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Factors Associated With Maternal Mortality in Greater Accra Ghana 2016: Case-Control Study

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Walden University
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Abstract

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by

Edmund Eghan

MPH, Kaplan University, 2013

BA, Ohio State University, 2011

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health - Epidemiology

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Abstract

Maternal mortality is a critical area of concern globally, despite the availability of accessible preventive measures. The role of sociodemographic and service delivery factors in maternal mortality in the Accra Metropolitan Area of Ghana are important to examine. As part of the United Nations (UN) Millennium Campaign, the UN implemented 8 Millennium Development Goals (MDGs); maternal mortality reduction by 75% between 1990 and 2015 was among the fundamental MDGs to be achieved by 2015. The purpose of this case-control study was to use secondary data to assess the relationships between sociodemographic variables, service delivery factors, and maternal mortality among 8,171 women of reproductive age (15-45 years) living in the Greater Accra metropolitan area in Ghana. The health belief model and social cognitive theory provided the theoretical framework to interpret the study findings. Particularly, income (p = .023), primary (p = .035) and secondary (p = .002) education, and health insurance (p = .008) were significantly associated with maternal-related mortality. However, for survival outcome, health insurance (p = .003), prenatal care (p = .001), and presence of a skilled attendant at delivery (p = .020) were significant factors. These study results provide support for the significant effects of sociodemographic and service delivery factors on maternal mortality and survivorship in the Greater Accra metropolitan area in Ghana. The results of this study could enhance educational and outreach programs designed to lower maternal mortality rate. Further research needs to be done to advance knowledge and practice in health delivery services and public health education with respect to the importance of sociodemographic and service delivery characteristics.

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Dedication

This dissertation is dedicated to my wife, Awurama Eghan, and also my son and two daughters Emmanuel Eghan, Emmanuela Eghan and Elsie Eghan

Acknowledgments

I would like to take this opportunity to express appreciation to the many people that helped make my dissertation journey a great success. Without the help of the Lord almighty God, I would not have made it through this though journey of education. My favorite quote in the Bible is that "He that has begun a good work will accomplish it." Many others selflessly offered me a helping hand and guided me through the process. I very much appreciate my dissertation chair, Dr. Krishnamoorthy, whose direction, patience, guidance, encouragement, prompt responses, wealth of knowledge, understanding of methodology, and commitment made it possible to accomplish my goal. Secondly, I want to say a big thank you to my committee member, Dr. Diana Naser, for her great input in regard to the content and organization of my dissertation. She is phenomenon and thank you again for your insightful guide to my dissertation,

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Chapter 1: Introduction to the Study

Introduction

Maternal death is defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes'' (UNICEF, 2013, p. 3). Though the causes and risk factors for maternal death are known and preventable, it is a major health problem concentrated in resource-poor regions of the world, including Ghana (Menéndez et al., 2008). The reduction of maternal deaths is a key international development goal; therefore, health policy and interventions targeted at significantly reducing should be evidence based (Khan, Wojdyla, Say, Imezoglu, & Van Look, 2006).

As part of the United Nations' (UN) Millennium Campaign, the UN implemented eight Millennium Development Goals (MDGs). Maternal mortality reduction was among the fundamental MDGs to be achieved by 2015 (World Health Organization [WHO], 2015). It is a crucial factor when assessing the progress made toward reducing the maternal and morbidity rates among maternal mothers. The fifth MDG was aimed at improving maternal health and reducing maternal mortality ratio (MMR) by 75% from 1990 to 2015 (Mills, 2011; World Health Organization, UNICEF, UNFPA, The World Bank, and the UNP Division, 2014). Although considerable progress has been made worldwide with the number of maternal deaths halved in the past 20 years (with an MMR of 210 per 100,000 live births in 2010), many countries in sub-Saharan Africa failed to attain the MDG by 2015. The region had an MMR of 500 maternal deaths per 100,000

live births in 2010 and is composed of 36 of the 40 countries with the world's highest MMR (WHO, 2012a). This has made the region a dangerous place to give birth even though leadership are sure of what to do to stop the deaths that occurs during childbirth. Prevention of childbirth complications can be achieved by having an accessible place for family planning, hiring more skilled midwifery, and having accessible obstetrics care (Osotimehin, 2012).

Results from my research can support the promotion of positive social change by helping health professionals identify sociodemographic and service delivery factors that can be targeted to prevent or reduce maternal mortality in the Accra metropolitan area of Ghana. These study findings may also help prevent complications and improve service delivery to maternal mothers. Similarly, there is a need to investigate and inform policymakers to work toward the UN's Sustainable Development Goal (SDG) Goal 5, which is to achieve gender equality and empower all women and girls. Maternal mortality affects women worldwide; however, countries in the sub-Saharan Africa region have the highest prevalence of maternity-related deaths (Alkema et al., 2016).

In this study, I review the effects of maternal mortality in Ghana as well as previous research on the subject. I examine the gaps in service delivery, which lead to maternal mortality as well as the services required to fill those gaps. I explain the background, problem statement, purpose and nature of the study, the scope, delimitations, limitations, and significance of the study in this study.

Background of the Study

Worldwide Causes of Maternal Death

The causes of maternal death are categorized into direct and indirect causes. The direct causes are due to obstetrics causes and represent a failure in the health care system that need urgent improvement (Menéndez et al., 2008). The direct causes of maternal mortality are, among others, hemorrhage, infection, eclampsia, obstructed labor, and unsafe abortion (WHO, 2015a); specifically, hemorrhage and hypertensive disorders are the major contributors to maternal mortality in developing countries (Khan et al., 2006). The indirect causes, however, are due to other nonobstetric factors and they include malaria, HIV/AIDS, bronchopneumonia, meningitis, tuberculosis, anemia, and institutional difficulties (Oosterbaan, 1995; Khan et al., 2006; Abe & Omo-Aghoja, 2008). In India, where majority of the world's maternal deaths occur, 38% of these deaths are due to hemorrhage, infection is 11% eclampsia and obstructed labor 5% each, abortions 8%, and 34% results from other causes (Mavalankar, Vora, Ramani, Raman, Sharman, & Upadhyaya, 2009) as shown in Figure 1.
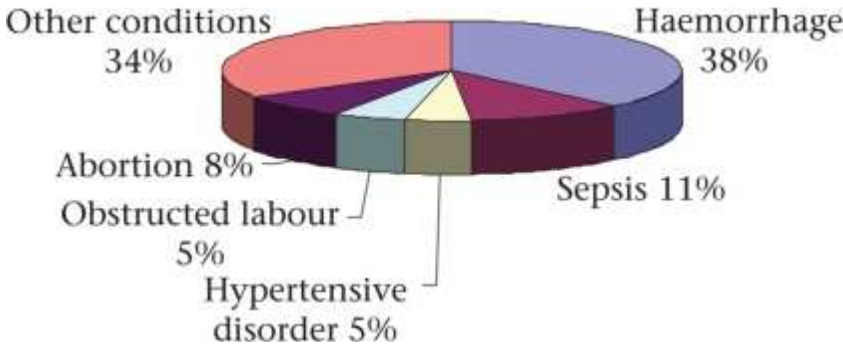
Figure 1. Causes of maternal deaths in India. Source: Mavalankar et al. (2009).

The causes of maternal deaths in Ghana follow the trends of a developing country with hemorrhage, hypertensive disorders, abortion-related complications and septicemia leading way, in that order (Mensah, Bentil, Adjepong, & Dolo, 2011). To reduce maternal mortality successfully, the sociodemographic and service delivery factors associated with maternal mortality in the Accra metropolitan area of Ghana need examination. Maternal mortality rates are not the same in every region therefore; there is a need to investigate whether there are factors that are exclusive to certain geographic areas.

Hemorrhage

Postpartum hemorrhage occurs worldwide with nearly 8 million to 136 million maternal mothers suffering from excessive bleeding caused during delivery. Postpartum hemorrhage is the leading cause of maternal mortality among women worldwide. The mortality rate is increased when a mother loses nearly 500 milliliters of blood, which can result in a mother who has undergone a caesarian section or complications in the birth canal resulting in excessive blood loss, putting their lives at risk (Shakur et al., 2017). The situation experienced in Accra is different from developed countries due to the existence of an enhanced system of care for maternal mothers where specialized care is given when instances like postpartum hemorrhage occur. Nearly 3% of all vaginal deliveries in Accra will lead to postpartum hemorrhage (Shakur et al., 2017). This is the main case of maternal mortality in Accra and it occurs in undeveloped countries that have no enhanced system of medical care, compared with developed countries such as the

United Sates. Furthermore, postpartum hemorrhage causes morbidity after deliveries if no specialized care is provided during this stage, these mothers can succumb to death.

Anemia

As explained by the WHO (2014), maternal mortality is influenced by anemic conditions in maternal mothers. Considering that in West Africa more than 50% of the women have deficient levels of hemoglobin, which is defined as level below 100 grams per liter, these women are exposed to death before or at childbirth (Sidney, Bates, & Islam, 2002). Anemia leads to maternal mortality because it impairs the ability of pregnant women to resist infections. In Accra, parasite-based diseases are the major contributor to this condition.

Anemia impairs the immune system of pregnant women, rendering them susceptible to bacterial, viral, and parasitic infections as well as major conditions that may compromise their health. Obstructed labor is another issue and a severe complication leading to the determent of labor pain because of the blockage birth canal (Sidney et al., 2002). Obstructed labor is a result of pregnancy at an early age, poor nutrition during the early childhood, fetopelvic disproportion and abnormality in the fetal presentation (Sidney et al., 2002).

Abortion

Abortion is termination of pregnancy. Unsafe abortion is the process involved in terminating pregnancies notably if it was accidental (Blencowe et al., 2012). Abortion as the factor influencing maternal deaths can be either voluntary or involuntary termination of the women's fertility before it reaches 20 weeks of gestation. It leads to maternal

mortality because it is associated with severe bleeding, excess pain in the lower abdomen, and channeling out both placental and fetal tissues (Blencowe et al., 2012). On a global scale, more than 42 million females decide to carry out abortion if the pregnancy is unintentional and, through the procedures followed, half of them stand at risk of death and complication after the abortion (Blencowe et al., 2012). Unsafe abortion is associated with at least 60,000 maternal deaths each year (Blencowe et al., 2012). Abortion is associated with an estimated 10% of the total maternal mortality. Most of the women in Accra who have attempted abortion are at risk of suffering from long-lasting health complications. It was challenging when it came to obtain reliable and accurate data concerning insecure abortions because the capacity to collect data shows varied information from one region to another. Unsafe abortion is conducted by the untrained professional, and it remains undocumented, hence some of the figures are just estimates (Blencowe et al., 2012).

Hypertension

Hypertensive disorders in pregnancy are associated with the presence of protein in urine and pedal edema (Singh, Ahmed, Egondu, & Ikechukwu, 2014). Singh et al. (2014) revealed that it is difficult to prevent, control, and manage hypertensive disorders and they are the significant factors associated with the maternal mortality Africa, especially in Accra (Singh et al., 2014). Failure to treat this condition leads to convulsions and brain damage, which may lead to death. In a cross-sectional study design, Edmond, Zandoh, Quigley, Amenga-Etego, Owusu-Agyei, and Kirkwood (2016) reported positive associations of hemorrhage, maternal health, anemia, abortion, obstructed labor, old age,

sepsis, and hypertension to maternal mortality rate. Maternal death in Accra is likely influenced by such factors.

Sociodemographic Factors

A need exists to investigate the sociodemographic factors such as marital status, education, income, and health insurance. The maternal mortality rate in Accra, and sociodemographic factors associated with the maternal mortality in Accra has not yet been researched. This has caused a gap, and knowledge of the sociodemographic factors regarding maternal mortality will help bring a positive approach to reduce maternal mortality.

Studies conducted across the world emphasize the association of maternal death with maternal age, education level, marital status, high poverty level and seasonality (Abe & Omo-Aghoja, 2008; Begum, Aziz-un, & Begum, 2003). In the Ejisu district of Ghana, 59% of maternal deaths occurred in women aged 20 to 35 years (Martey, Djan, Twum, Brown, & Opoku, 1994). In the Anambra state of Nigeria, 60.6% of maternal deaths occurred in women aged 21 to 35 years with 14.6% of women aged 21 to 25 years, 27.2% aged 26 to 30 years, and 18.8% were 31 to 35 years old (Chukudebelu & Ozumba, 1988). The contribution of these risk factors cannot be discussed without stressing the role the condition of roads and seasonality of an area play in maternal death. The rainy season has an association with maternal mortality with an estimated odds ratio of 2.4% (Garenne, Mbaye, Bah, & Correa, 1997).

Studies conducted in the past did not examine whether there is an association between service delivery factors such as prenatal care, delivery location, and presence of

a skilled attendant at delivery, and maternal mortality in Greater Accra, Ghana (Accra) that could possibly be the cause of the high maternal mortality rate. Last, the existing research did not present maternal survival rates between women in Accra, in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant birth. This study is timely and necessary to fill a gap in the literature by examining the maternal survival rates between women in Accra in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant birth.

Problem Statement

Although considerable progress has been made worldwide with the number of maternal deaths halved in the past 20 years (with an MMR of 210 per 100,000 live births in 2010), many countries in sub-Saharan Africa failed to attain the MDG by 2015. The region had an MMR of 500 maternal deaths per 100,000 live births in 2010, and is composed of 36 of the 40 countries with the world's highest MMR (WHO, 2012a). This has made the region a dangerous place to give birth even though people are sure of what to do to put an end to deaths occupancies during childbirth. This can be done by having accessible place for family planning, hiring more skilled midwifery and having obstetrics care that is accessible to the pregnant women to help prevent complication with childbirth (Osotimehin, 2012).

Ghana has a documented Maternal Mortality Ratio (MMR) of 350 per 100,000 live births for the year 2012 (Mahama, 2013). However, the district of Osu Klottey

submetro of the Accra metropolitan area in its report recorded 428 maternal deaths per 100,000 live births at the end of 2012. This is a 39% increase on the 309 per 100,000 live births recorded in 2011. According to Addo and Gudu (2017), the Accra metropolitan area, and urban and commercial metropolis in the Greater Accra region, has seen collaborative implementation of health policies and programs geared towards reducing maternal mortality for the past three years. Urban populations are mostly assumed to have access to better quality health care systems than their rural counterparts (Addo & Gudu, 2017). However, urban health systems in many low-income countries (LICs) and middle-income countries (MIC) have weak to nonexistent public health structures (Coast et al., 2012). They also lack uniform implementation strategies and inadequate infrastructure to improve population health (Coast et al., 2012). Even though Ghana, in collaboration with its development partners, has implemented interventions to reduce maternal mortality to achieve the UN MDG 5 Targets, institutional maternal mortality was very high in Osu Klottey sub metro for 2016 with the majority (80%) of maternal deaths being among individuals who did not attend antenatal clinic (Mahama, 2013). Studies have indicated a lack of access to obstetrics care due to the lack of health care facilities, poor transportation system and greater distances between client home and health facilities (Kaye, Mirembe, Aziga, & Namulema 2003).

Although the causes of maternal deaths are well established, knowledge on effective health care management has not been translated into significant outcomes (Coast et al., 2012). Observations at health care institutions in the Accra Metro area show that service delivery factors such as prenatal care coverage, and the presence of a skilled

attendant at delivery, may play a significant role in the mortality rate and therefore needs to be investigated to inform policy decisions if the Sustainable Development Goal (SDG) Goal 5 is to be met. The causes of maternal deaths in Ghana follow the trends of the developing country with hemorrhage, hypertensive disorders, abortion-related complications, and septicemia leading, in that order (Mensah et al., 2011). In this research study, I examined the association between sociodemographic and service delivery factors and maternal mortality.

Socioeconomic factors have been identified to have a connection with maternal mortality as it helps determine risk factors which can be associated with the life of the mothers before and after delivery (Owusu & Oteng-Ababio, 2015). Income determines the health status of maternal mothers in the country (Gelaye, Rondon, Araya, & Williams, 2016). To ensure that maternal mothers have a safe environment during and after birth, adequate income must be available within the family to access adequate health care. In the Northern and Central regions of Africa, the government formulated policies exempting women from paying for health care services in the region in the year 2003 to increase the number of those who could access health care institutions. Similarly, these policies were enacted with a view of ensuring that maternal mothers receive specialized care in the time of emergencies to reduce mortality rates.

Purpose of Study

In this case control quantitative research study, I investigated the sociodemographic and service delivery factors associated with maternal mortality. Particularly, the study was based from women in the Osu Klottery Sub Metro in the

Accra Metropolitan area of Ghana. The maternal mortality rates are not the same in every region and therefore I investigated whether there are factors exclusive to some geographic areas.

Significance

Since Ghana did not achieve its MDG 5 Target, there has been renewed effort to achieve the SDGs on maternal death reduction, yet very little research has been done on the factors for which intervention would yield the most effect. As Accra Metro is a high urbanized setting characterized by rural urban migration, with so much pressure on relatively few health facilities (National Health Insurance Authority, 2012), policymakers need more information on the major risk factors in this setting to guide decision making and resource allocation. The information gathered could inform the Metro and Regional Health Directorate on other policy interventions to help reduce maternal death in the Metro area. The positive social change implication that could result is to improve the quality of institutional antenatal, intra-partum, and postpartum service delivery in the Metropolis and add to the body of knowledge to reduce maternal death in Ghana.

This study is intended to use secondary data to assess the relationship between maternal mortality and sociodemographic variables among women of reproductive age (15 to 45 years). The maternal mortality rates are not the same in every region and, therefore, there is a need to investigate whether there are factors that are exclusive to some geographic areas. The dependent variables used in this study included age, education, marital status, income level, and employment opportunities. The independent variable is the maternal mortality rate in Accra.

Research Questions and Hypotheses

RQ1: Is there a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis (*Ho)*: There is no significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis (*H1)*: There is a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

RQ2: Is there a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis *(Ho)*: There is no significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis *(H1)*: There is a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

RQ 3: Is there a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income

above GH¢30.00, education above the high school level, marital status, and location of infant birth?

Null Hypothesis *(Ho)*: There is no significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant birth.

Alternative Hypothesis *(H1)*: There is a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant birth.

Theoretical Foundation

Social Capital Theory

According to the earliest theorists and researchers, the social capital theory is said to have existed in small societies as result of interactions of human beings although currently the concept of social capital has been popularized. The scholars believe that social capital helps people make informed decisions and can be examined at certain health needs (Krieger, 2011). The social capital theory as applied to my research indicates that social capital can be measured based on a women's level of education and networks. This theory can be applied by maternal health care providers to evaluate maternal mortality rate globally. Some philosophers argue that there is inadequate knowledge concerning maternal health in Accra. I used this theory to examine the role of social networks and social capital in health care systems, applied to the maternal

population in Accra, and the cases of maternal death may be lowered through prevention (Aidam, Perez-Escamilla, Lartey, & Aidam, 2005).

The Health Belief Model

The Health Belief Model (HBM) is a cognitively based model that originated from the psychological model developed by psychologists in the U.S (Hochbaum, Rosenstock, & Kegels, 1952; Skinner, Tiro, & Champion, 2015). I used this model to determine the mental processes as to how a person will conceive in their mind to begin a prevention health services and the reason as to why they will stick to that health regimens (Hochbaum et al., 1952). This theory explains how educating people about their health practices are important and the changes that can be noticed if the health behavior is changed (Glanz, Rimer, & Viswanath, 2008). HBM emphasizes that whether or not a person would likely take measures to prevent their actions, will depend on their perception of the condition they are in; if they perceive the outcome of the condition would be effective, they also perceive if they take precaution of their behavior, it would yield a good result and would prevent the condition, and lastly the benefit that one will gain from reducing the threat of the condition will exceed the cost of action taken (Glanz et al., 2008). The constructs of the HBM are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Hochbaum et al., 1952). I used HBM to assist me in understanding the way pregnant women perceive pregnancy, and the characteristics these women possess that cause them to take the action they took. In my study, I focused on the modifying factors that influence individual beliefs as defined within the constructs of the HBM.

Social and behavioral sciences focus on social, physiological, behavioral, and cultural factors that affect one's health behavior. To achieve the goal of behavioral changes, it is important for health care professionals to become aware of the hindrances and to be able to address them (Edberg, 2007). Edberg believed that human behavior can be shaped or affected by one or a combination of any of the above-mentioned criteria. To understand the issues of maternal mortality, one needs to know the factors to effectively understand people who are in that predicament (Edberg, 2007). One of the behavior theories that helps to explain why there is a high rate of maternal mortality in Ghana and several of the African countries is the Health Belief Model (HBM). The model proposes that a person decides to make changes or refuses to make changes due to five main factors. These factors are perceived susceptibility, perceived severity, perceived benefit, perceived of action, and perceived barriers to taking that action (Edberg, 2007). Each stage explains the reason a person will like to make changes or will not like to make changes. If pregnant Ghanaian women will consider this theory and actions to limit the growing epidemic of maternal mortality and not let any of the perceived behavior have effect on them, they will be successful in changing the maternal mortality rate. These theories served as the framework to determine how and to what extent sociodemographic and service delivery factors can affect health care outcomes such as maternal mortality which will be reviewed in-depth in Chapter 2.

Gender Equity Theory

The gender equity theory helps explains fairness among genders, in health care, social- economic, nourishment and the relations between sexes. Gender equity theory has

suggested prevention of maternal deaths, and the risks associated with it. This theory helps to create fairness and equality with women when it comes to fairness and human right. Having this theory in place helps women have the sense of belonging at their regular checkup because they will be treated fairly which helps them with quality service delivery and receives useful information prior to and after pregnancy (Aboderin & Beard, 2015). The information gathered helps women to make their decisions related to health without any barriers which may promote maternal death. The research indicates that expectant mothers who face death at home are not yet registered by the professional health care providers and therefore, the family members tend to avoid reporting such events. The information on maternal deaths in the societal setting has been limited due to failures of reporting and hidden abortions associated with the complications.

Although this theory helps with fairness and equality, it cannot prevent discrimination due to the substantive equity and does not address the disparities based on social and economic aspects among susceptible people, which are related to distributions of possessions and influence (Gelaye, Rendon, Araya & Williams, 2016). The fairness and equality of this theory will be discussed more in chapter 2

Social Cognitive Theory

Social Cognitive Theory is important in explaining the psychological condition of pregnant women. In this regard, I used the SCT to explain and analyze socially based determinants of the health of pregnant mothers (Bandura, 1998). Pregnancy wellbeing and the period of perinatal are described as the ultimate determinants of the maternal conditions before the last forty-two days of pregnancy. According to the SCT, maternal

mortality is not only influenced by the terms of the mother, but also the role of the midwives and nurses (Addo & Gudu, 2017).

I used SCT to obtain and maintain behavior changes and what type of modifications can be made to these behavior changes. Thus, my study focused on the self-efficacy of those who are involved in the study. In this case, self-efficacy refers to ability of an individual to be able to have self-control in specific situations as well as their ability to be able to attain high performance (Glanz et al., 2008; Strecher, DeVellis, Becker, & Rosenstock, 1986). Based on this understanding, it is important to determine variables concerning what these women know and need to know about the means they can use to improve their understanding and how they can apply this knowledge (Bandura 1998; National Cancer Institute, 2005). I applied this concept and involved the adoption of behavioral changes resulting in the desired results and thus behavioral acceptance. Therefore, SCT was important to my study due to the relationship between obtaining learning skills and self-efficacy and their effect on behavioral changes. Therefore, I applied this theory in the prevention of maternal mortality which I review in-depth in Chapter 2.

Nature of the Study

The nature of this study followed a quantitative method to examine quantitative unmatched case control study. This choice of design is used were appropriate in determining the strength and direction of the association between risk factors and maternal death. For the study population, I used inclusion criteria for women of childbearing age living in the Osu Klottery Sub Metro the Accra metropolitan area in

Ghana. Cases utilized were maternal deaths which occurred in hospitals in the Osu

Klottery Sub Metro Accra metropolitan area in 2016. Controls I used were mothers who

delivered at the hospitals in Accra in 2016 who were alive at the end of the puerperal

periods. Cases were defined as obstetric patients who died or were declared dead upon

arrival, or after admission (including those who died before the fetus were delivered).

Controls were randomly selected from mothers who delivered in the Osu Klottery Sub

Metro Accra Hospital in 2016 and were alive at the end of puerperal period using simple

random sampling. For sampling frame, the second postnatal attendants register in both

hospitals were used for control selections. My study used and analyze secondary data for

the year 2016.

Possible Types and Source of Information or Data

1. I reviewed medical records (folders) of cases and controls for the period of one
   year in hospitals in the Accra metropolitan area.

2. I reviewed and obtain records from the Registry of Births and Deaths in the Accra
   metropolitan area.

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Definitions

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Socioeconomic status: in this study, socioeconomic status, which is denoted as

SES, means the sociological and economic factors combined to measure the workplace

experience of a person or the family's economic status in comparison to the others based

on education, occupation, and income. This is very important in this study because it

reveals the access to the resources, and other issues related to the privilege, power, and

control.

Health Service professional: health service professional refers to the health care practitioner or the health care provider. In this study, it refers to the people providing promotional, curative, and preventive care services to the pregnant mothers.

Antenatal Care: Also called prenatal care and is defined as the care that is given to an expectant mother from an organized health facility. The two terms mean the same and they are both used in this project.

Antenatal visit frequency: the antenatal visit for this study is used to refer to the number of the antenatal care visit that are recorded in the health care services center.

Health literacy: this is measure of the degree of how one can read, process, and comprehend with basic health information and services that are imperative in making the soundest health decisions.

Maternal characteristics: for this study, maternal characteristics mean the personal details of the pregnant mother which include cultural beliefs, religion, income, occupation, age, and education level.

Maternal health: this refers to the health of the mother at the time she is pregnant and during the postnatal period. The also incorporates the antenatal care that the expectant woman receives when she is pregnant.

Maternal health literacy: this indicates the social and cognitive skills which determine the ability and the motivation of pregnant women to obtain comprehend and utilize the information to guarantee positive and sound outcomes for them and the baby they are carrying. The term seems to be comparable with health literacy.

Maternal mortality: According to WHO (2014), maternal mortality is the death of the pregnant women in relation to the causes of the death or within 42 days of the termination of the pregnancy, without taking into consideration the site of pregnancy and the duration of the pregnancy. The cause of death refers to any because it can be related to or aggravated by the pregnancy or its management, but not incidental or accidental causes of death.

Maternal mortality ratio (MMR): MMR refers to the number of the maternal deaths that are recorded per every 100,000 live births at a specified period, usually one year.

Maternal pregnancy complications: Refers to the health problems that might occur when one is expectant which may have negative effect to the maternal health of the woman. The complications that are associated with maternal pregnancy include but are not limited to: gestational diabetes, hypertension, urinary tract infection, anemia, malaria related complications and mental health issues.

Number of antenatal visits: in this project, the antenatal visit is used to refer to the number of the antenatal visits that the expectant mother made during the respondent's last pregnancy.

Pregnancy outcomes: the pregnancy outcome is the status of the born baby which is stated as either healthy or unhealthy baby.

Assumptions

One of my assumptions in this study is that the Osu Klottery Sub Metro of the Accra Metropolitan Area, Ghana, represents the cases that are going to be found in other

areas of the same country, in terms of the demographic and socioeconomic

characteristics, since it is found in Accra, which is the capital city of Ghana. This is due

to the variety in social background of the overall population, ranging from lower, middle,

and upper class. I also assumed that all pregnant women, not only in the Ghana area, but

other parts of world, want to have a healthy and sound baby (pregnancy outcome), and

will also need to protect themselves and their babies from any complications that can lead

to harm or death. For women to accomplish the above-mentioned goals, they must have

basic education as well as individual characteristics such as cultural beliefs, age, income,

religion, etc. Data was collected by use of simple random sampling method. I also

assumed that the responses from the participants were true and accurate and that the

participants were not coerced or forced to take part in the study. Lastly, for this study, I

also assumed that the respondents would represent women of all educational

backgrounds.

Scope and Delimitations

The outcome of the study was based in the Accra Metropolitan area of Ghana,

which, when generalized, may be limited. The recommended interventions must adhere

to culturally appropriate values of the country as well as the entire African continent in

terms of religious distribution, ethnic and socioeconomic characteristics.

My target group for this study were women who were pregnant before but were

not pregnant at the time of the survey. Cases are defined as obstetric cases that died or

were declared dead upon arrival, or after admission (including those who died before the

fetus was delivered). Controls were be randomly selected from mothers who delivered at

Accra hospitals in 2016 and are alive at the end of puerperal period.

Accra is the city of Ghana and is one of the cities with a diverse population and

income level. I used the data of pregnant women to gather information about their

antenatal practices in the area of survey. I have a special interest in discovering what the

pregnant women have in common and the differences in their antenatal care services as

well as various levels of education. This helped me to gain data concerning the

relationship between the maternal death and the socioeconomic characteristics of the

pregnant women.

Limitations

The limitations that are potentially associated with this study is use of the self-

reported data, which has high possibility of developing recall bias. In this study, I use the

simple random sampling method using face to face interviews to ensure that the feedback

is given, ensuring that the questions asked are fully answered as well as assisting the

participants to answer the generic questions. The method that I used might have

eliminated the nonresponse bias, but it did not guarantee anonymity, thus the participants

might not truthfully answer the most sensitive questions (Creswell, 2007). Pannucci and

Wilkins (2002), devised an appropriate way of addressing the previously mentioned

problem which requires the use of a validated scale. The scale that I employed has

already been validated and I provided questionnaires for the participants who may be

busy in their daily chores or not willing to complete the survey form that I will provide

them. I stored the forms in a sealed envelope, and this could, in one way or the other, have led to nonresponse bias.

Moreover, Frankfort-Nachmias, and Nachmias (2008), stated that it is important to ensure that the questions that are asked are not threatening to the respondents by asking them to rate the questions asked according to how easy or uneasy they felt or rate how other people would feel by answering the same questions in terms of how much difficulty they will have in answering the questions. Being cognizant of the bias enabled me to critically analyze the data, although not all bias in the project could be fully controlled.

Another limitation that I experienced during collection of the data was obtaining the data for the women who died while delivering. This data might have been very paramount to this research, but there is no way one can obtain data from person who is dead. Moreover, collecting data from the families of the deceased might refresh the bad and unpleasant memories, thus it remains unavailable in the records, the information that will be collected from such situation might only be hearsay (Adjei, Wallace, & Boateng, 2015b). Nevertheless, the study was strictly limited to women above the age of 18 years in order to avoid adult consent or permission to participate in this type of study.

Significance of Study

There is some other research that has been conducted in the other parts of Ghana involving the etiology of maternal mortality, showing the relationship between maternal mortality in different socioeconomic groups, which indicates a high number of deaths remains despite the strong efforts which have been put forth to meet the MDG 5 Goal.

Beyond the studies that have been conducted concerning maternal mortality and its relationship with socioeconomic groups, there is a need to research further into the factors associated with maternal mortality. In this study, the assessment was done to show the cause of the maternal mortality in respect to the sociodemographic factors (Sakeah, Doctor, McCloskey, Bernstein, Yeboah-Antwi, & Mills, 2015).

The results of the research showed that maternal mortality will most frequently be caused by hemorrhage, with married women having an elevated risk of dying from hemorrhage compared to the single mothers. However, single mothers are more prone to die from abortion. Other studies indicate that approximately 605 maternal deaths experienced in the year 2007 were comprised of women between the ages 12 to 49 years. However, the data does not closely examine this data according to the age, educational levels, income, antenatal care services available, and marital status. The study that is done to provide evidence of the various causes of maternal mortality among different socioeconomic groups should not be overlooked. The interventions must be made to mitigate the causes of maternal deaths in entire country (Ghana), which are cause specific or target specific.

The reasons for maternal mortality are normally sub-gathered into coordinate obstetric and aberrant causes. Coordinate reasons for maternal mortality, as demonstrated in past examinations led in Ghana, incorporate drain (baby blues and bet partum), fetus removal, unnatural birth cycle, sepsis, impeded work, ectopic pregnancy, (Pre-) eclampsia and embolism. The indirect reasons for maternal mortality are, for the most part, irresistible and nonirresistible ailments, and different various causes. These

ambiguous causes incorporate mostly intestinal sickness, HIV/AIDS, respiratory contaminations, hepatitis, sickle cell ailment, paleness, meningitis, cerebrovascular maladies, and others.

In Ghana, few mediations focusing on the decrease of maternal mortality have been executed. Outstanding among these is the client expense exclusion strategy initiated in 2003. This approach exempts every single pregnant woman from paying for conveyance costs at open, mission, and private wellbeing offices. Assessment of this mediation in approximately 2003 and 2006 demonstrated sensational diminishment of direct maternal mortality, yet no noteworthy effect on roundabout maternal deaths. Hence, maternal mortality can be counteracted much of the time, yet this request a far-reaching understanding of the causes, as well as, more essentially, an understanding of how the diverse causes are appropriated in different gatherings with various attributes.

Various investigations have been directed on maternal mortality in Ghana; nonetheless, just a single endeavor to break down reasons for maternal mortality regarding sociostatistic gatherings and did as such with restricted detail. The examination detailed the rate conveyance of maternal deaths by reason for death, as indicated by age and region. Much accentuation was put on premature birth in the investigation (Sakeah et al., 2015).

The investigation did not reveal the maternal mortality cause-particular dangers related with the diverse sociostatistic gatherings. In this way, definite investigation of the reasons for these mortalities, stratified by different financial and statistical attributes, is fundamental for detailing specific mediations to manage these causes in various

sociostatistic gatherings. This would quicken Ghana and other comparative countries in sub-Saharan Africa, towards the achievement of MDG 5. The point of the examination is, in this manner, to evaluate and break down the reasons for maternal mortality as per sociostatistic factors in Ghana (Kassebaum, Wang, Lopez, Murray, & Lozano, 2015). In this study, I examined the reliability and the validity of the instrument that is utilized in distinct culture and geography.

Implication for Social Change

This study is significant to theory because it generates a foundation for the existing theory, as well as the potential that is explored for the development of the future theory, as it relates to women's health care and pregnancy outcomes in third world countries. My study adds to the body of knowledge in public health regarding the antecedents and consequences of unskilled medical personnel, lack of medical personnel availability in the hospital, lack of service delivery, cultural behaviors, and lack of insurance and financial issues that can be associated when it comes to maternal death. My study paves the way and opens the opportunity for more research to be done, thus advancing knowledge and practice in health delivery services and public health education. The outcomes from my project may be of significant help to conclude the way the probable influence of a pregnant woman's characteristics on birth outcomes, as well as the effect of the MMR in Ghana. This can lead to robust mitigating strategies for maternal mortality. In addition, my study also provides public health practitioners with the information that will help to accurately understand factors that influence the individual's behavioral intention toward material mortality.

The positive social ramifications resulting from this study could enable wellbeing specialists to provide socially proper instructive messages amid antenatal and postnatal sessions and furthermore figure out how to guarantee pregnant women obtain satisfactory antenatal care services (Sakeah et al., 2015). Understanding the wellbeing, education level, and social insurance needs of pregnant women may prompt instructive and preparing chances to enable women in the investigation region in Ghana when my dissertation is finished. Results from this investigation could advance positive social change by helping wellbeing experts to recognize the attributes of women at risk amid antenatal instruction sessions and help with the advancement of focused antenatal care mediations. This may conceivably diminish maternal wellbeing inconveniences and enhance pregnancy results.

Summary

Maternal mortality is a critical area of concern across the globe even though there are accessible preventive measures. In Ghana, and other third-world countries, women are dying still because of complications that are linked to pregnancy. In this study, I examine how the sociodemographic and service delivery factors are associated with maternal mortality in the Accra Metropolitan Area of Ghana. The maternal mortality rates are not the same in every region and therefore there is a need to investigate whether there are factors that are exclusive to some geographic areas.

Although the causes of maternal deaths are well established, knowledge on effective management of conditions has not translated into significantly improved outcomes (Coast et al., 2012). Observations at health institutions in the Accra Metro area

show that service delivery factors such as prenatal care coverage and the presence of a skilled attendant at delivery may play a significant role in the mortality rate and therefore needs to be investigated to inform policy decisions if the SDG 5 is to be met (Thompson & Sofo, 2014; WHO, 2015a). The cause of maternal deaths in Ghana follow the trends of the developing country with hemorrhage, hypertensive disorders, abortion related complications, and septicemia as primary contributors in that order. In this study, I examined the association between sociodemographic and service delivery factors and maternal mortality. Most of the existing literature focuses on single variables to help explain the disparity that could exist with maternal mortality. Unfortunately, there is limited literature on the relationship of the factors associated with the maternal mortality.

According to Thompson and Sofo (2014), the information that is gathered could inform the Metro and Regional Health Directorate on other policy interventions to help reduce maternal deaths in the Metro area. The positive social change implication that could result is to improve the quality of institutional antenatal, intra-partum, and postpartum service delivery in the Metropolis and add to the body of knowledge to reduce maternal death in Ghana.

The external environment and the daily social interactions and support systems play a pivotal role in an individual's overall health. This theory is also founded on the premise that poor social capital is one of the leading causes of physical and mental distress (Krieger, 2011). To elaborate, a strong social connection has been shown to lead to improved all-cause mortality rates. Lack of social connection can have an adverse effect on health outcomes. Social epidemiologists are tasked with identifying the social

aspects that affect the pattern of disease distribution and its mechanisms in a populace. Social relationships, social inequalities, and social capital are some of the most important concepts of social epidemiology.

This project was a quantitative unmatched case control study. This is the most probable design to ascertain the strength and direction of association between risk factors and maternal death. For the study population/inclusion criteria, my population was women of childbearing age living in Accra metropolitan area in Ghana. Cases that I used include maternal deaths that occurred in hospitals in the Osu Klottey Sub Metro of Accra metropolitan area in 2016. The controls were the mothers who delivered at the Accra Hospitals in 2016 who were alive at the end of the puerperal periods. Cases were defined as obstetric patients who died or were declared dead upon arrival, or after admission (including those who died before the fetus was delivered). Controls were randomly selected from mothers who delivered at hospital in 2016 and are alive at the end of puerperal period using simple random sampling. For sampling timeframe, the second postnatal attendants register in both hospitals would be used for control selections. I analyzed secondary data for the year 2016. In chapter 2, I provide my justification for the literature referenced and the databases that I searched for literature related to the study.

Chapter 2: Literature Review

Introduction

Maternal death is defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes'' (UNICEF, 2013, p. 3). Though the causes and risk factors for maternal death are known and preventable, it is a major health problem concentrated in resource-poor regions of the world (Menéndez et al., 2008) including Ghana. The reduction of maternal deaths is a key international development goal, therefore, health policy and interventions targeted at significantly reducing it should be evidence-based (Khan et al., 2006). Similarly, there is a need to investigate and inform policymakers to work towards the UN's Sustainable Development Goal (SDG) Goal 5, which is to achieve gender equality and empower all women and girls. Maternal mortality affects women worldwide; however, countries in the sub-Saharan Africa region have the highest prevalence of maternity-related deaths (Alkema et al., 2016). In sub-Saharan Africa, nearly one woman dies for every 11 women who have had successful deliveries and are alive. This maternal mortality rate is not comparable to the maternal mortality rate of European women. Statistics indicate that a maternal mother faces as high as a 1 in 13 chance of dying, in Latin America and in the Caribbean the chance of maternal death is 1-in-160 and, in industrialized nations the risk is low as 1 in 4100 live births (Jan-Vandemoortele, 2002). Further, there are also statistics showing that 515,000 women face death every year (GBD 2015 Mortality and Causes of Death Collaborators, 2016).

Maternal mortality is one of the crucial concerns in most of the communities in Accra, which is the capital city of Ghana, Africa. Within this region, there are several possible determinants of maternal deaths. Pregnant women out of marriage settings are more likely to experience incidental termination at the initial stages of pregnancy (4 to 5 weeks after conception) than their counterparts (WHO, 2015a). Low level of education is also a leading cause of maternal death. Furthermore, occupation also affects maternal death (WHO, 2015a).

Although most maternal deaths are preventable, governments in sub-Saharan countries have struggled to address the issue at the local level. Despite the known risk factors of maternal mortality, lack of economic resources and leadership skills in this region make it difficult to adequately address the issue of maternal mortality. The reduction of maternal deaths is a key international development goal (WHO, 2015a).

In Accra, Ghana [Accra], even though the city and the hospitals are presumed to be equipped with modern medical equipment considered to be advanced in medical care, mothers are still at risk of adverse outcome-based pregnancies whereby incidents of death are likely to occur. In a cross-sectional study by Addo and Gudu (2017), which used descriptive analysis to test for a relationship between independent factors and utilization of skilled delivery services, the authors emphasized the effort toward implementation of health programs since 2015. The investigators performed chi-square test for those who utilized delivery services and those who did not. The authors recruited 400 women to determine how many women out of this number would deliver in a health care facility. A majority of the mothers (97.3%) attended or received antenatal care [ANC] at their last

pregnancy with 75.0% of them having four or more confirmed ANC visits. Further, the urban populations are assumed to have access to higher quality health care systems than their rural counterparts. This study reveals the need to address the concern of perceived harm that mothers who do not utilize skilled delivery facilities and mothers who do not attend ANC visits could cause to the life of the baby. Although this study identifies a key predictor of not utilizing skilled service delivery and ANC visits, it does not address other factors (Addo & Gudu, 2017). Urban health systems in many LICs and MICs have weak to nonexistent public health structures. In collaboration with its developmental partners, Ghana has implemented interventions to reduce maternal mortality to achieve the UN's MDG 5 Target. Addo and Gudu (2017) observed a tremendous concentration of maternal maternity cases among the illiterate, unemployed, and poor.

Maternity deaths occur not only in LIC, but also in other countries around the world, although resources are available for control. A quantitative research study conducted by health institutions in Accra in 2015, which included most regions in Accra, revealed that 30% of service delivery factors such as prenatal care coverage and the presence of a skilled attendant at delivery may play a significant role in maternal mortality. This study examined whether there is an association between sociodemographic variables and maternal mortality; and whether there is a meaningful relationship between service delivery factors and maternal deaths.

My purpose in this study was to determine the factors associated with the maternal mortality in Accra. In this study, I examined the sociodemographic and service delivery factors associated with maternal mortality in Accra. In this chapter, I present my

literature search strategy and provide an overview of the current literature related to factors associated with maternal mortality. I also discuss the theoretical foundation for this study.

Literature Search Strategy

For this literature review, databases were accessed from the Walden University library and included ProQuest, PubMed, Google Scholar, and Ebscohost. The keywords used in the search were *risk factor of maternal mortality*, *sociodemographic factors of maternal mortality, economic factor of maternal mortality*, *service delivery*, *operational factors, decision-to-delivery time by caesarean section, hemorrhage, the age of women, maternal health, anemia, abortion, obstructed labor, sepsis*, *income*, *literacy*, *access to health centers, nutritional knowledge); and the relationship of the variables to another* and *disorders related to hypertensive*. English was the primary language I used in my search. Google was found to be useful as a search engine because it provided several causes of maternal deaths. The publication dates were limited to the previous 5 years, from 2013 through 2018. More than 20 articles were retrieved from the literature search. The search produced ten sources and reports. Peer-reviewed and academic resources were considered useful for my study and, after sorting the articles, only eight articles were ultimately retrieved. Through search of dissertations, some essays were retrieved from the database from the Walden library and the Michigan State University library. Additionally, the same search for discourse produced seven outcomes.

Five articles from the search for factors were associated with the maternal mortality in Accra, but some of them could not be applied to this study. For the

development of the background information, specific terms like *hemorrhage, anemia, abortion, obstructed labor, sepsis,* and disorders related to *hypertensive* were used. The Google Search engine provided credible and useful information related to the maternal mortality rate in Accra.

Theoretical Foundation

Theory provides a basis for the research and help in determining the direction and methodologies for the research study. Theory also provides crucial guidance on how to establish a changed behavior allowing anyone who was carrying out the research to evaluate and provide reasons supporting the changes.

Social Capital Theory

According to the earliest theorists and researchers, the social capital theory is said to have existed in small societies as result of interactions of human beings although currently the concept of social capital has been popularized. The scholars believe that social capital helps people make informed decisions and can be examined at certain health needs (Krieger, 2011). The social capital theory as applied to my research indicates that social capital can be measured based on a women's level of education and networks. This theory can be applied by maternal health care providers to evaluate maternal mortality rate globally. Some philosophers argue that there is inadequate knowledge concerning maternal health in Accra. This theory can be used to examine the role of social networks and social capital in health care systems, applied to the maternal population in Accra, and the cases of maternal death may be lowered through prevention (Aidam, Perez-Escamilla, Lartey, & Aidam, 2005).

The theory of social capital is very broad and has found a place in public policy, public health, and more specifically in epidemiology. A key construct of the SCT is that social relationships are a determinant of health (Begum et al., 2003). The external environment and the daily social interactions and support systems play a pivotal role in an individual's overall health. This theory is also founded on the premise that poor social capital is one of the leading causes of physical and mental distress (Krieger, 2011). Lack of social connection can have an adverse effect on health outcomes. Social epidemiologists are tasked with identifying the social aspects that affect the pattern of disease distribution and its mechanisms in a populace. Social relationships, social inequalities, and social capital are some of the most important concepts of social epidemiology. Krieger (2011) takes the position that social epidemiologists exploit indicators of life chances such as occupation, skills and income which inform on social inequality. The underlying factors linked to social equality are the most important determinants of health. The knowledge, skills, and resources possessed by individuals are factors contributing to the social stratification and consequentially the health outcomes of a given population (Krieger, 2011). Research indicates a social gradient of health whereby most of the individuals with a lower socioeconomic position have been shown to have poor health (Krieger, 2011).

Social capital occurs at various levels. These include the macro-level (social, economic, and political aspects of society), mesolevel (organizations and the neighborhood) and the individual context through social interactions. Many ecological studies conducted indicate a positive association between social capital and health

outcomes (Mensah et al., 2011). The concept of social inequality is of fundamental importance to epidemiology and health research since it is evident that social factors, such as level of education and income levels, affect access to the quality of health care services in a particular region. Epidemiologists can capitalize on this premise to establish health patterns in a given population informed by the socioeconomic status of the persons residing there. Social support structures influence help-seeking behavior, adherence to medical treatment and use of health care services (Pearce, 1996). The theoretical aspects of social capital theory and factors behind them such as social inequalities, social capital, and social relationships form an integral part of my research.

Health Belief Model

In the 1950s, it was discovered that many failed to participate in screening and preventive program to help determined of symptoms and disease at an early stage (Rosenstock, 1974). HBM is used to bring to light the understanding of how people associated themselves when it comes to health-related outcomes. Although it has few limitations, such as predictive capacity ($R2 < 0.21$ on average) of existing HBM variables, lack of guidance on how to use it when it comes in terms of the relationships between the individual variables being studied and individual variable effective size (Orji, Vassileva, & Mandryk, 2012).

The HBM was first developed by psychologists Rosenstock and Kegels in the 1950s. They developed the theory to explain why people will wait until the last minute before seeking medical help. The HBM explains how poor a person's behavior is when it comes to preventive care (Edberg, 2007). The HBM seeks to explain that for a person to

take action to prevent the health problems they are in, they must perceive they are

susceptible, and they must perceive the condition as serious, knowing the action they take

will help with the pregnancy complication. This means pregnant women must use

antenatal care services, take their medications, and follow instructions needed to prevent

the causes of maternal mortality (Edberg, 2007). Further, HBM theory assumes that

people tend to make decisions to help with their present situation if they believe taking an

action about their situation could help to improve a negative health condition. In so

doing, positive intention is put in place by the person to make changes (Glanz et al.,

2008). The HBM highlights six constructs in the model: a) self-efficacy--a person's

confidence in his or her ability to take action in respect to that behavior, b) perceived

barriers to taking the suggested action, c) perceived severity in one's opinion about the

seriousness of the health matter and what the consequences are, d) perceived

susceptibility is the chances of getting the condition, e) perceived benefits of taking an

action, and f) cues to action and self-efficacy in respect to that action (Glanz et al., 2008).

Austin, Ahmad, McNally, and Stewart (2002) looked at factors associated with

breast and cervical cancer screening in Hispanic women living in Toronto, Canada. They

discovered that cultural belief, lack of English speaking, and the fear women has about

cancer were barriers as why they did not want to do the screening to determine if they

have cancer. Other women also did not see themselves as potentially susceptible to breast

cancer because, looking at their family history, they did not perceive they could have the

cancer and so they did not want to do the screening. Others also expected to see

symptoms of the breast and cervical cancer before they take the necessary decision to

seek treatment (Austin et al., 2002). This is important to know because many women tend not to go to their antenatal care visit because they have not seen any physical symptoms or have not seen any health issues with their pregnancy (Gazali, 2012). Therefore, using the HBM in my studies helped to assess perceived susceptibility of pregnancy complications by keeping pregnant women informed of what needed to be done to prevent maternal mortality by getting checkups done assuming they do not have any symptoms or physical complications.

To determine perceived severity of the pregnancy related mortalities in Ghana, questions should be asked to pregnant women regarding their awareness and knowledge of mortality during pregnancy. To measure perceive barriers of the pregnant women, knowing the reason as to why they do not want to attend the antenatal care would help. For my studies I utilized HBM to determine the factors that influence individual beliefs. I also used the health belief model to evaluate my independent variables such as delivery. In Goldberg's study, the HBM was used to determine associations that exist in measuring factors associated with maternal mortality regarding HPV vaccine (Goldberg, 2014).

Gender Equity Theory

The gender equity theory is entrenched in search of fairness among genders, in health care, social- economic, nourishment and the relations between sexes. Gender equity theory has suggested prevention of maternal deaths, and the risks associated with it. This includes achieving social justice and fairness and embracing human rights for women. The rights in this matter include efficient and quality service delivery and provision of useful information prior to and after pregnancy (Aboderin & Beard, 2015).

The information gathered helps women to make their decisions related to health without any barriers which may promote maternal death. The research indicates that expectant mothers who face death at home are not yet registered by the professional health care providers and therefore, the family members tend to avoid reporting such events. The information on maternal deaths in the societal setting has been limited due to failures of reporting and hidden abortions associated with the complications.

Official equality sources are John Locke's philosophy of abundant individuality and make gender to be neutral and same when carrying out diagnosis and cure (Meizoso, 2015). However, this theory fails to consider discrimination which still arises due to the substantive equity and does not address the disparities based on social and economic aspects among susceptible people, which are related to distributions of possessions and influence. Substantive equality is based on results, and recognizes and reflects situations, essential and needy population. Equity regarding health care has been a progressing objective for quite a few eras in developing nations like Accra (Gelaye, Rendon, Araya & Williams, 2016).

Gender equity theory are entrenched in pursuing justice and equity in the two genders, economic, nutrition, social relationships as well as health. The equity concept has two main subdivisions which are substantive and formal equity which forms the main basis of laid down rules. Formal equality is also referred to as de jure. This type of equality delves on liberal individualism as stipulated by philosophy of John Locke. Based on this understanding, it is important in providing gender neutrality as wellness as equity of "*diagnosis and treatment*" however, it fails to state that discrimination can still exits

due to de facto equity beliefs and makes less efforts in ensuring that there is gender equality for those who are susceptible in our societies. The susceptibility is caused by lack of equality in the resource allocation and distribution. On the contrary, substantive equality considers all these factors as well as the needs of those who are susceptible in the community. For example, women have a role in bearing children, have different responsibilities compared to men and thus, this may have an effect on the need that women are to promote gender equity in their societies. Therefore, equality in gender has a significant role to play in promotion of adequate health for both the mother and the infant.

There was enactment of a treaty in 1981 by *International United NATIONS Human Rights Treaty called Convention on all the Elimination of all forms of Discrimination against women*. This treaty was important in ensuring that there is equity among women as well as removal of all forms of discrimination against them. Nevertheless, this treaty provided two mechanisms through which this aim was to be achieved: *Equality of opportunity* which was to enable them to be able access resources inside the country. Secondly there was *Equity of results* involves recording of real changes that occurs with accessibility of resources and opportunities for women in a country.

In Ghana, gender has a significant role in the society and thus, can influence maternal health of women. Similarly, there is evidence that gender violence in the society can reduce women ability in seeking health care. Further, women's attitudes have also been a hiccup for women in having equality in the society according to International

Institute for Population Sciences and Macro International (2007) which demonstrate that

54% of women have a belief that it is normal for men to beat his spouse. Therefore, the

gender equity theory was important in understanding the discrimination and inequality

faced by women in Accra.

Social Cognitive Theory

      SCT is important in explaining the psychological condition of pregnant women.

In this regard, the SCT can be used to explain and analyze socially based determinants of

the health of pregnant mothers (Strecher, DeVellis, Becker, & Rosenstock, 1986).

Pregnancy wellbeing and the period of perinatal are described as the ultimate

determinants of the maternal conditions before the last forty-two days of pregnancy.

According to the SCT, maternal mortality is not only influenced by the terms of the

mother, but also the role of the midwives and nurses (Addo & Gudu, 2017).

      Social cognitive theory is used to explain how individual acquires and maintains

their behavior in the community and the how that behavior affects their daily living

(Bandura, 1998). The SCT is used to address self-efficacy of individual participant. SCT

helps to know how human influence such as what they do, what their characteristics are

and the way they are able to response to their environment can influence their life. Since

this attribute have correlations and they work together with each, changes is one is likely

to affect the other.

      The SCT can be adopted in health communication where it delves on emotional,

cognitive, and behavioral changes. Further, SCT is important in providing new means of

behavioral research in educational health care. Lastly, this theory is important in touching

areas of psychology and thus, enables better understanding of the health of subjects.

Based on this understanding, researchers can use SCT to examine how specific

behavioral characteristics are acquired and maintained by individuals and thus, provide

intervention strategies that are used (Bandura, 2014). Therefore, evaluation of change in

behaviors of individuals in Ghana will be dependent on environmental issues as well as

people themselves. SCT provides models for designation, implementation, and evaluation

of programs. In this case, issues in environment can be described as issues that can have a

negative or positive effect on peoples' behaviors. Social environmental issues of people

involve work mates, neighbors as well as family members. Physical environment refers to

food availability, house size as well as temperature of the room. Therefore, looking into

environmental factors of maternal mothers can be a good approach in learning more

about the behavioral changes (Denler, Wolters & Benson, 2014; Glanz et al., 2008).

These situations can be described as mental wellbeing that affects the health behaviors of

mothers in Ghana. Equally, this can describe maternal mothers' perceptiveness to health

care system and services in terms of availability, accessibility as well as quality

(Bandura, 2014; National Cancer Institute, 2005).

The practical use of the SCT constructs during the women's pregnancy could

enhance maternal health and reduce maternal mortality by controlling the factors

associated with deaths of mothers during childbirth. Literacy among the disadvantaged

group was also considered to contribute to maternal death, due to the lack of awareness

within the societal setting concerning the handling of the pregnant woman from the first

day of conception until birth. Maternal deaths are associated with delays at home, delays

in reaching the health care facilities and delays in receiving treatment in health care facility. The adoption of the three delay models aimed at classifying the factors associated with maternal mortality helps in the identification of the factors that influence the maternal deaths (Edmond et al., 2016).

SCT have been used in obtaining and maintaining behavior changes and what type of modifications can be made to these behavior changes. Thus, this study focused on the self-efficacy of those who are involved in the study. In this case, self-efficacy refers to ability of an individual to be able to have self-control in specific situations as well as their ability to be able to attain high performance (Glanz et al., 2008; Strecher, DeVellis, Becker, & Rosenstock, 1986). Based on this understanding, it is important to determine variables concerning what these women know and need to know about the means they can use to improve their understanding and how they can apply this knowledge (Bandura 1998; National Cancer Institute, 2005). The application of this concept involves the behavioral changes adoption that would result into desired results and thus behavioral acceptance. Therefore, SCT is important to this study due to the relationship between getting learning skills and self-efficacy and its effects on behavioral changes. Therefore, this theory helps to understand the prevention of maternal mortality.

Further, SCT can be used in explaining interpersonal issues and how an individual's surroundings are related. Behavioral determinants are intrinsic factors which look at how an individual response to environment. Thus, SCT helps researchers explain the modification of personal behaviors and environmental factors. Self-efficacy, outcome expectancies as well as goals leads to behavioral changes in health of an individual due to

the reason that new behavior maintenance is due to the expected results from the new

behavior and a person's ability to be able to embrace the new behavior (Bandura, 1998).

Based on this understanding, SCT can be adopted in conceptual framework gives more

insights into issues that determines individual behavior as well as learning outcomes.

This is because functions of the human body are caused by interaction of environmental

factors and behavioral factors with self-efficacy and outcome expectancies (Bandura,

1998).

Due to the interaction of personal factors, environmental and behavioral factors

have been analyzed by researchers using SCT to solve maternal related problems, I

adopted SCT in order to assist in analyzing the way issues in environment (e.g. home,

place of work and community), individual behaviors (e.g. instruction of the clinicians,

and ANC visits) personal issues (e.g. hygiene, maternal mothers health, level of

education in comprehending instructions provided by clinician) can affect the behavior of

the maternal mother. I used SCT in exploring health care services accessibility,

availability of transport services and provision of educational services. Emphasizing the

education of maternal women will be important in ensuring that maternal mothers are

able to understand ANC services and thus, they will be able to know problems that can

arise during pregnancy (Gelaye, Rondon, Araya, & Williams, 2016; Reich et al., 2016;

Owusu & Oteng-Ababio, 2015; UNICEF, 2014. This will in turn reduce mortality of both

the mother and the infants due to increased level of awareness. During pregnancy, it is

important to provide social support to mothers as this will in turn contribute to good

pregnancy results as social support is known to cause reduction in anxieties among

pregnant mothers. SCT delves on the behavioral changes; I adopted its constructs like self-efficacy, outcome expectation as well as learning outcomes in carrying out this research. The emphasis on learning by pregnant women will be important in increasing the level of awareness among pregnant women and thus, the pregnant women will be able to embrace preventive health care services. In this regard, they will be able to embrace positive behavior change important for their wellbeing (Jain & Bisen, 2012).

Literature Review Related to Content

Various programs have been put in place in Accra, as well as internationally, to address the prevalence of maternal deaths, however, the program goals of maternal death elimination in Ghana have not been fully realized. Many studies have been conducted to investigate factors that can predispose expectant mothers to high mortality risks. The major factors which have been identified include low literacy levels, lack of ANC attendance, low income levels, and insufficient care during health care visits, among others. Situations of complications can also arise which require specialized care, and additional care must be administered to maternal women to save their lives (Koduah, Diji, & Aypong, 2015).

In my review, I also discovered that there is lack of access to health care institutions which is determined by proximity of the mothers to health care facilities. In addition, mothers must have sufficient financial means to afford transportation to the health care facility in time, either during ANC visits, during delivery or while seeking other medical treatment because the greater Accra area has the highest proportion of health care institutions and mothers from outlying areas will have to travel to utilize

them. Approximately 80% of the health care facilities in the Accra area can be accessed within a half an hour travel time. This number is relatively high compared to the national average of Ghana, which is at 57.6% and the lowest which is in the Upper Region of Ghana at 26.7%. Women of childbearing age constitute approximately 22% of the population in third world countries (Ametepee & Anastasiou, 2015). In the absence of health care providers or the economic means to access the health care facilities, pregnant women in these countries are usually tasked with the responsibility of managing their own pregnancies in most situations, and taking care of the child after it is born, which causes them to become one of the most vulnerable groups in the society (Ametepee & Anastasiou, 2015). Different studies have described various realities which occur during the antenatal period which could be the sole cause of maternal deaths. According to Rosenfield & Maine (1985) maternal mortality is a neglected tragedy. Additionally, Ngom, Depbuur, Akweongo, Adongo, & Binka (2003), described maternal mortality as tragedy that has never been solved fully in Ghana. Similarly, Anderson & Johnson (2015) have echoed these statements.

Maternal mortality cases in the country are estimated to be around 1,400 and, out of this number, 3,900 women stand a chance of dying every year due to complications that can happen during delivery. Furthermore, between 28,000 and 117,000 women will experience disabilities due to the complications which occur during the pregnancy and delivery period every year (Atuoye, Dixon, Rishworth, Galaa, Boamah, & Luginaah, 2015). Maternal mortality cases have been on the rise in the city; hence, knowing the factors that are leading to this problem is significant (Atuoye et al., 2015). Looking at the

factors that lead to maternal mortality will be beneficial for the development of evidence so that interventions can be put in place to prevent future deaths (Cofie, Barrington, Singh, Sodzi-Tettey & Akaligaung, 2015).

According to a recent study by Khaskheli, Baloch, Sheba, & Baloch, (2015), more than 50,000 women between 15 and 49 years of age die due to pregnancy related complications and during childbirth. Researchers also indicate that 40% of pregnant women can have obstetric disorders that cannot be corrected during the time of delivery which will eventually affect the mothers in years to come (Khaskheli et al., 2015). This condition accounts for 55%-80% of maternal mothers' admission to Intensive Care Unit. In this regard, medical conditions can be described as the leading cause of maternal mortality in the world. Similarly, the emergence of maternal mortality is due to a range of factors, for example, chronic illness during pregnancy, older age at the first time of pregnancy and severe conditions caused by physiologic changes of pregnancy. This condition increases the chances of maternal mother facing morbidity or mortality for the woman or the unborn. Women of the childbearing ages 15 to 45 years tend to die more during antenatal period. This accounts for more than 16% of deaths in this age group. This percentage shows that it is a clear a concern, not only in Accra, but countrywide (Kalisa, Rulais, van den Iker, & van Rosmaren, 2016).

Maternal mortality among adolescents in Ghana is also a concern for the government. Deaths in adolescent mothers are due to same causes as those that affect adult women, although evidence has shown that hypertensive cases are the ones in the majority. Worldwide, it is estimated that 16 million adolescent girls give birth every year.

Of those adolescent girls, there are an estimated one million under the age of 15. The disadvantage that results from these phenomena has been documented, and adolescent mothers can face several challenges later in their lives. Recent literature has indicated that mortality in this population is not as great as it was stated previously, however, complications which occur during adolescent pregnancies present a major challenge. Additionally, infants born to adolescent mothers are at an elevated risk of neonatal mortality or have a higher risk of being born prematurely. It has been stated that most adolescent maternal deaths are due to obstetric causes which include hypertensive conditions (14%) and sepsis (10%). There are variations in the causes of death in regions throughout the world (Nyarko, 2015).

A community-based study conducted on maternal mortality in 1990 to determine the number of women who died during pregnancy showed that 40 women died due to several mortality causes; 59% of these women were between the ages of 20 and 34 years; 82% were married, and 66% had more than primary education (Brugiavini & Pace, 2016). Statistics from crude death rates among maternal women showed that 1988 was the year of the lowest maternal death rates in Ghana with 120 deaths per 100,000 total deliveries, and the highest cases of mortality occurred in the year 1989 in which 235 women died per 100,000 deliveries. The main mortality causes were due to post hemorrhage that occurs after deliveries, representing 45.5% of the total maternal deaths, followed by jaundice at 22.7%, and obstructed labor at 6.8%. Further, fifty-nine percent (59%) of these deaths occurred in hospitals; 2% died in government maternity homes, and 7% died during referrals. Thirty percent (30%) of the women who died while

delivering outside an antenatal clinic (Brugiavini & Pace, 2016). Though these were considered to be the actual results representing the mortality cases during that year, it is considered that the number of mortality cases may have been higher, according to Brugiavini & Pace (2016). A community-based survey was conducted in the Ejisu health district among 1200 child-bearing age women in Ghana. Data were collected to determine death causes among maternal mothers and the characteristics of women who died during the same period. The sample community consisted of 200,000 women. This survey revealed that among the death cases, 44 women died during pregnancy, delivery or due to postpartum hemorrhage such as excessive bleeding. Additionally, the results indicated that 65.9% had at least received basic primary education and 81.8% were married. Furthermore, 27.3% did not have any child during their deaths (Atuoye et al., 2015).

Maternal deaths have continued to be a challenge in developing nations. According to UNICEF (2014), 99% of the cases have occurred in developing nations. More than half of these deaths occur in Sub-Saharan Africa. To describe the situation fully, a 25-year study conducted between 1990 and 2015 showed that maternal mortality ratio (MMR) reduced by 44% during this period to an estimated 216 deaths per 100, 000 live births. The maternal deaths per year also reduced by 43% from an estimate of 532,000 (UI 496 000 to 590 000) to an estimate of 303,000 (UI 291 000 to 349 000) however, it is alarming that an estimated 99% (302, 000) were in underdeveloped nations with Sub-Saharan Africa accounting 66% deaths (UNICEF, 2014).

The UN formulated eight MDGs for its 191-member states, including Ghana to be achieved by 2015. These MDGs included integrated problems that had to be solved together by the member states for example; they were supposed to reduce poverty, hunger, diseases, illiteracy, and discrimination among them. Improving maternal health was the fifth MDG which requested that every member country had to put efforts to combat the problem. The UN emphasized that it is important for a Ghana to ensure that MDGs are achieved by the year 2015 which involved a reduction of maternal mortality globally by three-quarters. The reduction in rate of maternal mortality it was to be done hand in hand with ensuring that universal health care is provided to people among the 191-member states. It has been three years since 2015 when the MDGS were supposed to be achieved. The UN has now developed Sustainable Development Goals (SDGs), which will be essential in ensuring a transformative new agenda for maternal health towards ending preventable maternal mortality, that it targets 3.1 of SDG 3.

Planning and accounting for improvement of maternal health, and assessment of MDGs and SDGs targets is to be done with accurate and internationally acceptable measurements of maternal mortality. Countries like Ghana have made efforts collecting data through civil registration systems, survey and cases and census for the past ten years (WHO, 2015a). In the past ten years, Ghana has improved accessibility to health care by its citizens, though more efforts are still needed to have an accurately working registration system. This system will be helpful in ensuring that all maternal deaths are reported immediately, and actions are taken to avoid future mistakes that may have caused them. It has also been observed that nurses in the maternity wards assess and

implement interventions to ensure that various needs of maternal mothers are met (Aboderin & Beard, 2015).

Low literacy is one of the risk factors of a maternal women's health in Ghana. The literacy level distribution in Ghana is disproportional. It is highest in Greater Accra at 77.6%, with the Eastern area at 56.6%, Ashanti at 60.5% and 56.6% in the Western area. The rate of educated males is higher in Greater Accra (57.7%) compared to females which is at 42.3%. Furthermore, the rate of admissions of children to secondary schools is lower compared to primary schools which shows higher rate of school dropouts at the primary level. Although it is not the only risk factor, the existing literature shows a strong positive association between maternal health and literacy levels (Atuoye et al., 2015). Several actions have been put in perspective to ensure that the rate of maternal mortality is being reduced, but this has not been achieved due to ever changing demographic factors and wants. For example, the government had put in place Facility Based Maternal Deaths Review as one the tools that can be used curb this problem, but its positive results are not yet known. Furthermore, much research and review has been made on the subject matter (WHO, 2015a).

Beliefs and traditional cultural practices affect the lives and wellbeing of maternal women. For example, in Ghana, like many other African nations, HIV/AIDS is one of the indirect causes of death among maternal mothers. The prevalence of HIV and AIDS is partly due to polygamy, which is still being practiced in Ghana. Polygamous husbands are more likely to infect their wives. It is also stated that due to polygamy, the husband cannot be able to satisfy all his wives, hence, creating an opportunity for wives to seek

men outside marriage (Ramjee & Daniels, 2013). Hence, these men become susceptible to HIV infection through and can also end up infecting other wives in the family (Ramjee & Daniels, 2013).

Religious beliefs in the family have also been shown to have a connection with maternal mortality among the pregnant women (Ganle, Obang, Segbefia, Minuti, Yeboah & Bateman, 2015). Gazali, Muktar & Gana (2012) also noticed that some women are comfortable staying home to depend on their Muslim religious leaders' rituals including reading the Quran to protect them rather than seeking medical attention when pregnant. Some of the maternal women also seek advice and prayers from religious leaders and priests when they have various complications arising from pregnancies. Furthermore, many African women seek guidance from witchdoctors during pregnancies because they think that they have been bewitched (Ganle et al., 2015). In Ghana, these women end up consulting fetish priests/pastors or *Baraka* for prayers instead of seeking prompt medical care before the condition worsens (Ganle et al., 2015; Gazali et al., 2012). It is also a practice among many African mothers to seek the guidance from priests/Baraka before going to clinics or they can visit both (Ganle et al., 2015). Additionally, they have a belief that visiting priests/Baraka will protect them from witchcraft and ensure that their health and that of the unborn baby is ensured (Ganle et al., 2015; Gazali et al., 2012).

Ganle et al. (2015) emphasized that the traditional practices make it difficult for girls to become educated on the required standards. The main job for men in the family in Ghana is to be the head of the family, while women take care of the family and the children. Though there have been campaigns for education of girls in Ghana implemented

by both the government and nongovernmental organizations, some practices still hinder

progress. Thus, some of the traditional practices in Ghana can lead to an increase in

illiteracy among women of child-bearing ages, which affect their ability to make

informed choices during pregnancies and postpartum. Childlessness in African societies

can also lead to stigmatization forcing women to have children when they may not be

ready (Ganle et al., 2015). When mothers can find a place to take care of their child in the

form of a day care or a babysitter, this placement allows the mothers to have adequate

time to take care of their health when they become pregnant again. A woman having

many children has been considered to be a blessing, however this increases the chances

of the mother dying due to childbirth. Hence, Ganle et al., (2015) suggested that African

cultural beliefs and practices can have a connection with the high maternal mortality rate

(Ganle et al., 2015; Gazali et al., 2012).

Annan, Flexner, Portillo, Lahm, Selby & Stevenson (2015) posit that Ghana is

making efforts to provide health care for women in a new to be improved and

strengthened health care system. Though the process is gradual, its completion will yield

a significant result in the country. According to Annan et al. (2105), leadership attention

and allocation of resources are important in reducing the high prevalence of maternal

death. Additionally, formulating the right policies and ensuring their total implementation

also had enabled the country to make significant steps in combating the deaths of

maternal mothers (Annan et al., 2015). Good policies can be made to ensure that there is

fair distribution of resources in the city to deliver great care for pregnant women

throughout this period. The components that are fundamental in ensuring that the

maternal health interventions are reduced is that; the pregnant mothers should make four visits to ANC clinic during pregnancy where they will be given iron and folic acid supplements (IFAS). These supplements are given to ensure that they have enough of these ions, which are essential for growth of the baby, and at the same time the baby does not use what the mothers have stored in them, which in some cases might be insufficient for both mother and baby. Although there is 96.5% of ANC attendance among the Ghanaian women, 42.7% attend clinic after the 1st trimester. Furthermore, more than 36% had their deliveries through unskilled personnel. In Accra, 87.4% of births are performed by a trained doctor or nurse, which is much higher than the national average which lies at 51.8%. The lowest percentage of births attended by a trained doctor or nurse is recorded in the Northern region of Ghana (16.5%). Statistics reveal that these high rates of complications in childbirth are known to be increasing the risk of maternal mortality, for example, excessive bleeding during childbirth (Amoakh-Coleman, Ansah, Agyepong, Grobbee, Kayode & Klipstein-Grobusch, 2015).

The WHO analyzed the factors that have led to increased mortality rates among pregnant women during and after pregnancy in Accra (WHO, 2015a). This research revealed insufficient prenatal care, poor income of the maternal mothers and inadequate information to pregnant mothers. Similarly, there are instances of complications which require specialized care and maternal women must be provided with further care so that their lives can be saved. The study also revealed that there is lack of access to health care institutions, which is determined by the proximity of the health care facility and adequate

income, which can provide the means of transport in moving to the health care facility in time either during ANC visits, during delivery or while seeking treatment (WHO, 2015a).

Trials, which have been implemented by the government and other international organizations to prevent deaths, have not been 100% successful. These interest groups have come up with measures to ensure that mortality rate is reduced, but there are still challenges that are connected to the programs which have been put in place in achieving this goal (Tunçalp, Hindin, Adu-Bonsaffoh & Adanu, 2013). These programs have been aimed at changing the entire health care system through the introduction of vibrant reforms by the government, though the problem of lack of adequate resources to ensure the programs' 100% success. Remedies focused on ending the problem in the entire country are to be formulated, which will be effective and cover all areas with gaps which still need to be bridged. Moreover, the WHO (2015a) reports have shown there is poor use of the services which are available in the ANC and maternal care services in the city by the pregnant mothers. ANC attendance has not been 100%, and there is a poor mortality index in the Accra. It has been reported by the WHO (2015a) that the reporting of problems that are related to the use of maternal services is in Ghana, is unreliable and problematic. Therefore, more efforts should be placed in unearthing the underlining factors so that the problem is dealt with to reduce the prevalence of the maternal death caused by service delivery (Ganyaglo & Hill, 2012). Though there have been ongoing developments in the societal, enlightening, and wellbeing sectors concerning gender equality in Accra, there remains great health inequality, predominantly with maternal health and local poor societies. This let-down to nurture, in the face of goals, has been

allied to the unfortunate distribution of outcomes, inadequate policies to make follow-up

and reduced programs about to plummeting health care discrepancies. Frequently, the

study in the humblest nations remains un-addressed. The Worldwide Opportunity for

Health Research (2014) and the WHO Report (2015a), presented that only at least ten

percent of the study subsidy is spent on at most ninety percent of the ailment and

international burden initiate in unindustrialized states, such as Accra. The limited interest

on research, aid, and effort is perceived as a form of inequity based on maternal health

care. This theory applies to maternal mortality control by serving as the basis to realize

the importance of fairness regarding health care based on the treatment needed to prevent

the maternal mortality rate for the women in Accra.

Sociodemographic Factors

Socioeconomic factors have been identified to have a connection with maternal

mortality as it helps determine risk factors which can be associated with the life of the

mothers before and after delivery (Owusu & Oteng-Ababio, 2015). Income determines

the health status of maternal mothers in the country (Gelaye et al., 2016). To ensure that

maternal mothers have a safe environment during and after birth, adequate income must

be available within the family to access adequate health care. In Northern and Central

regions of Africa, the government formulated policies exempting women from paying for

health care services in the region in the year 2003 to increase the number of those who

could access health care institutions. Similarly, these policies were enacted with a view of

ensuring that maternal mothers receive specialized care in the time of emergencies to

reduce mortality rates. The strategy was later put in place in the remaining regions, which

was significant achievement in reducing the rate of deaths due to lack of ANC during pregnancy. In most instances, the income of the family will influence whether the mother will receive adequate care from health care centers. This is since these women must travel to health care centers so that they can receive adequate care.

The rate of unemployment of people aged from 15 years and older is higher in the city at 12.2% which is approximately 114,198 persons, which is only surpassed by the Upper East Region which is at 13.2%. The rate of unemployment in these two regions is much higher than the national average, which is 5.4% (Owusu & Oteng-Ababio, 2015). Furthermore, the percentages are higher for females in this region compared to females in all Greater Accra (Gelaye et al., 2016). The records from greater Accra reveal people having difficulty meeting their household food requirements due to unemployment. Those who face unemployment were about 12.2%. Income further plays a role in determining the time spent by the mothers reaching the health care facility when there is an emergency during delivery. Though Ghana is the only nation in Sub-Saharan Africa to have achieved MDGs of lowering the poverty rates, 24.3% of the population is still within the poverty range currently, compared to those evaluated in the year 2005. Poverty in Ghana is a result of social and economic discriminations where there are more than 114,198 unemployed people (Owusu & Oteng-Ababio, 2015; Dalaba et al., 2015; Gelaye et al., 2016). The persons residing in Accra depend on employment to meet their daily needs, which can be critical in determining income levels of a household. The level of poverty in certain suburban areas in Accra–Chokor, Nima, and Ga Mashie is much higher than in other parts of the city (Owusu & Oteng-Ababio, 2015). The indigenous natives of

Accra are highly susceptible to poverty, due to the high unemployment rates (Owusu & Oteng-Ababio, 2015)**.** For example, the natives of Ga Mashie, who are mostly farmers or fishermen, may not have a steady income. In addition, families in which mothers are the head of the household, and are without husbands, were seen to live under poverty compared to families where both parents are present (Browne, Van Nievelt, Srofenyoh, Grobbee & Klipstein Grobusch, 2015).

Although there are several maternal mothers in Ghana who seek ANC during pregnancy, lack of a stable source of income makes it difficult for them to meet their daily nutritional needs, which are essential for their health and that of the infant. Additionally, poverty reduces the chances of women to receive adequate education which will enable them to be aware of their medications, nutrition, and to make informed choices during and after pregnancy. Before the introduction of the User Free Exemption policy in Accra, most women were not able to get access to prenatal care and services when they were in labor. Furthermore, the cash and carry system in the entire Ghana region made it difficult for pregnant mothers to have access to health care centers when they were sick during pregnancy (Ganle et al., 2015).

Cigarette smoking and alcohol consumption puts the lives of both the child and mother at adverse risks. The abuse of these dangerous drugs is known to be leading causes of hypertension, anemia, complications during child birth, and diabetes related pregnancy (WHO, 2015a). Furthermore, micronutrient deficiency is further worsened by pregnant mothers who are smokers and who drink alcohol (Van Lerberghe et al., 2014).

According to Singh et al. (2015), mothers with low education levels tend to have an inadequate income. Therefore, education is also related to the level of income in families. Most educated people tend to have a sufficient source of income which they can use in making informed choices when they are purchasing their foods (Singh, Ahmed, Egondu, & Ikechukwu, 2014). Furthermore, they will use the money to buy a variety of foods to ensure that they get adequate nutrition. Education levels can also act as a source of desire for the learned people who want to obtain access to information to their health. Consultation requires the mothers pay their medical expenses with enough money when they see the health practitioner. This trend is common in developed countries, where many can afford their health care bills or pay with insurance and doing so helps them to achieve maximum health (Singh et al., 2015). Contrary to Accra, developed countries in which most people are adequately educated, women are more likely to make informed choices which can be beneficial in ensuring that they achieve adequate health and have better nutritional status (Singh et al., 2015).

Tunçalp et al. (2013) considered maternal age as the most significant aspect that influences the decision-making process by mothers in adopting health care literacy. The absence of research on maternal mortality suggests that there was no information which was found that could be examined to determine the effect of maternal age on pregnancy. However, through the cross-sectional study variable, from some small town in Accra, the secondary data study shows that maternal period must be considered to avoid the unplanned pregnancies, which can lead to unsafe abortion. Tunçalp et al. (2013) suggested that inadequate nutrition at an early age was an issue and that parents should

provide nutritious food so that, at the reproductive age, daughters do not face pregnancy complications. For the safety of the mother and newborn, not only in Accra but also in any other part of the world, pregnant women should attend to health care facilities to access the medical personnel and to be enlightened on the how the unborn is growing including the health status of the two.

O'Neill et al. (2014) asserted that equity in gender has been evidenced in societies in which the education level is high, compared to societies where gender discrimination has not yet been dealt with completely. Attending school and acquiring maximum education has been shown to have formed a fundamental of health standards in these societies. Well educated mothers are most likely to have families at later years in life, have adequate health care for their children, attend immunization centers every time they conceive, and are likely to have fewer children through utilization of family planning methods. The birthing of children at appropriate time intervals is essential to ensure proper health of both the mother and infant. During these intervals, the mother must be able to replenish the iron stores that will be essential for growth of the second born. These informed choices in health care concerning family planning cannot be made when there is lack of awareness, which can be acquired only through education or visiting health care consultants for dissemination of information. The relationship between education, health, and earnings is to be made clear as determining factors in bringing adequate health care for the maternal mothers. As a fact, these scenarios of having enough education, better health, and income will repeat itself in the family as children

will learn from their parents on the importance of these three necessities, laying the

basics for social and economic growth (O'Neill et al., 2014).

In a single year nearly 529, 000 mothers die during this critical period of life, 20

million mothers will have different cases of complications every year. Most of these

complications are caused by factors that can be stopped before they occur through the

earlier existing MDGs which countries were supposed meet in 2016 (Goodman et al.,

2017a; Khanal, 2012; WHO, 2015a). The MDGs have been changed to Sustainable

Development Goals (SDGs), which will be essential to improve the health of maternal

mothers. The MDGs were the basis on which the progress in health care and education

were measured by most governments and organizations that have interests in improving

and maintaining health. The UN has invested its efforts not to impose their interest on

these maternal mothers, but to care for the poor who cannot afford adequate health care in

order improve their health and minimize the occurrence of maternal deaths. Though their

efforts are effective for those who have been reached, these efforts are not enough to

cover all maternal mothers in the city. Many women still face the challenges of accessing

health care facilities for themselves and their babies. The foundation that is set in

education and health are essential for future generations as they will follow suit. The

MDGs had to be achieved together so that all required elements work in line together in

solving different problems of poor nations (Goodman et al., 2017b; Sachs, 2012; WHO

2015a).

Srofenyoh et al. (2012) emphasized that increased pregnancies among teens have

shown to result in complications during childbirth. Pregnancy in teenage years is

challenging due to the reason that there are increased requirements for iron for both the mother and the infant. The teens might end up giving birth to children who will be stunted and have reduced cognitive ability. Teen pregnancies have been known to include increased risk compared to adult maternal mothers who have become pregnant after passing their teenage years. During the teenage period, girls are still considered to have insufficient iron stores, which cannot sufficiently support the mother and the unborn child. Similarly, a great amount of iron is lost during menstruation period, which is supposed to be replenished and, if this is not met, the mother and the child will have high risk of mortality, which has been occurring in teenagers who have had unplanned pregnancies (Srofenyoh et al., 2012).

A pre-occupation with education can lower these risks as girls can still engage in educational activities, thus reducing the risk of unwanted pregnancies. Consequently, education can offer girls skills that will be essential for making informed decisions in life, which will, in turn, reduce the risk of them having unplanned pregnancies. The spread of pandemic diseases like HIV and AIDS have been on the rise with pregnancies. The informed choices in life will include family planning, visiting ANC before, during and after pregnancies. Determination of iron stores will ensure that the mother has adequate health before conceiving, hence no risk of complications such as anemia, which is due to reduced iron stores in the body. Reduced iron stores can result from diseases or insufficient consumption of foods which contain iron such as beef, poultry, pork, and others. During teenage years, peer influence is foremost, and teenagers may engage in unprotected sexual behaviors that can result in contracting HIV, AIDS, and STDs, which

further increase the macronutrient and micronutrient requirements which must be met. These lifestyle complications increase energy needs, protein, and vitamin requirements to provide the unborn child with the required nutrients in the appropriate amounts essential for its wellbeing (Nove, Matthews, Neal, & Camacho, 2014).

Furthermore, education enables these mothers to grow mentally and ensure that their wellbeing is maintained during this critical time. Not only is the dissemination of information important in improving the health of the mothers, but also the places where the disseminated information will be put into practice. This will depend on the cognitive skills of the mother which will enable her to acquire the information and use it to influence her life positively. During these periods of acquiring education, midwives and health care providers must ensure that the mothers put what they are being taught into practice by doing follow ups, which will be essential preventing mortality rates, which can be controlled (O'Neill et al., 2014).

Insufficient specialized obstetric facilities, as seen in most developing countries, are still a factor that causes increased mortality rates in Accra. Ghana, as a third world country, has an inadequate number of these services, which are incomparable to developed nations. The WHO (2015a) make mention that 98% of the mortality rate among maternal mothers in underdeveloped countries is due to lack of specialized care during complications which cannot be compared to that in developed countries (O'Neill et al., 2014). In Ghana, the specialized care is available only in Korle Bu Teaching Hospital and other enhanced hospitals, not in clinics where delivery services are also

found. This specialized care can be ensured by enacting effective policies, which will enable adequate funding to the health sector to benefit maternal mothers and their infants.

The HIV and AIDS menace continues to be a major problem in Accra, due to lack of medication for complete suppression and treatment for women of child-bearing age. During the last decades there has been an increased maternal mortality which is caused by this untreatable condition (Gómez-Olivé et al., 2013). HIV and AIDS not only affect the life of the mother, but the risks of transference are high (25%) for newborns during birth when the mother is not receiving anti-retroviral medications. AIDS continues to increase the risk of death of the mother, especially if she is not receiving adequate nutrition essential to boost nutrient stores which become depleted when the mother has contracted the condition. The mother must increase her intake of proteins, carbohydrates, fats, vitamins, and minerals more than a healthy mother. HIV/AIDS also increases the risks of contacting TB, Typhoid and Malaria conditions which are known to be life threatening conditions if there is no prompt treatment provided to the victim (WHO, 2015a).

Barry et al. (2013), in a longitudinal study of a cohort of HIV-infected children initiating anti-retroviral therapy (ART), revealed that Greater Accra has highest rate of HIV prevalence and mortality. These numbers are most prevalent in the Eastern region where the rate of HIV infection was at 3.5% in the year 2015. Some of the mothers who are infected are not yet receiving ART, putting them at risk of succumbing to death due to HIV infection. The number of people who are affected countrywide by HIV was approximately 150, 0000 in 2014, where Eastern Ghana had the most people suffering

from the infection at 1.3%. This percentage was reduced in the Northern regions when compared to that of Eastern Ghana. Efforts have been made by organizations and governments to reduce the rates of infections to zero, however the objective has not fully been met due to the ever-rising challenges; the main challenge being the condition is not curable. The best method that these international organizations and governments are using to ensure that there is reduction in rates of HIV infections is through education and prevention of mother to child transmission. The process of eliminating HIV is moving at a slow rate, however, there has been some success. During 2012, the National AIDS Control Council (NACOP) indicated that the rate of HIV AIDS among adults was at nearly at 1%, where an estimated 200,000 cases were undiagnosed (Barry et al., 2013).

The statistics of women attending ANC clinics in Accra have been recorded since 1994, indicating the number of people who have been affected by HIV and AIDS continues to rise significantly (Barry et al., 2013). The data has revealed that the rate of HIV infections has risen from 3% to 9.1%, with an expectation that the number will rise due to increased infection among women. Similarly, among the undiagnosed 200,000 people who are thought to have the infection, women of reproductive age are also thought to be amongst them (WHO, 2015a). In 2002, the rate of infection among expectant mothers was estimated to be 4.1% in Accra, which had the highest rate of HIV infection countrywide, in other parts of Ghana the rate was approximately between 3.2% to 3.4%.in the same year. This shows the degree of the problem in the city as Accra is an urban center and the number of HIV infections in Accra have not been seen in other parts of the country. The WHO (2015a) further revealed that the HIV infection cases were low

among young adults, but highest among newborns due to mother to infant transmission. The rate of transmission was at 15% among the infants born of mothers who have the infection. This shows that the increasing rate of infection cannot be eliminated (UNICEF, 2014).

Nketiah-Amponsah and Afful-Mensah (2013) showed in their research that government and international organizations have made good efforts in ensuring that there is an increased awareness among people concerning the HIV condition. Programs have been sponsored by local radio and television broadcasters to ensure that all citizens have access to the essential knowledge of how the condition can be managed or prevented if a person is not yet infected. Nearly 95% of people in Ghana have access to information concerning HIV disease thanks to the efforts made by the international organizations and government through their programs. Although these efforts are being made to ensure improved living standards of people living with HIV and AIDS, they still live under stigma and fear of being victimized by community and family members, hence women hide their HIV status and do not go to ANC clinics. This is a real problem which is difficult to resolve as the mother who is infected will not receive adequate care since she does not attend to ANC treatment. Perceived stigma continues toward those who are infected with HIV/AIDS leading to a withdrawal of the mothers from communities, causing them to association less with other people (Nkentiah-Amponsah & Afful-Mensah, 2013).

HIV/ AIDs in women affects gestational weight during pregnancy. The conditions cause cachexia, a condition in which body fat and muscles are reduced in a process

known to wasting, which eventually reduces gestational weight during pregnancy (Reitter et al., 2014). This has been seen in women where the HIV infections have reached full blown stage resulting in AIDS. This stage of HIV infection is accompanied by several complications of greater magnitude which result in the mother needing more specialized care such as highly antiretroviral therapy (HART), which is known to slow the progress of HIV in the body and reduce the complication rates. During this time, maternal mortality is at a higher rate when not enough treatment and care of the mother is provided. The mother will become susceptible to opportunistic diseases which can include TB, typhoid, malaria, asthma, and other forms of disease conditions (Reitter et al., 2014).

After delivery, the mother can have oral infections, which can affect the health of the mother and the infant. These oral infections have shown to influence diet, nutritional intake, and type of foods consumed, and cause difficulty swallowing solid foods which may hinder interaction with people. During the postnatal period, the mother must consume enough food to provide nutrients for herself and her infant. Furthermore, the mother must replenish the nutrient stores that were reduced due to loss of blood during birth of her newborn baby. The baby continues to receive the mother's insufficient nutrient stores through daily breastfeeding. Therefore, a lack of oral health can lead to malnourishment of both the mother and infant. Hence, health care providers should act promptly to ensure the problem is solved before the life of the mother is lost (Reitter et al., 2014).

Service Delivery and Operational Factors

A shortage of health care workers in Ghana has also occurred across the past decades. This problem has increased due to brain drain where Ghana health care workers moved to Western countries where they were able to earn better wages compared to the wages they received in Ghana. The 2010 health report revealed an inadequate amount of skilled personnel in the city (Reich et al., 2016). The high doctor to patient ratio is one to 54, 000. In order for hospitals to keep up with the demand for medical services, the services received are often inadequate. To solve the problem of a lack of medical personnel, medical doctors in Ghana often work in six hospitals at once. However, this is not a solution as a maternal mother in labor can need the physician's services in any given health institution at any time, even after the physician has worked the 6 hours deemed to be the maximum number of hours a physician should work to provide adequate medical attendance to maternal patient. As a result, there is still a sizeable shortage of medical doctors in Ghana. Furthermore, Dr. Bach's report (Haagsma et al., 2016) indicates that there are several nurses from Ghana who have been registered in the United Kingdom, however, but their own country needs medical personnel as well. This problem of inadequate personnel has increased workload on the available population of health workers (Reich et al., 2016).

Delivery that is carried out at home has shown to have a higher propensity of maternal deaths due to insufficient health care training to the nonmedical caregivers (UNICEF, 2014). Though this culture of avoiding visiting health care has reduced, there are still instances in which it was reported, and, in most cases, it affected the lives of the

mothers due to excessive bleeding that cannot be controlled at home for the stated reason. This shows that women with inadequate income do not have the opportunity to acquire good health care and adequate nutrition, putting their lives in jeopardy. In Ghana, there are high risks for maternal women whose socioeconomic statuses are not up to the expected level (Baker, Williams, Parker, Gazmararian, & Nurss, 1999).

Decision-to-Delivery Time by Caesarean Section

Sheldon et al. (2014) maintained that obstetric emergencies are life-threatening and the need for prompt responsiveness to institute lifesaving interventions cannot be over emphasized. Situations in which surgical intervention or delivery is required, the industrialized world advocates standard decision-to-delivery or surgery-time of 30 minutes. While a UK-based study revealed decision-to-delivery time by caesarean section of 42.9 minutes for fetal distress and 71.1 minutes without fetal distress, a Norwegian study revealed 52.4 minutes as mean decision-to-delivery time for emergency caesarean section. For acute C-sections, decision-to-delivery time was 58.7 minutes, and 11.8 minutes for urgent emergency operations. Most of the decision-to-delivery time variation was at the patient level and not due to delays with the department or health facility. Reasons attributed to the long delay included huge case load of severe cases, delays in obtaining complete surgical kits, and the absence of clear policy towards ensuring prompt, adequate treatment for life threatening emergencies (Sheldon et al., 2014).

Hemorrhage

Postpartum hemorrhage occurs worldwide and nearly 8 million to 136 million maternal mothers suffer from excessive bleeding caused during delivery. This is the

leading cause of maternal mortality among women worldwide. The mortality rate is increased when the mothers have lost nearly 500 milliliters of blood, which can result from a mother undergoing caesarian section or complications in the birth canal resulting in excessive blood loss, putting their lives at risks (Shakur et al., 2017). The situation experienced in Accra is different from developed countries due to the existence of an enhanced system of care for maternal mothers where specialized care is given when instances like postpartum hemorrhage occurs. Nearly 3% of all vaginal deliveries will lead to postpartum hemorrhage in Accra (Shakur et al., 2017). This is the main case of maternal mortality in Accra, as it occurs in undeveloped countries that have no enhanced system of medical care, compared to developed countries such as the United Sates. Furthermore, postpartum hemorrhage causes morbidity after deliveries if no specialized care is provided during this stage, these mothers can succumb to death. A study conducted by Adika, Chutiyami, Dathini, and Adamu (2017) employed a qualitative phenomenological approach, using an in-depth semi-structured interview. A total of 10 men participated. A narrative synthesis through identification of themes/sub-theme was used. The results show that the death of the mothers occurred due to hemorrhage and delay of the maternal mother getting to the hospital in a timely manner. Further delay was also due to the accessibility of the health care facility to the mothers. The cultural factors mainly included seeking care from unskilled attendants and use of traditional preparations to aid delivery (Adika et al., 2017). Complications during this crucial moment of life are: Hypertension, tiredness, and anemia due to excessive blood loss. This can result in depression and withdrawal, which can delay the rate at which the mother

breastfeeds her child, which can result in a life-threatening situation for both the mother and newborn child (Sheldon et al., 2014).

Aidam et al. (2017) revealed that over several years, hemorrhage has remained the primary cause of maternal death, and deaths related to it frequently happen within one to two days of delivery. During pregnancy, excessive bleeding can be indicative of various maternal conditions. At the initial stages of pregnancy, these issues can be attributed to the threats of and attempted abortions. Several days after conception, bleeding is an indication of placentation problems. The cross-sectional study and secondary data from health maternal analysis by Aidam et al. (2005) revealed out of 50% of the maternal deaths, 10% death cases are linked to the hemorrhage conditions of a woman and are similar to that of a woman suffering from anemia; meaning that, just a single loss of blood from the body exposes a woman to fetal health conditions (Aidam et al., 2005).

Most of the cross-sectional and secondary data concerning maternal death indicates that understanding ailments, health and all the related issues and are based on cultural contrasts. For example, it is essential to know if a woman is expecting twins, or boy or a girl, because the pain associated with the sex of unborn varies. Decision making should not be delayed as most births that expose women to emergency conditions happen quickly, therefore decision making must happen quickly for appropriate action to be taken. A delay in decision making may be linked to inadequate skills about the location of best facilities or even limited finance to get access to health facilities. Hemorrhage accounts for 99% deaths in developing countries, as compared to 1% in developed

countries. Studies suggest that hemorrhage reduction involves identifying the risk factor, immediate diagnosis, and early management of the condition (Edmond et al., 2016).

Anemia

As explained by the WHO (2012a), maternal mortality is influenced by anemic conditions in maternal mothers, and thus considering West Africa, more than fifty percent of the women have deficient levels of hemoglobin, which is below 100 grams per liter which exposes women to death before or at childbirth (Sidney, Bates, & Islam, 2002). Anemia leads to maternal mortality because it impairs the ability of pregnant women to resist infections. In Accra, parasite-based diseases are the major contributor to this condition. Obstructed labor is another issue and a very severe complication leading to the determent of labor pain because of the blockage birth canal (Sidney et al., 2002). If it is not checked, it is possible for a woman to suffer from fistula ion whereby feces and urine enter into the reproductive systems of women. Obstructed labor is a result of the poor nutrition during early childhood, teenage pregnancy, the disproportion of fetal-pelvic, and abnormality in the fetal presentation (Sidney et al., 2002).

Abortion

Abortion as a factor influencing maternal deaths can be either voluntary or involuntary termination of the women's embryo before it reaches twenty weeks of gestation. Abortion leads to maternal mortality because it is associated with severe bleeding, excess pain in the lower abdomen, and channeling out both placental and fetal tissues (Edmond et al., 2016).

When the causes of deaths for women are ranked in Ghana, abortion is also considered a factor in the maternal mortality rates. Every year nearly 20% of all pregnancies end up in induced abortions performed under unsafe conditions. Thirteen percent of maternal deaths occur worldwide due to unsafe abortion. In addition, 5 million women in third world countries are admitted to the hospital due to abortions (Maxwell, Lau, & Howard, 2015). Maxwell et al.'s (2015) research also revealed abortions that result in complications for maternal mothers are being performed by unqualified personnel. Africa is ranked among the highest rate of unsafe abortions in the world (29 out of every 1000 women between 15 and 49 years of age) where 62% of the deaths due to unsafe abortion occurred in Africa continent (WHO, 2012b). The abortion rate is higher in societies that have no access to contraceptives, which can increase if nothing is done to provide contraceptives to sexually active age and the women of reproductive age (Adjei et al., 2015a). Laws on legalization of abortion in Ghana were amended in 1985 to allow women access to abortions under conditions such as rape, defilement, and incest where pregnancy can lead to stress and psychological torture of the woman, or the pregnancy can be terminated when the health of the pregnant mother is in danger. Though current regulation has been formulated, they have not been able to prevent unsafe abortions. It is estimated that approximately 15 unsafe abortions are performed for every 1000 women between 15-49 years of age (Boyle, Levin, Hatefi, & Santos, 2015; Abdoulaye, 2006; WHO & UNICEF, 2014).

In Ghana, induced abortions are estimated to be nearly 11% of maternal deaths (Maxwell et al., 2015). Nearly 131 deaths occurred when there was no manual vacuum,

which is a little bit safer when compared to traditional methods, which were claiming the

lives of hundreds of women. The degree of the matter is further evidenced in the number

of gynecological ward admissions where induced abortions account for 12% of

admissions (Maxwell et al., 2015; Adika et al., 2017). Carrying out an abortion in the

second trimester is associated with higher risks of mortality due to probability an

increased risk of complications (Maxwell et al., 2015). The progress that has been made

in combating poverty and maternal deaths is quite limited due to poor governance,

conflicts, economic crisis, insufficient resources and repugnant traditional or cultural

practices which are hindrance to success (Gazali et al., 2012; Adika et al., 2017).

Religious, political, and social factors continue to form significant obstacles

especially in the developing countries like Ghana. Approximately 97% of unsafe abortion

procedures occur in less developed countries because there is still a need to educate the

health care providers on the legal and safe abortion practices as well as postabortion care.

It has been reported by the WHO (2015a) that, in developing countries, a woman dies

every eight minutes due to unsafe abortion complications.

Hypertension

The hypertensive disorders in pregnancy are associated with the presence of

protein in urine and pedal edema (Singh et al., 2014). This study revealed that it is very

difficult to prevent, control, and manage hypertensive disorders and they are the

significant factors associated with the maternal mortality Africa, especially in Accra

(Singh et al., 2014). Failure to treat this condition leads to convulsions and brain damage

which may lead to death. In a cross-sectional study design, Edmond et al. (2016) reported

positive associations of hemorrhage, maternal health, anemia, abortion, obstructed labor, old age, sepsis, and hypertension to maternal mortality rate. Maternal death in Accra is likely influenced by such factors.

Edmond et al. (2016) further revealed that the period of pregnancy and other transitions to motherhood require specific psychological support which is shaped by social and cultural aspects of the women. In this case, tangible and informational support is important to mother's mental and physical wellbeing at the time of delivery. Therefore, SCT is important in explaining the psychological condition of pregnant women and provides care though the risk of death. In this regard, the SCT can be used to explain and analyze socially based determinants of the health of pregnant mothers. Pregnancy wellbeing and the period of perinatal are described as the ultimate determinants of maternal conditions before the last forty-two days of pregnancy. According to the SCT, the terms of the mother do not only influence maternal mortality, but also the role of the midwives and nurses (Addo & Gudu, 2017).

The practical use of the SCT constructs during a women's pregnancy could enhance maternal health and reduce maternal mortality by controlling the factors associated with deaths of mothers during childbirth. Literacy among the disadvantaged group was also considered to contribute to maternal death, due to the lack of awareness within the societal setting concerning the handling of the pregnant woman from the first day of conception until birth. Maternal deaths are associated with delays at home, delays in reaching the health care facilities and delays in receiving treatment in health care facility. The adoption of the three delay models aimed at classifying the factors

associated with maternal mortality helps in the identification of the factors that influence the maternal deaths (Edmond et al., 2016).

Summary

Many types of research and studies have been conducted on the factors associated with the maternal mortality in Accra. However, the factors associated with maternal mortality have not been conclusively and efficiently controlled. The Accra Metropolitan District Analytical Report (2016) reveals the effect of motility on the maternal population in Accra have not yet been studied, although some scholars and philosophers, as well as statisticians, are investigating the issues. There remains a lack of studies focusing and emphasizing the effects of the protective features, maternal education, and the ability to control the risks related to the pregnancy complications. Women acquire knowledge during the antenatal visits which helps in determining if maternal characteristics and/or the level health literacy influence the understanding of prenatal facilities and utilization of the information that they receive. In chapter three, I focus on the methodology, collection of data, and data-based analyses plans.

Chapter 3: Research Method

Introduction

My purpose in this quantitative, case-control study was to examine the sociodemographic and service delivery factors associated with maternal mortality in the metropolitan area of Accra, Ghana. The maternal mortality rates are not the same in every region of Ghana; therefore, there is a need to investigate whether there are factors exclusive to some geographic areas.

As part of the UN Millennium Campaign, the UN implemented eight MDGs. Maternal mortality reduction was among the fundamental MDGs to be achieved by 2015 (WHO, 2015a). It is a crucial factor when assessing the progress made toward reducing the maternal and morbidity rates among maternal mothers. The fifth MDG was to reduce maternal mortality by 75% between 1990 and 2015. Among the strategies to achieve this mortality reduction was a strategy to ensure that all maternal births were to be carried out by skilled personnel or qualified health care practitioner (Addo & Gudu, 2017; Ametepee & Anastasiou, 2015; Brugiavini & Pace, 2016; Chola et al., 2015; Nyarko, 2015; WHO, 2015a).

Ghana is one of the few countries in Africa whose government has implemented initiatives to ensure that there is midwifery care in the city of Accra. To achieve the MDGs, Ghana launched a safe motherhood program ensured that a midwife is assigned to every part of the city (Rominski, Lori, Nakua, Dzomeku, & Moyer, 2017; WHO, 2015a). The program has integrated 3379 midwives since its inception. Due to the training that

was carried out, the number of births that were being carried out by midwives doubled

(35 % in the early 1990s to 69% in the early 2000) (Ebu, Owusu, & Gross, 2015).

Further, the government of Ghana introduced a safety social program which was

aimed at replacing the cash and carry system. This was aimed at ensuring that those with

low socioeconomic status can access health care easily (Johnson, Frempong-Ainguah, &

Padmadas, 2015). Ghana started a universal health care system called the National

Insurance Scheme to reduce the number of people who died because they could not

afford medical expenses during admission. The previous system of cash and carry

involved paying cash before health care is administered. This cash and carry system led

to increased mortality among the maternal mothers in the city (Brugiavini & Pace 2016).

Thus, no health care services were administered to those who could not afford to pay for

the service even in emergency situations (Ibrahim, Maya, Donkor, Agyepong, & Adanu,

2016).

In 2008, the Ghana government introduced free medical care to maternal mothers

and infants (Ibrahim et al., 2016). This increased the number of consultations in the

country to 43,000 consultations throughout the country in the same year (Ibrahim et al.,

2016). Unfortunately, the hospitals were not adequately equipped to handle the sudden

influx of maternal patients into the health care system. For example, the Achimota

maternity clinic, which had only one doctor, eight nurses, and 20 midwives, began to

receive and see more than 400 patients in a day (Ibrahim et al., 2016).

Therefore, I intended to use secondary data to assess the relationship between

maternal mortality and sociodemographic variables among women of reproductive age

(15 to 45 years). The maternal mortality rates are not the same in every region and, therefore, there is a need to investigate whether there are factors that are exclusive to some geographic areas. In this chapter, I describe the research design of the study along with the rationale, methodology, population, sampling procedures, data collection and analysis, and ethical consideration.

Research Design and Rationale

I purposely designed this study to use quantitative-secondary analysis to evaluate the relationship between maternal mortality and sociodemographic variables. I also used the data available to relate the sociodemographic factors to the maternal death rate. The use of available secondary data provides a timely data set, which can be used to investigate the connection between the variables and answer the research questions. The use of secondary data from National Health Information Statistics provided vital information to help advance scientific knowledge in areas where the use of primary data is difficult, due to prohibitive cost that might be involved in data collection, and long follow up time of cohorts. The use of secondary data makes it a unique contribution to the knowledge and science (Singh et al., 2015; Smith et al., 2011).

Methodology

Population

The target population for the study was women of childbearing age living in Accra metropolitan area, Ghana. The sample population that I recruited was women who had been pregnant, but not at the time of the study. I sampled women between the ages of 15 to 45 years due to a lot of women being fertile in this age range. I used Osu Klottey

sub metro of the Accra metropolitan area because, as the capital city of Ghana, it has the

highest literacy level in the country. Some research reveals that more than 80% of the

people living in Osu sub metro, Accra, can communicate in English and other foreign

languages, such as French (Weobong et al., 2015).

　　　According to the World Bank report on development indicators, Ghana's 2016

population was composed of 50.2% people living in urban areas, population growth rate

is at 2.2% and total number of births in the year 2016 was 58,361. Major ethnic groups in

the city include the Akans, Ga, Dagbani, Ewe, Guan and Gurunsi. In terms of religion,

most people living in the city are Christians (71%) and Muslims forms approximately

17%. This study focused on women of reproductive age between 15 to 49 years of age

(Weobong et al., 2015).

　　　I analyzed and utilized secondary data for the year 2016. Specific cases were

those maternal deaths that occurred in hospitals in the Osu Klottey submetro of Accra in

2016. Controls were mothers who delivered at Hospitals in 2016 in Accra who were alive

at the end of the puerperal periods. *Study cases* were defined as obstetric patients who

died or were declared dead upon arrival, or after admission (including those who died

before the fetus was delivered). Controls were randomly selected from mothers who

delivered at Hospitals in 2016 in the Accra area and were alive at the end of puerperal

period using simple random sampling. For the sampling period, the second postnatal

attendants' registers in both hospitals will be used for control selections.

Instruments to Measure Maternal Deaths

Various methods have been used in measuring maternal mortality among women in Accra, Ghana. Reproductive Age Mortality Surveys (RAMOS) involve the use of various sources of information such as death registers, midwifery records, burial records, and hospital records, to compile the list of maternal deaths. Putting together such data from the various sources could be very expensive and not too feasible in situations where the list of deaths is missing (Weobong et al., 2015).

Deaths that occurred outside the health care system were inappropriate to be used in this study. Before 2011, almost all factors associated with maternal mortality were measured using primary data. To measure the literacy level of those being studied, the secondary data used were obtained from health screening questions, which were developed, by Chew, Bradley, & Boyko (2004) among others. The screening tool he developed was to assess the ability of the people to understand the information or to perform the assigned tasks, which are usually administered in the health care setting. The instrument uses approximately 16 questions and utilizes a five-point Likert scale. Among the 16 questions found in the instrument, three of them are the most effective to measure maternal mortality.

The questions are, "How often do you have someone help you read hospital materials?" "How confident are you filling out medical forms by yourself?" and How often do you have problems learning about your medical condition because of difficulty understanding written information? The tool was previously used by Ohl et al., (2010) to test the mortality occurrences in the hospital setting.

Data Collection

This study focused on survey questions in the household and sample files available in hospitals about the target populations' sociodemographic features and those who underwent specialized deliveries. The sociodemographic characteristics included, but were not limited to, those who have given birth in Accra, citizen status, age, level of education, employment, and income. To collect the data, the Field Representatives (FRs) were appropriately trained and supervised by Ghana Statistical Service. The FR received yearly refresher training on the basic procedures, and they were supervised directly by the Ghana Statistical Service supervisors so that they were updated on the arising changes in the subject matter. Their activities were further monitored by Central Bureau of Statistics, which may be interested in the information collected.

The Ghana Statistical Service sent out letters in advance to every selected household, which was asked to participate in the survey. The letter clearly stated the reasons why the survey was to be done, the maximum amount of time that will be taken during the survey, and an assurance of confidentiality of the information that is provided by the participant. The letter delivered to the households also explained that the selected mother should voluntarily be involved in the process and there was no law that required safe handling of the information that is collected. The letter also contained information regarding the time and location of the first interview. On the interview day, the FR arrived on time to the selected areas where the interviews were carried out and presented another copy of the letter to each of the maternal mothers to obtain written consent for

participation in the interview (Center for Health Statistics - Division of Health Interview Statistics, 2015; Atuoye et al., 2015).

After receiving the consent, the FR conducted a face-to-face interview when the mothers visited the ANC clinic, but when it was necessary to conduct follow-ups, it was carried out through telephone when the interviewer utilized the contact number of the interviewee provided during the first interview. Sometimes the interviewee was willing to carry out telephone interviews, which was conducted in several languages as those who are living in Accra speak in different local languages. The telephone contacts were obtained during the first face-to-face interview with the FRs. This method was simple, and the FR did not have to waste time going to the home of the interviewee to obtain information. Rather, the FR conducted the interview in the office and obtained the required answers. It is important to note the drawback that through conducting phone interviews, it is not possible to see the body language and facial expressions, which are possible in face-to-face interviews.

In every household selected, the pregnant woman or the one that has just delivered was interviewed to provide information on her experience with the health facilities, insurance coverage, health service utilization and sociodemographic factors. The Ghana Statistical Service, who conducted the interviews, used a computer assisted personal interviewing (CAPI) system, applying computer software guided by CAPI Reference Questionnaire which will appear on the computer screen during the interviews. Every maternal mother interviewed was asked "whether they feel they got/get specialized delivery and care at the health facility" and they were able to select the answers from a

lists that contains "Yes" or "No", "Doctor refused when asked" and "Refused"; those who received shots were asked how easy it was for them to have access to health care and whether they had health insurance, and, if paid with cash, difficulty of paying the medical costs or choosing their coverage plan.

Variables

Specialized delivery and care refer to the ability of maternal mothers to receive adequate and skilled care during pregnancy and after delivery to be able to continue with their normal lives (WHO, 2015a). Most of the literature has indicated that most maternal deaths result from a lack of specialized delivery and care. The WHO (2015a) believe that it should be a requirement for maternal mothers to have specialized care during pregnancy and after delivery, so that many complications that can put the life of the mother in danger are eliminated. The WHO (2015a) incorporates the social determinant of health, which includes political, social, and environmental issues that may make a mother to be vulnerable to untoward health outcomes. The skilled or specialized care was measured directly in the survey. Further, knowledge of health was used in knowing if there is a relationship with maternal mortality. Hence, in this research the unstandardized regression coefficients of specialized care models was applied to General Social Survey (GSS) data set to derive a proxy for health score, using known sociodemographic variables. All dependent variables that were measured and categorized in the questionnaire included age, education, marital status, income level, and employment opportunities. In this regard, every age was categorized into three age groups (i.e., 15-25, 26-36, 37-49). Categories of marital status were: married, never married, single,

divorced, separated, widowed, and status not provided. For education, categories were in terms of level of education (i.e., an alphabet, primary, secondary, and tertiary levels). Categories include location where the death and birth occurred in the Greater Accra such as Accra Metropolitan, Tema Metropolitan, GA West, GA East, Dangme West, and Dangme East. For health insurance in terms of mother who received prenatal care and mother who did not receive prenatal care. Categories were in terms of those who had health in insurance or those without health insurance. Another category includes place of Birth such as home, in the hospital or dispensary. Lastly, categories of how frequent the mothers receive the prenatal care were looked at.

Data Merge

The publicly available data from 2016 exist in various tables which may contain data not relevant to this study. Therefore, the irrelevant data reviewed was not used in the current study. Upon receipt of approval from Walden Institutional Review Board (IRB) all data was closely examined and analyzed prior to removing irrelevant data. Cases that involved more than 30% missing data were deleted. Furthermore, cases which have outlier values were also removed from statistical analysis and the appropriate tables were merged and manipulated before data analysis was carried out.

Descriptive Statistical Analysis

Descriptive statistics utilized included sample size, measure of dispersion, and the central tendency measurements; the descriptive statistics are presented in the tables and graphs (Marshall & Jonker, 2010). I reported the mean or median values for continuous variables including participants' age during delivery, income, and literacy levels.

Categorical and nominal variables were specialized care delivery, health insurance status, and health care utilization; these were reported by their total counts and percentages. I also inform the readers as to the validity of the results, references, and generalizability by accounting for categorical variables, cross tabulations showing missing values and their characteristics

Inferential Statistics

The research questions and hypothesis for this study were as follows:

Question 1**:** Is there a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis (*Ho)*: There is no significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis (*H1)*: There is a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

Question 2: Is there a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis *(Ho*): There is no significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis *(H1)*: There is a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

Question 3**:** Is there a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and delivery location.

Null Hypothesis *(Ho)*: There is no significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and delivery location.

Alternative Hypothesis *(H1)*: There is a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and delivery location.

Tests of Assumptions

In preparation to test my hypotheses, I examined the continuous data for normality by assessing the mean of the sampling distribution and any parameters to estimate. A P-P plot, histogram with a normal curve, and other statistical tests of normality were conducted to the data to test for the normality of distribution. Before analyzing the data utilizing multinomial logistic regression, it is important to ensure the data meet assumptions. In order to use multinomial logistic regression, the dependent

variable must be measured on a nominal scale; for example, the dependent variable levels include maternal mortality, nonmaternal mortality, and survivor. Also, it is important to make sure the independent variables contain one or more level, regardless if the variable scale is nominal, ordinal, interval, or ratio. In addition, multinomial logistic regression dependent on observation and independent variables must be mutually exclusive and exhaustive categories (Tabachnick & Fidell, 2001). I considered a *p*-value of 0.05 or greater as not significant in which the failure to reject the null hypothesis means one can assume equal variances among the distinct groups.

Continuous and Categorical Variables

Continuous variables, as assessed, included age and income. However, age was also transformed into three categories including "15-25," "26-36," and "37-49" to enable descriptive comparison of maternal mortality by age group. Categorical variables included maternal mortality, marital status, education, health insurance status, prenatal care, presence of a skilled attendant at delivery, and delivery location. Education level of maternal mothers was also categorized as "none," "primary level," "secondary level," and "tertiary level."

Inferential Statistics

The dependent variable, outcome of childbearing-aged women, of all three study research questions consists of maternal death, survivor, and nonmaternal death nominal categories. In order to test associations between study variables and the nominal dependent variable, multinomial logistic regression was the appropriate inferential statistical test (Tabachnick & Fidell, 2001). Therefore, a multinomial logistic regression

was conducted separately for each study research question. Before performing hypothesis testing with the multinomial logistic regression, it was important that several assumptions were met. Specifically, the dependent variable must be nominal, observations must be independent with mutually exclusive dependent variable categories, and the independent variables must be entered in the model as nominal, interval or ratio (i.e., ordinal variables must be treated as continuous or categorical). Significant associations between the independent variables and dependent variable were determined by independent variables that demonstrated a *p*-value less than .05. Additionally, odds ratios (OR) were calculated to provide more intuitive comparison of maternal mortality between groups based on health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and delivery location.

Threats to Validity

Although the design incorporated many methodological strengths, several threats to validity exist in this study. Given the self-reported nature, recall bias may lead to inaccurate data provided by participants. Social desirability may have affected the accuracy of reporting sociodemographic and service delivery factors, especially due to the lack of anonymity in the data collection methodology. However, the use of sealed envelopes may have alleviated some of this validity concern. Further, the use of face-to-face interview methodology may also increase sensitivity to social desirability bias. Additionally, it is possible that there was underreporting and underrepresentation of maternal mortality in cases that occurred outside of the hospital. Specifically, due to the sensitive nature of the study and direct data collection, there may have been

underrepresentation of nonhospital maternal deaths due in part to ethical issues of possibly causing anguish and emotional distress based on discussion of the loss of the family member to maternal death.

Ethical Procedures

All research must follow ethical compliance, particularly the tenants of the Belmont Report of 1979, including respect for persons, beneficence and justice. I followed the regulations for the protection of human subjects in checking for ethical considerations (Crosby, DiClemente, & Salazar, 2013). The Walden University Institutional Review Board (IRB) approval number for the study is 11-21-18-0570339. Further, I used secondary data that was gathered by the Birth and Death of the Ghana registry in Greater Accra. The data were supplied voluntarily, and data collection did not violate ethical principles. Specifically, this study focused on women of reproductive age between 15 to 49 years of age who voluntarily agreed to participate in the study after obtaining informed consent. For the participants that were under 18 years old, informed consent was sought from their parents before they participated in the study. Authorization was sought from and credit was given to authors whose tools or documentation were used. Files, computers, and transcripts are stored in a locked cabinet in my home office of which only I have access and will be kept for a period of 5 years.

Summary

In the next chapter, I present the descriptive statistics of the study variables. I use the validated model to compute the mortality rate by the participants and conduct a series of statistical analyses to examine associations between the variables with the outcome

(Martin et al., 2009). Specifically, through multinomial logistic regression models and the

calculation of odds ratios, I test the three null hypotheses in this study. Subsequently, I

discuss the results of each research question and explain the relationships between the

independent variables with the study outcome.

Chapter 4: Results

Introduction

My purpose in this quantitative, case control study was to examine the sociodemographic and service delivery factors associated with maternal mortality in the Accra Metropolitan area of Ghana. The maternal mortality rates are not the same in every region and, therefore, a need exists to investigate whether factors are exclusive to some geographic areas. Specifically, sociodemographic and service delivery factors were examined in relation to maternal mortality. According to a recent study by Khaskheli, Baloch, Sheba, & Baloch (2015), more than 50,000 women between the ages 15 and 49 years die more due to pregnancy related complications than during childbirth. Research also reveals that 40% of women can have obstetric disorders and cannot be saved during the time of delivery, which will eventually affect the mothers in the future (Khaskheli et al., 2015). The women of childbearing age, between the ages 15 to 45 years, who tend to die more during maternal period accounts for more than 16% of this age group. This percentage shows that it is a clear a concern not only in Accra but also in countrywide (Khaskheli et al., 2015).

The research questions and hypotheses that guided this study were as follows:

RQ1: Is there a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis (*Ho)*: There is no significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis (*H1)*: There is a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

RQ2: Is there a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis *(Ho)*: There is no significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis *(H1)*: There is a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

RQ 3: Is there a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant birth?

Null Hypothesis *(Ho)*: There is no significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual

median income above GH¢30.00, education above the high school level, marital status, and location of infant birth.

Alternative Hypothesis *(H1)*: There is a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant birth.

In this chapter, I discuss my protocol for data collection and analysis and present the results of my investigation.

Data Collection and Results

I analyzed secondary maternal data for the Greater Ghana obtained for 2016. The sociodemographic characteristics included, but were not limited to, those who have given birth in Accra, citizen status, age, level of education, employment, and income. To collect the data, the Field Representatives (FRs) were appropriately trained and supervised by Ghana Statistical Service. The FRs received yearly refresher training on the basic procedures, and they were supervised directly by the Ghana Statistical Service supervisors so that they were updated on the arising changes in the subject matter. Various data analysis techniques were employed in the analysis. Descriptive statistics were provided on maternal death for women in the reproductive age. Inferential statistical analysis was conducted using multinomial logistic regression models as well as the calculation of odds ratios.

Descriptive Statistics

The following table provides information on the frequency of maternal deaths of women in the reproductive age. From the secondary data on mortality in women between ages 15 to 45 years that was available, a total of 8,171 deaths were reported and recorded for 2016. Out of that total, 7,462 (91%) women died due to causes unrelated to maternal risk factors, while 644 (7.9%) women survived from maternal risk factors and had a successful delivery. Nevertheless, 65 (.8%) women succumbed to death due to risks associated with maternal mortality as illustrated in Table 1.

Table 1

Frequency and Percentage of Outcomes in Women 15-45 Years of Age in 2016

Outcome of women ages 15-45 (years)	Frequency	%	Valid %	Cumulative %
Maternal deaths	65	.8	.8	.8
Survivors	644	7.9	7.9	8.7
Nonmaternal deaths	7,462	91.3	91.3	100.0
Total deaths reported	8,171	100.0	100.0	

Further, as illustrated in Table 2, the maternal death toll was greater among older women as compared to younger women. Specifically, 29 (44.62%) women were between 37 to 45 years of age, 27 (41.54%) women were in the 26 to 36 years of age cohort, and only 9 (13.85%) women were 25 years of age or younger. Considering those women who gave birth with no or nonfatal complications, 248 (38.51%) of them were above 37 years of age, 290 (45.03%) were between 26 to 36 years, and 106 (16.46%) were below 25 years of age.

Table 2

Age Distribution of Maternal Outcomes

| Years of age | Number | Maternal outcomes | | |
		Maternal deaths	Nonmaternal deaths	Survivors
15–25	1,405	9	1,290	106
26–36	3,585	27	3,268	290
37–45	3,181	29	2,904	248
Total	8,171	65	7,462	644

Comparing the educational levels of the sample population to their areas of residence, 8,008 (98%) of the women came from the Accra Metropolitan district, according to records from hospital and Registry of Births and Deaths in the Greater Accra region. The data indicate that educational levels were evenly distributed across the population with 2,492 (30.5%) having no education, 1,827 (22.35%) had a primary level education, 2,234 (27.34%) had a secondary education and 1,603 (19.62%) had tertiary levels of education as illustrated in Table 3. Of the total sample, 15 participants had missing values for educational level. Most participants reported from the Accra Metropolitan region.

Table 3

District of Death/Birth and Educational Level

| District of death/birth in the greater Accra region | Educational level | | | | |
	None	Primary level	Secondary level	Tertiary levels	Total
Accra metropolitan	2,453	1,783	2,193	1,579	8,008
Tema metropolitan	16	11	14	6	47
GA West	22	22	25	14	83
GA East	1	9	1	2	13
Dangme West	0	0	1	1	2
Dangme East	0	2	0	1	2
Total	2,492	1,827	2,234	1,603	8,156

Further, as illustrated in Table 4 and 5, from the records of women with health insurance coverage, most of them attended prenatal clinics and received prenatal care. Two-thirds of the women (n = 5,099; 62.40%) demonstrated consciousness in having medical insurance and 3,072 (37.60%) did not have any medical coverage. Health insurance and receiving prenatal care, for practical reasons, work hand in hand together. For Antenatal clinics, 5,756 (70.4%) of the mothers' attended the clinics and received prenatal care. Conversely, 2,415 (29.6%) did not access antenatal clinics and had no prenatal care provided to them as shown in Table 5. Fundamental components of maternal health interventions include ensuring that pregnant mothers make four visits to the ANC clinic during pregnancy where they will be given iron and folic acid supplements (IFAS) (Koduah, Diji, & Aypong, 2015). These supplements are given to provide adequate levels of these micronutrients, which are essential for healthy growth of the baby while maintaining recommended levels for the mother's own health.

Table 4

Frequency and Percentage of Mothers with Health Insurance

Health insurance coverage	Frequency	%	Valid %	Cumulative %
No	3,072	37.6	37.6	37.6
Yes	5,099	62.4	62.4	100.0
Total	8,171	100.0	100.0	

Table 5

Frequency Distribution for Mothers Who Received Prenatal Care

Prenatal care	Frequency	%	Valid %	Cumulative %
Yes	5,756	70.4	70.4	70.4
No	2,415	29.6	29.6	100.0
Total	8,171	100.0	100.0	

Table 6 demonstrates that almost all the women were cared for by a skilled attendant during labor and delivery. In the Accra metropolitan area, 98.94% of the women were cared for by a skilled attendant while only 87 (1.06%) of the women did not receive skilled attended care during labor and delivery. Each region in the Greater Accra area provided the number of skilled attendants which was proportionate to the number of birthing women from the region with 5,429 (67.5%) in Accra Metropolitan, 1,258 (15.35%) in Tema Metropolitan, 359 (4.39%) in both GA East and West, and 1,038 (12.7%) in both Dangme East and Western districts. These percentages only reflect their presence and their skilled services the attendants employed in relation to birthing mothers from the area.

Table 6

District of Death/Birth and Presence of a Skilled Attendant at Birth

District of death/birth in the greater Accra region	Presence of skilled attendant at birth		Total
	Yes	No	
Accra metropolitan	5,429	87	5,516
Tema metropolitan	1,258	0	1,258
GA West	286	0	286
GA East	73	0	73
Dangme West	409	0	409
Dangme East	629	0	629
Total	8,084	87	8,171

The frequencies of women who had the presence of a skilled attendant at birth by region is displayed in Table 7. As shown, 29 women out of the total 59 maternal deaths (49.15%) were married, 12 (20.34%) were never married, 9 (15.25%) were widowed, and 6 (10.17%) were either divorced or separated. It is worth noting that the death toll of women who were married was 3,478 (42.6%) while the death toll of those never married was 1,216 (14.88%).

Table 7

Marital Status and Patient Outcomes

	Patient outcomes			
Marital status	Maternal deaths	Survivors	Nonmaternal deaths	Total
Status not provided	3	28	336	367
Never married	12	94	1,216	1,322
Married	29	315	3,478	3,822
Divorced	2	61	657	720
Separated	4	22	252	278
Widowed	9	73	751	833
Total	59	593	6,690	7,342

Table 8 displays the frequency of maternal death or survival based on education level. The women in Greater Accra appear to be elite in the sense that 69% of the sample earned their primary level education or above. A notable number of the women who succumbed to maternal death also identified as women with no education ($n = 24$; 37%). However, it is important to note that education alone is not a sole protector from maternal death risk.

Table 8

Educational Level and Patient Outcomes

	Patient outcomes			
Educational level	Maternal deaths	Survivors	Nonmaternal deaths	Total
No education	24	184	2,284	2,492
Primary level	12	170	1,645	1,827
Secondary level	17	166	2,051	2,234
Tertiary levels	12	123	1,468	1,603
Total	65	643	7,448	8,156

A review of the records of women with health insurance coverage revealed most of them attended prenatal clinics and received prenatal care. Additionally, most of the women who had skilled medical attendants at birth were from the Accra Metropolitan district as compared to the other districts. However, this assertion may not be meaningful as most of the records were from Accra Metropolitan (as shown in Table 9).

Table 9

Crosstabulation for Health Insurance, Prenatal Care, and Patient Outcomes

Health insurance	Prenatal care	Patient outcomes			Total
		Maternal deaths	Survivors	Nonmaternal deaths	
Not covered	Yes	18	171	1,982	2,171
	No	10	65	825	901
Covered	Yes	27	279	3,279	3,585
	No	10	129	1,375	1,514
Totals		65	644	7,462	8,171

Table 10

Location of Death/Birth, Presence of a Skilled Attendant, and Patient Outcomes

Locations of death/birth in the greater Accra	Presence of a skilled attendant	Patient outcomes		
		Maternal deaths	Survivors	Nonmaternal deaths
Accra metropolitan	Yes	56	622	7,204
	No	2	4	91
Tema metropolitan	Yes	4	3	43
	No	0	0	0
GA West	Yes	0	5	78
	No	3	0	0
GA East	Yes	0	1	32
	No	0	0	0
Dangme West	Yes	0	5	2
	No	0	0	0
Dangme East	Yes	0	3	12
	No	0	1	0
Total		65	644	7,462

Most mothers in greater Accra were aware of medical services and sought medical attention from dispensaries and hospitals. My review of the maternal data collected in 2016 revealed that 3,397 (41.57%) women went to hospitals for medical attention and 4,630 (56.66%) went to dispensaries. Only 144 (1.76%) women did not seek medical services in a health care facility. From this group none was recorded to have succumbed to maternal related complications leading to death. Although most of the maternal deaths were as a result of other complications like accidents, HIV/AIDS, and stomach obstructions, there appeared to be a preventable intervention when mothers deliver in health facilities as shown on Table 11.

Table 11

Place of Birth and Patient Outcomes

Place of death/birth	Patient outcomes			
	Maternal deaths	Survivors	Nonmaternal deaths	Total
In hospital	26	266	3,105	397
At home	0	5	139	144
At dispensary	39	373	4,218	4,630
Total	65	644	7,462	8,171

Inferential Statistics

Research Question 1**:** Is there a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis (*Ho)*: There is no significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis (*H1)*: There is a significant association between sociodemographic factors (marital status, education, income, and health insurance) and maternal mortality in Greater Accra, Ghana.

The hypothesis was tested using a multinomial logistic regression to determine the significant relationships between the sociodemographic factors and maternal mortality. The independent variables included marital status, education, income, and health insurance; the dependent variable was outcome of childbearing-aged women. A *p* value less than .05 for any given independent variable would indicate a significant association with maternal mortality. Given the results, approximately 38% of the variance

in the dependent variable was accounted for by the combination of sociodemographic

variables in the model.

In terms of the significance of the individual sociodemographic variables, several

demonstrated significant associations with the outcome of maternal mortality in

comparison to nonmaternal related mortalities. Income was significantly associated with

maternal death (B=.05, SE=.02, p = .023). Compared to tertiary education level, there

were significant associations with maternal death for the education categories of primary

level (B=.01, SE=.42, p = .035) and secondary level (B=-.05, SE=.41, p = .002).

Compared to those with health insurance coverage, the lack of health insurance coverage

was significantly associated with maternal mortality (B=.73, SE=.27, p = .008). Marital

status was not statistically significant in explaining the chances of maternal mortality in

comparison to nonmaternal related mortalities. In terms of association with survivorship,

only health insurance coverage was significantly associated with surviving a birth related

complication as compared to nonbirth related deaths (B=-.03, SE=.09, p = .003). Income,

marital status, and education level were not statistically significant in addressing the

chances of surviving a birth related complication as compared to nonbirth related deaths.

Table 12

Multinomial Logistic Regression with Sociodemographic Variables

Patient outcomes[a]	B	SE	df	*p*.	Exp(B)	99% Confidence Interval for Exp(B)	
						Lower	Upper
Maternal Deaths							
Intercept	-6.198	.846	1	.000			
Income	.053	.024	1	.023	1.055	.993	1.121
Married	-.325	.671	1	.628	.722	.128	4.067
Married	-.170	.445	1	.702	.843	.268	2.654
Married	-.352	.384	1	.359	.703	.261	1.892
Married	-1.364	.784	1	.082	.256	.034	1.928
Married	.260	.606	1	.668	1.297	.272	6.182
Married	0[b]	.	0	.	.	.	.
Education	.293	.372	1	.431	1.340	.514	3.493
Education	.008	.420	1	.035	1.008	.342	2.972
Education	-.050	.406	1	.002	.951	.334	.705
Education	0[b]	.	0	.	.	.	.
HI=0	.726	.267	1	.008	0.753	.630	.893
HI=1	0[b]	.	0	.	.	.	.
Survivors							
Intercept	-2.346	.277	1	.000			
Income	.000	.008	1	.956	1.000	.980	1.021
Married	-.147	.232	1	.525	.863	.475	1.569
Married	-.241	.163	1	.141	.786	.516	1.197
Married	-.072	.136	1	.599	.931	.655	1.322
Married	-.042	.182	1	.817	.959	.600	1.531
Married	-.100	.254	1	.695	.905	.470	1.742
Married	0[b]	.	0	.	.	.	.
Education	-.037	.126	1	.770	.964	.698	1.332
Education	.184	.129	1	.154	1.201	.862	1.674
Education	-.069	.129	1	.593	.933	.670	1.301
Education	0[b]	.	0	.	.	.	.
HI=0	-.030	.090	1	.003	.970	.771	.922
HI=1	0[b]	.	0	.	.	.	.

[a.] Represents the reference category which is Nonmaternal deaths.

[b.] Represents category taken as the reference.

Question 2: Is there a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana?

Null Hypothesis *(Ho)*: There is no significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

Alternative Hypothesis *(H1)*: There is a significant association between service delivery factors (prenatal care, delivery location, and presence of a skilled attendant at delivery) and maternal mortality in Greater Accra, Ghana.

The hypothesis was tested using a multinomial logistic regression to determine the significant relationships between the service delivery factors and maternal mortality. The independent variables included prenatal care, delivery location, and presence of a skilled attendant at delivery; the dependent variable was outcome of childbearing-aged women. A *p* value less than .05 for any given independent variable would indicate a significant association with maternal mortality. Given the results, approximately 46% of the variance in the dependent variable was accounted for by the combination of service delivery variables in the model.

In terms of the significant associations, none of the individual service delivery variables demonstrated significant associations with the outcome of maternal mortality in comparison to nonmaternal related mortalities. Conversely, prenatal care (B=.03, SE=.09, *p* = .001) and presence of a skilled attendant at delivery (B= -.56, SE=.51, *p* = .003) were statistically significant in addressing the chances of surviving a birth related complication

as compared to nonbirth related deaths. Delivery location was not statistically significant in addressing the chances of surviving a birth related complication as compared to nonbirth related deaths.

Table 13

Multinomial Logistic Regression with Service Delivery Variables

Patient outcomes[a]	B	Std. Error	df	Sig.	Exp(B)	99% Confidence Interval for Exp(B)	
						Lower	Upper
Maternal Deaths							
Intercept	-4.842	.214	1	.000			
Prenatal	.065	.270	1	.809	1.067	.532	2.141
Attendant Presence	1.062	.727	1	.144	2.891	.444	18.829
Place of Birth	.050	.128	1	.695	1.052	.755	1.464
Survivors							
Intercept	-2.474	.069	1	.000			
Prenatal	.027	.090	1	.001	.128	.116	.394
Attendant Presence	-.563	.514	1	.003	.570	.521	.660
Place of Birth	.018	.042	1	.669	1.018	.914	1.135
[a.] Represents the reference category which is Nonmaternal deaths.							

Question 3**:** Is there a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant death?

Null Hypothesis *(Ho)*: There is no significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant death

Alternative Hypothesis *(H1)*: There is a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of health insurance coverage, income, education, marital status, and location of infant death.

First, a multinomial logistic regression was conducted to determine the model to predict probability of surviving a birth related complication as compared to nonbirth related deaths based on health insurance coverage, annual median income, education, marital status, and place of death. Given the results, approximately 7.9% of the variance in the dependent variable was accounted for by the combination of variables in the model. Of the individual variables in the model, health insurance coverage, annual median income, education, and place of death were significantly associated with the outcome. Specifically, health insurance coverage (B=.18, SE=.29, p = .028), annual median income (B=-.02, SE=.02, p = .024), primary compared to tertiary education (B=.20, SE=.44, p = .041), and death at home compared to dispensary (B=17.02, SE=.51, p<.001) were statistically significant in addressing the chances of surviving a birth related complication as compared to nonbirth related deaths.

The hypothesis was tested using a series of odds ratio (OR) calculations. Women with no medical insurance coverage are 24.8% less likely to survive a complication resulting from child delivery (OR=.75). Further, for each unit increase in the annual median income of a woman, she will be 94% more likely to survive after a complication during child delivery, adjusting for all the other factors. Moreover, a woman who delivers at home is 22.4% less likely to survive a complication resulting from child delivery as compared to the one in a medical facility (OR=.78).

Table 14

Multinomial Logistic Regression for Difference in Rates

Patient outcomes[a]	B	Std. Error	df	Sig.	Exp(B)	99% Confidence Interval for Exp(B) Lower	Upper
Survivors							
Intercept	2.806	.892	1	.002			
AA	-.023	.021	1	.024	.977	.844	1.012
HI	.180	.286	1	.028	1.198	.749	0.916
Education	-.261	.393	1	.506	.770	.403	1.471
Education	.204	.437	1	.041	1.226	.597	1.518
Education	.012	.424	1	.077	1.013	.504	2.033
Education	0[b]	.	0	.	.	.	.
Married	.239	.706	1	.735	1.270	.397	4.057
Married	-.225	.486	1	.643	.798	.359	1.776
Married	.295	.404	1	.466	1.342	.691	2.608
Married	1.382	.803	1	.085	3.982	1.063	14.910
Married	-.333	.650	1	.608	.717	.246	2.086
Married	0[b]	.	0	.	.	.	.
Place of Death	.036	.278	1	.898	1.036	.656	1.638
Place of Death	17.016	.511	1	.000	10.768	43.715	22
Place of Death	0[b]	.	0	.	.	.	.

[a]. Represents the reference category which is Nonmaternal deaths.

[b]. Represents category taken as the reference.

Overall, the results support the relationships between various sociodemographic and service delivery factors with outcomes of childbearing-aged women. Socio demographic characteristics, including income, education, and health insurance, were significantly associated with maternal related mortality whereas none of the service delivery factors were significantly related. Conversely, survival was associated with the service delivery factors, prenatal care and presence of a skilled attendant at delivery, in addition to health insurance. In terms of maternity mortality rates, the results supported

that income, education, health insurance, and location of death shared significant associations.

Therefore, in trying to control for maternal related mortalities for women of reproductive ages, it is necessary to review the women's health insurance, prenatal care, and presence of a skilled attendant at delivery. It is important to be aware of possible risks and barriers faced by women without medical insurance coverage or lower than median income. Further, delivery at home appears to be a potential risk compared to a medical facility. These parameters will be useful in reducing maternal mortality within Greater Accra region.

Summary

In this chapter, I conducted both descriptive and inferential statistics to inform on the study variables and research questions. Through multinomial logistic regressions, I modeled the effects of sociodemographic and service delivery factors on outcomes of childbearing-aged women. Income, education, and health insurance were associated with maternal related mortality. Conversely, health insurance, prenatal care, and presence of a skilled attendant at delivery were associated with survival. Increase in age, lack of health insurance coverage, a unit decrease in annual median income, lack of prenatal care, and childbirth outside of health care facilities had negative effects on chances of survival for a woman of reproductive age. In chapter 5, I present the interpretation of the findings, limitations of the study, recommendations from the research, implications for mothers and health service providers, and my conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

My purpose in this study was to use secondary data to assess the relationship between sociodemographic variables, service delivery factors, and maternal mortality among women of reproductive age. The sociodemographic factors that were considered included marital status, education, income, and health insurance. Prenatal care, delivery location, and presence of a skilled attendant at delivery were considered as service delivery factors. Sociodemographic factors and service factors were examined independently in relation to outcomes of childbearing-aged women. Income, education, and health insurance were associated with maternal related mortality. Conversely, health insurance, prenatal care, and presence of a skilled attendant at delivery were associated with survival. Further, in examining maternity rates, income, education, health insurance, and location of death are important factors to consider. The significance of this research was to promote positive social change by helping health professionals identify sociodemographic variables and service delivery factors that can be targeted to prevent or reduce maternal mortality in Greater Accra metropolitan area in Ghana. The study findings will potentially reduce complications and improve service delivery to maternal mothers.

Interpretation of the Findings

My findings revealed that several sociodemographic and service delivery factors were associated with maternal mortality in Greater Accra Metropolitan. Past studies showed limited association between service delivery factors, such as prenatal care,

delivery location, and presence of a skilled attendant at delivery, and maternal mortality. Along with sociodemographic factors, a better understanding of the roles of service delivery factors in maternal mortality could potentially explain the high maternal mortality rate in in Greater Accra metropolitan area in Ghana. To further address the gap in the literature, I evaluated differences in maternal survival odds of women in Accra in terms of health insurance coverage, annual median income above GH¢30.00, education above the high school level, marital status, and location of infant death. I estimated that 7.9% (Nagelkerke R^2) of the variation in survival of women in the reproductive age range succumbing to complication arising during childbirth is explained by health insurance status, prenatal care, income, primary education, and place of birth. These results add to previous research conducted by health institutions in Accra in 2015 which revealed service delivery factors, such as prenatal health care coverage and the presence of a skilled attendant at delivery, played a significant role in maternal mortality. In addition, Gelaye et al. (2016) concluded that equity in regard to health care is important when health care is mentioned (UNICEF, 2013, p. 3). Essentially, income still has an effect on maternal health care outcomes in Accra, Ghana. My study revealed that service delivery factors are important to consider related to maternal death, especially prenatal care, which was directly correlated to a mother's successful delivery; particularly, a woman of reproductive age who received prenatal care is 94.0 % more likely to survive a complication resulting from childbirth. Therefore, the need for prenatal care is of paramount importance.

Based on my results, with an increase in annual median income, a woman of reproductive age is drastically (94%) more likely to survive a complication during childbirth. This percentage demonstrates that equity regarding health care is still yet to be achieved. Income was associated with the outcome women of reproductive age experienced (i.e., survival, maternal mortality, nonmaternal mortality). This evidence supports past researchers' findings of the association between income and maternal mortality. Income determines the health status of maternal mothers in the country. Related to income, location of birth is also important. Delays related to travelling to health care facilities influence maternal deaths. Particularly, previous research supports that maternal deaths are associated with delays at home, delays in reaching the health care facilities, and delays in receiving treatment in health care facility (Edmond et al., 2016). Similarly, my study findings also affirm that place of delivery remains significant in determining the maternal outcome of mothers. Specifically, the location that a woman delivers her baby, whether at home or in the hospital was correlated with maternal outcomes. Women who deliver at home are less likely to survive a complication resulting from childbirth as compared to a woman giving birth in a medical facility. Iyaniwura and Yusuf (2009) revealed that skilled obstetric assistance during delivery and adequate antenatal care are important to reducing maternal mortality and morbidity. To ensure that mothers have a safe environment during and after birth, adequate income must be available within the family to access adequate health care (Gelaye, Rondon, Araya, & Williams, 2016).

Contrary to previous research, my study results indicated marital status has no significant influence on maternal outcomes. This lack of association between marital status and maternal mortality disconfirmed the findings of the (WHO, 2015a). The WHO (2015a) found that pregnant women out of marriage settings are more likely to experience incidental termination at the initial stages of pregnancy (4-5 weeks after conception) than their married counterparts. However, in terms of education, my research confirms other findings by the WHO. My results indicated primary education was associated with maternal mortality. Primary education was the only significant level of education that could explain maternal outcome when compared to no education; it is possible that more advanced education may only provide incremental protective effect. Secondary and tertiary levels of education were not significantly related to maternal mortality. Therefore, to a larger extent, the education status of the Greater Accra Metropolitan women may have very little effect when determining maternal mortality as the majority had at least primary education. My results are in line with the WHO's finding that lower levels of education are a leading cause of maternal death (WHO, 2015a).

Conceptual Framework

The framework for this study was the health belief model (HBM). The constructs of the HBM framework are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy. The HBM will assist in understanding the way pregnant women perceive pregnancy and the characteristics these women possess that lead to their action or inaction (Hochbaum et al.,

1952). Therefore, this conceptual framework aids the study in understanding the influential factors of women's outcomes. Examining my results in the context of the HBM provides the insight of how the sociodemographic and service delivery factors relate to women's mortality or survival outcome in the Greater Ghana region. Additionally, the social capital theory and gender equity theory supplement the interpretation of study findings.

The HBM framework emphasizes that whether a person would likely take measures to take actions will depend on their perception of their current condition. Recall that the delivery location, presence of skilled staff in the health care facilities, health care insurance coverage, income, and education level, particularly the lower primary level compared to secondary or more advanced education, are related to the likelihood of maternal death. According to the HBM, these sociodemographic and delivery factors can be considered modifying factors in the way women perceive their health care practices (Glanz et al., 2008). For instance, mothers with health insurance coverage may experience less perceived susceptibility to maternal mortality or morbidity, and in my study did experience lower maternal deaths than those without coverage. My study reveals a higher number of women did not have any medical coverage. Within the group of women that had insurance, it was revealed that the majority were aware and successful in seeking prenatal care. This evidence confirmed the findings of previous researchers (e.g., Gelaye, Rondon, Araya, & Williams, 2016; Owusu & Oteng-Ababio, 2015; Reich et al., 2016; UNICEF, 2014). Most of the women demonstrated awareness of the importance of having medical insurance; however, about one-third of the sample did not

have health care coverage. Using the HBM for theoretical context, programs can be implemented to specifically target perceived barriers and implement cues to action to encourage women to attend prenatal care as early as possible after determining their pregnancy status; ensuring this coverage will help promote healthy practices in these women that otherwise may face perceived and actual barriers to prenatal care.

In the social capital theory, scholars believe that social capital helps people make informed decisions and can be examined by certain health needs (Krieger, 2011). The social capital theory, as applied to my research, indicates that social capital can be measured based on a women's level of education and networks. This theory can be applied by maternity health care providers to evaluate the maternal mortality rate globally. This study reveals to a larger extent that the education status of women in the Greater Accra Metropolitan area may have little effect on maternal mortality. The majority of the women living in Accra, through some mechanism, are aware or have knowledge that lead most mothers to make informed decisions about their health, to attend regular checkups, and to follow their prenatal care as recommended by their doctor. However, it may not be lack of knowledge, but other barriers for the women who did not receive prenatal care such as financial hardship. This focus on barriers faced by women can be viewed through the gender equity theory framework, which is entrenched in the establishment of fairness between men and women in terms of health care, socioeconomic, nourishment, and the larger relationship between sexes.

The gender equity theory provides an approach for the prevention of maternal medical complications and mortality through achieving social justice and fairness by

embracing human rights for women (Gelaye, Rendon, Araya & Williams, 2016). The

rights in this matter include efficient and quality service delivery and the provision of

useful information prior to and after pregnancy (Aboderin & Beard, 2015). This

information would help women to make their decisions related to health with fewer

barriers which subsequently may prevent maternal death. The research indicates that

expectant mothers who face death at home are typically not yet registered by the

professional health care providers and, therefore, the family members tend to avoid

reporting such events (Gelaye, Rendon, Araya, & Williams, 2016). Applying the gender

equity theory to this study, I found evidence that has more association with the women

residing in Accra. Specifically, this theory suggests equal access to health services for

women; however, considering my study results, the income variation for women was

associated with different maternal outcomes (Gelaye et al., 2016). Most mothers in the

greater Accra area were aware of seeking prenatal services and sought medical attention

from clinics and hospitals. This often occurred because these women were aware of the

prevention measures to take while they were pregnant, the importance of seeing a health

care professional, and taking medication as needed.

Limitations of the Study

Despite the valuable results gained from the study, it is important to note

limitations to the generalizability and validity of the results. This research included the

use of secondary data from hospital registries and was therefore limited to only those

cases and controls that were exclusively captured in those records. Further, this method

of data collection may be susceptible to data entry errors, incomplete information, total

noninclusivity of the targeted population, and recall bias. Obtaining data from Ghana health services was difficult due to limited availability of the custodian of the data. Ghana, being a third world country, did not have the correct software to collect the data in an effective manner. As the researcher, I was required to clean the data, which took a considerable amount of time. Moreover, any obstetric disorders that could not be corrected during the time of delivery or any disabilities related to the birth process were not considered. In the process of collecting data, outcomes of successful or complicated deliveries were not specifically identified in the data. Follow-up data as to the overall postpartum health status of the babies or mothers was not examined. Another limitation of the data was concerning women who died on arrival. Family members were unreliable sources as to the cause of death; therefore, much of the data collected on cause of death was unknown. Consequently, even if the death on arrival was due to maternal mortality, the official cause was considered unknown. Besides, data collection from family members might also have created unpleasant memories for the family members, thus it remains unknown or unavailable in the records.

Further, in terms of the sampling frame, this study was restricted to women of the reproductive age (15-45 years). Women who may have died during childbirth whose ages were outside the study criteria were not included in the study; hence, a segment of the population that may have contributed more relevant data to the study was not excluded. Another chief limitation present in the study was the physical location of the mothers at the time they gave birth. Women who lived in the Greater Ghana region, but gave birth outside the region, were excluded; however, women from outside the Greater Ghana

region, who gave birth in the region, were included in the study. This could have posed a

great influence in the outcome of the maternal cases reported or misrepresent the region.

Recommendations

Future researchers should consider replicating this research in other districts of

the greater Ghana region to better advise the health fraternity of the underlying factors

exacerbate maternal mortality. It is possible that other regions have different distributions

of socioeconomic and service delivery characteristics, along with other factors, that might

inform interventions specific to the region. Additionally, research using primary data

collection methodologies by obtaining information directly from the cases and controls

within the population of interest would provide more relevant information and form a

fuller picture of the drivers of maternal mortality. For example, direct interaction with the

mothers may shade more light even to other factors that may affect maternal mortality

like religious beliefs. It may be possible to understand other cultural influences such as

shared knowledge among families or neighbors that could affect knowledge and choices

like health care coverage or prenatal care.

It is important for researchers to better understand and provide clarity on the

causal relationship between maternal related complications and development of a

disorder within the child or mother immediately after birth. This will incorporate medical

personnel knowledge and competence in the maternal health provision. In previous

research, it is estimated that between 28,000 and 117,000 women will experience

disabilities due to the complications which occur during the pregnancy and delivery

process every year (Atuoye et al., 2015). Does this discovery still apply to Ghanaian

population? It remains an important area to study and understand. In response to the reasons perceived by mothers on whether to attend prenatal clinics, future researchers should investigate the reason given for nonattendance. As deduced by Gazali (2012), many women tend not to go to their antenatal care visit, because they have not seen any physical symptoms or have not seen any health issues with their pregnancy. Similarly, others also expected to see symptoms of the breast and cervical cancer before they would make the necessary decision to seek treatment (Austin et al., 2002).

Implications

Social Change

The results from this research has shown that there is a significant association of sociodemographic and service delivery factors with maternal mortality in the Accra metropolitan area of Ghana. It will therefore be important for mothers to be conscious of the importance of attending prenatal clinics, having medical insurance cover, giving birth in a medical facility, and being attended to by a skilled midwife. On the other hand, since education levels are reasonably high, sensitization to mothers needs to be conducted to raise awareness on the risk factors that are likely to increase the chances of mothers dying in the process of giving birth. Emphasis on the usefulness of having health insurance coverage and some increase in the level of disposable income would facilitate a reduction in maternal mortality. Moreover, the association of annual median income and maternal mortality risk is revealing and prompts discussion regarding the potential benefits of a free maternal care policy. The government and policymakers should explore this type of program as it may reduce the effect of mothers' income raising their risk for maternal

mortality. Specifically, regarding the medical fraternity and professional practice, prenatal care follow-up and sensitization to the mothers will be essential in improving their consumption of these services. It will also be important to review and revise the medical insurance policies to accommodate and encourage more mothers to gain coverage. Income should not be a hindrance to accessing maternal care.

Conclusion

This research was a case-control study in which study cases were obstetric patients who were declared dead upon arrival or died after admission (including those who died before the fetus was delivered) within hospitals in the Osu Klottey sub metro of Accra in 2016. Controls were randomly selected mothers who delivered at Accra Hospitals in 2016 and are alive at the end of puerperal period. Exposure statuses are the maternal related outcomes of mothers in the reproductive ages while unexposed status refers to the nonmaternal related outcomes of the mothers. Pregnant women who are less likely to seek medical attention are likely to die of maternal related complications than mothers who sought for medical attention. Policymakers focusing on universal maternal health care regardless of income and health insurance would be a good thing to consider. In addition, empowerment women (gender equity theory) with better financial and societal roles may enable them to fully seek out medical care. These sociodemographic and service delivery factors cannot be ignored in the attainment of zero maternal related deaths in the Greater Accra metropolitan area of Ghana.

The evidence found in the study could be used to potentially enhance educational programs designed to lower maternal mortality. Further, these study results can support

and generate theoretical support for existing frameworks like the Health Belief Model

applied to maternal mortality, or provide the impetus for the development of a future

theory, as it relates to women's health care and pregnancy outcomes in third world

countries, integrating aspects of HBM, social capital theory, and gender equity theory.

My study will add to the body of knowledge in public health regarding the antecedents

and consequences of unskilled medical personnel, unavailability of skilled medical

personnel in the hospital, lack of service delivery, effect of cultural behaviors, and

financial issues, such as lack of health insurance, that can be associated with maternal

death. My study will pave the way and create opportunity for more research to advance

knowledge and practice in health delivery services and public health education as related

to maternal mortality in third world countries in particular. The outcomes from my

research may heavily support the conclusion of probable influences of a pregnant

woman's characteristics on birth outcomes, as well as, the influence of the maternal

mortality rate in Ghana. This can lead to robust mitigating strategies for maternal

mortality. In addition, my study will also provide public health practitioners with the

information that will help to accurately understand some of the factors that influence the

individual's behavioral intention toward actions that would reduce maternal mortality

risks.

The positive social ramifications of the study results could enable wellbeing

specialists to provide socially proper instructive messages amid antenatal and postnatal

sessions and furthermore determine how to ensure pregnant women obtain satisfactory

antenatal care services (Sakeah et al., 2015). Results from this investigation could

advance positive social change by helping wellbeing experts and to recognize the attributes of women at risk amid antenatal instruction sessions and help with the advancement of focused antenatal care mediations. This may conceivably diminish maternal wellbeing inconveniences and enhance pregnancy results. Understanding the wellbeing, education level, social factors, and health insurance needs of pregnant women may prompt opportunities to enable women in Ghana, and beyond through dissemination of study results, to receive maximum benefit to reduce maternal mortality risk.

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Appendix A: NIH Certificate of Completion

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural
Research certifies that **edmund eghan** successfully completed the
NIH Web-based training course "Protecting Human Research
Participants."

Date of Completion: 05/22/2013

Certification Number: 734775

NIH National Institutes of Health
Office of Extramural Research

Appendix B: Data Use Agreement

THE REGISTRAR

BIRTHS AND DEATHS REGISTRY

MINISTRIES, ACCRA

Dear Sir,

DATE USE AGREEMENT

As a Public Health Student and as part of the requirement for finishing my PHD in public health a bias in empimeology, and I am writing dissertation on the subject matter factors associated with maternal mortality. so this letter is to request access to the medical records of women who fall within the following variables.

 That date elements of interest include gender.

A. the mothers who died, I need their socio-demography such their marital status, education status, income status, and health insurance status in Accra

B. those pregnant women who died, did they die because of service delivery factors such as non access to prenatal care, or did person die at home or at the hospital or died on arrival. and who was in charge of the delivery. is it a doctor, midwifery or an elderly person.

C. is there a significant difference in maternal survival rates between women in Greater Accra, Ghana in terms of their health insurance coverage or without insurance, their annual median income above GH¢ 30.00, their educational level above the high school, marital status, and location of infant death?.

 Kindly find attached a letter form my university confirming my enrollment status and a summary of my research proposal.

I look forward to a positive response from you.

I…………………………………position ..Principal Assistant Registrar that we will furnish Edmund Eghan PHD candidate the above variable to conduct his dissertation.

Yours sincerely,

Edmund Eghan

(phd candidate)

REGISTRAR OF BIRTHS & DEATHS
CENTRAL REGISTRY OFFICE
C . A C C R A.

(signature)