ENSIGN COLLEGE OF PUBLIC HEALTH, KPONG, EASTERN REGION GHANA

FACULTY OF PUBLIC HEALTH

DEPARTMENT OF COMMUNITY HEALTH

DETERMINANTS OF PRETERM DELIVERY AT THE TEMA GENERAL HOSPITAL IN THE TEMA METROPOLIS OF THE GREATER ACCRA REGION OF GHANA

BY

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DECLARATION

I, Cynthia Nartey, declare that this dissertation is my own original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award. However, all references cited in this script were duly acknowledged.

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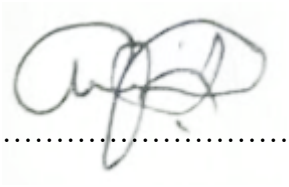
Signature……  Date…… 11-06-2020

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DEDICATION

This thesis is dedicated to all preterm mothers and all preterm babies delivered at Tema General Hospital and those yet to be born.

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I sincerely thank my parents for the sacrifices they have made in my life. I am forever grateful for their love in all forms of support.

I am greatly indebted to my supervisor; Dr. Stephen Manortey, for his guidance, insight, supervision and support that he gave me throughout this project and the postgraduate program.

To all academic staff of Ensign College of Public Health, and also to my classmates and all other colleagues in other institutions and staff at Tema General Hospital. Thank you all, and may God bless you.

DEFINITION OF TERMS

Anaemia in Pregnancy: This is a hemoglobin level <10g/dl as measured antenatal.

Gestational age: The post-conceptional age of the baby based on menstrual dates and confirmed by clinical assessment using the Finn-strom score.

Induced preterm birth: Induction of labour or elective Caesarean section before 37 completed weeks of gestation

Inter-pregnancy interval: The duration between one pregnancy and the next. This is calculated to the nearest month as the period between the date of the previous delivery and the date of the last menstrual period (LMP) for the current pregnancy.

Low Birth Weight: Birth weight less than 2500 grams.

Low Mid Upper Arm Circumference (MUAC): A MUAC <24cm.

Obstetric wheel: A standard tool used to simplify calculation of gestation based on the LMP.

Parity: The total number of times a woman has been pregnant regardless of the outcome.

Preterm birth: All births before 37 completed weeks of gestation.

Spontaneous preterm birth: Spontaneous onset of labour or labour following premature rupture of membranes (PROM)) occurring before 37 completed weeks of gestation.

ABBREVIATIONS AND ACRONYMS

AM	Accra Metropolis
ANC	Antenatal care
AVD	Assisted Vaginal Delivery
BMI	Body Mass Index
DHS	Demographic and Health Survey
EmONC	Emergency Obstetric and Neonatal Care
FHD	Family Health Division
GAR	Greater Accra Region
GHS	Ghana Health Service
HIV	Human Immunodeficiency Virus
IOM	Institute of Medicine
KBTH	Korle-Bu Teaching Hospital
KNH	Kenyatta National Hospital
LBW	Low Birth Weight
MOH	Ministry of Health
NEC	Necrotizing Enterocolitis
PN	Post-Natal
PNC	Attended Postnatal Care
PPROM	Preterm Premature Rapture of Membrane
PTB	Preterm Birth / Preterm delivery
RDS	Respiratory Distress Syndrome
RHD	Regional Health Directorate

RRH	Ridge Regional Hospital
SCD	Sickle Cell Disease
SPTB	Spontaneous Preterm Birth
SUMMIT	Supplementation with Multiple Micronutrient Intervention Trial
SVD	Spontaneous Vertex Delivery
TGH	Tema General Hospital
UTI	Urinary Tract Infection
WHO	World Health Organization

ABSTRACT

Preterm birth is a major cause of neonatal morbidity and mortality. Globally, the main causes of neonatal deaths are preterm birth complications (35%), intrapartum-related complications (including complications during labour and delivery such as with asphyxia) (24%), and sepsis including neonatal tetanus and pneumonia (15%). The aim of the study was to examine the determinants of preterm deliveries at Tema General Hospital in the Greater Accra Region, Ghana.

METHOD: A descriptive cross-sectional research design using a quantitative approach was used to collect relevant data from preterm mothers who have delivered at the Tema General Hospital from the period of time the study took place.

RESULT: The study recruited a total of 257 respondents with the responding rate of 98.46%. In this study, however, maternal educational levels had no significant association with preterm delivery($p=0.076$). Also, mothers with tertiary education were found to be 40% more at risk of preterm birth compared to mothers without or with lower qualifications. This may be because mothers with higher education had also advanced in age and thus may be desperate for children. Also, it was noted from this study that, 91.44% of the respondents had heard of preterm delivery and the most frequent source was from health staff (56.59%). Others such as religious programs, personal interactions and the media accounted for 43.41%. Again about 70% were of the view that preterm delivery could not lead to complications such as Cerebral Palsy, learning impairment, Psychological problems etc. This, however, was an indication of a low level of knowledge on maternal health issues.

CONCLUSION: Stakeholders into health programs should build capacity on maternal health

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CHAPTER ONE

1.0 Introduction

This chapter contains information related to the following items: background, statement of problem, rationale, research questions, objectives, conceptual framework, the scope of the study and organization of the study.

1.1 Background of the Study

A live baby born before 37 weeks of gestation is premature birth (PTB). There are around 15 million babies born with PTB, more than 1 in 10 babies a year worldwide (Cousens et al., 2013). About 50% of PTB are spontaneous, and the rest are early initiation of labour for medical and non - medical reasons. Congenital deformities correlated with PTB blame for 28% of all neonatal deaths. The PTB occurrence is distinct in low - income and high-income countries, on average 12% and 9% (Lawn et al., 2005). Nevertheless, over 60% of PTB occur throughout Africa and South Asia. The high speed countries are Malawi (18.1%), Comoros (16.7%), Congo (16.5%), Zimbabwe (16.5%), Equatorial Guinea (16.5%), Mozambique (16.4%), Gabon (16.5%) and Pakistan (15.5%), Indonesia (15%) and Mauritania (15%). The triggers of PTB remain unknown. The Millennium Development Goal 4 was aimed at reducing mortality under five and contributes substantially to neonatal mortality. There was no achievement of a 2015 target of fewer than 40 live births per 1000 live births at 110 to 120 per 1000 live births in 1990 (Ghana Data, 2014). Preterm birth is a common cause of neonatal mortality and an important cause of long – term loss of human potential amongst survivors. Premature birth complications are 35% of the world's 3.1 million deaths per year and the second largest cause of neonatal deaths after pneumonia, caused by direct neonatal deaths. (Blencowe et al., 2013). Preterm birth is a significant public health concern worldwide, contributing to more than 1 million deaths per year and increased morbidity

and disability rates in patients (Chang et al., 2013). Preterm birth avoidance has therefore been a major focus of interest. Preterm infants suffer from increased morbidity, including respiratory distress syndrome (RDS), enterocolitis necrotized (NEC), premature retinopathy, premature anaemia, neonatal jaundice, sepsis and difficulties with eating. Long-term complications such as cerebral paralysis, mental disabilities, progressive pulmonary disease, vision and hearing loss, also highly affect people that are born preterm, their families and their communities (Barros et al., 2010). Due to initial hospital stay, neonatal intensive care and ongoing serious health conditions resulting from illnesses, preterm delivery is of considerable cost benefit (Petrou et al., 2011).

1.2 Statement of the Problem

Africa has the highest PTB in the world, with an overall incidence of 18.1% currently estimated (Blencowe et al., 2012). Over a fifth of the 4,000,000 child deaths per year worldwide are directly attributed to premature infection (sepsis, diarrhoea, gastrointestinal necroticism, or enterocolitis), while over 1% was secondary premature infection (Barros et al., 2010). Of the 4 million deaths during the first week of life, seventy-five (75%) rise, with a vast majority occurring in the first 48 hours (Lams et al., 2008). The major public health problem is preterm delivery (preliminary to 37 completed weeks of pregnancy) that causes about 1 million deaths per year and high morbidities and incapacity among survivors.

It has consequences for the physical, psychological, social-cultural, legal and wellbeing of the baby and the family, as the current high preterm death rates in Ghana are high. In terms of neonatal intensive care costs and continuing health and education demands, the economic cost of preterm birth is high. Preterm delivery involves stressful hospitalization (Pichler-Stachl et al., 2016), the psychological and cultural acceptability of having a preterm birth or child loss while their parents remain alive (Blencowe et al., 2013; Baía et al., 2016)). Prematurity has extensive effects on

children's development and health and may even last through adulthood. The approach that desperately need to be applied for a nation such as Ghana with a very large preterm mortality burden (GHS,2012) is to recognize the preterm determinants for measures to be taken. Preterm delivery at the Tema General Hospital is still through even after several operations by the management of the hospital. Premature deliveries of 26%, 29% and 34% of all total deliveries were from 2017 - 2019 (TGH, Annual Report 2019). Therefore, the causes of concern leading to early deliveries should be established when any results can be produced on minimizing neonatal mortality, which contributes to prematurity. In this respect, the study was designed to examine the preterm determinants of delivery in the chosen facility of Tema General Hospital.

1.3 Rationale of the Study

Many premature births remain unknown in both developed and developing countries. Although several studies have been carried out in the developed world, there have been limited studies in the Ghanaian context. This study will help to review preterm birth epidemiology and could help us understand the specific determinants of the hospital site selected and potentially make recommendations for efforts to increase awareness and use the data to respond to premature birth. This research will therefore include evidence-based information on preterm delivery determinants. This may also add information to the current written literature on premature delivery determinants. Eventually, it would enable the Ministry of Health (MOH) advise government strategies to reduce premature delivery, its risks and eventually the risk of neonatal mortality.

1.4 Hypothesis/Conceptual Framework

The conceptual framework shows how the various variables influence preterm delivery. As shown in figure 1, the framework for this study has been categorized into; maternal socio-demographic characteristics, maternal medical conditions, maternal obstetric conditions and foetal determinants.

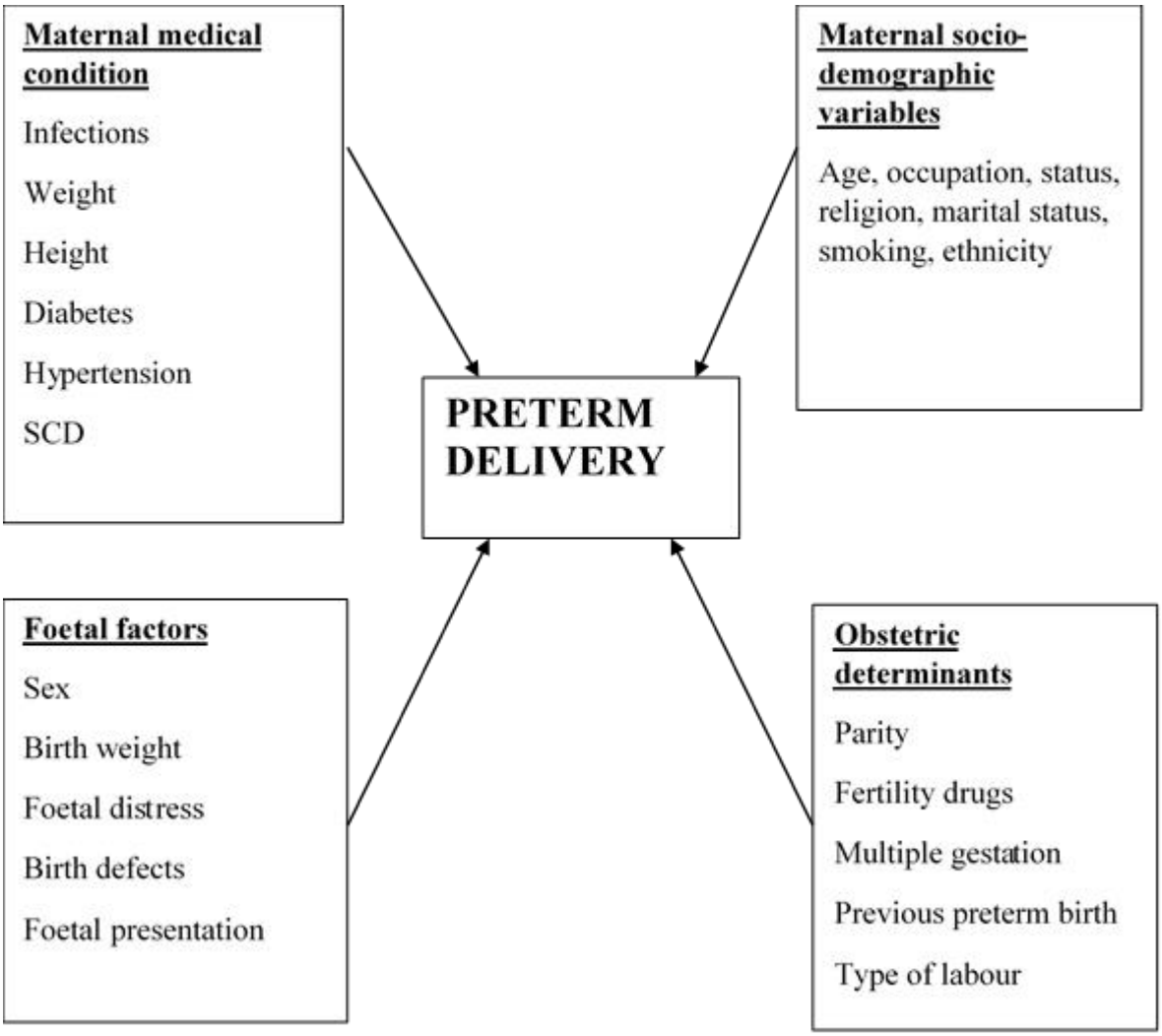

Fig1.1 conceptual framework

These variables work individually or collectively to influence preterm delivery.

In developed and developing countries, several maternal socio-demographic factors have been found to be linked to preterm delivery. Maternal age and infant mortality in preterm births, for example, were linked to the non-married / non-cohabiting status of mother, low family income, low maternal education, rural status and low family income, compared with high family income (Calling *et al*., 2011). It is because maternal marital status, education and family income are factors that influence decisions to attend antenatal clinic in order to recognize the early delivery conditions. It also shows how a mother's age could influence premature delivery. Preterm delivery is characterized by age extremities. Very young girls' reproductive system is not fully developed that predisposes them to early labour. Furthermore, older women who have infertility treatment can be vulnerable to iatrogenic conditions. Maternal obstetric events such as multiple pregnancies and gestational diabetes have shown to be linked with premature delivery.

The framework also explains the connection between sociodemographic and obstetrical factors. These include age and parity when elderly women are sometimes delivered iatrogenically before term to prevent maternal and foetal complications.

Medical conditions such as high blood pressure, diabetes, SCDs interfere with obstetric factors like previous preterm birth, parity, multiple gestation, pre-eclampsia, ante-partum haemorrhage or other conditions which are dependent on or independently, and may give indication for early delivery. Infections such urinary tract infections, Syphilis, HIV, HBV may force the mother into premature labour.

Foetal conditions such as birth defects, foetal presentation and foetal distress could lead to early initiation of labour.

1.5 Research Questions

1. What knowledge do mothers have on preterm delivery?
2. What are the maternal preexisting and obstetric risk factors to preterm delivery in Tema General Hospital
3. What is the proportion of preterm delivery in Tema General Hospital

1.6 General Objective of the Study

To assess the determinants of preterm delivery at the Tema General Hospital in the Greater Accra Region of Ghana.

1.7 Specific Objectives

1. To assess mothers' knowledge on the determinants of preterm delivery in Tema General Hospital

2. To determine the maternal preexisting and obstetric risk factors associated with preterm delivery in Tema General Hospital

3. To determine the proportion of preterm births in Tema General Hospital, within the year 2019

1.8 Profile of Study Area

Tema Metropolis is one of the 16 districts of the Greater Accra Region, located in the Southeastern part of Ghana. Tema Metropolis is a virtually fully-built-up area. It is a vibrant commercial and industrial city, about the only well-planned city in the country. It has a large harbor, one of the world's biggest man-made harbours which are the main sea-port entry to Ghana. The estimated 2015 population of Tema Metropolis was 341,045 (as projected from the 2010 Census), making it the second largest-populated of the 16 districts in the Greater Accra Region, after Accra Metropolis (Ghana Statistical Service, 2014). The Greenwich Meridian (longitude zero) passes through the

Metropolis and situated only about 5^0 N from the Equator. Tema Metropolis is considered as being the city in the center of the world. Tema was commissioned by Ghana's first president, Dr. Kwame Nkrumah, and grew rapidly after the construction of a large harbour in 1961. It is now a major trading center, with numerous industries that produce aluminum, refined petroleum, chemicals, food products, and building materials.

Tema General Hospital is a Metropolitan Hospital located in Tema Metropolis, which is in the Greater Accra Region of Ghana. The facility was established between 1954 and 1957 to serve as a medical centre for workers at the ports. The Hospital has a total bed complement of 280 and ten wards. It offers both General and Specialist Care Services in all the major clinical disciplines including Internal Medicine, General Surgery, Pediatrics, Obstetrics and Gynaecology, Dental and Eye care. The total staff strength is about 680, which includes 10 Specialists, 40 other Medical Doctors, and 340 nurses. Tema General hospital is a very busy Hospital with a daily average Out-Patient Department attendance of 650 and an average bed occupancy rate of 80%.

1.9 Scope of the Study

The research was conducted at the Tema General Hospital in the Greater Accra Region of Ghana. The target population for the study included all mothers who attended Postnatal Care (PNC) at TGH who had experienced preterm birth between January to May 2020. Any such potential respondents who were not willing to consent to participation or found to be psychologically unstable at the time of the study were excluded from participating in the study.

1.10 Organization of Study

The study is divided into six chapters. Chapter One is a description of the context and the general background of the study. Chapter Two reviews relevant literature on preterm delivery. Chapter Three presents the research methodology. While Chapter Four presents the findings of the study

in tables and charts, and Chapter Five presents the discussion of findings. Chapter Six includes a summary of the major findings, recommendations and topics that need further research

CHAPTER TWO

2.0 REVIEW OF RELATED LITERATURE

2.1 Preterm Delivery

Preterm delivery, was viewed as an uncertain and an inevitable part of life at a time of less than 37 completed gestations. Clinical interventions were targeted towards reducing complications instead of reducing the incidence and prevalence of preterm delivery. This approach has led to improved neonatal results, but the impact on society was immense both in terms of the suffering of children and their families and the economic burden (Behrman, 2007). Ghana should step up its efforts to prevent premature birth by "providing quality, obstetrical and emergency care facilities and appropriate skilled birth assistants, especially in remote areas," says Prof. Richard Adanu Country Director of Evidence for Action (E4A), Mama Ye Coalition. He spoke on 17th November 2013, ahead of the World Day of Prematurity (Young, 2013). The Ministry of Health, Ghana Report MOH, (2013) reported that majority of baby or child deaths in Ghana are induced by diseases that are preventable or treatable by simple and low costs intervention. In comparison to the premature birth, the Ministry of Health has reported that the primary cause of newborn mortality is low birth weight, inflammation, and asphyxia. Knowledge of such causal factors can help to implement strategies or solutions for preventing these devastating and avoidable deaths. Premature birth is a root cause of childhood morbidity and mortality, but its determinants, particularly in the Ghanaian context, are not so much medically understood. Prematurity is the leading cause of premature mortality, and now the second most prominent cause of pneumonia in children under the age of five, according to the 2012 Global Action Report on Preterm Birth Study. Preterm labor develops more often and unpredictably. Reliable data from most countries has shown that, the world's preterm birth rate is consistently high (Kendall, 2016). According to Poulsen *et al.*, (2015), preterm

deliveries vary from 3.7% and 7.5% among the 12 samples analyzed in Europe in to assess educational difference.

An estimated 14.9 million babies in 2010, or 11.1% of all live births, 1 in 10 babies were born in preterm (Blencowe *et al.,* 2013). In a study that looked at US birth data in 2013 based on a broad variety of characteristics, the proportion of preterm births decreased for the 7th straight year (Martin et al., 2015). In the United States of America, the prevalence of preterm singleton births has increased from 12.3% throughout 2003 to 12.7% in 2010. Much of this increase is attributed to late premature births (between 34 and 36 weeks of gestation), often the result of interventions for medical evidence (Loftin et al., 2010). Continuous increases in mortality have been exacerbated by the rise in late premature births. Trends are similar in most other high - income countries to the U.S. (Countries *et al*., 2011). Loftin et al., (2010) found that, in high-income countries with reliable data, premature births tend to have risen from 9.4% in 1981 to 12.7% in 2010 following decades of effort (34 to < 37 weeks) after 2007, despite a slight decrease in the incidence of late premature birth in United States (Martin et al., 2015). According to the WHO, 8 million children born worldwide each year die prior to their first birthday (Zupan *et al*., 2005). 8 million children die each year. 17 to 34% of these child deaths are premature in the United States and only about five of these incidents are early causes. In a study by Beck *et al*., (2010), they found that in 2005, 11 million (85%) of the 12.9 million deliveries worldwide were distributed in Africa and Asia. Europe and North America reported about half a million each (excluding Mexico) while almost one million registered in Latin America and the Caribbean (Beck *et al*., 2010). In other research studies, of 5,400 live birth infants in Yasuj, Iran, 130 were premature (2.4%) in 2010 (Nabavizadeh *et al*., 2012). A study was conducted to establish their prevalence and preterm biomedical factors. In

2012, however, the lowest rates were Africa and North America (11.9% and 10.6%) compared with Europe (6.2%).

2.2 Maternal Obstetric Risk Factors Leading to Preterm Delivery

A study of 315 preterm babies in India carried out by Shubhada *et al*., (2010) showed that last preterm childbirth and chronic maternal urinary tract infection (UTI) have been mainly related to preterm pregnancy, while PIH and APH have not been. A cross - sectional study by Jandaghi and Khalajinia carried out in Iran in 2008 has also shown the significant association of preterm birth records, maternal anaemia, PROM, placental abruption and UTIs, while PIH was not. When tested for uncertainty, it was shown that the placental abruption (OR=8), previous premature childbirth (OR=3.48), PROM(OR=3.78) and anaemia (OR=2.8) were important. Lopez et al., (2013) reported that preterm birth history was significantly connected with preterm birth while anaemia (hemoglobin < 10.5 g/dl) and number of births were births were not. The most common non-obstetric risk factor in a case - control study of preterm delivery risk factors was < 1.50 m (Rao *et al.*, 2014) in a high care hospital in Southern India. Nonetheless, height was not significantly related to preterm delivery in another study by Sebayang *et al*., (2012) analysis that investigated the linkage between preterm delivery and risk factors in Lombok, Indonesia (Sebayang *et al*., 2012). In China, the univariate model was used to analyze risk factors for low birth weight. The findings indicated that low primary education, anaemia, high blood pressure disorders, placental previa and oligohydramnios would predict poor baby weight and premature membrane separation (Bian *et al*., 2013). Rosenberg et al., (2002) also studied bias perceptions, recorded by the Black Women's Health Study data. In the study, premature rates of women reporting racial experiences, especially people with lower educational standards, have increased. Obstetrical disorders, including placenta previa, placental abruption, maternal hypertension, polyhydramnios, period of

limited perception, duration of the cervical woman in all trials, cervix performance of people under 32, 35 and 36 weeks of gestation, vagina mycoplasma and the bishop score (Alhaj, Radi & Adam, 2010; Iams et al., 1998; Massaro et al., 2009; Newman et al., 2008; Ofori, Le Tiec, & Bérard, 2008).

A study by Riley et al., (2016) found that, although all the controversies related to increased body mass index (BMI) and pregnancy outcome were involved, obesity is not associated with spontaneous premature delivery. Nevertheless, as BMI or body weight rose, the chance of tentative delivery decreased by 32 to 36 weeks. In addition, there has been no significant change in the BMI or weight between pregnancies in maternally-related California births (Riley *et al*., 2016). It follows a further study carried out in the USA. The contradictory data for the correlation of maternal and BMI weight with spontaneous preterm birth (SPTB) has been found by Palatnik et al., (2014). It was noted that spontaneous preterm delivery among mothers with increased BMI was less common (Palatnik, Miller & Kominiarek, 2016). Villamor & Cnattingius (2016) has found that the gain in weight in interpretation is associated with the increasing risk of medically indicated preterm delivery among Swedish women. Spontaneous, mildly preterm birth is also associated with high weight gains or losses in normal weight people.

Sebayang *et al*., (2012) from a Multiple Micronutrient Intervention Trial Complementation (SUMMIT), a dual blind cluster - randomized cohort controlled test of 14,040 single-ton births to study pre-mature birth determinants LBW and SGA, in Lombok, Indonesia. The results showed that the chances of pre-acquiring women (OR 0,64) were 36 percent lower than women who did not attend primary education (10 years of education) and that the chances were not significantly associated with pre-acquiring. The study was similar to the results of Kalanda study (2005) in a rural district of Malawi, which showed that the low maternal MUAC (<23 cm) was significantly

associated with LBW, premature birth, and the restriction of intrauterine growth. A study conducted by Jandaghi *et al*., (2011) on 200 preterm and 200-term infants in Iran revealed that 74% of preterm births occurred amongst socioeconomic low - level women, but premature birth did not include maternally active occupation. In a retrospective study conducted in Japan on 1, 194 children, Ohmi *et al*., (2002) observed that preterm birth risk increased significantly when mothers smoked in any pregnancy trimester. In an Italian case study Parazzini *et al*., (2003) showed a significant preterm birth risk associated with high maternal consumption of alcohol (> 3 drinks per day). The Ilorin Teachings Hospital in Nigeria conducted a research study of 185 premature babies, (almost 52% were premature, < 34 weeks of gestation), > 35 years' maternal age. S.J. Etuk *et al*., (2005) in a related study of 217 cases with a similar number of controls found that single pregnant women were strongly associated with early birth, but maternal age (<20 or ≥20 years) and their levels of education (< 0r to norm 6) were not. In a study among 1,626 HIV infected women in Lagos, Nigeria, premature birth was more common among the unmarried, whiles maternal age was not (Ezechi *et al*., 2004). There was no association regarding LBW preterm delivery with maternal age, levels of education, smoking and consumption of alcohol during pregnancy or UTI in the case-a control study of 200 Rwandan topics Bayingana *et al*., (2010).

A study by Christian Medical Center of Kilimanjaro in Tanzania. E. Siza (2008) with 460 babies (91% preterm), observed that the risk of developing LBW was four (4) times greater among women with no formal education. An age of less than 6 months was found to be approximately 5% in a study of second births in Scotland among mothers who conceived under 5 years from the early birth (Smith et al., 2003). The probability of severe (< 32 weeks' gestation) preterm delivery was significantly high when compared with those with a span of 18 - 23 months and those with intervals of 24-59 months. The results showed that gap periods for preterm birth were short of 18 months,

greater than 59 months, and that the probability of preterm birth was higher, LBW and the SGA, as was the case in 67 research on birth spacing and perinatal outcomes (Conde-Agudelo 2006). In Tanzania (Siza, J.E., 2008) the risk for mothers with antenatal anaemia and those with no ANC is higher than that for mothers who are HIV positive and with twice as high risk of preterm birth and LBW babies is higher. While the correlation between HIV status and the preterm delivery was important for Jenny Cole *et al*., (2001) in Dares Salaam, Tanzania, the symptomatic HIV positive mothers are more prone to deliver prematurely than HIV - uninfected mothers. In **a** study in South Africa (Ndirangu., 2003), maternal HIV status was not associated with premature birth, but with SGA. In a study conducted in a hospital in Kenya, (Switzerland 2014), approximately a third of preterm birth cases were linked to PROM, 26% had no ANC; 50% had primiparas, and about 16.5, 8.5% and 8% had multiple gestational, PIH and APH.

3.3 Pre-Existing medical condition

A recent study in Ethiopia, Abdela, (2015), showed that, mothers with chronic conditions were 4.5 times more likely to have preterm birth in subsequent pregnancies than mothers who had no history of chronic conditions such as; diabetic mellitus, hypertension, cardiac problem or asthma. Pre - existing sickle cell disease (SCD) conditions are associated with poor outcomes in pregnancy. For instance, a retrospective study revealed that, low weight at birth and inability to gain weight were shown to be precipitating factors to pre-term birth in mothers with sickle cell disease. (Thame, Singh-Minott, Osmont, & Melbpurne-Chambers, 2016). Also, poor fetal growth has been seen to be strongly linked to premature delivery. Infants born to mothers with sickle cell disease are at greater risk of being born preterm due to the nature of their haemoglobin phenotype. (Kuo & Caughey 2016). Many studies have shown preterm birth - related neurodevelopmental defects

(Schieve *et al*., 2016). For emphasis, in a study in Nigeria, the investigators found a strong association between weak foetal growth and early delivery (Iyoke *et al*., 2014).

In 2010, a study was conducted to determine the relationship between cerebral paralysis and APGAR score in low and average birth weight babies using medical data from the Norwegian birth register; they noticed that there was an important relationship between APGAR score and preterm delivery (Lie, Grøholt, & Eskild, 2010). In a related analysis in the Korle Bu Teaching Hospital, however, the investigators found that there was no substantial gap in the categorization of the Apgar score in < 7 and>7 as far as the likelihood of preterm delivery is concerned. Also in a study to determine prevalence and perinatal mortality in a tertiary health center in South - East Nigeria, preterm deliveries and Apgar Score have also been significantly linked (Iyoke *et al*., 2014). Poor foetal growth is strongly linked to early delivery. The prevalence of haemoglobin phenotype of children with SCD is more likely to be preterm babies in mothers with anaemia (Kuo & Caughey, 2016). This is the case for women with SCD. Other studies showed preterm birth - related neurodevelopmental defects (Schieve *et al*., 2016). The investigators also found a strong link between low foetal growth and premature growth in a study in Nigeria (Iyoke *et al*., 2014). A study was conducted to establish a cerebral paralytic association in low and standard birth weight infants, using medical data from the Norwegian birth registry, with APGAR 's score and premature delivery; a significant association was noticed (Lie, Grøholt & Eskild, 2010). The authors noted, however, in a similar study conducted in Korle-bu Teaching Hospital (KBTH), that there were no significant differences in the Apgar rating in < 7 and > 7 when the risk of preterm delivery was categorized. They found a significant link between preterm delivery and Apgar Score (Iyoke *et al*., 2014) in a study to identify prevalence and perinatal mortality associated with premature childbirths in a tertiary medical facility in South - Eastern Nigeria.

A research by Bergenhenegouwen *et al*., (2016) explored the impact of the mode of delivery in women (who had pre-term breech presentation) on neonatal and maternal outcomes, post-pregnancy. Results showed better results, indicating lower incidents of morbidity and death. Additionally, another research (2015) carried out by the same investigators showed that the expected mode of delivery is correlated with perinatal morbidity and mortality in preterm breech fetuses (Bersenegouwen *et al*., 2015). Several studies were conducted in order to examine; by delivery method and breech presentation, neonatal morbidity and death rates during gestational period (Lyons et al., 2015).

2.4 Outcomes of Preterm Birth

Premature birth is the main cause of neonatal mortality of children under the age of 5 (babies under 28 days) and the leading cause of death. The increase in risk of infant mortality is the result of premature birth (Lawn, Cousens, & Zupan, 2005). In the first four weeks of life worldwide, more than four million babies die, with a third or so of premature births and 75% of perinatal deaths in premature infants (Slattery & Morrison, 2002). Live baby survival in 2006 was 2% (n=3), 19% (n=66), 23, 40% (n=1 78) and 24 weeks, 66%(n=346) of the babies, 25 of the babies and 77% (n=448) and 26 weeks (Costeloe *et al*., 2013).). (Costeloe *et al*., 2013.) However, maternal anxiety, motherly exhaustion, preeclampsia, foetal distress and small for gestational age, together with placental abruption are linked to early birth and hospitalization (Ananth & Vintzileos 2006; Davis et al. 2003; Eisengart *et al*., 2003; Singer et al., 2003).

Preterm delivery, most specifically, is often followed by smaller premature births for the gestational age (SGA). The second reason for infant death is premature birth (Mattison *et al*., 2001). A premature child cohort study at 2, 5 and 9 to 14 years of age (total 1,338) found that 40% of adolescents were incapable of functioning fully as self - employed adults at age 2, 5 and 9 to 14

(total 1,338) (Walther *et al*., 2000). A national cohort study conducted in Sweden from 1973 to 1979 found a strong link to young adulthood hypertension, including increased risk of short - term births. (Crump *et al*., 2011), in contrast to full - term infants, preterm infants have an increased incidence of death in the neonatal period. Decline gestational age and birth weight reverse mortality levels (Allen et al., 2000; Lemons et al., 2001). Preterm birth also results in complications involving the respiratory, gastrointestinal, infectious, immune, cardiovascular system, hematological, central, nervous, luminary, deaf, delayed language, poor developmental and behavioural problems (Barker, 1995; Laas *et al*., 2012; Marlow 2004; Saigal & Doyle, 2008)). The expensive duration of hospital stays and care is usually necessary for early born kids (IOM, 2007). The United States Institute of Medicine (IOM) estimates that preterm birth costs exceed $26 billion annually. A systemic assessment of the prevalence and risk factors of postpartum in women with preterm infants indicated that in the immediate post - partum period mothers of premature infants are at a higher risk of depression than mothers of term infants in the immediate postpartum period (Vigod *et al*., 2010).

CHAPTER THREE

3.0 METHODOLOGY

3.1 Introduction

Chapter Three is composed of the research and methods and design, data collection techniques and tools, study population, study variables, sampling technique, pre-testing, data handling, data analysis, ethical considerations and limitations of the study.

3.2 Research Methods and Design

A descriptive, cross-sectional research design was conducted to identify the determinants of preterm deliveries between January to May, 2020. This design was preferred because it provides further insights into the research problem by clarifying the variables of interest, estimating, predicting and examining associative relationships

3.3 Data Collection Techniques and Tools

Data collection is a series of interrelated activities aimed at gathering information to answer emerging research problems/questions (Creswell, 1998). Questionnaires were used to collect data from the respondents. The questions were both opened and closed-ended. There were 28 items on the questionnaire. The items covered all the objective/ research questions. This enabled the researcher to analyse the data per the objectives.

Face to face interview was conducted with postnatal preterm mothers which, takes into consideration their demographic information and other variables such as knowledge on preterm delivery.

3.4 Study Population

The study population for the study were women who had preterm delivery at Tema General Hospital in the Tema Metropolis of the Greater Accra Region of Ghana between January to May 2020.

3.5 Study Variables

The following were the variables that were investigated under the study:

Dependent variable – Determinates of preterm delivery.

Independent variable(s) – marital status, religion, socio-economic factors, age, educational level, factors that contribute to preterm delivery and mother's knowledge on preterm delivery.

3.6 Sample Size

To determine the sample size for the study, the researcher used Cochran's formula (1977).

$$\boldsymbol{n = \frac{Z^2 \times p * q}{e^2}}$$

Where,

$\boldsymbol{n}$ = sample size

$\boldsymbol{Z}$ = the z-score that corresponds with 95% confidence interval which is 1.96

$\boldsymbol{p}$ = Prevalence of preterm birth 0.33 (Asiedu et al., 2019)

$\boldsymbol{q}$ = 1-33% = 0.67

$\boldsymbol{e}$ = Margin of error set at 6% (0.06)

Therefore,

$$n = \frac{(1.96)^2 \times (0.33 \times 0.67)}{(0.06)^2} \cong 235$$

A non-response rate of 10% was added to the sample size to get 258.5. Therefore, the sample size of 260 was used to administer the questionnaire.

3.7 Sampling Technique

To select a respondent a convenience sampling technique was employed. Based on the inclusion criteria, qualified mothers with preterm babies were approached, and the research procedure was explained to them. Those who agreed to be part of the research were selected.

3.8 Pre-Testing

A pre-testing was done in order to evaluate the clarity of the questionnaires and do necessary amendments where applicable to the final questionnaires. The pre-testing was done among 15 respondents at Tema Polyclinic, a suburb of Tema. This helped to determine the validity of the instrument before the action data collection was done.

3.9 Data Handling

Participants were informed of the purpose of the study by so doing, their consent were sought and the questionnaires were administered to them to answer appropriately. Two Research Assistants were trained in collecting the data. Guidance was provided where necessary. The reliability of the tool was ensured by accurate and careful phrasing of each question to avoid ambiguity. This was done to discover potential challenge which was removed before the tool was deployed. Respondents were educated on the need to respond truthfully.

The data collected from respondents were confidential and kept only for the purpose of the study. The names of respondents were also not recorded on the questionnaire.

3.10 Data Analysis

The data was analyzed using Microsoft Excel version 2016 and STATA statistical software package (*StataCorp. 2007. Stata Statistical Software. Release 14. Statacorp LP, College Station, TX, USA*). A descriptive data analysis was done using STATA. The analyzed data were tabulated on frequency table.

3.11 Ethical Consideration

Ethical approval was sought from the Ensign College of Public Health Ethical Review Committee. Before the commencement of the project, permission was also sought from the Greater Accra Regional Health Directorate and Tema General Hospital Administration. Informed consent was also sought from participants after explaining the purpose of the study and the benefits to them. Participants were notified of their ability to take part in the study or not.

3.12 Limitations of the Study

Some difficulties that were encountered during the research included:

The unwillingness of some respondents to answer the questions to the researcher's satisfaction. The findings could not be generalized because of the small nature of the sample size used. Due to the Corona Virus Pandemic, getting the respondents to respond to the questions was a challenge.

3.13 Assumptions

It was assumed that all the study participants had knowledge of preterm delivery and had experienced it. It was further assumed that the respondents understood the questions asked and gave truthful answers.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction.

The study recruited a total of 257 respondents (preterm mothers) in Tema General Hospital, where all of them completed the survey resulting in a 98.46% response rate. The demographic information provided by the respondents showed that out of 257 mothers sampled, 14.01% (36) of them were teenagers ages between 14-19 years, while 104 respondents representing 40.47% fall between the ages of 25-29 years. Most of the mothers who delivered in Tema General Hospital (TGH) were married women which represent 60.31%. However, those who were either divorced, separated or widowed at the time of participation in the study constituted 5.45%, which was the least among the marital categories. Christians were of the majority (81.71%) while Muslims were the least of 18.29%.

Another demographic characteristic explored was the respondent's educational level. While 8.56% of the respondents had no formal education, 31% making up the majority had completed second cycle level of education. About 43.58% of the respondents were self-employed, including engaging in petty trading (Casual work), while 9.34% reported being housewives at the time of participation in the study (Table 4.1).

Table 4:1: Demographic characteristics of the study respondents

Variables	Freq. N=257	Percent (%)
Age Group		
14-19	36	14.01
20-24	59	22.96
25-29	104	40.47
30-34	58	22.57
Marital Status		
Single	88	34.24
Married	155	60.31
Divorced/Separated/Widowed	14	5.45
Religion		
Islamic	47	18.29
Christianity	210	81.71
Educational level		
No formal education	22	8.56
Primary	49	19.07
JHS	52	20.23
SHS/Voc./Tech	81	31.52
Tertiary	53	20.62
Occupation		
Student	28	10.89
Self employed	112	43.58
Casual work	42	16.34
Formal employment	51	19.84
Housewife	24	9.34

4.2 Alcohol and drug used Status

The use of alcohol and smoking during pregnancy was also an indicator the researcher explored from the respondents. From the study, it was realized that majority (84.4%) of the respondents do not use alcohol or smoked during pregnancy. However, 9 (3.50%) of the respondents said they use both alcohol and smoke during pregnancy as couples (Table 4.2).

Table4:2: Smoking and alcohol use pattern of the study participants during pregnancy

Variable	Frequency	Percent
Smoking Status		
Only my partner smoked	31	12.06
Both of us smoked	9	3.50
None of us smoked	217	84.40
Alcohol during Pregnancy		
No	223	86.77
Yes but occasionally	33	12.84
Yes, I took frequently	1	0.39

4.3 Knowledge on preterm delivery

This section tries to determine the knowledge of the respondents on preterm delivery. The investigator noticed that 22 respondents representing 8.56% had not heard of preterm delivery before while 91.44% who had heard of preterm delivery mentioned hospital (56.6%) as the source of their information. This means they heard it from the health worker, that is from the Midwife, Doctor, Community Health Nurses/ Community Health Officers (CHOs) while "others" said they heard from churches during health programs, community education by Non-Governmental Organization (NGOs) (Table 4.3)

Table 4.3 Respondents' knowledge level and source of information on preterm delivery

Variable	Freq. (N=257)	Percent (%)
Heard of preterm Delivery		
Yes	235	91.44
No	22	8.56
Asked among only those who heard about preterm **(n=235)**		
Source of Information		
Hospital	133	56.59
Media	26	11.06
Others	76	32.34

4.4 Perception of Preterm Delivery

About (49.03%) of the respondents were of the view that the mother's age does not determine preterm delivery while 40.47% disagreed and stated that, the maternal age is a determining factor of preterm delivery. Out of 257 respondents, the majority (59.53%) were of the view that smoking is a contributing factor to preterm delivery. The same as Alcohol use (58.75%) during pregnancy and illegal use of drugs (58.37%) as well as high blood pressure (69.26%) play a role in preterm delivery. According to the respondents, the height of the mother (51.36%) and previous medical conditions such as diabetics (40.47%) had no association with preterm delivery. The majority (78.99%) of the mothers were of the notion that domestic violence plays a critical role in preterm delivery (Table 4.4).

Table 4:4: Respondents' perception of the causes of preterm delivery

Variables	Freq. (N=257)	Percent (%)
Age of Mother		
Agree	104	40.47
Disagree	126	49.03

None	27	10.51
Smoking		
Agree	153	59.53
Disagree	65	25.29
None	39	15.18
Drinking of Alcohol		
Agree	151	58.75
Disagree	66	25.68
None	40	15.56
Using illegal drugs		
Agree	150	58.37
Disagree	64	24.9
None	43	16.73
High blood pressure		
Agree	178	69.26
Disagree	46	17.9
None	33	12.84
Height of the mother		
Agree	57	22.18
Disagree	132	51.36
None	68	26.46
Diabetes		
Agree	75	29.18
Disagree	104	40.47
None	78	30.35
Domestic Violence		
Agree	203	78.99
Disagree	35	13.62
None	19	7.39

4.5 Respondents' Perception of the Complications of Preterm Delivery

Assessing the participant's knowledge on complications of preterm delivery, it was observed that, the majority (62.26%) of the respondents were of the view that Cerebral Palsy is not a complication of preterm delivery. However, 97 respondents representing 37.74% were also of the view that Preterm delivery can also lead to the complications of cerebral palsy. Other complications (impaired learning, vision, psychological and hearing problems) that were explored from the respondents shows they perceived that preterm delivery does not lead to any of the variables mentioned above (Table 4.5).

Table 4:5: Perceived complications of preterm Delivery

Variables	Freq. (N=257)	Percent (%)
Cerebral Palsy		
Yes	97	37.74
No	160	62.26
Impaired learning		
Yes	99	38.52
No	158	61.48
Vision problems		
Yes	83	32.3
No	174	67.7
Hearing problems		
Yes	65	25.29
No	192	74.71
Psychological problems		
Yes	78	30.35
No	179	69.65
Chronic health issues		
Yes	87	33.85
No	170	66.15
Dental Problems		
Yes	39	15.18
No	218	84.82

4.7 Maternal obstetric risk in relation to preterm Delivery

In this section, the investigator explored obstetric and other medical indicators prior to preterm delivery. The variables include; gestational age of the respondents, parity, and other indicators. It was realized that only a few of the respondents (1.17%) had extremely preterm babies, the majority (82.88%) of the respondents falls between the very preterm classification (Blencowe,2012) whereas, (15.95%) are within the moderate to late preterm classification. In assessing the number of children (parity) that the respondent had 51.4% of the respondents were first-time mothers. Approximately 48.60% of the respondents had one up to four and above deliveries. Again, the

researcher explored other medical indications that could influence preterm deliveries; it was noticed that, Ante Partum Hemorrhage 115(44.75%) accounted for the highest medical condition that had effect on preterm deliveries.

Pre-Eclampsia/Hypertension 68(26.46%), premature rapture of membrane 46(17.90%) and Pregnancy Induced hypertension 11(4.28%) also played the top four leading roles in preterm deliveries. The rest of the medical conditions had minimum impact on preterm deliveries.

Out of 257 respondents, only 40 (15.56%) had pre-existing medical conditions while the majority had no such pre-existing medical conditions. 40 (15.56%) of the respondents had various medical conditions before getting pregnant, hypertension accounts for 42.5% of the risk factors whereas respondents who had both medical conditions (Hypertension/DM) accounted for 5% of the risk factors associated with preterm deliveries (Table 4.7).

Table 4:6 Maternal obstetric risk factors to preterm deliveries

Gestational age		
	Freq (N-257)	**Percent (%)**
Extremely Preterm	3	1.17
Very Preterm	213	82.88
Moderate to Late Preterm	41	15.95
Parity		
Zero	132	51.4
One	64	24.9
Two	44	17.1
Three	12	4.7
Four and Above	5	1.9
Indication for preterm Delivery		
Ante Partum Hemorrhage	115	44.75
Incompetent Cervix	4	1.56
Infections	2	0.78
Multiple Pregnancy	2	0.78

Pre-Eclampsia/Hypertension	68	26.46
Pregnancy Induced Hypertension	11	4.28
Premature Rupture Of Membrane	46	17.9
Previous Preterm Delivery	2	0.78
Sickle Cell Disease	3	1.17
Trauma	2	0.78
Foetal Distress	1	0.39
Gestational Diabetics	1	0.39
Pre-existing medical Condition		
No	217	85.77
Yes	40	15.56
Type of medical Conditions	**(N=40)**	
Hypertension	17	42.5
Asthma	13	32.5
Sickle cell disease	8	20
Hypertension/DM	2	5

4. 7 Bivariate analysis- association between demographic characteristics and knowledge on preterm delivery

The demographic determinants associated with preterm are shown in the table below using the bivariate analysis, it was observed that maternal age at registration (Pr-0.011) and Marital Status (Pr- 0.034), as well as Occupation (Pr- 0.000), were found to be significantly associated with Preterm Delivery. However, Maternal Education with the P-Value of (Pr-0.076) and Religion (Pr-1.000) had no association with preterm delivery (Table 4.8).

Table 4:7: Bivariate analysis to assess the association between knowledge and selected demographic characteristics

Demographic characteristics (N=257)	Heard about preterm delivery		P-value
	Yes n=235(%)	No n=22 (%)	
Age group (years)			
14-19	32 (88.89)	4 (11.11)	**0.011**
20-24	147 (81.36)	11(18.64)	
25-29	63 (96.88)	2 (3.12)	
30-34	93 (94.90)	5 (5.10)	
Marital status			
Single	75 (85.23)	13 (14.77)	**0.034**
Married	147 (94.84)	8 (5.16)	
Widow/Separated/Divorced	13 (92.86)	1 (7.14)	
Religion			
Christianity	18 (8.57)	192 (91.43)	**1.000**
Islam	4 (8.51)	43 (91.49)	
Education			
JHS	75 (85.23)	13 (14.77)	**0.076**
Primary	147 (94.84)	8 (5.16)	
SHS	76 (93.83)	5 (6.17)	
Tertiary	52 (98.11)	1 (1.89)	
No Formal Education	20 (90.91)	1 (9.09)	
Occupation			
Casual Work	33 (78.57)	9 (21.43)	**0.000**
Formal Employment	51(100.00)	0 (0.00)	
House Wife	19 (79.17)	5 (20.83)	
Self Employed	106 (94.64)	6 (5.36)	
Student	26 (92.86)	2 (7.14)	

***Fisher's exact** test*

CHAPTER FIVE

5.0 DISCUSSION

5.1 Preterm Delivery

This study examined the determinants of preterm delivery in Tema General Hospital. Reviewing secondary data from Tema General Hospital (TGH) from 2017 to 2019, it was revealed that the proportion of preterm delivery stood at 34% (DHIMS2, 2019). This proportion is high because TGH is one of the referral health facilities that provide essential/ specialized services to its client.

5.2 Demographic Determinants of Preterm Delivery

Some earlier empirical studies have established the relationship between selected demographic characteristics and preterm delivery (Nagalo *et al.*, 2015; Safer, 2007). Five demographic factors assessed in this study, including the ages of the respondents revealed that maternal age influences preterm delivery (p=0.011). This supports findings in the studies conducted by (Schoen & Rosen, 2009; Conde-Agudelo *et al*., 2005; Jacobsson et al., 2005). In another study conducted in Kenya, Pike, (2000), also reports that maternal age shows statistically significant (p=0,001) to preterm delivery. These findings were, however, contrary to another study by Adomako, (2017), which established no association between maternal age and preterm delivery (p=0.435).

The reported maternal marital status of the respondents in this study had seen a significant association (p=0.034) with preterm delivery. In Zimbabwe, a survey conducted among post-natal mothers who delivered prematurely (Tachiweyika, 2017) suggests that preterm delivery is influenced by respondent's marital status (p=0.021). In contrast to this, another study conducted in Southern Western Nigeria found maternal status at registration had no association with preterm delivery (Ezechi, 2003). Also, a study by Zerfu, (2016), reported that maternal status does not influence preterm delivery (p=0.231). A similar study done by Gregory and MacDorman (2015),

noted that marital attributes of mothers had no associations with preterm delivery. Maternal educational level is generally accepted as an essential predictor of preterm delivery (Mekonnen *et al.,* 2013). A higher maternal level of education may increase mothers' knowledge about child health and healthcare services, and thereby improve mothers' healthcare-seeking behaviours during pregnancy. In this study, however, maternal educational levels have no significant association with preterm delivery(p=0.076). Also, mothers with tertiary education were found to be 40% more at risk of preterm birth compared to mothers without or with lower qualifications. This could be because mothers of higher education are also older and may therefore be hungry for babies. With such thought, the least possibility of injury can therefore contribute to the uterus being drained by an obstetrician (Miyake *et al*., 2013). Again most of these women with higher education will have access to information and could hardly contact their providers for support for any alarming condition for medical decisions. These findings contrast with a study which examined educational disparities as a preterm risk. This was a comparative study of 12 European samples of birth, where Poulsen *et al*., (2015) observed different correlations between schooling and preterm care. They reported that 8 out of 12 populations with a low level of education was preferential to early birth. In this study, the profession of the respondents showed a strong association with preterm birth (p=<0.001). This is similar to a study carried out in Malawi (Bard, 2015), in which premature delivery among women who visit the Central Hospital of Kamuzu (KCH) has a statistical correlation with premature delivery (p=0.014). Nonetheless, the study by Asiedu (2016), showed no significant association between occupation and preterm delivery (p= 0.90). He was of the view that the level of patients referred from other facilities were of a lower socioeconomic status.

5.3 Knowledge and Perception of Preterm Delivery

From this study, it was revealed that 91.44% of the respondents had heard of preterm delivery and the most frequent source was from health staff (56.59%). Others such as religious programs, personal interactions and the media accounted for 43.41%. According to Fitzsimons & Cooper (2012), sources of information concerning the study of attitude, behaviour and perception is a determining factor of that study. The study added that sources of information predict the outcome of the area studied. In a similar study conducted in Uganda (Kiondo, 2014) reported that 87% of the respondents heard of preterm labour from the media. This was because preterm delivery was becoming an area of concern, and therefore stakeholders disseminated information in local languages for mothers and other stakeholders to understand. According to the report (Kiondo, 2014), the newspapers were the best source of information to express maternal health issues. In a survey by MacDorman (2014), 83% of health details was recorded by health workers and healthcare institutions. In this study, the respondents selected healthcare workers because they felt the best source to obtain information on health issues was from the health care providers.

Perception on preterm delivery was examined and about 40 % of respondents believed that the age of mothers was a decisive factor in premature delivery. This finding is similar to the studies by Losonkova *et al*., (2010) and Wagura (2014). They found that older mothers (40 and over) were at a greater risk of premature delivery and were even higher when compared to younger multiparous women (Losonkova *et al*., 2010).

5.4 Alcohol and Drug Use During Pregnancy

Studies show that smoking and drinking of alcohol during pregnancy has a direct impact on the unborn child. Drinking of alcohol and smoking of cigarette during pregnancy increases the chance of birth defects, premature babies, underweight babies, and stillborn births. These drugs can also

affect the child's memory and attentiveness. Furthermore, several findings show that the differences in the brain structure of babies born of mothers who use drugs, alcohol or tobacco when they are pregnant occur in early adolescents.

In contrast to this observation, another study conducted by Paula (2015), in Craiova Country Hospital, Romania reported that 77% of the mothers who had preterm delivery smoked during pregnancy. It is also reported by Cnattingius, (2004) that 64% of pregnant women smoked during pregnancies. This, according to Cnattingius, (2004) pointed out that the outcome of maternal smoking behaviour plays a significant role in preterm delivery.

According to Centre for Disease Control and Prevention (CDC), (CDC, 2014), Smoking during pregnancy increases the risk of health problems for developing babies, including preterm birth, low birth weight, and birth defects of the mouth and lip. Smoking during and after pregnancy also increases the risk of sudden infant death syndrome (SIDS). Additionally, E-cigarettes and other tobacco products containing nicotine (the addictive drug found in tobacco) are not safe to use during pregnancy. Nicotine is a health danger for pregnant women and developing babies and can damage a developing baby's brain and lungs. Also, some of the flavorings used in e-cigarettes may be harmful to a developing baby. The CDC in addressing the issue suggested every country should have a database and that this will help to know the socio-demographic features associated with preterm delivery, not just a facility-based survey with few respondents.

In this study, 12.84% of the respondents used alcohol during pregnancy. This, according to them, boosted their appetite level to crave for food for a healthy baby. Cnattingius (2004), in his study, noted that 10% of the mother's drank during pregnancy. Streissguth (2018) reported that 78% of the mothers did not drink during pregnancy; however, those who drank were of the view that they get energized for mobile activities. According to the CDC, the appropriate use of alcohol during pregnancy or during breastfeeding is not known. There is no healthy time to drink during breastfeeding. They have said that alcohol in

the blood of the mother passes through the umbilical cord to the baby a range of physical, behavioural and intellectual disabilities throughout its entire life. These challenges are known as foetal alcohol spectrum disorders. Kids with foetal alcohol spectrum disorders (FASDs) could also develop abnormal facial features such as the smooth border between the nose and upper lip (called the philtrum), small head circumference, shorter than average height, small weight of the body, etc. It is inappropriate for women to drink or smoke whiles pregnant, in the Ghanaian culture. Therefore, even if they did, they would not disclose it due to the immense complexities of alcohol consumption.

Additionally, smoking (Miyake *et al*., 2013) and excessive alcohol intake during pregnancy were key factors linked with preterm delivery in a similar study (Cornman-Homonoff *et al*., 2012). In a study carried out in singleton live births of women in Leicestershire and Nottinghamshire, Great Britain, a production that does not ban smoking and alcohol use, they did not observe any significant effect on the premature delivery of tobacco or recreational drugs. Yet alcohol and premature delivery have been significantly linked and indicated that avoiding drinking at an early pregnancy lowers the risk, thus providing an effective preterm delivery strategy (Smith *et al*., 2015). The use of illegal drugs during pregnancy is an important health concern. From this study, the participants believe that (58.75%) taking illegal drugs during pregnancy could lead to preterm delivery. According to the American Pregnancy Association, using illegal drugs is not safe for the unborn baby or the mother. They added that studies have shown the use of illegal drugs during pregnancy can result in miscarriage, low birth weight, premature labour, placental abruption, fetal death, and even maternal death (Wolf *et al*., 2001). Also in a similar study conducted by Ellickson (2017), reported that 89% of mothers who took in illegal drugs such as marijuana, cigarettes, and other forms of tobacco had different health defects with their babies. Mondal, (2015), in his paper

stated that preterm delivery and children born under-weight are the results of poor maternal nutrition, low prenatal vitamins, lack of rest by mothers, maternal stress and anxiety and use of alcohol, caffeine, tobacco and some other harmful drugs during pregnancy.

The United States Department of Health and Human Services, (2013) reported that between 2007 to 2008 about 95% of pregnant women abstained from illicit drug use within a period of 30 days. According to the report, lifestyle choices, such as smoking, cocaine use, and heavy alcohol consumption, can increase preterm delivery. Many studies have shown that an increased risk of preterm birth is related to maternal anxiety, maternal stress, and antenatal depression (Dole *et al.*,2003; Kim & Jung, 2012; Rondó *et al.*, 2003).

Maternal High blood pressure was assessed in this study; it was realized that 62.26% of the respondent noted that high blood pressure could cause a pregnant woman to have a preterm baby. According to Hilmert (2013), high blood pressure as well as hypertension including pregnancy-induced hypertension (PIH), preeclampsia, or toxaemia are considered as a major health concern for the pregnant woman and should be reported immediately.

The plurality of 51.36% denied when assessing maternal height that the height of the woman (short or high) could be a risk factor in premature delivery. According to Aseidu (2016), the female height had no major preterm birth relation (p=0.63). It is likely because in recent studies, the idea of vulnerability in people with small size has been questioned. The incidence of preterm in this group of women can be caused by other unexplained factors. This is similar to the finding from Sebayang *et al*., (2012), in which the associations between premature delivery and the risk factors were not significantly associated with premature delivery in Lombok, Indonesia and height. Against this study, a research study conducted in southern India to evaluate the risk factors for premature delivery in a secondary care hospital found that premature delivery was significantly linked to

height < 150 cm (Rao et al., 2014). The most common non-obstetric risk factor was < 150 cm in height. Gestational diabetes is associated with a higher rate of preterm delivery (Melamed & Hod, 2009; Engmann *et al.*, 2009). Pre-gestational diabetes currently complicates 4% of pregnancies, while gestational diabetes complicates approximately 8% of pregnancies (Starikov, Dudley, & Reddy, 2015). Some studies have showed that women with diabetes mellitus had worse pregnancy outcomes compared to women without diabetes, and gestational diabetes was associated with preterm delivery (Rashid *et al*., 2017). In this study, 40.47% of the respondents were of the view that diabetes could not account for preterm delivery. They, however, agreed (78.99%) that domestic violence is one of the factors that contribute to preterm birth and this supports a study conducted in Tanzania (Stöckl, 2013). According to Stockl (2013), most respondents were of the view that maltreatment of women during pregnancy has the highest chance for the woman to deliver her baby pre-mutually (p=0.011).

5.5 Perceived Complications of Preterm Delivery

In assessing the respondents view on complications associated with preterm delivery, about 37.74% said Cerebral Palsy is not a complication of preterm delivery. A Lie study (2010) has shown that premature birth before 37 weeks is a risk factor in developing numerous medical conditions, including brain paralysis. Children born early face a number of challenges. By addition, the womb of mothers protects the baby from disease and multiple abnormalities; premature birth fails such protections and thus many premature babies have to stay in intensive care facilities for newborns'. The study indicates that many of the neurological conditions and causes associated with cerebral paralysis (such as damage to the white matter of the brain, called leukomalacia periventricular or PVL), are closely associated with premature delivery. Premature babies have also an increased infection rate, which is another important risk factor for cerebral paralysis. Research were done to determine the

correlation between cerebral paralysis and premature delivery. In another study neonate that live were shown to be at increased risk of blindness, deafness, cerebral palsy, and developmental impairment (Akelllo *et al.,* 2008). There was a strong statistical association between premature birth and cerebral palsy (<0.001) (Lie, 2010). Studies have shown that there is a link between preterm birth and learning disability or cognitive impairment. This was assessed with an intelligence quotient (IQ) and a comprehensive neurological examination to detect movement disorders. A pioneering research, the National Institute of Neurological and Communicative Disorders and Stroke Collaborative Perinatal Program monitored 35 000 children born before neonatal intensive care for seven (7) years from the 1950's to the early 1960's. While 177 children born less than 34 weeks ago survived, the research showed that the risk of cognitive and motor failure increased. In his longitudinal study Aylward (2014) revealed that 34 percent of children born before 38 weeks have a cognitive impairment, and the need for Neurodevelopmental follow - up of the population born prematurely, especially given the emergence of neonatal intensive care and high-risk obstetric care, dramatically lowered the gestational age - specific mortality rate but not preterm birth rates. Nevertheless, in this study, the respondents believed that premature delivery is not a deficiency source. Vision problems were recorded as one of the health issues that affect preterm babies. This is because the final stages of vision and hearing development occur in the last few weeks of pregnancy (Alshaheen, 2010). Also, Bailit (2010) noted that premature birth is responsible for 35 per cent of instances of vision impairment and 25 per cent of instances of cognitive or hearing impairment. This study however recorded that (74.71%) of the respondents disagreed with the assertion that preterm delivery could result in vision problems. Bellizzi (2017), revealed that the eyes develop the most during the last three months of pregnancy. This means that the earlier a baby is born, the more likely they are to experience eye problems.

Other complications assessed such as, chronic health issues and dental problems were all not considered by the respondents as preterm complications.

A recent study in Ethiopia, observed that mothers who had a history of chronic illness such as diabetic mellitus, hypertension, cardiac problem, or asthma were 4.5 times more likely to have preterm birth in the subsequent pregnancy than mothers without a history of these chronic illnesses (Abdela &Amanon, 2015). Yet in this study, the respondents believed that chronic disease could not result in preterm delivery (66.15%).

5.6 Maternal Obstetric Risk Factors to Preterm Deliveries

The WHO describes pre - term childbirth as any pregnancy before 37 weeks, or less than 259 days from the 1st day of the last menstrual period of the mother (LMP). However, these types are classified into 3 depending on the gestational age of the female (GA): highly preterm (28 weeks); very preterm (28-32 weeks); mild or late preterm (32–37 gestation week). In this analysis (82.88%) of respondents' preterm babies came under the second group of WHO premature delivery classifications. The WHO (2014) reports that every year 15 million babies are born too early. It's higher than one child in five. About 1 million children die every year from preterm birth complications (Mullins, 2012). Many survivors face a lifetime of disability, including learning disabilities and visual and hearing problems (Kumar, 2012).

In the WHO (2012) report, it was found that the main cause of children under 5 deaths is prematurity. And premature birth rates are growing in almost all countries with reliable data. Many early births occur spontaneously (Mekonnen, 2013), although others are at risk of early labor induction or caesarean section, whether for medical or non - medical purposes. Musafili (2015) said frequent pre - term pregnancies, illnesses, and chronic conditions such as diabetes and high blood pressure are the common causes of preterm birth. In another study, it was reported that most

children born prematurely in Gavardo, Mali, were listed as WHO seconds. It is a guide to it research. Parity zero mothers were also found to be the majority (51.4%). Another study showed that parity zero or null parity is associated with a higher pre - term risk, with low perinatal results (Ota *et al*., 2014). By contrast, a study to determine preterm birth variables at Kenyatta National Hospital (KNH) found that preterm childbirth is linked to multiparty greater than three (3) (Wagura 2014). The study showed that 76% of the deliveries are also in the second group of WHO pre - term distribution classifications. Nevertheless, Aseidu (2016) noted that parity (p=0.295), background of early neonatal death (p=0.492), history of abortion(p=0.934) and hypertension(p=0.101) and tetanus toxoid vaccines (p=0.316) were maternal factors that did not significantly contribute to perinatal mortality in univariate logistic regression studies. The leading cause of premature delivery in this study appears to be antepartum haemorrhage. During the evaluation, the mothers found out that they were early born because of menstrual bleeding (44.75%). APH is bleeding from or into the genital tract after 24 weeks of pregnancy and before the child is born. Placenta praevia and placental abruption are the two significant causes of APH, although they are not the most common. APH makes 3 to 5 percent of pregnancies more difficult and is the world's leading cause of maternal and perinatal mortality (Sheiner, 2001). Studies by Faiz (2003), Rodger (2010) and Walfish (2009) all showed that maternal bleeding is a primary cause of premature delivery. Other medical conditions such as preeclampsia / hypertension (26.46%) and premature rupture of membrane (17.9%) were lower compared with antepartum haemorrhage.

Out of 257 respondents, 40 (15.56%) were of the assertion that pre-existing medical conditions could trigger preterm delivery. This was due to depression (42.5%) and asthma (32.5%). CDC (2016) shows that a pregnant woman and her infant are at risk of problems with consistent poorly

controlled blood pressure before and during birth. The incidence of maternal complications, such as severe preeclampsia, placental abruption, and gestational diabetes is enhanced. Such mothers are also at higher risk of poor birth outcomes, such as premature delivery, a young child for his gestational age, and child mortality. Kramer *et al.*, (2001) investigated the connection between socioeconomic pre - term delivery inequalities where they speculated that pre - term delivery among the socially disadvantaged is growing. They observed that chronic and acute psychosocial stressors, psychological distress caused by these stressors, increased secretion by CRH, changes in sexual behaviors or increased susceptibility to bacterial vaginosis and chorioamnionitis were positive for pre - term delivery, which could also complicate pre-life. Wadhwa *et al*., (2001) found out that maternal, psychological stress, known to be linked to unfavorable lifestyle factors, can encourage neuroendocrine activation or proinflammatory work - friendly pathways. Alshaheen (2010) stated that even after correction of the effects of social structural, medical and behavioral risk factors, mothers with elevated psychological or social tension are at an increased risk of preterm childbirth (generally twofold). Preterm birth has often been associated with susceptibility to clinically adverse circumstances such as accommodation, poverty and severe maternal suffering.

CHAPTER SIX

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This study shows respondents' knowledge on preterm delivery was adequate given that most (91.44%) who had heard of preterm delivery were also in agreement that medical conditions such as high blood pressure, the use of illegal drugs and drinking of alcohol influenced preterm delivery. Yet some disagreed diabetes is a precursor, but they did not form the majority. Areas of much concern in this study were about complications associated with preterm delivery. It was noticed that the respondents lacked information on this area. It was noticed that, majority of the respondents said complications such as cerebral palsy, learning problems, hearing loss etc. could not occur as a result of preterm delivery.

It was also observed that most of the women gave birth prematurely due to antepartum haemorrhage.

6. 2 Recommendations

The following recommendations will be beneficial if adopted

6.3 Community-level

There should be community-based education concerning preterm delivery through the collaborative efforts of the Assemblymen, religious leaders and Non-Governmental Organisations.

1. **Municipal Assembly**

The Municipal Assembly, through the social services sub-committee, should liaise with the Municipal Health Directorate to support the implementation of maternal health policies.

2. **Tema General Hospital**

The facility should ensure they intensify education on maternal health issues and throw more light on issues on preterm delivery and its associated complications. The facility should deploy the use of local languages in communicating with the caregivers at all levels

3. **Municipal Health Directorate**

The Directorate should make educational material available to all health facilities and support their efforts with well qualified public health nurses to scale-up maternal health education.

4. **National and Regional Health Directorate**

The Ghana Health Service (National) should ensure the Reproductive Health Strategic Plan (2007-2011) is modified and replaced with new ones as most health facilities are still using the older version. They should also strengthen the existing maternal framework to support service delivery. The regional level should play a supervisory role to meet the expectation of the national target.

5. **Future Research**

Future academic research work should focus on the use of a qualitative approach to gain an in-depth understanding of the attributable factors to preterm birth in the geographical area.

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APPENDIX A: INFORMED CONSENT

INTRODUCTION AND INFORMED CONSENT

Hello, my name is Cynthia Nartey and I am a student of Ensign College of Public Health, Ghana. I am conducting a research at Tema General Hospital in the Tema Metropolis on determinants of preterm delivery. I will be glad if you grant me your consent.

ur time to partake in this interview. Prematurity has a far-reaching impact on their development and on their health as children and adults. For a country like Ghana with a very high burden of preterm deaths, the solutions that require urgent implementation is to identify the determinants of preterm delivery for action to be taken. This interview will like to know the determinants of preterm delivery.

Confidentiality

We will not be sharing information about you to anyone outside of the research team. The information that we collect from this research project will be kept private. Any information about you will have a number on it instead of your name. Only the researchers will know what your number is and we will lock that information up with a lock and key. It will not be shared with or given to anyone except the research team on this study.

Risks

We are asking you to share with us some very vital and personal information about preterm delivery, and you may feel uncomfortable talking about some of the topics. You do not have to answer any question if you don't wish to do so, and that is okay with us. You do not have to give us any reason for not responding to any question, or for refusing to take part in the interview.

Benefits

There will be no direct benefit to you, but your participation is likely to help us to know the determinants of preterm delivery. You will not be provided any incentive to take part in the research.

Duration

I would like to ask you some questions about your knowledge and conditions that can lead preterm delivery. The interview usually takes about 20 to 30 minutes to complete.

Participation in this survey is voluntary and you can choose not to answer any question or all of the questions

At this time, do you want to ask me anything about the interview?

Would you want to participate now? **YES** **NO** ☐

ANSWER ANY QUESTIONS AND ADDRESS RESPONDENT'S CONCERNS.

RESPONDENT *AGREES* TO BE INTERVIEWED

1 - - - → BEGIN

OR

RESPONDENT *DOES NOT AGREE* TO BE INTERVIEWED

2 - - - - → END

Name of Interviewer _____

Date: _____

THUMB PRINT

RESPONDENT'S SIGNATURE: _____

DATE_____

APPENDIX B: QUESTIONNAIRE

DETERMINANTS OF PRETERM DELIVERY IN TEMA GENERAL HOSPITAL

Respondent's ID #: ……. Date:/……. /……...

Name of interviewer…….…….……..

Dear Respondent,

This questionnaire is in respect of a research being carried out on the topic above. It is purely for academic purpose, and your responses shall be kept in strict confidence and will not be transmitted to anyone. You also reserve the right to withdraw from the study, but your participation is much valued and appreciated. Your consent is implied for completing the questionnaire.

Please kindly take some time off your busy schedule and fill out this questionnaire honestly. Thank you.

SECTION A: DEMOGRAPHIC INFORMATION

Instruction: Tick where appropriate and answer the necessary question where require

1. Age of the mother (in years) .....

2. Marital status.

a. Single (never married). [ ]

b. Divorced/separated [ ]

c. Married. [ ]

d. Widowed. [ ]

3. Religion.

a. Catholic. [ ]

b. Muslim [ ]

c. Protestant. [ ]

d. others (specify).....

4. Maternal level of education.

a. No formal education [ ]

b. Primary [ ]

c. Junior High [ ]

d. Senior High [ ]

e. Tertiary [ ]

5. Maternal occupation.

a. Formal employment [ ]

b. Casual work [ ]

c. Self-employed/Business [ ]

d. House-wife [ ]

e. Student [ ]

Section II Risk factors of preterm delivery

6. Mother's Gestational age? [ ]

7. Maternal exposure to Preterm delivery …….

8. Parity prior to delivery [ ]

9. Pre-existing maternal medical condition delivery

a) [ ]

b) [ ]

If Yes what condition

a) Asthma [ ]

b) SCD [ ]

c) Chronic HPT [ ]

d) Diabetes [ ]

e) Others…….

10. Did you or your partner smoke tobacco during your pregnancy?

a. None of us smoked [ ]

b. Only my partner smoked [ ]

c. I smoked but my partner did not [ ]

d. Both of us smoked [ ]

10. Did you use alcohol during the pregnancy?

a. No [ ]

b. Yes but occasionally [ ]

c. Yes, I took frequently [ ]

Section II: Knowledge on preterm delivery.

Instruction: Tick where appropriate and answer the necessary question where require

11. Have you heard about preterm delivery?

A. Yes [ ]

B. No [ ]

13. If yes where did you get the information?

a. Hospital [ ]

b. Midwife [ ]

c. Media [ ]

d. others [ ]

Section III: Determinants of preterm delivery

Instruction: Tick where appropriate and answer the necessary question where require. which of the following are determinants of preterm delivery?

Statement	**Agree**	**Disagree**	**None**
14. Age of mother			
14. Smoking			
15. Drinking of alcohol			
16. Using illegal drugs			
17. High blood pressure			
18. Height of the mother			
19.Diabetes			
20. Domestic violence			

Section IV: Complications of preterm delivery

Instruction: Tick where appropriate and answer the necessary question where require. which of the following can be a complication of preterm delivery?

Statement	**Yes**	**No**
21. Cerebral palsy		
22. Impaired learning		
23.Vision problems		
24. Hearing problems		
25. Psychological problems		
26. Chronic health issues		
27. Dental problems		

Section III: Prevention of preterm delivery

28. In your own view, how do you think preterm delivery can be prevented?

……

……

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……

……

…….