. However, a study conducted by Nigussie, Mariam and Mitike (2004) to assess utilization of maternal healthcare services and factors influencing women to use the services in the North Gondar Administrative Zone of Ethiopia, depicted poignantly the rural-urban differences in utilization of maternal healthcare services. Nigussie,

et al, demonstrated that the percentage of women living in urban areas and receiving adequate antenatal care services was three times greater than the percentage of women living in rural areas and receiving adequate antenatal care. Although these studies were carried out in different countries (both developed and developing), it is unquestionably clear that, interactions involving the factors influencing disparities in access to healthcare services between rural and urban areas – at both individual and community levels – are critical to utilization of the services. It is evident that women resident in urban areas are more likely to use the assistance of trained maternal healthcare professionals and hence maternal healthcare services than are women resident in rural areas. In Ghana, the healthcare system has equally not been responsive to the needs of consumers of the services (Ghana Ministry of Health, 2002). The availability and use of government healthcare facilities and healthcare-related interventions are low – especially in rural areas – with the growing financial barriers to accessibility to healthcare excluding rural people from taking advantage of available healthcare services (Ghana Ministry of Health, 2002; 2005).

It is evident from the foregoing that both conceptual frameworks for the utilization of healthcare services – health care seeking and health seeking behaviours – emphasize the importance of the characteristics of the consumers of the healthcare services in determining utilization. While few of the characteristics are non-modifiable (e.g. age), many could be modified through education.

Impact of Health Literacy on Utilization of Services

Many studies have established the impact of key maternal healthcare interventions on preventing women from dying of pregnancy-related causes and improving their health status during pregnancy, delivery and puerperium. Attendance at antenatal care, delivery at a hospital or health centre, and having a trained maternal healthcare professional to attend to childbirth, have been noted to improve maternal health (World Bank, 1994; Adam, Lim, Mehta, Bhutta, Fogstad, & Mathai, 2005; McCaw-Binns, La Grenade & Ashley, 2007). However, there is limited utilization of these interventions, especially by women in developing countries (World Bank, 1994; WHO, 2007; Say & Raine, 2007). Additionally, the observed limited utilization of maternal healthcare services has been connected to factors relating to place of residence and socioeconomic status. These factors have included the age, education, religion, and culture of women, as well as women's need for healthcare and decision-making powers, and costs, location and quality of healthcare services (Bedri, 2001; Dyer, et al, 2002; Mugisha, et al, 2004; Future Health Systems, 2008; McCarthy, 2008). These factors act together in diverse ways to determine utilization of maternal healthcare services. However, one key factor that has been noted to impact on utilization of maternal healthcare services irrespective of the many afore mentioned factors is health literacy.

Several studies measuring the relationship between maternal health literacy levels and knowledge of the use of maternal healthcare services have demonstrated statistically significant associations between higher maternal health literacy levels and knowledge of and use of the services (Kaufman, Skipper & Small, 2001; Lindau, Tomori & Lyons, 2002; Scott, et al, 2002;

Lee, Gazmararian and Arozullah (2005)). In their studies, Kaufman et al demonstrated a positive significant relationship between maternal health literacy and breastfeeding while Scott et al, by measuring attendance at Pap smear and mammography screening, demonstrated that women with inadequate health literacy had greater odds of never having had a Pap smear or mammogram. Similarly, comparing women with adequate health literacy to those with limited health literacy Lee, Gazmararian and Arozullah (2005) identified that women with limited health literacy were more likely to seek assistance with understanding health information and to be constantly reminded of the things to do to remain healthy. Moreover, women with limited health literacy perceived less tangible social support available to them.

A study, which examined associations between health literacy and health behaviour among British adults aged between 18 years and 90 years, demonstrated a strong association between health literacy and health behaviour (Wagner, Knight, Steptoe & Wardle, 2007). Using a modified version of the Test of Functional Health Literacy in Adults Wagner, et al carried out health literacy test on a sample of 719 respondents. The test revealed that, older respondents were more likely to have limited health literacy as compared to younger respondents; and respondents without formal education were more likely to have limited health literacy. Multivariate logistic regression models determining associations between health literacy and health behaviours revealed that every point higher on the health literacy scale was associated with a greater likelihood of eating at least five servings of fruit and vegetables a day; and the higher the health literacy score the more likely the individual would be a non-smoker. Similarly, Liu, Mao, Sun, Liu,

Yao and Chen (2009), to evaluate the impact of health and nutrition education on dietary quality and health behaviour during puerperium conducted a randomized controlled trial (pre-test/post-test) involving 410 participants selected from four hospitals in the urban area and four health centres in the rural area in China. The study was carried out between August 2003 and June 2004. The pre-test revealed a low level of knowledge and understanding of nutrition and health during puerperium among participants from both rural and urban areas; with no significant differences between the intervention and control groups. However, after the intervention, the post-test revealed a significant improvement in overall nutrition and health knowledge among the women in the intervention groups. In both rural and urban areas, significantly more women in the intervention groups exhibited improvement in knowledge and understanding than did those in the control groups. There was also a significant change in behaviour as most women in the intervention groups ate fruits and vegetables, brushed their teeth and took their bath during the puerperium, which behaviours were hitherto tabooed during the puerperal period.

These studies clearly demonstrate the effect maternal health literacy could have on the knowledge and use of maternal healthcare services among women. Despite the contributions of socioeconomic indicators, rural-urban disparities and availability of maternal healthcare services to influencing access to the services, the influence of health literacy stands out as key to improving utilization of maternal healthcare services both in the rural and urban areas. Knowledge and understanding of the services provided at maternal healthcare facilities is thus crucial to making informed behavioural

choices. Women have to comprehend the pros and cons of taking advantage of the services and their understanding the likelihood of successful gestation, parturition and puerperium and the factors that influence effectiveness of the services may influence their behaviour choices. Currently, the environment of the healthcare system poses many challenges for healthcare professionals on one side, and women and their families who use the healthcare services on the other. The healthcare system is challenged to meet improved health care outcomes and safety among the women who use the services while the women and their families face challenges navigating the complex healthcare system, asking the right questions, and being provided with the right information so they can participate in their health care (Brashers, Stephen & Neidig, 1999; Marelich & Murphy, 2003). This could have perhaps formed the basis for the development and implementation of the policy to empower communities for health improvement and access to basic health care in Ghana (Ghana Ministry of Health, 2002). However, it is evident that many women value being provided with information as it serves to build relationships with healthcare professionals and maintains hope rather than forming a basis for decision-making (Beaver, Luker, Owens, Leinster, Degner & Sloan, 1996; Salander, Bergenheim & Henriksson, 1996; Salander, 2002; Elit, Charles & Gold, 2003). It is imperative that health education and communication of health information highlight both the gamut of maternal health literacy and its role in maternal healthcare service utilization and health outcomes. Many studies have however focused principally on comprehension of health information neglecting the skills required to address challenges in navigating the healthcare system and providing self-care. However, what is available

suggests that well conceived interventions could at least improve the outcome of knowledge for women with both higher and lower maternal health literacy levels.

Prevalence of Maternal Health Literacy

Effective communication is critical to the successful delivery and utilization of healthcare services. It enhances the development of health literacy, which in turn builds up people's ability to use available healthcare services. However, health literacy in turn depends on the capacity of individuals to comprehend health information on the one hand, and the demands posed by society and the healthcare system on the other. Prevalence of health literacy, therefore, is a measure of not only the capacities of individuals using healthcare services but also of the ability of the healthcare system to communicate health information effectively. Screening patients for level of health literacy has been, and still is, the only first step for assessing the prevalence of health literacy. Population based assessment of prevalence of health literacy has primarily been founded on literacy assessments. On this basis, Kirsch, Jungeblut, Jenkins and Kolstad, (1993) asserted that since most healthcare materials are written at a level equivalent to 10th-grade level or higher (senior secondary school level), about 50% of adults are unable to understand printed healthcare materials since most adults read and comprehend materials between the eighth and ninth grade levels (basic school level). Thus, using literacy assessment measures to assess the prevalence of health literacy is in the right direction. This assertion, therefore, uses formal educational attainment as the basis for acquiring health literacy. Consequently, it is assumed that prevalence of higher levels of formal education correlate to

higher prevalence of health literacy. This assumption is, however, supported by many reports (Bledsoe, Casterline, Jonson-Kuhn & Haaga, 1999; Sen, 1999; Nussbaum, 2000). A study by Benson & Forman (2002), to confirm this assumption, investigated the prevalence of limited comprehension of healthcare information among a group of well-educated persons with average of 15 years of formal education completed. Overall, only 30% of the subjects had limited comprehension of the healthcare information; supporting the assertion, that level of education is positively correlated with level of health literacy. Again, a review of 85 studies conducted in the United States involving data on 31,129 subjects to examine the prevalence of limited health literacy, revealed that prevalence of low health literacy was associated with level of education, ethnicity, and age (Paasche-Orlow, Parker, Gazmararian, Nielsen-Bohlman & Rudd, 2005). In their conclusion, the reviewers noted that the potential for enhancing the health of people and reducing health disparities rests on stepping up health education and simplifying health care services.

Notwithstanding the concrete evidence supporting the assertion of the positive association between level of formal education and level of health literacy, other researchers have pointed out the likelihood of healthcare professionals missing persons with limited health literacy skills with low literacy skills being so rife among the general population (Kirsch, Jungeblut, Jenkins, & Kolstad, 1993; Doak, Doak & Root, 1996; Baker, Parker & Williams, 1996; Weiss & Coyne, 1997). According to Kirch et al, circumstances contributing to the prevalence of limited health literacy are varied. While education may account for the prevalence of limited health literacy in the elderly, learning disabilities may account for a greater part of

the prevalence of limited health literacy skills among the youth who have formal education. They pointed out that although prevalence of limited health literacy is more frequently identified among persons of lower socioeconomic status and the elderly, the phenomenon is not limited to these groups. Similarly, in analysing data on teaching patients with low literacy skills, Doak, et al. (1996) illustrated that, such statements as, "people with low literacy skills are intellectually impaired and slow learners," and "years of schooling predict health literacy levels" are widely held misconceptions. They asserted that people with low health literacy skills are of average intelligence and function reasonably well within healthcare systems. Building on that premise, Baker et al. (1996) demonstrated that, more than 20% of adults tested in the United States National Adult Literacy Survey and 18% of subjects in a study of patients with inadequate levels of health literacy had high school diplomas. Baker et al. (1996), therefore, concluded that years of schooling only reflect the amount of education, and not the measure or the nature of skills acquired. Consequently, in addition to basic literacy skills, health literacy requires knowledge of topics covered in health education. Therefore, the prevalence of health literacy reflects more of knowledge or misinformation people have about the human body as well as the nature and causes of diseases and ill health. Prevalence of limited health literacy thus denotes a lack of understanding about the relationships between such factors as lifestyle (that is, diet, rest, and exercise) and various health outcomes (U. S. Department of Human and Health Services, 2000). Other studies have also intimated that health information could overwhelm even persons with high levels of formal education and that people are less likely to retain health information provided

in a stressful or unfamiliar situation (Institute of Medicine, 2004; National Centre for Education Statistics, 2006).

The prevalence of maternal health literacy has also been asserted not to be related to years of formal education attained (Ohnishi, Nakamura & Takano, 2007). A study conducted by Ohnishi et al to examine the factors that influence improvements in maternal health literacy among pregnant women in Paraguay, revealed that higher capabilities of healthcare professional and better living environment of women were significantly related to high prevalence of maternal health literacy. Using a group of pregnant women, which included those who did not complete formal education but participated in a community-based antenatal care educational program, interviews were conducted to assess the maternal health literacy of the pregnant women during their first, second, and third visits to the antenatal clinic. The mean maternal health knowledge score for the women who completed the three-consecutive assessments was noted to have increased between the first and third assessments. Through multiple regression analysis, capabilities of healthcare professional in communication of health information and living environment of the women was found to be positively associated with prevalence of maternal health literacy. However, due to limitation of access to literature on prevalence of maternal health literacy, (almost all literature accessed related maternal health literacy to an aspect of maternal health care), this assertion of Ohnishi et al could not be corroborated. Nonetheless, it is evident from the foregoing that prevalence of maternal health literacy is more associated with interactions with healthcare professionals than with years of schooling.

Summary

Maternal health literacy as a discrete form of literacy denotes the capacity of women to obtain, process, and understand basic maternal health information and services needed to make appropriate reproductive health decisions. It is described to encompass cognitive and social skills enabling women gain access to, and use health information to promote and maintain good health. Measurement of maternal health literacy requires a multifaceted approach covering three areas; namely, functional, interactive and critical health literacy. Several studies have demonstrated the impact of inadequate maternal health literacy on the health status of women. However, while many theories have been put forward to explain the utilization of maternal healthcare services, there is consensus on prevalence of maternal health literacy being a key determinant of maternal healthcare services utilization.

Provision of maternal healthcare services requires strategies that promote quality services and improved maternal health literacy. In Ghana, the Safe Motherhood Initiative is the main strategy for delivery of maternal healthcare services and is implemented at the policy, supervisory, and operational levels of the healthcare system with the KEEA district as one of the operational levels.

Rural-urban disparities in maternal healthcare are rife in many developing countries. However, high prevalence of maternal health literacy is adjudged to effectively reduce the disparities between the rural and urban utilization of maternal healthcare services. Many studies, employing varied methodologies, both quantitative and qualitative, have established the association between maternal health literacy and maternal healthcare services

utilization. Nevertheless, a number of methodological issues beset the study of maternal health literacy. Firstly, most instruments used to measure health literacy assume testees have had some level of formal education. Secondly, most studies used subjects reporting to the healthcare facility, which sample could be different from the rest of the population of women who could use the healthcare facility. Thirdly, the definition of trained maternal healthcare professional was not standard. While some defined trained maternal healthcare professional to exclude trained TBAs, others included them into the definition. Nonetheless, the statistical tools used in many of the studies were rigorous to establish effectively the associations between maternal health literacy and utilization of maternal healthcare services.

CHAPTER THREE

METHODOLOGY

The purpose of this study was to investigate the availability of health information to women in a district, assess their level of maternal health literacy, and determine the differences in maternal health literacy between women resident in rural and urban areas in the district. The intent of the study was also to examine associations between maternal health literacy and health behavioural patterns, and attempt explaining any observed patterns of utilization of maternal healthcare programmes prevailing between rural and urban women in the district.

Advancement of almost every discipline is dependent upon contributions made through systematic research. This procedural and systematic approach to the acquisition of new knowledge to advance the discipline is firmly based on the empirical approach, which is an evidence-based method that relies on direct observation in the acquisition of new knowledge (Kazdin, 2003). Observation thus refers to the process of making careful and accurate measurements in order to avoid biased information. This chapter, therefore, describes the processes adopted to conduct the study. It comprises descriptions of the following: study setting, research design, study population, research procedures, and analysis of data.

Description of the study setting and research design entails brief description of the district in which the study was carried out; and delineation of the research design and justification for the choice of design. Description of the study population involves details of the population from which the study participants were selected, the number of participants selected, and how they were selected. Description of the research procedures outlined the data collected, when the data were collected, and the data-gathering devices used. Description of analysis of data covered the strategies and statistical procedures employed to analyse and represent the data.

Study Design

According to Kumar (2005), a research design is a procedural plan adopted to answer research questions validly, objectively and accurately. It is a general strategy for conducting the research project and provides the approach that structures all of the major parts of the research project (Best & Kahn, 1993; Marczyk et al., 2005). A research design consists of the study type and study design with the former relating to the identification of the systematic approach and logistical arrangements to be adopted for the study and the latter, to the operational plan for undertaking the various procedures and tasks prescribed by the type of study (Kumar, 2005; Marczyk et al., 2005). Thus, the study type adopted for this investigation was quantitative descriptive research and the design, cross-section correlational study (ex post facto). These quantitative processes were used to obtain, analyse and interpret data to describe the characteristics of maternal health literacy among women living in rural and urban areas in the KEEA district and the relationship between the level of maternal health literacy and utilization of maternal healthcare

services. A cross-section of women of childbearing ages living in rural and urban areas in the district was studied. Variables such as exposure to maternal health information, level of maternal health literacy, and use of maternal healthcare services were measured and compared between women living in rural and urban areas. In addition, relationship between level of maternal health literacy and use of maternal healthcare services was determined.

Three reasons influenced the choice of the study type and design. Firstly, descriptive research is noted to be particularly appropriate for research in the behavioural sciences as it becomes very complicated to re-arrange most types of behaviour in a realistic setting to conduct an experiment (Kumar, 2005; Marczyk et al., 2005). It would, therefore, be difficult to re-arrange occurrences relating to acquisition of maternal health literacy and utilization of maternal healthcare services in order to ascertain levels of maternal health literacy and relationship between maternal health literacy and health behaviour. Secondly, correlational research is noted to be suited for studies that assess relationships between naturally occurring variables in order to identify predictive associations to allow predictions about future behaviour (Shaughnessy, Zechmeister & Zechmeister, 2003). Thus, through the correlational study design, assessment of the relationship between maternal health literacy and utilization of maternal healthcare services – both naturally occurring variables – in order to make predictions of the level of maternal health literacy and health behaviour among women in the KEEA district would be possible. Thirdly, appositeness of the descriptive quantitative method and cross-section correlational designs for studies that measure health literacy and relationships between health literacy and health behaviour have

been demonstrated by literature (Baker, et al., 1997; Williams, et al., 1998; Kalichman & Rompa, 2000; Schillinger, et al., 2002; Baker, et al., 2002; Scott, et al., 2002; Schillinger, et al., 2003; Baker, 2006; National Centre for Educational Statistics, 2006; Junko, et al., 2007; Shohet, 2007; Bazzano, et al., 2008; Becue-Bertaut, et al., 2008; Bonjour, et al., 2008).

Population

The reference population consisted of all women of childbearing ages living in the KEEA district. This population of women, who were aged between 15 and 45 years, formed about 23% of the total population of the district. Although majority of these women were educated to the basic level (that is, primary, middle or junior high school levels), the predominant occupations among them were petty trading, subsistence farming and fish mongering.

From age 15, through various reproductive health and health education programmes organised by the Ghana Health Service and other health agencies, the women in the district were exposed to maternal health information and education aimed at preparing them for responsible adulthood, childbearing and motherhood. Consequently, it was expected that by the time childbearing began, every woman of childbearing age in the district might have been provided with adequate information and education on maternal health issues and therefore might have been in the position to utilize all maternal healthcare services appositely. The study population, therefore, consisted of all women of childbearing ages who were having a child aged less than 12 months and were living in the KEEA district. This population of women formed about 17.3% of the population of women of childbearing ages in the district (RCH Unit,

2007). It was presumed that the opportunity to be exposed to the gamut of maternal health information and education and to utilize the full range of maternal healthcare services was not long past among this group of women of childbearing ages.

Study Setting

The KEEA District is located at the southwestern corner of the Central Region of Ghana. It shares boundaries with the Lower Denkyira District on its northern, Cape Coast Metropolitan Area on the eastern, and the Western Region of Ghana on the western borders. The district faces the Gulf of Guinea on the south. The estimated total population of the district was about 135,043 (as projected from the 2000 Ghana Population and Housing Census) and the estimated population of women of childbearing ages, 31,060 (RCH Unit, 2007). The people of the district are predominantly Fantes and are grouped under four main traditional areas; namely, the Edina, Komenda, Abrem and Eguafo Traditional Areas. In all, there are about 120 towns and villages. However, while the capital town, Elmina, is classified as a municipality and about 12% of the towns as urban, most of the towns and villages are classified as rural. The predominant occupations among the peoples of the district are farming, fishing and fish mongering. A network of roads, which are motorable throughout the year, links most of the towns and villages.

The district is endowed with a number of educational institutions ranging from pre-school to tertiary institutions. In addition, there were eleven healthcare facilities; namely, one district hospital, four health centres, five maternal and child health centres, two specialised hospitals (leprosy and psychiatric hospitals), one quasi-government clinic (prisons clinic), and two

private maternity homes. There were also a number of reproductive health and child welfare outreach centres in the district (RCH Unit, 2007). All the healthcare facilities, including the child-welfare-clinic outreach points in the district provide maternal health information to the public.

Sample and Sampling Procedure

According to Kumar (2005), sampling involves the process of selecting a few members (sample) of a study population to become the basis for estimating or predicting the occurrence of a phenomenon regarding the study population. The process consists of estimating the size and delineating the means for selecting the sample. Accordingly, using the method of sample size estimation as described by Bennett, Woods, Liyanage and Smith (1991) and the Statistics Division of the Department of Economic and Social Affairs (DESA), United Nations (2005) for household surveys, the sample size for the study was estimated at 448 women of childbearing ages who were having a child aged less than 12 months and were living in the KEEA district. Refer to Appendix A for estimation of the sample size.

A multi-stage cluster sampling strategy, usually called compact segment sampling design (Bennett, Woods, Liyanage & Smith, 1991; DESA, United Nations, 2005), was employed to select respondents for the study. The strategy employs a simple two-stage cluster sampling, which ensures meticulous stratification together with effective area segmentation. In general, the compact segment sampling design consists of selection of a sample of geographical units through probability proportionate to size sampling at the first stage. The geographical units, which form the clusters, are typically villages or groups of villages in rural areas and city blocks in urban areas. The

second stage consists of quick canvassing and segmentation of the selected clusters using existing maps or sketch maps of the areas. The number of segments per cluster is predetermined by dividing the population of the cluster by the desired cluster size. One segment is then selected through a random selection process and all households in the selected segment visited. Consequently, a sample of 56 clusters was selected through probability proportionate to size. In each selected cluster, a sketch map of the area was used to divide the cluster into segments and one segment was selected through simple random sampling. Since there was approximately one woman of childbearing age who was having a child aged less than 12 months per household, the number of households in a segment was most likely to approximate the number of eligible respondents in the segment. However, using a design effect value of 2.05 and an intra-class correlation of 0.15, a cluster size of eight respondents was used for the study (cluster size = [(deff – 1) + rho] ÷ [rho]). Consequently, eight women of childbearing ages having a child aged less than 12 months were chosen from each selected segment and interviewed.

Of the 448 women sampled, 51% (n=228) was resident in rural areas while 49% (n=220) was resident in urban areas. The mean age of the sample resident in rural areas was 25.6 (SD=5.7) years, while that of those resident in urban areas was 25.8 (SD=5.8) years. The mean length of stay in the community among the sample residing in rural areas was 19.3 (SD=8.6) years, while that among those residing in urban areas was 17.8 (SD=9.7) years. As shown in Figure 1, most of the samples from both rural and urban areas (83% [n=189] and 77% [n=169], respectively) were married.

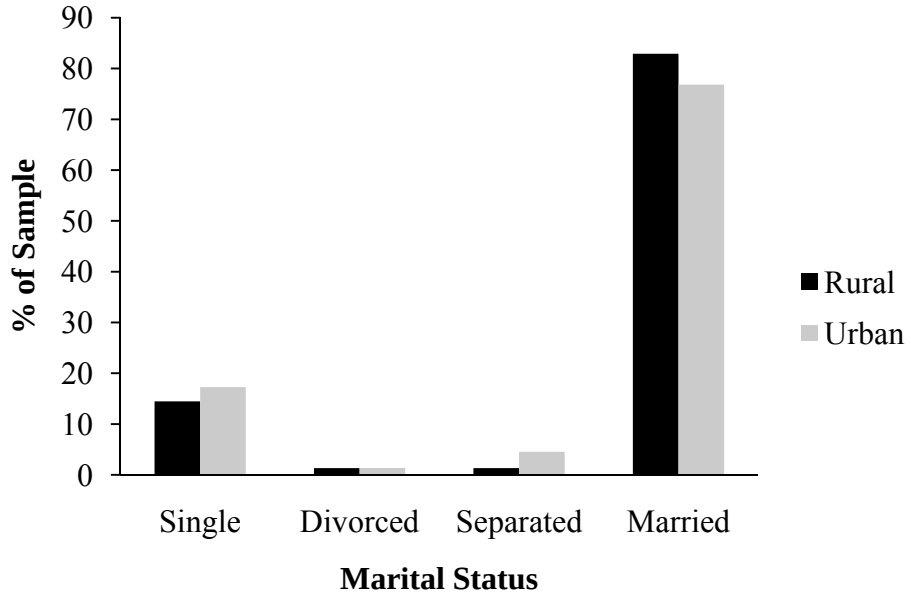

Figure 1. Marital status of sample between rural and urban areas

Level of education was similar between the two samples of women as portrayed in Figure 2. However, a smaller proportion (8%, n=18) of the sample from rural areas, as compared to those from urban areas (11%, n=24), had had education up to the senior high/vocational school level.

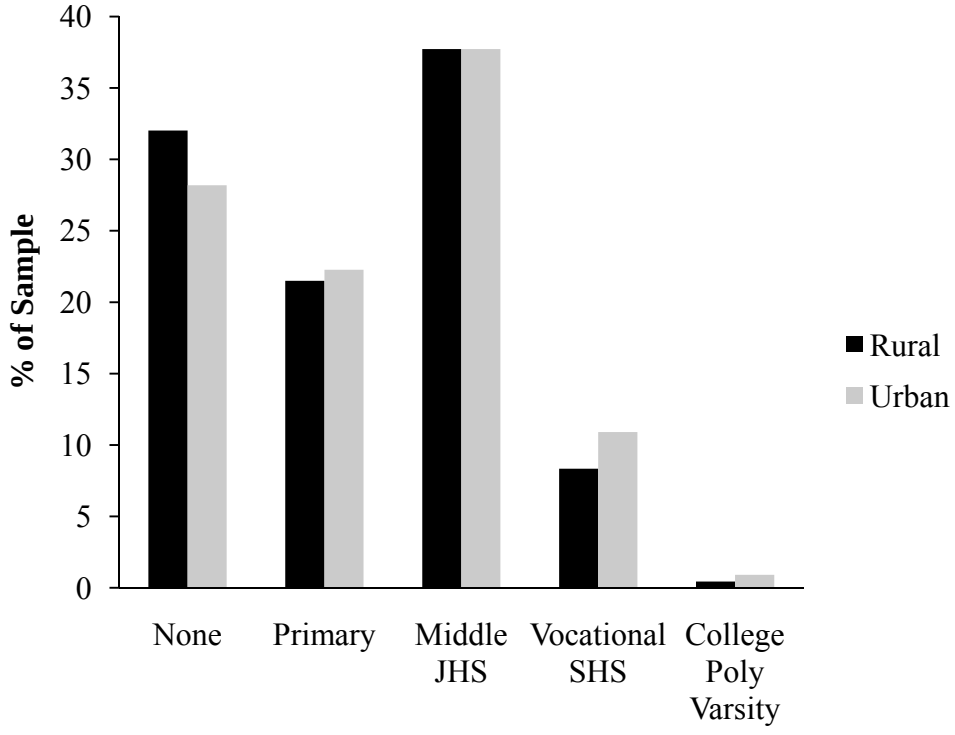

Figure 2. Level of education of sample between rural and urban areas

The predominant occupations of the sample of women were petty trading and farming. The occupations of the sample of women between rural and urban areas are presented in Table 1.

Table 1: Occupations of Sample between Rural and Urban Areas

Occupation	Category of residence					
	Rural		Urban		Total	
	n	%	n	%	n	%
Petty trading	52	23	68	31	120	27
Farming	87	38	29	13	116	26
Dressmaking	16	7	22	10	38	9
Fish mongering	2	1	26	12	28	6
Hair dressing	7	3	9	4	16	4
Food vendor	9	4	9	4	18	4
Others	9	4	15	7	24	5
Unemployed	46	20	42	19	88	19
Total	228	100	220	100	448	100

As shown in Table 1, while the largest proportion (38%, n=87) of the sample of women resident in rural areas were farmers, the largest proportion (31%, n=68) of those resident in urban areas were petty traders. The predominant religion between the samples of women resident in rural and urban areas was Christianity (90% [n=205] and 87% [n=191], respectively). The classes of Christian denomination between samples resident in rural and urban areas are presented in Figure 3. Refer to codebook in Appendix D for classification of Christian denominations.

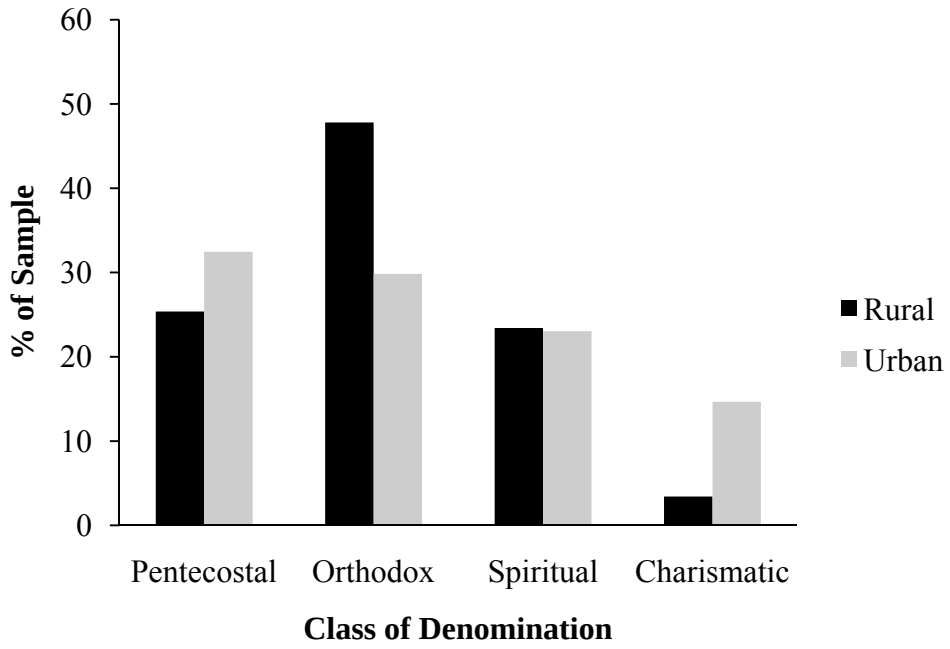

Figure 3. Classes of denomination of sample between rural and urban areas

Whereas the Orthodox denomination predominated among the Christians of the sample of women resident in rural areas (48%, n=109), the Pentecostal denomination predominated those resident in urban areas (32%, n=70).

Instrument

A number of variables were measured in order to answer the research questions. The variables, which were derived from literature (IOM, 2004; Baker, 2006; David and Baker, 2006; Nutbeam, et al., 2007; Junko, et al., 2007; Shohet, 2007), were categorized into two; namely, demographic and research variables; to enhance comparability between women living in rural and urban areas. The demographic variables comprised the Age, Place of Residence, Length of Stay, Level of Education, Occupation, Religion and Religious Denomination of the subjects of the study. The research variables consisted of Sources of Maternal Health Information, Types of Maternal

Health Information, Frequency of Exposure to Maternal Health Information, Level of Maternal Health Literacy, and Utilization of Maternal Healthcare Services. Refer to Appendix B for the definitions and scales of measurement of the variables.

Two instruments, a Questionnaire and a Likert Summated Rating Scale, were used to collect data for the study. However, the two instruments were joined into a composite instrument with two parts; namely, the questionnaire and the Likert summated rating scale. While the questionnaire part of the instrument measured the demographic variables and some research variables (sources of maternal health information, types of maternal health information, frequency of exposure to maternal health information, and utilization of maternal healthcare services), the Likert Summated Rating Scale measured the level of maternal health literacy. Regarding the sources of maternal health information, three characteristics were covered; namely, persons providing health talks on maternal health issues in communities, places where women went for maternal health information, and most common means through which women obtained maternal health information. In respect of the types of maternal health information, the 10 key categories of information on maternal health recommended by the Ghana National Reproductive Health Service Protocols (Ministry of Health, 1999) were covered; namely, importance and purpose of antenatal care, attendance at antenatal clinic, diet and nutrition (including breastfeeding), physiological changes and events in pregnancy, danger signs during pregnancy, high-risk women groups for pregnancy, preparation towards delivery, importance of delivering in a healthcare facility, importance and purpose of post-natal care,

and attendance at post-natal clinic. As regards frequency of exposure to maternal health information, the questionnaire covered how often women were exposed to each category of information. Regarding utilization of maternal healthcare services, three aspects were covered; namely, the use of antenatal care, delivery, and post-natal care services provided by trained healthcare providers.

The development of the instrument was based partly on the research questions, variables of the study, and suggestions from literature (Lee, et al., 2005; Nutbeam, et al., 2007; Shohet, 2007; Wagner, et al. 2007) and partly on two standard instruments used for measuring health literacy, the Rapid Estimate of Adult Literacy in Medicine (REALM) and the Test of Functional Health Literacy in Adults (TOFHLA). The instrument consisted of a total of 60 items with 54 items being closed-ended and six open-ended. The items were arranged such that items 1 to 9 measured the demographic characteristics of the respondents of the study; items 10 to 14 assessed maternal health information that women in the KEEA District received; items 15 to 24 appraised maternal healthcare services utilization behaviour; and items 25 to 60 determined maternal health literacy. This formatting of items was to all intents and purposes apposite for data collection instruments designed for personal interviews with largely semi-literate potential respondents who are scattered over a wide geographical area as it affords effective establishment of rapport and bolstering of respondent confidence and interest as well as savings on time (Shaughnessy, et al., 2003, Kumar, 2005). Refer to Appendix C for the data collection instrument. The instrument was administered through

personal face-to-face interviews with potential respondents on one-on-one basis.

The assessment of maternal health literacy, which is considered multi-component, requires instruments that measure all the components adequately and repetitively. While adequacy relates to the validity of the data collection instrument, repetitiveness relates to the instrument's reliability. Consequently, the fundamental focus of validity of a data collection instrument is to ensure that items on the instrument sample a significant aspect of the purpose of the study while reliability ensures the consistency of measurements from the instrument (Best & Kahn, 1993; Araoye, 2003). Thus, there should be a coherent connection between the items on the instrument and the research questions being examined to ensure validity and comparison of findings from either two independent processes of data collection using the same instrument or two halves of the scores after one data collection process using the instrument (Best & Kahn, 1993; Araoye, 2003; Kumar, 2005). While comparison of findings from two independent processes of data collection is to ensure external reliability, comparison of two halves of scores from one data collection process ensures internal validity (Best & Kahn, 1993; Kumar, 2005). However, the former is more appropriate to establish the reliability of questionnaires and the latter for the reliability of tests (Best & Kahn, 1993).

Accordingly, to establish the validity of the data collection instrument designed for the study, two types of coherent connections between the items on the instrument and the research questions for the study, face and content validity, were examined. A group of health education experts from both the National Headquarters and Central Regional Health Administration of the

Ghana Health Service was selected to examine the data collection instrument independently to ensure the relevance, appropriateness and adequacy of the items and formatting of the instrument. Feedback from this examination was used to revise the instrument. The revised instrument was given to a select group of practicing maternal healthcare professionals from the Central Regional Health Administration of the Ghana Health Service to judge the extent to which the items represented the components of maternal health literacy being measured. Feedback from this second examination of the data collection instrument was then used to finalize the instrument.

To test for the reliability of the instrument, the data collection instrument was administered on two separate occasions six weeks apart (15th to 18th December 2009 and 26th to 29th January 2010, respectively) to 40 women of childbearing ages selected from four communities (two rural and two urban) in the Abura-Asebu-Kwamankese District of the Central Region. Ten women were selected from each community. The district and the communities were chosen based on the similarities they shared with the study district in terms of topography and population. While the test-retest method was used to establish the reliability of the questionnaire part of the data collection instrument, the split-half reliability measure (employing the coefficient alpha) was computed, using the 'Statistical Package for the Social Sciences' (SPSS) Version 16, to establish the reliability of the Likert scale part of the instrument. The scores on second administration of the questionnaire were compared to the scores on the first administration. With a ratio of 0.9 (after comparing the test and retest scores) and a Standardized Items Alpha of

.83 for the questionnaire and the Likert scale parts, respectively, the data collection instrument was considered to be reliable.

Data Collection

Data collection involved two categories of activities; namely, pre-collection and collection activities. Pre-collection activities covered the selection and training of research assistants and pre-test of the research procedures and instrument; and collection activities covered obtaining permission to proceed with data collection, collection of data, and data handling.

Four research assistants were selected for the data collection exercise. The criteria for selection hinged on level of education (at least holders of West African Senior High School Certificate of Education), knowledge about maternal healthcare, knowledge about the KEEA District, and not being a maternal healthcare services provider in the study district. The research assistants were trained in interview skills – asking questions in a neutral manner without any expression of what responses were expected, and recording responses as they were provided without showing any agreement, disagreement, or surprise. They were also trained in community entry skills, sampling procedures in the community, establishment of rapport with respondents, and what to do if respondents were unavailable or refuse to participate. Following from the training of the research assistants, a pre-test of the research procedures and instruments was carried out. The pre-test was used to ascertain the suitability of the study methods and data collection instrument and the adequacy, availability, and accessibility of the sample for the study. It was also used to test the procedures for data collection and the ability of

research assistants to obtain accurate data, as well as estimate the level of response to items on the data collection instrument. The pre-test also helped to test the procedures for data entry and analysis, and estimate the costs and duration of the main study. Two communities (one urban and one rural) in the study district were randomly selected. In these communities, 10% of the sample size for the study was selected through the sampling procedures set out for the study and the data collection instrument administered to them in accordance with the procedures for data collection. Result from the pre-test was used to rectify potential deficiencies in the research procedures, data collection instruments and procedures, and procedures for data analysis, as well as data collection skills of the research assistants. The result also was an input towards the planning and management of data collection, analysis, report writing, and completion of the main study.

The data collection process began with obtaining approvals, introductory letters and consent to proceed with data collection from relevant authorities and individuals. An approval to proceed with data collection was first sought from my supervisors. Following the approval from my supervisors, I obtained a letter of introduction from the Department of Health, Physical Education and Recreation, University of Cape Coast, introducing the purpose of the study and the researcher to the District Director of Health Services (DDHS) for the KEEA District. The DDHS elected the District Disease Control Officer and the District Public Health Nurse who introduced the research assistants and the researcher to the chiefs, elders and community health volunteers of city blocks and villages (clusters) selected for the study. In each selected cluster, the purpose and procedures of the data collection

exercise was thoroughly explained to the chiefs, elders and community health volunteers and their approval for the exercise sought. Suitable dates for the exercise in the respective cluster were then arranged with them. On the scheduled dates for data collection, permission to proceed with the exercise was sought from the chiefs, elders and community health volunteers as well as from leaders of households of potential respondents. Notwithstanding the permissions from the chiefs, elders, community health volunteers and leaders of households, consent of the potential respondents to participate in the study was also sought before any interview commenced.

Following the approvals, introductions and permissions, data collection commenced. The purpose of the study and the duration of the interview were explained to each potential respondent. In addition, potential respondents were assured that their identity and all information provided would be held in strict confidence. Interviews were carried out in quiet open places with minimal distractions and during the day between the hours of 8.00 a.m. and 6.00 p.m. The interviews were, however, carried out at the convenience of the potential respondents. At the end of the interviews, each respondent was thanked and verbally appreciated for spending time to participate in the study. Data collection proceeded and was completed in each selected cluster before moving on to another. At the end of the data collection exercise in each selected cluster, the chiefs, elders and community health volunteers were thanked and verbally appreciated for allowing the exercise to be carried out in the cluster. Data collection was carried out over a two-week period, from 20th April through to 5th May 2010.

Data handling involved cleaning, sorting and storage of data. Notwithstanding measures put in place to ensure quality of data, at the end of each day of data collection, each completed data collection instrument was cleaned by checking for any inconsistency, incompleteness and/or inaccuracy and correcting them before leaving the community. After ensuring that the responses on the completed data collection instruments were consistent, complete and accurate, the instruments were sorted into two categories; namely, rural and urban. The sorted completed data collection instruments were then stored in their raw state into separate paper bags, respectively.

Data Analysis

Data analysis involved two steps; namely, processing the data for analysis and analysing the data. Processing the data for analysis involved coding the responses on the data collection instrument and entering the data into a computer format for analysis. Thus, all responses to open-ended items and "other specify" options of items were listed and grouped into either nominal or ordinal categories as appropriate. A codebook was then developed and used as a coding key to code all of the items and responses to the items. Refer to Appendix D for the codebook. The coded data were then entered twice, respectively, into two computer-data-matrix files created with the statistical software, Statistical Package for the Social Sciences (SPSS), Version 16. The data were cleaned by examining frequency distributions for each data set, as well as comparing the two sets of frequency distributions, in order to identify any inconsistencies and/or errors in data entry. Analysis of the data was carried out per research question, using the same statistical software – SPSS Version 16.

The first research question examined the difference in maternal health information received between women resident in rural and urban areas in the KEEA district. Data derived from items 10 to 14 on the data collection instrument were analysed to describe the sources of maternal health information, type, and frequency of exposure to the information between women resident in rural and urban areas. Frequency distributions were used to determine the typical sources and types of maternal health information between women resident in rural and urban areas. Data on frequency of exposure to each type of maternal health information was first transformed into a four-point ordinal scale. Refer to codebook in Appendix D for frequency of exposure scale. Frequency distributions were then used to determine the prevalent level of exposure for each type of maternal health information between women resident in rural and urban areas in the district. Chi square test of independence was then used to determine the association between place of residence and sources and frequency of exposure to maternal health information.

The second research question assessed the difference in maternal health literacy between women resident in rural and urban areas of the district. Two features of maternal health literacy, maternal health literacy score and level of maternal health literacy, between the two groups of women were described. To describe maternal health literacy score between women resident in rural and urban areas, each item on the Likert scale (items 25 to 60 on the data collection instrument) was weighted from 1 to 5 on an interval scale, with 1 denoting downright illiteracy and 5 representing expedient literacy for the respective item. The score for maternal health literacy for each woman was

determined by totalling the weights she obtained for the 36 items. Thus, the score for maternal health literacy ranged from a minimum of 36 to a maximum of 180. The mean maternal health literacy score, and standard error and 95% confidence interval for the mean score were then computed for the two groups of women. The independent samples t-test was then used to determine any significant differences in maternal health literacy scores between women resident in rural and urban areas. To describe the level of maternal health literacy between women resident in rural and urban areas a five-point ordinal scale was developed based on suggestions from Nutbeam, et al. (2007) and used to grade the maternal health literacy scores into five levels. Refer to codebook in Appendix D for level of maternal health literacy scale. Frequency distributions were then carried out to determine the prevalent levels of maternal health literacy between women resident in rural and urban areas of the district. Chi-square test of independence was carried out to verify any significant differences in level maternal health literacy between women resident in rural and urban areas.

The third research question examined the influence of level of maternal health literacy on health behaviour between women resident in rural and urban areas. Data derived from items 15 to 24 on the data collection instrument were first analysed to determine the maternal healthcare services utilization behaviour between the two groups of women. Six characteristics of utilization behaviour were described; namely, place of antenatal care, frequency of attendance at antenatal clinic, place of delivery, conductor of delivery, attendance at postnatal clinic, and frequency of attendance at postnatal clinic. While places of antenatal and postnatal care were measured on a nominal

scale, place and conductor of delivery were measured on an ordinal scale. Frequencies of attendance at antenatal and postnatal clinics were measured on an interval scale. Frequency distribution was used to determine the typical places of antenatal, delivery and postnatal care and conductor of delivery between women resident in rural and urban areas. The mean, standard error and 95% Confidence Interval were computed to delineate frequencies of attendance at antenatal and postnatal clinics between women resident in rural and urban areas. Chi-square test of independence was used to ascertain the association between place of residence and places of antenatal, delivery and postnatal care, while the independent samples t-test was then used to determine any significant differences in frequencies of attendance at antenatal and postnatal clinics between women resident in rural and urban areas. Scatter plots were then constructed to relate maternal health literacy scores to frequencies of attendance at antenatal and postnatal clinics; and level of maternal health literacy to place of delivery for both groups of women. Where any linear relationship between the variables was evident, correlation coefficients were calculated to ascertain the degree of relationship. All significance tests were carried out at $\alpha = .05$ level.

CHAPTER FOUR

RESULTS AND DISCUSSION

The purpose of the study was firstly to determine the type of maternal health information that women in the KEEA District receive and to measure the level of maternal health literacy among them. The second purpose of the study was to determine the differences in health literacy between women resident in rural and urban areas in the district, examine associations between health literacy and health behavioural patterns, and to attempt an explanation of the observed patterns of utilization of healthcare programmes prevailing between rural and urban women in the district. The result and discussion of the result are, therefore, presented per research question.

What is the Difference in Maternal Health Information Received between Women Resident in Rural and Urban Areas in the KEEA District?

Majority of the respondents (61%) reported that only trained maternal healthcare providers (doctors, midwives, and community health nurses) provided health talks on maternal health issues in communities in the district. Few respondents, however, reported that trained healthcare providers in addition to teachers (1%) and religious leaders (1%) provided health talks on maternal health issues in communities. Quite a number of the respondents (37%) reported that no one (or they had no knowledge of anyone) provided

health talks on maternal health issues in communities in the district. Notwithstanding persons or no persons providing health talks in communities, 89% (n=399) of the respondents reported having ever attended health talks on maternal health issues and 11% (n=49) reported never attending health talks. Among those who reported having ever attended health talks on maternal health issues, 67% (n=267) reported attending health talks at the hospital or health centre, 29% (n=116) at reproductive health and child welfare outreach centres, and 4% (n=16) at places such as traditional healers,' churches and mosques. Nonetheless, to most of the respondents, attending hospital or health centre was the most common means for obtaining maternal health information. As shown in Figure 4 below, 72% of the respondents reported attending hospital or health centre as being the most common means for obtaining maternal health information.

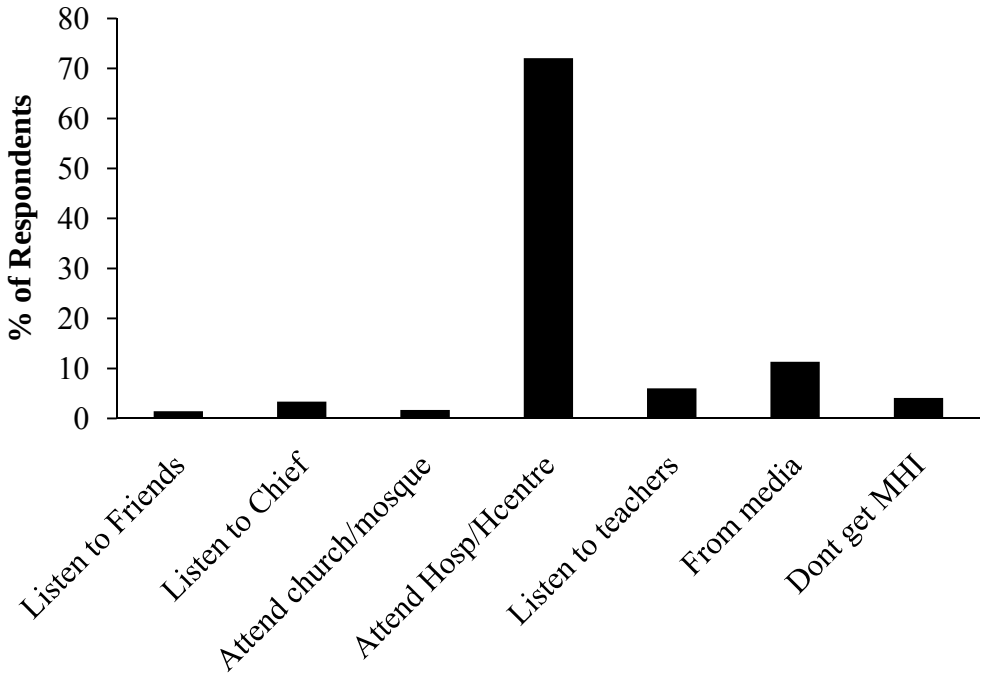

Figure 4. Most common means of obtaining maternal health information among respondents

Regarding types of maternal health information and frequency of exposure to the information, however, almost all of the respondents (93%, n=415) reported having ever been exposed to all 10 key categories of information pertaining to maternal health. Only 7% (n=33) of the respondents reported having never been exposed to any of the 10 key categories of information pertaining to maternal health. More than half of the respondents who have ever been exposed to information on maternal health reported that they have always been exposed to four key categories of information; namely, diet and nutrition (including breastfeeding), preparation towards delivery, importance of delivering in a healthcare facility, and importance and purpose of antenatal care as shown in Table 2.

Between respondents resident in rural and urban areas, 90% (n=205) and 88% (n=194), respectively, reported having ever attended health talks on maternal health issues. Among those resident in rural areas who reported having ever attended health talks on maternal health issues, 52% (n=107) reported attending health talks at the hospital or health centre, and 38% (n=78) at reproductive health and child welfare outreach centres. Among respondents resident in urban areas who reported having ever attended health talks on maternal health issues, 84% (n=163) reported attending health talks at the hospital or health centre, and 12% (n=23) at reproductive health and child welfare outreach centres. Examination of the data for differences in sources of maternal health information between the two groups of respondents revealed that, respondents resident in rural areas used community-based sources of information significantly more than did those resident in urban areas, $\chi^2(4, n=399) = 51.5, p=.000$.

Table 2: Frequency of Exposure to 10 Key Categories of Information on Maternal Health among Respondents

Category of information	Frequency of exposure									
	Always		Usually		Seldom		Never		Total	
	n	%	n	%	n	%	n	%	n	%
Importance and purpose of antenatal care	220	53	66	16	116	28	13	3	415	100
Attendance at antenatal clinic	158	38	54	13	187	45	16	4	415	100
Diet and nutrition (including breastfeeding)	307	74	33	8	66	16	8	2	415	100
Physiological changes and events in pregnancy	79	19	58	14	224	54	54	13	415	100
Danger signs during pregnancy	95	23	42	10	216	52	62	15	415	100
High-risk women groups for pregnancy	71	17	29	7	195	47	120	29	415	100
Preparation towards delivery	261	63	30	7	108	26	16	4	415	100
Importance of delivering in a healthcare facility	236	57	37	9	126	30	16	4	415	100
Importance and purpose of post-natal care	133	32	66	16	183	44	33	8	415	100
Attendance at post-natal clinic	104	25	46	11	220	53	45	11	415	100

As regards frequency of exposure to maternal health information, 93% (n=213) and 92% (n=202) of respondents resident in rural and urban areas, respectively, reported having been exposed to the 10 key categories of information. Tables 3 and 4, respectively, show frequency of exposure to the 10 key categories of information on maternal health between respondents resident in rural and urban areas. As shown in Table 3, only two key categories of information on maternal health, namely diet and nutrition (including breastfeeding), and preparation towards delivery were reported by most respondents resident in rural areas to have always been exposed to. However, as shown in Table 4, most respondents resident in urban areas reported being always exposed to six key categories of information on maternal health; namely, diet and nutrition (including breastfeeding), preparation towards delivery, and importance of delivering in a health facility. Others were importance and purpose of antenatal care, attendance at antenatal clinic, and importance and purpose of postnatal care. Comparison of frequency of exposure to the 10 key categories of information on maternal health between respondents resident in rural and urban areas revealed significant association between place of residence and frequency of exposure to information. As shown in Table 5, respondents resident in rural areas reported being exposed to each of the 10 key categories of information on maternal health significantly less frequently than were those resident in urban areas.

The result shows that, in general, the hospital, health centres and trained healthcare providers serve as the key sources of maternal health information for most women of childbearing ages in the KEEA district.

Table 3: Frequency of Exposure to 10 Key Categories of Information on Maternal Health among Respondents Resident in Rural Areas

Category of information	Frequency of exposure									
	Always		Usually		Seldom		Never		Total	
	n	%	n	%	n	%	n	%	n	%
Importance and purpose of antenatal care	81	38	40	19	88	41	4	2	213	100
Attendance at antenatal clinic	42	20	28	13	132	62	11	5	213	100
Diet and nutrition (including breastfeeding)	151	71	13	6	45	21	4	2	213	100
Physiological changes and events in pregnancy	19	9	19	9	147	69	28	13	213	100
Danger signs during pregnancy	26	12	11	5	138	65	38	18	213	100
High-risk women groups for pregnancy	15	7	6	3	124	58	68	32	213	100
Preparation towards delivery	111	52	12	6	81	38	9	4	213	100
Importance of delivering in a healthcare facility	94	44	13	6	96	45	10	5	213	100
Importance and purpose of post-natal care	34	16	32	15	128	60	19	9	213	100
Attendance at post-natal clinic	25	12	11	5	147	69	30	14	213	100

Table 4: Frequency of Exposure to 10 Key Categories of Information on Maternal Health among Respondents Resident in Urban Areas

Category of information	Frequency of exposure									
	Always		Usually		Seldom		Never		Total	
	n	%	n	%	n	%	n	%	n	%
Importance and purpose of antenatal care	139	69	24	12	28	14	11	5	202	100
Attendance at antenatal clinic	115	57	28	14	53	26	6	3	202	100
Diet and nutrition (including breastfeeding)	158	78	22	11	20	10	2	1	202	100
Physiological changes and events in pregnancy	61	30	38	19	77	38	26	13	202	100
Danger signs during pregnancy	73	36	30	15	77	38	22	11	202	100
High-risk women groups for pregnancy	55	27	20	10	74	37	53	26	202	100
Preparation towards delivery	149	74	14	7	28	14	11	5	202	100
Importance of delivering in a healthcare facility	145	72	23	11	28	14	6	3	202	100
Importance and purpose of post-natal care	101	50	32	16	55	27	14	7	202	100
Attendance at post-natal clinic	79	39	33	16	74	37	16	8	202	100

Table 5: Chi-Square Tests Results on Differences in Frequency of Exposure to 10 Key Categories of Information on Maternal Health between Respondents resident in Rural and Urban Areas

Key category of information	*Chi-square test result	
	χ^2 value	p value
Importance and purpose of antenatal care	50.5	.000
Attendance at antenatal clinic	68.6	.000
Diet and nutrition (including breastfeeding)	12.3	.006
Physiological changes and events in pregnancy	46.0	.000
Danger signs during pregnancy	54.2	.000
High-risk women groups for pregnancy	42.7	.000
Preparation towards delivery	30.6	.000
Importance of delivering in a healthcare facility	50.7	.000
Importance and purpose of post-natal care	63.5	.000
Attendance at post-natal clinic	65.6	.000

* n=415; df=3

Nonetheless, frequent exposure to maternal health information is limited to only four key categories; namely, diet and nutrition (including breastfeeding), preparation towards delivery, importance of delivering in a healthcare facility, and importance and purpose of antenatal care. The result also reveals significant differences in the maternal health information women of childbearing ages receive between residents in rural and urban areas of the district. More women resident in rural areas use community-based sources of information than do those resident in urban areas; and women resident in rural areas of the district are less frequently exposed to the key categories of information on maternal health.

The result is suggestive of a deficiency in the maternal health information that women of childbearing ages in the KEEA district receive. With most women being less frequently exposed to the types of information dealing with issues on physiological changes, events and danger signs during pregnancy, high-risk women groups for pregnancy, attendance at antenatal and postnatal clinics, and importance and purpose of postnatal care, women's perception of their vulnerability to any ill-health during pregnancy, delivery and puerperium would be hindered. As noted by Sheeran & Abraham (1996) and Mitu (2005), threat perception relating to pregnancy and childbirth, and knowledge of advantages that accrue to those who use maternal health services are fundamental to maternal health literacy. Women having knowledge of their susceptibility to ill health during pregnancy, and the probable outcomes during delivery and puerperium are more likely to use maternal healthcare services to ensure their health and safety, as well as that of their babies.

To ensure adequate use of all maternal healthcare services, women ought to be regularly exposed to all ten key categories of information on maternal health (Ministry of Health, 1999). Communication and exchange of information between trained maternal healthcare providers and the women in the district is pertinent to the acquisition of knowledge and skills that are apt to the utilization of maternal healthcare services. As noted by Hamilton (2006), acquisition of health literacy is considerably influenced by these interactive processes between healthcare professionals and the clients of the healthcare system. However, notwithstanding the importance of trained maternal healthcare providers taking charge of the provision of maternal health

information, inclusion of teachers, religious leaders, and other community workers as sources of information would ensure that women in communities are constantly and continuously exposed to adequate information on maternal health. The paucity observed in the sources, types, and frequency of exposure to maternal health information prevalent among women of childbearing ages in the district, especially those resident in rural areas, would most likely result in inadequacies in maternal health literacy and, thereby, hamper accessibility to maternal healthcare services.

What is the Difference in Maternal Health Literacy between Women Resident in Rural and Urban Areas in the District?

The result revealed a wide range of maternal health literacy scores among the respondents. Among the whole sample of women, maternal health literacy scores ranged from a minimum of 77 to a maximum of 180. The mean score was 135.0 (SE=1.39, 95% CI=132.3 – 137.7). Twenty-two percent of the respondents exhibited "very high" level of maternal health literacy, while 28% exhibited "inadequate" level (Table 6). Comparison of respondents resident in rural and urban areas on maternal health literacy scores at α=.05 level of significance revealed a remarkable difference between the two groups. Respondents resident in rural areas, as predicted, scored lower (M=122.4, SD=27.7) on the maternal health literacy test than did those resident in urban areas (M=148.1, SD=25.1), t(446)= -10.27, p =.000 (one-tailed), d= -.97. A chi-square test of independence on level of maternal health literacy between the two groups of respondents revealed that respondents resident in rural areas exhibited significantly lower levels of maternal health literacy than did those resident in urban areas, $\chi^2(4, N=448) = 95.21$, p =.000.

Table 6: Levels of Maternal Health Literacy between Respondents Resident in Rural and Urban Areas

Category of Residence	Level of maternal health literacy										Total	
	Very High		High		Moderate		Low		Inadequate			
	n	%	n	%	n	%	n	%	n	%	n	%
Rural	25	11	32	14	25	11	48	21	98	43	228	100
Urban	73	33	71	32	35	16	15	7	26	12	220	100
Total	98	22	103	23	60	13	63	14	124	28	448	100

More than 60% of respondents resident in rural areas were below "moderate" level of maternal health literacy (Table 6). However, controlling for the effect of level of education, the apparent relationship between place of residence and level of maternal health literacy disappeared at educational levels of senior high school and above, $\chi^2(4, N=43)=5.4$, $p=.249$. Nonetheless, further analysis revealed a weak relationship between level of education and level of maternal health literacy, $\rho = .30$, $n = 448$, $p = .000$ (one tailed).

The result shows that, generally, maternal health literacy among the respondents was moderate, as indicated by the mean maternal health literacy score among the whole group. However, comparison of maternal health literacy scores between respondents resident in rural and urban areas revealed lower levels of maternal health literacy among respondents resident in rural areas than was among those resident in urban areas. Moreover, relationship between level of education and level of maternal health literacy among the respondents was weak.

This result is a reflection of the maternal health information received by women in the district. The level of maternal health literacy observed among the women is consistent with other studies on the prevalence of maternal health literacy (Baker, et al., 1996; Doak, et al., 1996; Ohnishi, et al., 2007). Maternal health literacy does not only depend on the aptitude of individuals to understand maternal health information, but also on the categories of information covered in health education programmes, as well as frequency of exposure to the information. Thus, the low levels of maternal health literacy observed among the women, especially among those resident in rural areas in the district, might be a reflection of a lack of understanding and lack or

misinformation of the women. The Safe Motherhood Initiative (GHS, 2007) endorses client education as one of the essential components of maternal healthcare services delivery and, therefore, enjoins all maternal healthcare services providers to ensure adequate education of all women of childbearing ages. By so doing, most women, especially those resident in rural areas, would be empowered to make full use of maternal healthcare services.

The weak relationship between level of education and level of maternal health literacy was not surprising, since other studies (Baker, et al., 1996; Institute of Medicine, 2004; National Centre for Education Statistics, 2006) have documented similar findings.

How does the Level of Maternal Health Literacy between Rural and Urban Women Influence their Health Behaviour?

Utilization patterns of maternal healthcare services for antenatal and postnatal care between respondents resident in rural and urban areas are presented in Table 7. As depicted in Table 7, almost all of the respondents resident in rural and urban areas, respectively, received antenatal care with majority attending clinic. However, among respondents resident in rural areas, 93% (n=184) attended clinic at the hospital or health centre, 6% (n=12) at reproductive and child health outreach centres or CHPS zones, and 1% (n=1) at the maternity home. Among respondents resident in urban areas, 98% (n=192) attended clinic at the hospital or health centre and 2% (n=3) at the maternity home. The minimum and maximum numbers of visits to antenatal clinic among the whole group of respondents were 1 and 16, respectively. The mean number of visits was 8.1 (SE=0.19, 95% CI= 7.7 – 8.4) visits. Among respondents resident in rural areas, minimum and maximum numbers of visits

Table 7: Pattern of Antenatal and Postnatal Care Services Use between Respondents Resident in Rural and Urban Areas

Use pattern	Place of residence								
	Rural			Urban			Total		
	Yes (%)	No (%)	Total (%)	Yes (%)	No (%)	Total (%)	Yes (%)	No (%)	Total (%)
Received antenatal care	223(98)	5(2)	228(100)	211(96)	9(4)	220(100)	434(97)	14(3)	448(100)
Attended antenatal clinic	197(88)	26(12)	223(100)	195(92)	16(8)	211(100)	392(90)	42(10)	434(100)
Received postnatal care	170(75)	58(25)	228(100)	193(88)	27(12)	220(100)	363(81)	85(19)	448(100)
Attended postnatal clinic	90(53)	80(47)	170(100)	165(85)	28(15)	193(100)	255(70)	108(30)	363(100)

to antenatal clinic were 2 and 15, respectively, while those among residents in urban areas were 1 and 16, respectively. Mean number of routine visits to antenatal clinics during pregnancy between the respondents were 7.5 (SE=0.24, 95% CI=7.0 – 8.0) and 8.7 (SE=0.28, 95% CI=8.2 – 9.2) visits, respectively. Comparison of respondents resident in rural areas with those in urban areas on routine visits to antenatal clinic at α=.05 level yielded a significant difference between the two groups. Respondents resident in rural areas reported visiting antenatal clinic during pregnancy significantly less number of times (M=7.5, SD=3.4) than did those resident in urban areas (M=8.7, SD=3.9), t(390)= -3.09, p= .002 (one-tailed), d= -.31. Further analysis revealed a positive correlation between maternal health literacy score and number of routine visits to antenatal clinic during pregnancy, r = .65, n=392, p = .000 (one tailed). Analysis of the data for both rural and urban areas revealed similar relationship between maternal health literacy score and attendance at antenatal clinic during pregnancy, r = .73, n=197, p = .000 (one tailed) and r = .62, n=195, p = .000 (one tailed), respectively. Higher maternal health literacy score was associated with more routine visits to antenatal clinic. Respondents from both rural and urban areas, who did not access antenatal clinics for antenatal care, used the services of TBAs and spiritualists. Among respondents resident in rural areas, 50% (n=13) received antenatal care from TBAs, 46% (n=12) from spiritualists, and 4% (n=1) from the shrine. Among respondents resident in urban areas, 44% (n=7) received antenatal care from spiritualists, 31% (n=5) from TBAs, and 25% (n=4) from the shrine.

Similar to reception of antenatal care, majority of the respondents from both rural and urban areas, respectively, received postnatal care (Table 7).

However, of those who received postnatal care, 53% (n=90) of respondents in rural areas and 85% (n=165) of respondents in urban areas attended postnatal clinic, respectively. Comparison of number of visits to postnatal clinic for respondents resident in rural areas (M=1.7, SD=0.8) and those resident in urban areas (M=1.9, SD=1.1) revealed no significant differences between the groups, t(253)= -1.65, p= .100 (one-tailed), d= -.21. However, there was a significant association between place of residence and place where postnatal care is received, $\chi^2(1, n=363) = 0.36$, p=000. Residence in rural areas was associated with reception of postnatal care from traditional healers (TBAs, spiritualists, and priests of shrines). Respondents from both rural and urban areas, who did not access postnatal clinics for postnatal care, used the services of TBAs and spiritualists. Among respondents resident in rural areas, 66% (n=53) received postnatal care from TBAs, 33% (n=26) from spiritualists, and 1% (n=1) from the shrine. Among respondents resident in urban areas, 71% (n=20) received postnatal care from TBAs, and 29% (n=8) from spiritualists.

Regarding place of delivery, 52% of the whole sample reported delivering their babies at the hospital or health centre, while 30% reported delivering at home. However, as shown in Figure 5, while 44% (n=100) of respondents resident in rural areas reported delivering at home, 71% (n=156) of those resident in urban areas reported delivering at the hospital or health centre.

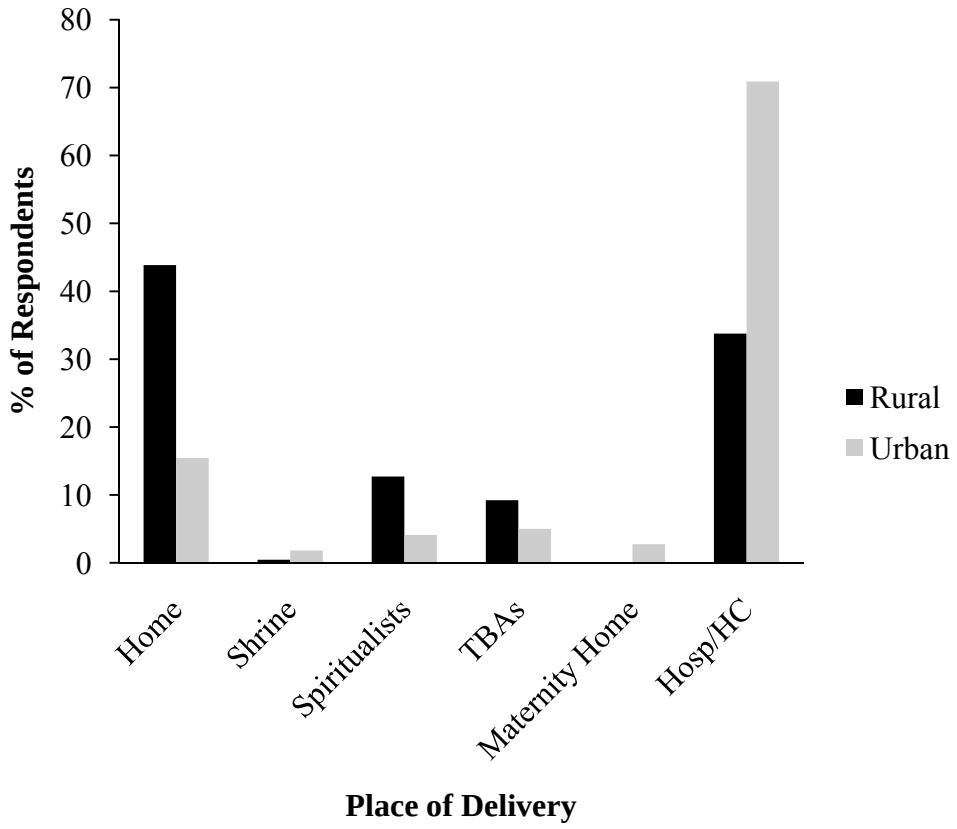

Figure 5. Reported places of delivery between respondents resident in rural and urban areas

A chi-square test of independence revealed a significant relationship between place of residence and place of delivery, $\chi^2(5, n=448)=80.63$, $p=.000$. Residence in rural area was associated with delivery at home. However, controlling for the effect of level of maternal health literacy, the association between place of residence and place of delivery disappeared at maternal health literacy levels of "moderate" and above, $\chi^2(4, n=62)=3.25$, $p=.516$. A correlation for the data revealed that level of maternal health literacy and place of delivery were significantly related, $\rho = .69$, $n = 448$, $p = .000$ (one tailed). Examining the relationship between level of maternal health literacy and place of delivery at rural and urban areas revealed similar result, $\rho = .57$, $n = 228$, $p = .000$ (one tailed) and $\rho = .55$, $n = 220$, $p = .000$ (one tailed), respectively.

Higher level of maternal health literacy was associated with delivery at hospital or health centre.

Similar to place of delivery, 50% of the whole sample reported that trained midwives conducted the delivery of their babies, while 32% reported that TBAs conducted the deliveries. Between respondents resident in rural and urban areas, TBAs and trained midwives, respectively, were the predominant conductors of deliveries. As shown in Figure 6 below, 46% (n=105) of respondents resident in rural areas reported TBAs conducted the delivery of their babies, while 69% (n=152) of those resident in urban areas reported trained midwives conducted the deliveries.

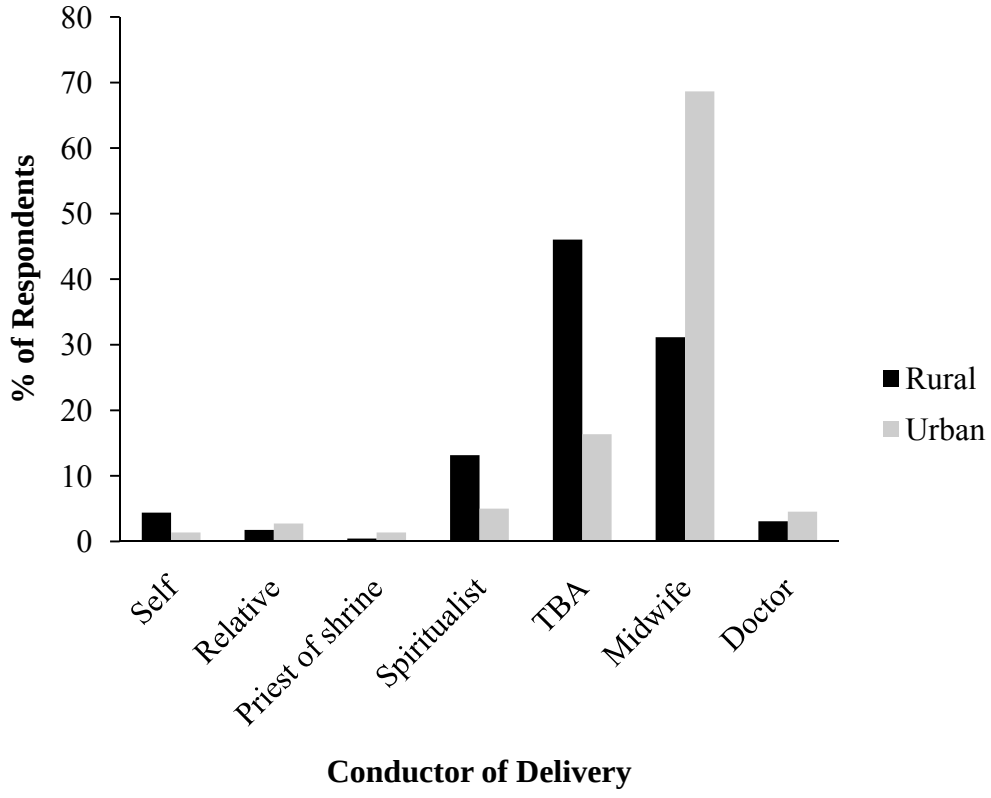

Figure 6. Reported conductors of delivery between respondents resident in rural and urban areas

The result showed that most women of childbearing age in the KEEA district use the maternal healthcare services made available to them. In both

rural and urban areas of the district, majority of women of childbearing age attend antenatal clinic in hospitals and health centres during pregnancy. However, a number of differences in maternal healthcare services utilization between women resident in rural and urban areas of the district were revealed. Women resident in rural areas attended antenatal clinic less number of times than those resident in urban areas. Similarly, more women resident in rural areas delivered their babies at home while more women resident in urban areas did so at hospitals or health centres. The result demonstrated a positive correlation between level of maternal health literacy and utilization of maternal healthcare services in the district.

The result is, however, characteristic of maternal healthcare services utilization described in many studies and reports such as Ghana Demographic Health Survey (2003), Ghana Health Service (2006), and Reproductive and Child Health Unit, Central Region (2007). It is virtuous that majority of respondents resident in both rural and urban areas access maternal healthcare services from hospitals and health centres in the district. This would ensure healthy outcomes of pregnancy, delivery, and puerperium for women in the district. Nonetheless, the result portrayed a significant rural-urban disparity worthy of note. The observation that women resident in rural areas in the district attend antenatal clinic less number of times, and more frequently deliver their babies at home, as compared to those resident in urban areas, agrees with Falkingham (2003), Mekonnen & Mekonnen (2003) and Nigussie, et al. (2004), which studies depicted poignant rural-urban differences in utilization of maternal healthcare services. Rural-urban disparity in utilization of maternal healthcare services leaves women resident in rural areas in

disadvantageous circumstances that endanger their development and the effort towards the attainment of the fifth United Nations Millennium Development Goal (UN Millennium Project, 2005).

The positive association between level of maternal health literacy and utilization of maternal healthcare services discovered in the study is consistent with Kaufman, et al. (2001). This result is suggestive of the influence of maternal health literacy on the health seeking behaviour of the women in the district. The low levels of maternal health literacy among the women resident in rural areas might have prevented them from adequately using maternal healthcare services. However, the study did not ascertain the causal relationship between maternal health literacy and utilization of maternal healthcare services.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The current targets of economic development are linked to human development and, subsequently, improvement of the health status of populations, especially the health of women and children. Thus, to improve the health of women and their children in the country, the Ghana Ministry of Health through the Ghana Health Service provides a package of healthcare maintenance and promotion services to women during pregnancy, delivery, and post-delivery periods. This package of healthcare services, daubed safe motherhood programme, aims at improving the health of women and reducing maternal morbidity and mortality through services such as antenatal care, supervised delivery, postnatal care, family planning, prevention and management of unsafe abortions, and health education. These maternal healthcare services are provided to all women at all levels of healthcare delivery in the country. Notwithstanding the widespread provision of these healthcare services, majority of pregnant women in the KEEA district attended antenatal clinic for the first time at gestational ages above the first trimester with few pregnant women attaining the required number of routine visits to the clinic before delivery, and fewer deliveries supervised. Nonetheless,

utilization of maternal healthcare services, as observed in the district, could be explained by the location of healthcare facilities offering the services in the district; since accessibility to maternal healthcare services has been revealed to determine utilization of such services. However, though utilization of maternal healthcare services could partly be influenced by location of healthcare facilities and its attendant accessibility characteristics, maternal health literacy has been identified as a key predictor of maternal healthcare services utilization. With most healthcare delivery facilities in the district being urban-centred, knowledge about maternal health literacy and its relationship to utilization of maternal healthcare services between women resident in rural and urban areas in the district was pertinent to the improvement of utilization of the services and, thereby, the health status of the women. Women resident in rural and urban areas in the district were, therefore, compared on the maternal health information they received, their level of maternal health literacy, and the relationship between their level of maternal health literacy and utilization of maternal healthcare services.

A quantitative descriptive research, employing a cross-section correlational design, was adopted for the study. Accordingly, a cross-section of women of childbearing ages living in rural and urban areas in the KEEA district was assessed and compared on variables such as exposure to maternal health information, level of maternal health literacy, and use of maternal healthcare services. In addition, relationship between level of maternal health literacy and utilization of maternal healthcare services was determined both for rural and urban areas. The reference population consisted of all women of childbearing ages living in the district. However, the study population

consisted of all women of childbearing ages who had a child aged less than 12 months and were living in the KEEA district. The sample size was 448 (228 from rural areas and 220 from urban areas). Compact segment sampling design, a type of multi-stage cluster sampling strategy, was employed to select the study subjects. A Questionnaire and a Likert Summated Rating Scale, which were joined into a composite data collection instrument, were used to collect data from the study subjects. Data collection involved two categories of activities; namely, pre-collection and collection activities. While pre-collection activities covered issues regarding assurance of quality data, collection activities covered administrative procedures for data collection and handling. Consequently, data were collected in the communities during the day between the hours of 8.00 a.m. and 6.00 p.m., and over a period of two weeks. Descriptive statistics were used to describe maternal health information that women in the district received, their level of maternal health literacy, and characteristics of utilization of three key maternal healthcare services. Both parametric and non-parametric measures, such as the independent samples t-test and chi-square tests of independence, respectively, were used to determine significant differences between women resident in rural and urban areas. Correlation coefficients were calculated to ascertain the degree of relationship between maternal health literacy and attendance at antenatal and postnatal clinics; and between level of maternal health literacy and place of delivery for respondents resident in rural and urban areas, respectively. All significance tests were carried out at $\alpha = .05$ level.

The result revealed significant differences between respondents resident in rural and urban areas of the district. Pertaining to maternal health

information women received in the district, differences in two aspects, namely sources of information and frequency of exposure to the 10 key categories of information on maternal health, were observed between respondents resident in rural and urban areas in the district. In respect of sources of maternal health information, respondents resident in rural areas used community-based sources of information significantly more than did those resident in urban areas. Regarding frequency of exposure to the 10 key categories of information on maternal health, respondents resident in rural areas reported being exposed to only two key categories of information more often, while those resident in urban areas reported being exposed to six key categories of information more often. Comparing the two groups of respondents revealed a significant association between place of residence and frequency of exposure to information. In respect of maternal health literacy, significant differences between the two groups of respondents were also observed in two areas; namely, maternal health literacy score and level of maternal health literacy. Pertaining to maternal health literacy score, respondents resident in rural areas exhibited lower maternal health literacy scores than did those resident in urban areas. Similarly, as regards level of maternal health literacy, respondents resident in rural areas exhibited significantly lower levels of maternal health literacy than did those resident in urban areas. As regards utilization of maternal healthcare services, differences between respondents resident in rural and urban areas were observed in the areas of attendance at antenatal clinic, place of delivery, and place postnatal care was received. Concerning attendance at antenatal clinic, respondents resident in rural areas reported visiting antenatal clinic during pregnancy significantly less number of times

than did those resident in urban areas. In respect of place of delivery, the result revealed an association between residence in rural area and delivery at home. Similarly, residence in rural areas was associated with reception of postnatal care from traditional healers (TBAs, spiritualists, and priests of shrines).

The result also revealed positive correlation between maternal health literacy and utilization of maternal healthcare services. Higher maternal health literacy score was associated with more routine visits to antenatal clinic during pregnancy. Similarly, higher levels of maternal health literacy were strongly related to delivery at hospital or health centre.

Conclusions

The study describes the differences that exist in maternal health literacy and health behaviour between women resident in rural and urban areas in the KEEA district. The findings confirm the hypotheses for the study and suggest certain conclusions about maternal health literacy between the two groups of women.

Women resident in rural areas tend to receive less information on maternal health from community-based sources of information. As a result of the paucity of maternal health information, women resident in rural areas tend to score lower on maternal health literacy appraisal and, hence, exhibit lower levels of maternal health literacy. These findings confirm the hypotheses that exposure to maternal health information is less frequent among women resident in rural areas and, consequently, women resident in rural areas will exhibit lower levels of maternal health literacy. While it may appear that women resident in rural areas prefer giving birth to their babies at home and have TBAs conduct the deliveries, the explanation for their preference may lie

more in their level of maternal health literacy rather than the location of maternal healthcare services. Although it is popularly accepted that use of maternal healthcare services is influenced by place of residence, evidence from the study supports the relationship between maternal health literacy and use of maternal healthcare services irrespective of place of residence. It confirms the hypothesis that in both rural and urban areas, higher levels of maternal health literacy are associated with increased use of maternal healthcare services. Maternal health literacy among women resident in rural areas in the KEEA district is lower than that among women resident in urban areas, and this may explain the pattern of maternal healthcare services utilization observed among women resident in the district. Further studies, however, need to be carried out to ascertain the causal relationship that exists between level of maternal health literacy and utilization of maternal healthcare services.

Recommendations

1. The Ghana Health Service in the KEEA district should design and implement health education programmes that emphasize the benefits of using maternal healthcare services, and that help women of childbearing ages develop the knowledge, attitudes, behavioural skills, and confidence they need to access maternal healthcare services appositely.
2. The health education unit of the Ghana Health Service in the central region and KEEA district should regularly evaluate the effectiveness of health education programmes promoting maternal health, and change the programme as appropriate to increase its effectiveness.

3. The Ghana Ministry of Health and Ghana Health Service should provide staff involved in maternal healthcare services delivery with adequate pre-service and ongoing in-service training in health education that focuses on teaching strategies for behavioural change among women of childbearing ages.
4. The Ghana Health Service, in collaboration with the Ghana Education Service, should develop and implement maternal health education from upper primary school through to senior high school as part of a sequential, comprehensive school health education curriculum to help students adopt healthy reproductive behaviours before they begin childbearing.
5. The Ghana Health Service should establish policies that promote the active involvement of family members and the community in supporting and reinforcing education on maternal health issues.
6. The Ghana Ministry of Health and Ghana Health Service, in collaboration with public universities that offer health education as a programme of study, should carry out studies to ascertain causal relationships existing between maternal health literacy and utilization of maternal healthcare services. The studies should emphasise the apposite period for introducing maternal health education to women of childbearing ages in order to enhance effective development of maternal health literacy among them.

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APPENDIX A

SAMPLE SIZE ESTIMATION

Formula for estimating the sample size, n, is:

$n = [z^2 \times r \times (1 - r) \times deff] \div [p \times n_h \times e^2]$

Where:

n = sample size in terms of number of households to be selected

z = the statistic that defines the level of confidence desired = 95% Confidence Level

r = an estimate of a key indicator to be measured by the survey. This is estimated at the highest level of maternal health literacy (164÷180x100= 91.1%) as measured by the study.

deff = sample design effect, which is dependent on the desired cluster size.

p = proportion of reference population accounted for by the target population and upon which the parameter r is based

n_h = number of respondents per household

e = margin of relative error to be attained = 10% of r (0.1r) [i.e. 2(0.05*x*) where *x* = r].

The sample design effect is estimated at:

$deff = 1 + [(b - 1) \times \rho]$

Where:

b = desired cluster size. This is principally dependent on the budget for the study. However, the greater a desired cluster size is, the less acceptable deff becomes, and the higher the variance due to clustering.

ρ = rate of homogeneity within cluster (intra-class correlation). This ranges between -1 to 1; however, 0.15 is usually used in household surveys in developing countries.

Calculation:

(a) deff = 1 + [(b – 1) x ρ] where b = 8 and ρ= 0.15

= 1 + [(8 – 1) x 0.15]

= 2.05

(b) Sample size = [z^2 x r x (1− r) x deff] ÷ [p x n_h x e^2]

= [1.96^2 x 0.911 x (1 – 0.911) x 2.05] ÷ [0.173 x 1 x $(0.1 \times 0.911)^2$]

= 0.638519827 ÷ 0.001435763

= 444.7251

= 445

Rounded up to **448**

APPENDIX B

CONCEPTUAL DEFINITION OF VARIABLES

Variable	Operational definition of variable	Scale of measurement
Age	Age of subject at last birthday (in years)	Interval
Marital status	Matrimonial condition of subject	Nominal
Place of residence	Area (rural or urban) where subject resides	Nominal
Length of stay	Total number of months subject has resided in place of residence	Interval
Level of education	Highest educational institution attended by subject	Ordinal
Occupation	Main livelihood subject has been engaging in for the past two years	Nominal
Religion	Faith community to which subject belongs	Nominal
Religious denomination	Religious sect within subject's faith community to which she belongs	Nominal

Variable	Operational definition of variable	Scale of measurement
Types of maternal health information	Category of information on maternal health issues provided to subject	Nominal
Frequency of exposure to maternal health information	Number of times a particular information on maternal health issues is provided to subject	Ordinal
Sources of maternal health information	Person, device and place subject obtains information on maternal health issues from	Nominal
Level of maternal health literacy	Extent of knowledge and skills on maternal health issues that ensures use of maternal healthcare services subject has	Ordinal
Utilization of maternal healthcare services	Number of requisite attendances subject made to 3 key safe motherhood services	Interval for antenatal and post-natal Ordinal for delivery

APPENDIX C

DATA COLLECTION INSTRUMENT

Questionnaire No.: .....

Name of Interviewer: .....

Date of Interview: .....

Name of Community: .....

Sub-district: .....

Basic instructions for data collectors

1. Begin by introducing yourself;
2. Explain the purpose of the interview and the amount of time it is expected to take;
3. Assure the respondent of anonymity and confidentiality;
4. For each item, write the response or tick (√) the appropriate box corresponding to the response the respondent gives.

Questionnaire Part

Background of Respondents

1. What is your age?: ..... years
2. What is your marital status?

   [ ] Married [ ] Separated [ ] Divorced

   [ ] Widowed [ ] Single
3. Do you live in this community? [ ] YES [ ] NO

   (*If **YES**, ask item 4 and continue from item 6; If **NO**, ask item 5 and continue with item 6*)
4. For how long have you been living in this community? ..... months
5. Where do you live? .....

6. What is the highest educational institution you have attended?

   [ ] None [ ] Non-formal [ ] Primary

   [ ] Middle/JHS [ ] SHS/Vocational

   [ ] College/Polytechnic/University

7. What job do you do for a living? .....

8. What is your religion?

   [ ] Christianity [ ] Traditional Religion [ ] Islam

   [ ] Others (specify) .....

9. To which denomination in your religion do you belong? .....

Maternal Health Information Women Receive

10. Who gives health talks on maternal health in this community? (*choose one/two most common persons*)

    [ ] Trained health providers [ ] Teachers [ ] Chiefs/elders

    [ ] Religious leaders [ ] Traditional Healers

    [ ] Drug peddlers/Chemical shop attendants/Dispensers

    [ ] No one [ ] Do not know

11. Have you ever attended any health talks on maternal health issues?

    [ ] YES [ ] NO

    *(If **YES**, continue from item 12; If **NO**, continue from item 13)*

12. Where do you attend health talks on maternal health issues? (*choose most frequent place*)

    [ ] Hospital/health centre [ ] Outreach centre

    [ ] Community clinic/CHPS Zone [ ] School

    [ ] Church/Mosque [ ] Traditional healer's

13. What is the most common means for you to get information on maternal health? (*choose one option*)

[ ] Listening to friends/relatives [ ] Listening to chiefs/elders

[ ] Attending church/mosque [ ] Attending hospital/health centre [ ] Listening to teachers/opinion leaders

[ ] From the media (print and electronic media)

[ ] Attending Traditional healer's [ ] Don't get maternal health information (*If this option is chosen continue from item 15*)

14. What maternal health issues are commonly addressed in health information you have received?

Maternal health concerns	Always	Usually	Seldom	Never
Importance and purpose of antenatal care				
Attendance at antenatal clinic				
Diet and nutrition (including breastfeeding and nutritional requirements)				
Physiological changes and events in pregnancy				
Danger signs during pregnancy				
High-risk women groups for pregnancy				
Preparation towards delivery				
Importance of delivering in a healthcare facility				
Importance and purpose of post-natal care				
Attendance at post-natal clinic				

Utilization of maternal healthcare services

15. Did you attend antenatal clinic when you were pregnant with this child?

[ ] YES [ ] NO

(*If **YES**, ask item 16 and continue from item 19; If **NO**, continue from item 17*)

16. How many times did you attend antenatal clinic when you were pregnant with this child? .....

17. Did you receive any antenatal care when you were pregnant with this child?

[ ] YES [ ] NO

(*If **YES**, continue with item 18; If **NO**, continue from item 19*)

18. From where did you receive antenatal care?

[ ] TBA's [ ] Shrine [ ] Spiritualist's

[ ] Others (specify) .....

19. Where did you deliver this child?

[ ] Hospital/health centre [ ] TBA's [ ] Private Midwife's [ ] Home [ ] Shrine

[ ] A spiritualist's [ ] Others (specify).....

20. Who conducted the delivery for this child?

[ ] Doctor [ ] Midwife [ ] TBA [ ] Self

[ ] Relative [ ] Spiritualist [ ] Priest of shrine

[ ] Others (specify) .....

21. Did you attend post-natal clinic after delivery of this child?

[ ] YES [ ] NO

(*If **YES**, ask item 22 and continue with Likert Scale; If **NO**, continue from item 23*)

22. How many times did you attend post-natal clinic after delivery of this child? .....

23. Did you receive any post-natal care after delivery of this child?

[ ] YES [ ] NO

(*If **YES**, ask item 24 and continue with Likert Scale; If **NO**, continue with Likert Scale*)

24. From where did you receive post-natal care after delivery of this child?

[ ] TBA's [ ] Shrine [ ] Spiritualist's

[ ] Others (specify) .....

Likert Scale Part

Level of Maternal Health Literacy

For each of the following items, tick (√) the appropriate box corresponding to the response the respondent gives.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
25. Pregnancy is a special period in a woman's life					
26. It is safe for a woman to start having children before 18 years of age					
27. It is safe for a woman to continue having children after 34 years of age					
28. Young women under 18 years of age are likely to have problems during pregnancy					
29. Older women aged 35 years and above are likely to have problems during pregnancy					

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
30. Women who have had 5 or more births already are likely to have problems during another pregnancy					
31. Women who are anaemic, diabetic, or have sickle cell are likely to have problems during pregnancy					
32. Women who had problems with a previous pregnancy or delivery are likely to have problems during another pregnancy					
33. Women who had an operation with a previous delivery are likely to have problems during another pregnancy					
34. Women who are likely to have problems during pregnancy ought to attend antenatal clinic throughout the pregnancy period					
35. Women who are not likely to have problems during pregnancy need not attend antenatal clinic					
36. Antenatal care provides women with vaccination against tetanus					
37. Antenatal care assures the good health of a woman and her baby					
38. Antenatal care helps to identify and treat complications that may develop					
39. Antenatal care provides the woman with vital information and counselling					

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
40. Pregnant women ought to receive antenatal care from only trained healthcare providers					
41. Women ought to start attending antenatal clinic within the first 3 months of pregnancy					
42. Pregnant women ought to attend antenatal clinic once every month from the 1st up to 7th month of pregnancy					
43. Pregnant women ought to attend antenatal clinic two times in a month from the 7th up to 9th month of pregnancy					
44. Pregnant women ought to attend antenatal clinic once every week from the 9th month of pregnancy up to delivery					
45. Trained healthcare providers should attend all deliveries					
46. Delivery in a healthcare facility is the safest					
47. Women under 5 feet tall should always deliver in a healthcare facility					
48. Women with deformities of the pelvis/lower back pain should always deliver in a healthcare facility					
49. Young women under 18 years of age should always deliver in a healthcare facility					

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
50. Older women above 35 years of age should always deliver in a healthcare facility					
51. Women having their first or fifth delivery should always deliver in a healthcare facility					
52. Women whose babies are not lying normally in the womb should always deliver in a healthcare facility					
53. Women with multiple pregnancy (twins) should always deliver in a healthcare facility					
54. Women who have sickle cell disease, or are anaemic, diabetic, or hypertensive should always deliver in a healthcare facility					
55. Women who had complications with a previous pregnancy/delivery should always deliver in a healthcare facility					
56. Women who had an operation with the previous delivery should always deliver in a healthcare facility					
57. Women having prolonged/obstructed labour should be sent to deliver in a healthcare facility					
58. Every woman ought to attend post-natal clinic within 7-10 days after delivery					

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
59. Women ought to attend post-natal clinic at least 2 times within the first 6 weeks after delivery					
60. Post-natal care is beneficial to both mother and baby					

APPENDIX D

CODEBOOK

A. Background of Respondents

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
1		Questionnaire No.	QNo.	Actual serial number	Code actual	-
2		Name of community	NCom	Actual name of community	Code actual	-
3		Sub-district	SDist	Elmina Kissi-Komenda Abrem-Agona Ankaful	1 2 3 4	-
4		Category of residence	CatRes	Rural Urban	1 2	Nominal
5	1	Respondent's age	QU01	Actual age in years	Code actual	Numerical
6	2	Marital status of respondent	QU02	Married Separated Divorced Widowed Single	5 4 3 2 1	Nominal
7	3	Residence in community	QU03	Yes No	1 2	Nominal
8	4	Length of residence in community	QU04	Actual length of time	Code time in months	Numerical
9	5	Where non-residents live	QU05	Actual name of community	Code actual	-
10	6	Educational level	QU06	None Non-formal Primary Middle/JHS Vocational/SHS College/Poly/Varsity	1 2 3 4 5 6	Ordinal
11	7	Occupation	QU07	Actual job	Code actual	Nominal

Background of Respondents (continued)

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
12	8	Religion	QU08	Christianity Traditional religion Islam Non-believer	1 2 3 4	Nominal
13	9	Denomination	QU09	Church of Pentecost Apostolic Church Church of Christ CAC Church of God Mizpah Church	Pentecostal	Nominal
				Catholic Church Methodist Church SDA Jehovah's Witness AME Zion Church Kingdom Place	Orthodox	
				MDCC 12 Apostles Church King of Kings African Faith New Continuation Christ Divine Church Church of the Firstborn	Spiritual	
				Amazing Grace Ministries House of Faith Victory Bible Church Christ Redeemer Church Int. Christian Faith Deeper Life Ministries Holy Fire Church Assemblies of God Life & Salvation Church ICGC Agape Love Church House of Praise Church Dunamis Firm Church House of Salvation Liberation Power Chapel	Charismatic	

B. Maternal Health Information Women Received

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
14	10	Persons giving health talks in communities	QU10	Health provider only Teacher only Chief/Elder only Religious leader only Traditional healer only Drug peddler only Health provider + Teacher Health provider + Chief/Elder Health provider + Religious leader Health provider + Traditional healer Health provider + Drug peddler Teacher + Chief/Elder Teacher + Religious leader Teacher + Traditional Healer Teacher + Drug peddler Chief/Elder + Religious leader Chief/Elder + Traditional healer Chief/Elder + Drug peddler Religious leader + Traditional healer Religious leader + Drug peddler Traditional healer + Drug peddler No one Don't know	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Nominal
15	11	Respondent attending health talk	QU11	Yes No	1 2	Nominal
16	12	Where respondents commonly attend health talk	QU12	Hosp/health centre Outreach centre Com clinic/CHPS School Church/Mosque Traditional healer's	1 2 3 4 5 6	Nominal

Maternal Health Information Women Received (continued)

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
17	13	Common means for respondents to get maternal health information	QU13	Listen to friends Listen to chief / elders Att. church/mosque Att. Hosp/H centre Listen to teachers From the media Att. Trad. Healer's Don't get health info	1 2 3 4 5 6 7 8	Nominal
	14	Types of maternal health information				
18		Importance and purpose of antenatal care	QU14A	Always Usually Seldom Never	3 2 1 0	Ordinal
19		Attendance at antenatal clinic	QU14B	Always Usually Seldom Never	3 2 1 0	Ordinal
20		Diet and nutrition	QU14C	Always Usually Seldom Never	3 2 1 0	Ordinal
21		Physiological changes and events in pregnancy	QU14D	Always Usually Seldom Never	3 2 1 0	Ordinal
22		Danger signs during pregnancy	QU14E	Always Usually Seldom Never	3 2 1 0	Ordinal
23		High-risk women groups for pregnancy	QU14F	Always Usually Seldom Never	3 2 1 0	Ordinal
24		Preparation towards delivery	QU14G	Always Usually Seldom Never	3 2 1 0	Ordinal
25		Importance of delivering in a healthcare facility	QU14H	Always Usually Seldom Never	3 2 1 0	Ordinal
26		Importance and purpose of post-natal care	QU14I	Always Usually Seldom Never	3 2 1 0	Ordinal
27		Attendance at post-natal clinic	QU14J	Always Usually Seldom Never	3 2 1 0	Ordinal

C. Utilization of Maternal Healthcare Services

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
28	15	Respondent attending antenatal clinic	QU15	Yes No	1 2	Nominal
29	16	Frequency of attending antenatal clinic	QU16	Actual number of times attended	Code actual	Interval
30	17	Reception of any antenatal care	QU17	Yes No	1 2	Nominal
31	18	Place of antenatal care	QU18	Hosp/HC Outreach Maternity CHPS TBA's Shrine Spiritualist's	1 2 3 4 5 6 7	Nominal
32	19	Place of delivery	QU19	Hospital Private Midwife's TBA's Spiritualist's Shrine Home	6 5 4 3 2 1	Ordinal
33	20	Conductor of delivery	QU20	Doctor Midwife TBA Spiritualist Priest of shrine Relative Self	7 6 5 4 3 2 1	Ordinal
34	21	Respondent attending post-natal clinic	QU21	Yes No	1 2	Nominal
35	22	Frequency of attending post-natal clinic	QU22	Actual number of times attended	Code actual	Interval
36	23	Reception of any post-natal care	QU23	Yes No	1 2	Nominal
37	24	Place of any post-natal care	QU24	TBA's Shrine Spiritualist's Maternity Home	1 2 3 4	Nominal

D. Level of Maternal Health Literacy

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
38	25	Pregnancy is a special period in a woman's life	QU25	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
39	26	It is safe for a woman to start having children before 18 years of age	QU26	Strongly agree Agree Undecided Disagree Strongly disagree	1 2 3 4 5	Interval
40	27	It is safe for a woman to continue having children after 34 years of age	QU27	Strongly agree Agree Undecided Disagree Strongly disagree	1 2 3 4 5	Interval
41	28	Young women under 18 years of age are likely to have problems during pregnancy	QU28	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
42	29	Older women aged 35 years and above are likely to have problems during pregnancy	QU29	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
43	30	Women who have had 5 or more births already are likely to have problems during another pregnancy	QU30	Strongly agree Agree Undecided Disagree Strongly disagree	1 2 3 4 5	Interval
44	31	Women who are anaemic, diabetic, or have sickle cell are likely to have problems during pregnancy	QU31	Strongly agree Agree Undecided Disagree Strongly disagree	1 2 3 4 5	Interval
45	32	Women who had problems with a previous pregnancy or delivery are likely to have problems during another pregnancy	QU32	Strongly agree Agree Undecided Disagree Strongly disagree	1 2 3 4 5	Interval
46	33	Women who had an operation with a previous delivery are likely to have problems during another pregnancy	QU33	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
47	34	Women who are likely to have problems during pregnancy ought to attend antenatal clinic throughout the pregnancy period	QU34	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval

Level of Maternal Health Literacy (continued)

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
48	35	Women who are not likely to have problems during pregnancy need not attend antenatal clinic	QU35	Strongly agree Agree Undecided Disagree Strongly disagree	1 2 3 4 5	Interval
49	36	Antenatal care provides women with vaccination against tetanus	QU36	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
50	37	Antenatal care assures the good health of a woman and her baby	QU37	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
51	38	Antenatal care helps to identify and treat complications that may develop	QU38	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
52	39	Antenatal care provides the woman with vital information and counselling	QU39	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
53	40	Pregnant women ought to receive antenatal care from only trained healthcare providers	QU40	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
54	41	Women ought to start attending antenatal clinic within the first 3 months of pregnancy	QU41	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
55	42	Pregnant women ought to attend antenatal clinic once every month from the 1st up to 7th month of pregnancy	QU42	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
56	43	Pregnant women ought to attend antenatal clinic two times in a month from the 7th up to 9th month of pregnancy	QU43	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval

Level of Maternal Health Literacy (continued)

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
57	44	Pregnant women ought to attend antenatal clinic once every week from the 9th month of pregnancy up to delivery	QU44	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
58	45	Trained healthcare providers should attend all deliveries	QU45	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
59	46	Delivery in a healthcare facility is the safest	QU46	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
60	47	Women under 5 feet tall should always deliver in a healthcare facility	QU47	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
61	48	Women with deformities of the pelvis/lower back pain should always deliver in a healthcare facility	QU48	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
62	49	Young women under 18 years of age should always deliver in a healthcare facility	QU49	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
63	50	Older women above 35 years of age should always deliver in a healthcare facility	QU50	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
64	51	Women having their first or fifth delivery should always deliver in a healthcare facility	QU51	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
65	52	Women whose babies are not lying normally in the womb should always deliver in a healthcare facility	QU52	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
66	53	Women with multiple pregnancy (twins) should always deliver in a healthcare facility	QU53	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval

Level of Maternal Health Literacy (continued)

Col. No.	Qu. No.	Variable		Response Pattern	Code	Scale
		Name	Code			
67	54	Women who have sickle cell disease, or are anaemic, diabetic, or hypertensive should always deliver in a healthcare facility	QU54	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
68	55	Women who had complications with a previous pregnancy/delivery should always deliver in a healthcare facility	QU55	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
69	56	Women who had an operation with the previous delivery should always deliver in a healthcare facility	QU56	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
70	57	Women having prolonged/obstructed labour should be sent to deliver in a healthcare facility	QU57	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
71	58	Every woman ought to attend post-natal clinic within 7-10 days after delivery	QU58	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
72	59	Women ought to attend post-natal clinic at least 2 times within the first 6 weeks after delivery	QU59	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
73	60	Post-natal care is beneficial to both mother and baby	QU60	Strongly agree Agree Undecided Disagree Strongly disagree	5 4 3 2 1	Interval
74		Maternal Health Literacy score	MHLS	Total of weights in Likert scale	Code actual	Interval
75		Level of Maternal Health Literacy	LMHL	Very high High Moderate Low Inadequate	5 4 3 2 1	Ordinal

Level of Maternal Health Literacy

Very high = MHLS ≥164

High = MHLS 146 – 163

Moderate = MHLS 128 – 145

Low = MHLS 110 – 127

Inadequate = MHLS ≤109