UNIVERSITY OF CAPE COAST

OBSTETRIC AND PERINATAL OUTCOMES OF PREGNANCY AMONG TEENAGERS IN THE CAPE COAST METROPOLIS

MARGARET NYARKO-SAMPSON

2016

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BY

MARGARET NYARKO-SAMPSON

Thesis submitted to the School of Nursing and Midwifery of the College of Medical and Allied Health Sciences, University of Cape Coast, in partial fulfillment of the requirements for the award of Master of Nursing Degree

SEPTEMBER 2016

DECLARATION

Candidate's Declaration

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

Candidate's Signature……...Date……..

Name: Margaret Nyarko-Sampson

Supervisors' Declaration

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

Principal Supervisor's

Signature……Date…….

Name: Dr. Peter Mate Siakwa

Co-Supervisor's

Signature…….Date……

Name: Dr. FunmilayoAdeniyiOkalanwon

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Name:Dr. Funmilayo Adeniyi Okalanwon

ABSTRACT

Teenage pregnancy is a social problem worldwide. Literature has reported that teenage pregnancy has adverse maternal and neonatal outcomes. This study sought to assess the obstetric and perinatal outcomes of pregnancy among teenagers in the Cape Coast Metropolis.This retrospective case control study was conducted among 1,006 respondents made up of 505 teenagers (case) and 501 adults (control). Secondary data were collated from the obstetric registers, client folders and labour ward report books of three hospitals in the Cape Coast Metropolis.The researcher used frequencies, percentages, graphs, Chi-square tests and odds ratios in the SPSS to analyse the data. It was found that the mean age of the teenage mothers was 16. 9 years whiles that of the adults was 26.9 years. The rate of antenatal attendance was high among the teenagers than the adult. The teenagers had a lower risk of caesarean section delivery and a higher rate of spontaneous vaginal delivery as compared with the adult ($P< 0.001$). The rate of low birth weight babies born to the young mothers was significantly higher than that of babies born to the adult mothers ($P<0.002$). It was observed that a statistically significant difference existed between the APGAR score at the 1st minute (4-7) and (>7) ($P<0.001$) between the two groups. It was also revealed that teenagers were more likely to have live births deliveries compared to the adults ($P<0.007$). The study concluded that Teenage pregnant mothers in the Cape Coast Metropolis seem to have less risk pregnancy outcomes. This is probably due to improved obstetric and perinatal care. It was recommended that intervention programmes targeted at teenagers should be pursued in order to eliminate the risks of obstetric and perinatal complications among teenagers.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to my supervisors, Dr. Peter Mate Siakwa of School of Nursing University of Cape Coast and Dr. Funmilayo Adeniyi Okalanwon who was on sabbatical leave at the School of Nursing, for their professional and technical guidance, advice, encouragement and good-will with which they guided this work. I am truly grateful.

I am also grateful to Mr. Musa Mohammed and MissJoana Peace Otu for their generous contributions towards making this work better.I am again grateful to my son Eric for his immense help in the typing of this work. I wish to thank the authorities and staff of the hospitals where I conducted this study, and my research assistants for their assistance. I am as well grateful to all authors whose works I consulted and used in this work.

Finally, I wish to thank my family for their support, especially, my mother Sarah Nyarko, my husband Prof. Eric Nyarko-Sampson and my children Kofi and Afua.

DEDICATION

To my family, husband, mother, and children.

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LIST OF ABBREVIATIONS

Foetal death:	The situation of foetal demise occurring in the last four weeks of pregnancy or immediately after delivery.
GDHS	Ghana Demographic Health Survey
GHS	Ghana Health Service
Gravida	This refers to total number of pregnancies.
HIV	Human Immunodeficiency Virus
MDG	Millennium Development Goal
Obstetric Outcomes	This refers to pregnancy, childbirth and postpartum outcomes.
Parity	This refers to total number of deliveries.
Perinatal period	The perinatal period commences at 22 completed weeks (154 days) of gestation and ends seven completed days after birth
PIH	Pregnancy Induced Hypertension
Post-Term	Birth that occurs after 40 weeks of pregnancy.
Pregnancy	This refers to the interval of time beginning when an egg and sperm unite and ending when a baby is born.
Pre-Term:	Birth that occur before 37 weeks of pregnancy.

PROM	Premature Rupture of Membranes
Teenage:	This refers to age from 13 to 19.
UCCIRB	University of Cape Coast Institutional Review Board
UTI	Urinary Tract Infection
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

Background to the Study

Teenage pregnancy has traditionally been considered high-risk pregnancy, especially in developing countries. The underdeveloped pelvis in younger teenage mothers can mean that they have more difficulties in childbirth than adults Sulaiman, Othman, Razali, &Hassan, (2013). Lot of research has been done regarding the risk factors, complications and outcome of teenage pregnancy, but studies specifically on obstetric and perinatal outcomes among teenage pregnant mothers, are quite scarce in our country.(Shaikh, Shaikh, Shaikh &Isran, 2012).

Teenage pregnancy is a social problem worldwide (Derme, Leoncini, Vetrano, Carlomagno & Aleandri (2013). It is estimated that 16 million girls between the ages of 15 and 19 give birth every year, with 95% of these births occurring in developing countries. This number represents 11% of all births worldwide (WHO, 2009). Seven countries India, Bangladesh, Brazil, the Democratic Republic of Congo, Ethiopia, Nigeria and the United States of America account for half of all teenage births: (WHO, 2009). Pregnant teenagers are generally considered to be a high-risk obstetrical population, although the published evidence is inconclusive and contradictory. It has been postulated that if there is an increased risk, it may be because of an inherent biological disadvantage of childbearing during the teenage period (Kirchengast& Hartmann, (2003). Acording to Al-Ramahi and Saleh (2006) teenagers are a socially and

economically disadvantaged group.There are confounding behavioural factors that are more prevalent among adolescents, such as substance use and inconsistent prenatal care.

Teenage pregnant girls showed increased rates of unfavourable obstetric outcomes, as compared to their older counterparts. Teens showed a two-fold increase in the risk of experiencing pregnancy-related hypertension, as well as an increased rate of low birth weight infants (Pérez-López, Chedraui, Kravitz, Salazar-Pousada,& Hidalgo, 2011). According to Pérez-López et al. (2011), no significant difference was observed between primi-gravid teens and older women, for most antenatal complications, including hypertension, placental abruption, placenta praevia, premature rupture of membranes, urinary tract infections and anaemia.

Several researchers (Galvez-Myles & Myles, 2005; Yildirim, Murat Inal,& Tinar, 2005; Al-Ramahi,& Saleh, 2006; Gilbert,Jandial,Field,Bigelow, &Danielsen, 2004; Gortzak-Uzan, Hallak, Press, Katz, & Shoham-Vardi, 2001) report that adolescents, compared with older women, are at increased risk of adverse pregnancy outcomes.Preterm delivery, low birth weight (LBW) infants, small for gestational age (SGA) infants, and late foetal demise have been reported. Increased risk of anaemia, urinary tract infections, and sexually transmitted infections has also been reported among adolescents. According to Yadav, Choudhary, Narayan and Mandal (2008), obstetric outcome of teenage pregnancies have a low rate of caesarean section.

In a study in Nigeria, Ezegwui, Ikeakoand Ogbuefi (2012),reported that majority of the teenagers (78.3%) were nulliparous, they found that 19%

delivered through caesarean section, cephalo-pelvic disproportion as an indication for caesarean section (9.4%), preterm delivery (18.9%), low birth weight (23.0%), episiotomy (61.7%), and instrumental delivery (6.8%). Another study revealed a significant increase in preterm delivery, LBW and neonatal mortality when age at first childbirth falls below 16 years (Phipps & Sowers, 2002). The Ghana Demographic and Health Survey revealed that births to young mothers (under age 20 years) continue to be at a higher risk of dying than those of older mothers (Ghana Statistical Service, 2009). This study seeks to assess obstetric and perinatal outcomes of pregnancy among teenagers.

Statement of the Problem

Teenage pregnancy is a major contributor to maternal and child mortality, and to the vicious cycle of ill-health and poverty (WHO, 2012). The Global strategy for women and child health, stress the importance of addressing the health and welfare needs of teenage girls in order to achieve the fifth Millennium Development Goal on maternal mortality reduction (WHO, 2012). Despite declines since 1991, the teen birth rate in the United States remains as much as nine times higher as in other developed countries (Ventura,& Hamilton, 2011). In a multi-ethnic American study, teenage pregnant girls showed increased rates of unfavourable obstetric outcomes, as compared to their older counterparts. Teens showed a two-fold increase in the risk of experiencing pregnancy related hypertension, as well as an increased rate of low birth weight infants (Pérez-López et al., 2011). Teenagers are considered high risk due to the physical

immaturity of their reproductive system, which may not be able to withstand the strains of pregnancy and childbirth (Yeboah, 2012).

Literature has revealed that Ghanaian adolescents are highly sexually active and begin sexual activity at an early age (Ghana Statistical Service, 2004). As indicated by Ghana Demographic and Health Survey, 9.0% of women and4.0% of men reported having sexual intercourse by age 15. However, by age eighteen, 48.0% of women and 25.0% of men have had sexual intercourse (Ghana Statistical Service, 2004). These figures imply that some proportion of first sexual experience occurs during teenage period which may lead to teenage pregnancy. The GDHS, again indicated that at national level, some 14.0% of 15-19 years old adolescents are pregnant or are already mothers (Ghana Statistical Service, 2004). The Ghana Demographic and Health Survey revealed that births to young mothers (under age 20 years) continue to be at a higher risk of dying than those of older mothers (Ghana Statistical Service, 2009).Statistics by the Ghana Health services has revealed that about 750,000 teenagers between the ages of 15and 19 became pregnant in 2013. Close to 14,000 teenagers in the Central Region got pregnant in 2013, indicating a tremendous 62% increase in the region over the previous years (Modern Ghana, 2013). Report of the Family health Division of the Ghana Health service revealed that Central Region recorded teenage pregnancy rate of 15% in 2013, 14.8% in 2014 and 14.5 in 2015. These rates are higher than the national average of 12.3, 12.1 and 12.1 respectively. This implies that teenage pregnancy is common in Central Region.Literature on outcome of pregnancy among teenagers is limited in Ghana. Many studies have reported on teenage pregnancy and pregnancy outcomes in relation to other conditions in Cape Coast and Ghana

(Yeboah, 2012; Siakwa et al., 2014a; Siakwa et al., 2014b; Siakwa, Kpikpitse, Wisdom, & Asamoah , 2016). Their studies did not specifically look at teenage pregnancy outcomes. The purpose of this study was to assess the obstetrical and perinatal outcomes among teenage pregnant mothers in the Cape Coast Metropolis.

Purpose of the Study

The main purpose of this study was to assess the obstetric and perinatal outcomes among teenage pregnant mothers in the Cape Coast Metropolis.

The specific objectives were to:

1. Determine the socio-demographic characteristics of teenage pregnant mothers in the Cape Coast Metropolis.
2. Assess the influence of antenatal clinic attendance of the teenage mother on obstetric and perinatal outcomes of pregnancy in the Cape Coast Metropolis.
3. Assess medical conditions among teenage pregnant mothers
4. Determine obstetric outcomes of pregnancy among teenagers in the Cape Coast Metropolis.
5. Assess perinatal outcomes of pregnancy among teenage mothers in the Cape Coast Metropolis.
6. Compare obstetric and perinatal outcomes of pregnancies among teenagers and adults in the Cape Coast Metropolis.

Research Questions

In order to address the objectives, the following research questions were formulated:

1. What are the socio-demographic characteristics of teenage pregnant mothers in the Cape Coast Metropolis?
2. Does antenatal clinic attendance influence obstetric and perinatal outcomes of pregnancy among teenagers in the Cape Coast Metropolis?
3. What medical conditions affect teenage pregnant mothers in the Cape Coast Metropolis?
4. What are the obstetric outcomes of pregnancy among teenagers in the Cape Coast Metropolis?
5. What are the perinatal outcomes of pregnancy among teenage mothers in the Cape Coast Metropolis?
6. What are the obstetric and perinatal outcomes of pregnancy among teenagers and adults in the Cape Coast Metropolis?

Significance of the Study

The study would be of great significance to various stakeholders. It would also make several noteworthy contributions to practice, education and research. This study would bring new knowledge that would be valuable for policy direction in the area of obstetric outcomes of pregnancy among teenagers. Findings from this study should direct policy makers to concentrate on policy direction guidelines on how to manage teenage pregnancy to prevent or reduce adverse obstetric outcomes. Findings from the study would allow measures to be

put in place to prevent teenage pregnancy or reduce its occurrence through improved adolescent health services in Ghana. Improved adolescent health would contribute to the achievement of MDG goals 4 and 5. The research would serve as a base for future studies by providing literature in the area.

For the Metropolitan Health Directorate, the study would serve to augment its continued information, education and communication programmes to curb teen pregnancy in the metropolis. Parents and the general public would also be educated on the adverse obstetric outcomes of teenage pregnancy and therefore know how to engage themselves well.

Delimitation of the Study

The study was delimited to three public hospitals, namely, the Cape Coast Teaching Hospital, Cape Coast Metropolitan Hospital and the University of Cape Coast Hospital in the Cape Coast Metropolis. The cohort consisted of teenage pregnant mothers and mothers aged 20-34 years. Mothers aged 13-19 years were the cases, while 20-34 years were the control group within the period of January 1, 2014 to December 31, 2014.

Limitations of the Study

A number of caveats needed to be noted regarding the study. The use of secondary data could be fraught with inconsistencies and some folders had missing data on certain vital variables. However, the researcher instituted robust statistical procedures to have reliable data for analysis.

Organisation of the rest of the study

The study is organised into five chapters. Chapter Two is the review of literature relevant to the research. Chapter Three discusses the research methodology of the study. It describes the study design, the study setting, population and sampling, and data collection and analysis. Chapter Four presents the results of data analysis and discussions. Chapter Five summarizes the findings, draws conclusions from the study and offers recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter deals with the review of related literature which serves as a link between past works and this current study. Title searches, articles, journals, and research documents, and applicable support references were gathered from online sources such as EBSCOHOST, CINAHL, HINARI, and Google Scholar. Using key word combinations such as teen pregnancy, teenage pregnancy, adolescent pregnancy, obstetric and perinatal outcomes. Only articles utilizing information gathered from 2000 to 2016 and relevant to this study were reviewed.

Related literature was reviewed under sub-headings such as:

- Concept of teenage pregnancy,
- Socio-demographic characteristics of teenage pregnant mothers
- Antenatal clinic attendance and obstetric and perinatal outcomes of pregnancy among teenagers.
- Medical conditions among teenage pregnant mothers
- Obstetric outcomes of pregnancy among teenagers
- Perinatal outcomes of pregnancy among teenage mothers
- Obstetric and perinatal outcomes of pregnancies among teenagers and adults.

Concept of Teenage Pregnancy

Teenage pregnancy is one of the important public health and social problems all over the world with a varying prevalent rate. According to Kumar, Singh, Basu, Pandey and Bhargava (2007), the incidence is increasing in recent years due to early onset of puberty, early sexual activities in girls, and relative lack of education about contraceptive methods. Hoque, Towobola, Mashamba and Monokoane (2014), assert that teenage pregnancy is considered to be an important public health problem and it is most prevalent in sub-Saharan Africa. The McGraw-Hill Concise Dictionary of Modern Medicine (2002) defined teenage pregnancy as pregnancy, occurring between thirteen and nineteen years of age. It is pregnancy by a female, aged 13 to 19, which is understood to occur in a girl who has not completed her core education, has few or no marketable skills, is financially dependent upon her parents and or continues to live at home and is mentally immature.

According to the United Nations Fund for Population Activities (UNFPA, 2002), teenage pregnancy is defined as a teenage girl, usually within the ages of 13-19, becoming pregnant. The average age of menarche (first menstrual period) in the U.K is 12.6 years old, though this figure varies by ethnicity, and body weight (Traggiai,& Stanhope, 2003). Worldwide, rates of teenage pregnancy range from 143 per 1000 in some sub- Saharan African countries to 2.9 per 1000 in South Korea (Treffers, 2003; UNICEF, 2001). Teenage pregnancy is defined as gestation in women before having reached the full somatic development. The percentage of childbearing teenage girls is regionally high variable depending on

cultural, religious, political, economic and other factors. Pregnancy in the very young is generally considered to be a high risk event because of the additional burden imposed by reproduction on a still growing body (Paranjothy, Broughton, Adappa, & Fone, 2008).

Teenagers may consider themselves grown up and therefore mature enough to have sex (Green, Pool, Harrison, Hart, Wilkinson &Nyanzi, 2001; Nzioka, 2001). The term in everyday speech usually refers to girls who have not reached legal adulthood, which varies across the world, who become pregnant. There are, however, girls as young as ten who are sexually active and occasionally become pregnant and give birth (Cherry, Byers,& Dillon, 2009).According to UNICEF (2008), factors that contribute to teenage pregnancies include customs and traditions that lead to early marriage (especially in developing countries), adolescent sexual behaviour which may also be influenced by alcohol and drugs, lack of education and information about reproductive sexual health including lack of access to tools that prevent pregnancies, and peer pressure to engage in sexual activity. Others are incorrect use of contraception, sexual abuse that leads to rape, poverty, exposure to abuse, violence and family strife at home, low self-esteem, and low educational ambitions and goals. Research, according to UNICEF (2008), indicates that teen pregnancy and motherhood can have detrimental socio economic and psychological outcomes for the teen mother and her child.

A teen mother is more likely to drop out of school, have no or low qualifications, be unemployed or low-paid, and live in poor housing conditions. She may also suffer from depression which may result in suicide.The child of a

teen mother again, is more likely to live in poverty, grow up without a father, become a victim of neglect or abuse, and do less well at school(UNICEF, 2008). The child may become involved in crime, abuse drugs and alcohol, and eventually become a teenage parent and begin the cycle all over again(UNICEF, 2008). It has been suggested that the increase in teenage pregnancy may be related to both the decrease in the mean age at menarche at every generation and a general breakdown in strong family ties and cultural norms ((Nessa, Zebunnesa, Bari & Saleh, 2014).

Socio-Demographic Characteristics of Teenage Pregnant Mothers

Teenage mothers are likely to be unmarried, poor and to sacrifice education. Isolation, unstable marriages, stress, and guilt are among many social and psychological problems faced by young mothers (Isa & Gani, 2012).The review of socio-demographic characteristics of teenage pregnant mothers was based on the following factors: age, educational background, religion, marital status, parity, occupational status, ethnicity and facility.Young maternal age at delivery has been proposed as risk factor for adverse pregnancy outcome, and it occurs in all races, faiths, socioeconomic statuses, and regions (Isa & Gani, 2012).

Mothers younger than 18 years are known as a group at high obstetric and foetal risk. Legally, in Chile they have not reached the maturity of age (López, & Bréart, 2013). According to Selcharan, Kim, Oulman,& Tamim, (2015), teenagers (18-19) are more likely to report intended pregnancy as compared to teenagers 15-17 years of age. Izugbara (2015) reported in a study conducted in Nigeria that adolescents aged 18 are more likely to experience teenage pregnancy. He further

observed that age was an important and also significant in the prediction of teenage pregnancy. In their study, (Kaminis,& Avvaru, 2014), found that 98% of their respondents belonged to higher teenage (17-19)and the rest 2% mothers were (15-16) years of age. No case was found in the lower teenage (13-14) group. A study conducted by Saxena et al, (2010), to assess maternal and perinatal outcome amongst primigravid teenage and older mothers at Safdarjung Hospital in Northern India, revealed that the age group of 15-19 years account for 19 per cent of the total fertility of the countrywith about 58 per cent of the total adolescents commencing childbearing.Research has reported that in Bangladesh, 72.5% of women experienced first marital pregnancy during their teenage (Sayem, & Nury, 2011). Nessa et al. (2014) set out to study the socio demographic factors related to teenage pregnancy and its complications. A cross sectional observational study was performed over a period of one year (September 2009-August 2010) at the obstetrics department of Chittagong Medical College Hospital. It was found that teenage mothers have significant lower mean age at delivery than adults.

A study conducted in Malaysia revealed that teenagers who had given birth had lower educational levels (Khairani, Suriati, & Azimah, 2010). The majority of pregnant teenagers attended up to secondary school, with a small percentage (22.5%) having only completed primary education and 2.9% not having received any formal education (Khairani et al., 2010). Another interesting finding of this study was that teenagers who do not involve themselves inschool activities have a significantly higher chance of becoming pregnant. Another study by Kwa et al. (2001)in a Malaysian semi-rural clinic showed a similar finding,

whereby 32.5% of pregnant teenagers had a low educational background (Kwa et al., 2001). Dropping out of school predisposes teenagers to possessing inadequate knowledge about reproductive health and hence to engage in risky sexual activity which may end up in teenage pregnancy(Suan, Ismail,& Ghazali, 2015).A study in Delta State, Nigeria showed, that teenage mothers with higher educational status utilized antenatal care services (Awusi, Anyanwu, & Okeleke, 2009). Limited education appeared to be related to teenage pregnancy (Brenon, McDonanald,& Shlomowit, 2005).Sharma, Vema, Katri,and Kannan, (2002)also reported that there is the likelihood that teenage pregnancy and childbearing is associated with low level of education. Education could play a significant role in developing self-confidence, increasing age at first sexual intercourse and delaying marriage (Waszak, Thapa,& Davey, 2003).

A study conducted by Wasuna and Mohammed (2002) in Kenyatta National Hospital revealed that teenage mothers were more likely to have less formal education.Another study conducted in Niger Delta of Nigeria, on socio-demographic determinants of teenage pregnancy, revealed thatmajority of the teenagers were with less formal education (Isa & Gani, 2012).According to Inzugbara, (2015)there was a significant increase in the risk of teenage pregnancy if the teenage girls had no education or only primary education. It was also observed that adolescent girl's education was an important and significant predictor of teenage pregnancy.Wellings et al. (2001) found that sexually active females who left school early (at the minimum school leaving age of 16) were more likely to experience early pregnancy and motherhood before age 18.

According to Brenon et al. (2005), religious and cultural factors appeared to be related with teenage pregnancy. Lisa, (2009) reported that the journal 'Reproductive Health' describes what researchers call "a strong association" between the teenage birth rate of a particular state and its "level of religiosity." The correlation was not what one might expect. The report revealed that the more religious the state, the higher the rates of teen pregnancy. On the contrary, research has suggested that greater religiosity is associated with either greater abstinence or lower teen birth rate (Hardy,& Raffaelli, 2003). Similarly, Dodge, Sandfort, Yarber, and de Wit (2005)observed that religiosity is associated with behaviors that could lead to a higher teen birth rate.Islam has no guidelines about the age of marriage either for boys or girls. It leaves the determination of appropriate age for marriage to individuals and their societies according to their needs and circumstances. What Islam guides about this matter is that there should absolutely be no sexual activity before or outside of marriage (Ayup, 2016).

A study conducted in Niger Delta of Nigeria on socio-demographic determinants of teenage pregnancy, revealed thatmajority of the teenagers were single (Isa,& Gani, 2012).Wasuna and Mohammed (2002),compared some socio-demographic and obstetric factors between teenage mothers (aged below 20 years) and older mothers of low birth weight (birth weight < 2000gm) babies in a cross sectional descriptive study in the New-born Unit of the Kenyatta National Hospital. Sixty nine(69) adolescent mothers and 73 older mothers were studied. They found that adolescent mothers were more likely to be unmarried.Sekharan et al. (2015) reported that teenagers who reported having a partner were more likely to experience an unintended pregnancy. Kamini and Avvaru (2014) also reported

in their study to explore maternal and foetal outcomes of teenage pregnancy that 98% of teenage mothers were married indicating that premarital sex is not an issue in this community.Result of a study conducted by Naseem, Hamayun and Bilal (2013) showed that majority of the teenage mothers were unmarried. This may have an association with Waziristan military operations, as early marriages and teenage pregnancies are common in tribal culture of that community.

A study carried out at a tertiary hospital in Enugu, Nigeria, revealed that majority of the teenage mothers were nulliparous (Ezegwuiet al.,2012). Wasuna and Mohammed (2002) compared some socio-demographic and obstetric factors between teenagers mothers (aged below 20 years) and older mothers of low birth weight (birth weight < 2000gm) babies in a cross sectional descriptive study in the New-born Unit of the Kenyatta National Hospital. Sixty nine adolescent mothers and 73 older mothers were studied. They found that adolescent mothers were more likely to be primigravida.Briggs, Hoppmanand Jamieson (2005), demonstrated that teenagers and adults were similar in terms of parity. Research in Pakistan to find out the foetal and maternal outcome of teenage pregnancy revealed that Primigravida were 94%, gravida two were 4.2% and patients with third pregnancy in teen age were only two (Naseem et al., 2013). A cross-sectional observational study conducted in three facilities at Pakistanto assess frequency of obstructed labor in teenage pregnancy showed that about 73.9% (190) of the respondents were primigravidas and the remaining were in their subsequent pregnancies (Shaikh et al., 2012).Briggs, et al. (2005), demonstrated that teenagers and adults were similar in terms of parity.

A study conducted in Niger Delta of Nigeria, on socio-demographic determinants of teenage pregnancy revealed thatmajority of the teenagers were unemployed (Isa,& Gani, 2012).Wasuna and Mohammed (2002) compared some socio-demographic and obstetric factors between teenagers mothers (aged below 20 years) and older mothers of low birth weight (birth weight < 2000gm) babies in a cross sectional descriptive study in the New-born Unit of the Kenyatta National Hospital. Sixty nine adolescent mothers and 73 older mothers were studied. They found that adolescent mothers were more likely to be unemployed.A United Kingdom-based study revealed that 89% of teenage mothers were unemployed and most live in poverty with nearly half being in the bottom fifth of income distributions (Mayor, 2004). It has been argued by Pérez-López et al.(2011), that the poor pregnancy outcomes associated with teenage reproduction are due more to the disproportionate number of teenage mothers who live in poverty and are unemployed.

According to Ash and Ogakwu (2014), ethnicity is known to be a very important determinant of teenage pregnancy. Their study conducted in London to identify the important risk factors as well as observe some short and long term maternal and perinatal outcomes associated with teenage pregnancy, revealed that White-British' cohort presented with the highest frequency (28.6%), followed by the 'Black (British) Caribbean' population (22.9%) and the 'Black (British) African' population (20.0%), with the lowest rate (0.7%) observed in the 'Bangladeshi' population. One population-based study in England by Bradshaw, Finch and Miles (2005) found that areas with more ethnic minorities had higher teenage pregnancy rates.Lemos (2009) reported that there are variances in the

incidence of teenage pregnancies between ethnic groups, which are not simply explained. The differences are not straightforward between white and black communities. Key variables seem to be that socially conservative communities tend to have fewer teenage pregnancies and ethnic communities more heavily represented in neighbourhoods of concentrated social disadvantage are those most at risk of teenage pregnancies (Lemos, 2009).A study by Adzitey and Suuk (2013) revealed that ethnicities of the respondents were Builsa (65%), Kasena (15%), Mamprusi (10%), Bimoba (5%) and Sisala (5%). This shows that Fumbisi is made up of different ethnicities; thus teenage pregnancy is a problem not only among the Builsas but other ethnic groups in Fumbisi and Ghana as a whole.

A research conducted in Tuen Mun Hospital in Hong Kong, showed that, the frequency of teenage primigravid pregnancies was 5.1% (Liu, & Cheung, 2011). This was much higher than 1.4% (figure for the general population in Hong Kong) (Territory-wide O&G Audit Report, Hong Kong, 2004). This could be because Tuen Mun Hospital is a facility that serves a region in Hong Kong that is relatively less well-off. It is populated with more new immigrants and socially deprived people. Teenage pregnancies tend to occur more frequently in communities where individuals receive less attention and care from family members (Liu,& Cheung, 2011).

Antenatal Clinic Attendance and Obstetric and Perinatal Outcomes of teenage Pregnancy

Antenatal care (ANC) or pre-natal care means, “care before birth” and includes education, counselling, screening to monitor and to promote the well-

being of the mother and foetus. ANC is one of the "four pillars" of safe motherhood; the other three are family planning, safe delivery and essential obstetric care(WHO, 2007). The package was devised to ensure that women go through pregnancy and childbirth safely and have healthy infants. In other words, it was to prevent the dreaded outcomes of maternal, perinatal and infant death (WHO, 2007). ANC service indirectly saves the lives of mothers and babies by promoting and establishing good health before childbirth and the early post-natal period (Bulatoo, 2000). It often presents the first contact opportunities for a pregnant woman to connect with health services, thus offering an entry point for integrated care, promoting healthy home practices, influencing care-seeking behaviours and linking women with pregnancy complications to a referral system; thus impacting positively on maternal and foetal health (Bulatoo, 2000).

The very low maternal/infant morbidity and mortality rates reported for developed countries compared with the extremely high figures in developing countries have been attributed to the higher utilization of modern obstetric services by the former. Currently, 71% of women worldwide utilizes ANC services; and in industrialized countries – 95%, South Asia – 54% and Sub-Saharan Africa – 64% (Lawn,& Kerber, 2006). Owing to denial and fear of rejection by their family, pregnant teenage mothers tend to skip antenatal care and in the worst case scenarios, do not book their pregnancy at all, (Suan et al., 2015).Studies conducted in Niger Delta of Nigeria on Socio-demographic determinants of teenage pregnancy revealed that majority of the teenagers were unbooked (Isa,& Gani, 2012).A cross-sectional study on 210 pregnant women referred to Afzalipour Hospital was carried out to determine the impact of pre-natal care on

maternal and foetal outcome among teenage pregnant mothers and their adult counterparts. The study revealed that, the birth weight of new-born with adequate prenatal care was significantly higher. The 1st and 5th minute Apgar scores were not significantly different between the two groups. However, in the study by Boss et al. (2001) sufficient prenatal care was associated with improved neonatal mortality, birth weight, and Apgar score. Gestational diabetes was more frequent in women with adequate pre-natal care (Boss et al., 2001).

A study conducted in a teaching hospital in Malaysia revealed that significantly higher percentage of teenage subjects (26.9%) than older women (12.5%) did not make any antenatal visits at all. The study found that low birth weight was the only significant difference between the two age groups, and it was related to non-utilization of prenatal care rather than biological age (Sulaiman, Othman, Razali, & Hassan, 2013).A 3-year retrospective study conducted at a Malaysian university hospital showed that nearly a quarter of the teenage mothers had less antenatal care visits and significant risk of delivering low birth-weight babies compared with an adult group (Sulaiman et. al.,2013).

In their study on teenage pregnancies at two major hospitals in Klang Valley, Khairani et al.found that teen mothers had had less antenatal care follow-up, more frequent anaemia, and were unsure about their expected delivery date (Khairani et al., 2010). Another study in Delta state found mothers with higher educational status; spouse's high education level and those who had income-yielding occupations utilized antenatal care services; while housewives, with no other occupation, and women with a parity of more than 4 children utilized antenatal care services less (Awusi et al., 2009).

Another study by Adekanle (2008)in Osogbo, on timing of first ANC visit (booking clinic) found that mean gestational age at booking was 20.3±6.2 weeks and prevalence of late entry to antenatal care was 82.6%. Maternal education and age were significant factors influencing late booking. Lack of awareness, illiteracy, low socioeconomic condition, delay in seeking ante and intra natal care are the factors adding risk to increased caesarean sections and perinatal complications in teenagers(Nessa et al., 2014).

However, there are studies which have attributed the poor pregnancy outcome of teenage pregnancy to lack of antenatal care, rather than to maternal age (Isaranurug, Mo-Suwan & Choprapawon, 2006; Taffa, 2003). Similarly, report of a study revealed that, low birth weight was the only significant difference between teenagers and adult mothers, and it was related to non-utilization of antenatal care rather than biological age Chen,Wen, Fleming,Demissie, Rhoads & Walker, 2007).Research indicates that pregnant teenagers are less likely to receive prenatal care than older women, often seeking it only in the third trimester, if at all (Loto,Ezechi,Kalu, Loto, Ezechi& Ogunniyi2004). A study conducted in University of Malaya Medical Centre, revealed that higher percentage of teenage subjects (26.9%) than older women (12.5%) did not make any antenatal visit at all(Sulaiman et al, 2013). Furthermore, Sulaiman et al, (2013) reported that, teenage mothers also had fewer antenatal visits compared with the older age group. However, Hogue& Hogue, (2010) observed higher numbers of average antenatal visits for both teenagers and adults. This is so because access to maternal health care was free at the public health facilities.

In a study from Zimbabwe, transport costs and costs for prenatal services were characterized as major factors influencing adolescents late or non-utilization of prenatal services. In the same study the limited knowledge of young women about antenatal care programs and the fear of HIV testing were further obstacles to inefficient antenatal care (Chaibva, Ehlers, &Roos,2009).Magadi, (2004) reported that delay in seeking ante and intra natal care is a factor adding risk to increased operative interference and perinatal complications in teenagers.

Medical Conditions among Teenage Pregnant Mothers

The medical conditions reviewed include: diabetes, Urinary Tract Infections, (UTI) syphilis, Human Inmmuno Virus (HIV) and Hepatitis B.According to Kovavisarach, Chairaj, Tosang, Asavapiriyanontand Chotigeat (2010), diabetes mellitus Diabetes Mellitus (DM) is significantly higher in the adult mothers as compared with teenage mothers. Previous research reports similar incidence of such complication between teenage and adult mothers (Nato, 2005; Thato, Rachukul, &Sopajaree, 2007; Al Ramahi, &Saleh, 2006; Kumar et al., 2007). DM during pregnancy in the USA has increased progressively with maternal age, showing from 8.3 per 1,000 singleton live-born infants of maternal age under 20 years old to 16.3, 25.1, and 33.8 per 1,000 singleton live-born infants of maternal age 20-24, 25-29, and 30-34 years old, respectively (Kovavisarach et al., 2010).A study conducted by the American Diabetes Association revealed that the rate of preterm birth and foetal death (still birth) among teenage pregnant mothers, who had type 2diabetes before getting pregnant, was high. This was not different when it was compared with their counterparts

aged 20–35 years old (Klingensmithet al., 2015).Carmody et al. (2010) reported that teenagers with type 1 diabetes mellitus may constitute a high-risk group for adverse pregnancy outcomes.

Two UK studies reported 1.5-fold to 1.6-fold risks of UTI (Jolly, Sebire,& Harris, 2000) and pyelonephritis (Gupta, Kiran & Bhal, 2008) among all teenagers. In contrast, no excess risk was found in a Latin American study in which teenagers were analyzed in subgroups by age (Conde-Agudelo et al., 2005). Researchers have speculated that, teenagers might be sexually more active during pregnancy compared with older women, placing them at a higher risk of UTI. In addition, poorer recognition of symptoms of UTI could lead to delayed care and put them at increased risk of pyelonephritis. UTIs and pyelonephritis in particular, have been associated with higher risks of adverse neonatal outcomes (Mittal &Wing, 2005; Farkash, Weintraub, &Sergienko, 2012). According to Briggs et al., (2007), having had a UTI during pregnancy is associated with a non-significant increase in the likelihood of preterm delivery.

According to Mayor (2004), teenage pregnancies and births are considered as risky. An adverse maternal outcome of teenage pregnancy includes,sexually transmitted diseases, such as syphilis. Literature reported that the prevalence of Sexually Transmitted Infectionsin pregnant teenagers was 28.1%, hepatitis B = 3.3%, trichomoniasis 1.7%, Herpes simplex = 0.8% and condyloma acuminata = 0.8%). No Syphilis was identified (Asavapiriyanont, Chaovarind, Kaoien, Chotigeat,& Kovavisarach, 2016).A study from South Africa has reported that the incidence of HIV is higher among pregnant women than among the general population (Rehle et al., 2007). Incidence of HIV and pregnancy among teenagers

remain high in South Africa. HIV prevalence among young women aged 15–19 is 6.9% and is 21.1% in the age range of 20–24 (Shisana et al., 2009).Adverse Maternal outcomes of teenage pregnancy include, sexually transmitted diseases, such as HIV(Mayor, 2004). Teenager's having unprotected heterosexual intercourse, are at risk of HIV infection and unwanted pregnancy (Christofides et al., 2014).

A study in Pakistan found that the HBV infection was lower (13.4%) among individuals aged 11 to 20 years and higher (34.9%) among those aged 21 to 30 years (Khan et al., 2011). Suen et al. (2013) observed that the prevalence of Herpatitis BVirus infection in university students in Hong Kong SAR, increased with age: it was 0.9%, 2.3%, 4.3% and 5.5% in those aged ≤ 18, 19, 20 and ≥ 21 years, respectively. The prevalence also increased with age among women who underwent antenatal screening at a hospital: it was 2.5%, 2.7%, 8.8% and 8.0% in those aged ≤ 16, 17, 18 and 19 years, respectively (Lao, Sahota, Suen, Chan, &Leung, 2013).Siakwa et al. (2014) conducted a study among 512 pregnant women attending antenatal clinic in the Cape Coast Teaching Hospital, Ghana. They obtained 262(51%) HBsAg positive and 250(48.8%) HBsAg negative and concluded that babies born to mothers with positive HBsAg status have a higher risk for vertical transmission as well as adverse neonatal consequences.Mbaawuaga, Enenebeaku, Okopi, & Damen, (2008) reported that the prevalence of HBsAg was highest among teenagers (10 – 19 years). Studies have suggested that acute HBV infection in pregnancy has no teratogenic effects (Jonas, 2009; To, Cheung, & Mok, 2003; Lobstein, Faber, & Tillman, 2011). Birth weight is perhaps the only pregnancy outcome that has been studied

extensively with regards to its relationship with maternal HBsAg status. Findings of a study revealed a significant positive relationship between a positive maternal HBsAg status and infant birth weight, despite no differences in obstetric complications (Lao et al., 2012).

Obstetric Outcomes of Teenage Pregnancy

Complications of Pregnancy

In general, teenage pregnancy is believed to carry a higher risk of adverse maternal outcomes. This is based on the fact that teenage mothers are physically and biologically immature to go through pregnancy. This is supported by findings from the 8th Report on Confidential Enquiries Into Maternal Deaths in Malaysia, where women younger than 20 years old had a Maternal Mortality Ratio (MMR) of 32.0 per 100,000 live births in 2006 (Suan et al., 2015).According to United Nations (2001), some of the maternal outcomes (complications) of teenage pregnancies include; anaemia, hypertensive disorders of pregnancy, gestational diabetes, antepartum/postpartum haemorrhage, ruptured uterus, traumatic lesions, premature rupture of membranes and chorioamnionitis. The complications, if not controlled can lead to maternal death (United Nations, 2001). Many studies have reported an increased risk of complications of pregnancy amomg teenagers, like anaemia, pregnancy-induced hypertension, preeclampsia, eclampsia, prolonged labour and cephalo-pelvic disproportion. (Kumar et al., 2007; Goonewardene, Deeyagaha & Waduge, 2005; Chen,Wen, Fleming & Demissie, Rhoads & Walker, 2007).

A study conducted by Al-Haddabi, Al-Bash, Al-Mabaihsi, Al-Maqbali, Al-Dhughaishi and Abu-Heija (2014), showed an increased risk of anaemia among teenage girls compared to older women (58% vs. 44 %,). Similar results were reported in a study by Dutta and Joshi, (2013) where anemia was noted in 68.7% of teenagers and 33.8% of older women. The prevalence of anaemia was significantly higher in teenage mothers than the women of older age group (Phupong & Suebnukarn, 2007).(Gupta et al., 2008;Edessy, Gaber, & Maher, 2014; Rudra, Bal, & Singh,2013), found that maternal outcome like anaemia among teen mothers were higher in comparison with adults. Usta, Zoorob, Abu-Musa, Naassan and Nassar (2008), concluded in their study that teenagers are more likely to suffer from anaemia than the adult mothers. A study conducted by Sulaiman et al. (2013), showed that there was no differences in the risk of anaemia when the teenagers were compared with the adults. According to Mayor (2004), teenage pregnancies and births are considered as risky. According to Saxena et al, (2010) the prevalence of anaemia was higher in the older mothers as compared to the teenage mothers in a study carried out in India. Ziadeh, (2001), also found that anaemia was higher among adults as compared with teenagers. However, result of other study by Kore et al, (2004) revealed that anaemia is higher among teenagers than adults.The incidence of anaemia was more in teenage mothers less than 19 years as compared to the women aged 20-30 years(Tufail & Hashmi, 2008).A study to evaluate the obstetric performance of teenage women was conducted in India. A total of 13,210 women were included in the study, of which 840 were teenagers. The finding revealed that teenage

women were at a significantly higher risk for the development of severe anaemia (Trivedi, &Pasrija, 2007).

Shahet al, (2011) found that hypertensive disorders of pregnancy, was not significantly different in teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan. Similarly, studies conducted in Malaysia did not find significant associations between teenage pregnancy and pregnancy-induced hypertension (PIH), (Siraj,& Ismail, 2000: Khairani et al., 2010; Sulaiman et al.,2013).However a study from Lahore, Pakistan reported higher rates of pregnancy-induced hypertension in teenage mothers than adult mothers (Iqbal, Azad &Tayyab, 2004). Other studies have shown an increased risk of pregnancy induced hypertension, among teenagers than their adult counterpart (Omar et al, 2010; Chotigeat & Sawasdiworn, 2011). Edessy et al., (2014) andRudra, et al., (2013) found that Pregnancy Induced Hypertension (PIH), among teen mothers were higher in comparison with adults. Saxena et al, (2010) found that teenage mothers were more prone to develop PIH. Chahande et al (2002) also had similar results. In another study, El-GilanyandHammad (2012), also concluded that, pregnancy induced hypertension is more frequent among older mothers as compared with the teenagers. According to Mayor (2004), teenage pregnancies and births are considered as risky. Adverse Maternal outcomes of teenage pregnancy include hypertensive disorders of pregnancy which is high as compared with adult mothers.Studies have shown an increased risk of pregnancy induced hypertension among teenage mothers as compared with adult mothers (Omar, et al, 2010; Kurth, et al, 2010; Chotigeat,& Sawasdiworn, 2011).

According to Kongnyuy et al. (2008), teenage pregnancy had higher rates of pre-eclampsia and eclampsia as compared with the adults. Usta et al. (2008), concluded in their study that teenagers are more likely to suffer from pre-eclampsia than the adults.Conde-Agudelo et aI, (2005) reported that, there was also a clear trend towards increasing rates of preeclampsia and eclampsia, as maternal age decreased. Tufail and Hashmi, (2008) reported that the incidence of pre eclampsia was more in teenage mothers less than 19 years as compared to the women aged 20-30 years. Pre-eclampsia, was one of the obstetric complications documented among the teenagers (Isa & Gani, 2012).Another study also showed that complications like pre-eclamptic toxaemia and eclampsia occurred more commonly in teenagers as compared to women of older age group (Kumar et al 2007).Some studies declared that pre-eclampsia and eclampsia wer significantly greater among adolescent mothers (Nili, Rahmati, & Sharifi, 2002; Kongnyu et al., 2008). Another study conduct by Sulaiman et al. (2013) showed that there was no difference in the risk of severe pre-eclampsia, when teenagers were compared with women in the older age group.

A study conducted by El-GilanyandHammad (2012), concluded that gestational diabetes mellitus, was more frequent among older mothers as compared with the teenagers.Shah, et al, (2011) found that gestational diabetes was not significantly different in teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan.Saxena et al, (2010) found that Antepartum Haemorrhage (APH) was not seen to be associated with maternal age and their findings were similar to that of (Ziadeh, 2001). Similarly, studies conducted in Malaysia did not find significant associations between teenage

pregnancy and antepartum haemorrhage (Siraj, & Ismail, 2000: Khairani, et al., 2010; Sulaiman et al., 2013).

Acording to Conde-agudelo et al, (2005) the rate of postpartum haemorrhage was high as maternal age decreased. Shah et al. (2011) reported that postpartum haemorrhage was not significantly different when compared with teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan.However a study from Lahore, Pakistan reported higher rates of postpartum haemorrhage in teenage mothers (Iqbal, Azad &Tayyab, 2004). Adeyinka, et al. (2010), also reported that postpartum haemmoraghe, was one of the obstetrics complications found among the teenagers.According to Shaikh et al.(2012) post-partum hemorrhage was the commonest complication seen in 41% (105)of teenage pregnant mothers.

Acording to Kongnyuy et al. (2008) teenage pregnancy carry less risk of premature rupture of membranes (PROM) as compared with their adult counterpart. To determine the obstetric outcome of teenage pregnancies at a tertiary hospital in Enugu, Nigeria, Ezegwui, Ikeako andOgbuefi (2012) carried out a retrospective review of all teenage pregnancies at University of Nigeria Teaching Hospital, Enugu over a 6-year period (2000--2005). They found that, premature rupture of membranes was not significantly different in teenage and non-teenage mothers. Derme, Leoncini, Vetrano, Carlomagno and Aleandri (2013) observed that PROM) and oligohydramnios were the most common pregnancy complications among teenage pregnant women when compared with their adult counterpart.

The modes ofdelivery reviewed include: Cesarean Section, Spontaneous Vaginal Delivery, Vacuum Extraction and Augmentation of Labour**.**Acording to (Tufail,& Hashmi, 2008), teenage pregnancy is associated with increased risk of operative delivery thanpregnancy among older mothers. Caesarean section was the major route of delivery inteenage mothers (34.6 percent) as compared to women of aged 20-30 years (10.6 percent).Rudra, Bal and Singh(2013), also found that operative deliveries (caesarean section) among teen mothers were poorer in comparison with adults. A study conducted by Sulaiman et al. (2013) showed that teenage mothers had a significant risk of caesarean delivery as compared with the women in the older age group.Kayastha and Pradhan (2012), found in a study conducted in Nepal Medical College Teaching Hospital that the rate of cesarean delivery was similar 10.2% and 10.7%, in both teenagers and adults. Incidence of instrumental delivery was more among the teenagers although it was not statistically significant (0.7% vs 2.2%). To determine the obstetric outcome of teenage pregnancies at a tertiary hospital in Enugu, Nigeria, Ezegwui, et al. (2012) carried out a retrospective review of all teenage pregnancies at University of Nigeria Teaching Hospital, Enugu over a 6-year period (2000--2005). They found that 19% delivered through caesarean section and this was not different in teenagers and non-teenagers. It has been postulated that the young adolescent is at increased risk for cephalopelvic disproportion leading to high caesarean section rate as compared with their adult counterpart (Ezegwui et al., 2012). (Smith & Pell 2001; Jivrag et al, 2010) found in their studies that the rate of emergency caesarean section is lower among teenage mothers as compared

with the adult mothers. In their study Hogue and Hogue (2010), reported that caesarean delivery was significantly lower among teenagers.

Derme et al. (2013),found that teenage mothers had a lower risk of instrumental delivery and a higher proportion of spontaneous delivery as compared to older mothers. This is similar to tudies conducted by (Kirchengast & Hartman, 2003: Smith & Pell, 2001; Galvez- Myles & Myles, 2005).They have consistently demonstrated that teenagers are more likely to deliver through the vagina. Hoque and Hoque (2010) undertook a study to estimate and compare the incidence of adverse obstetric and perinatal outcomes of teenage women with older women, and to identify specific health needs of teenage mothers during pregnancy and delivery in South Africa. The study showed that vaginal deliveries were similar for both groups. A study by Sulaiman et al. (2013) showed that the risk of obstetric complications was no higher in adolescents than in adult women. The study further showed that the adolescents had a significantly higher rate of normal vaginal delivery. Sulaiman, et al, found that teenagers had a significantly higher rate of normal (spontaneous) vaginal delivery as compared with the adult group. Naseem, Hamayun, and Bilal, (2013) showed that vaginal deliveries were conducted in 97 (92%) out of 118 teenage mothers which shows close relationship of smaller babies, and laxity of the pelvic structure. Studies have reported that teenage mothers had a significantly higher incidence of spontaneous vaginal delivery (Derme et al, 2013; Thato, Rachukul, & Sopajaree, 2007; Keskinoglu et al., 2007; De vienne, et al, 2009; Lewis et al 2009; Thaethae & Thao, 2011; Mukhopadhyay, Chauduhuri, & Paul, 2010). The better predisposition of teenage

pregnant women to have a spontaneous vaginal delivery is due to better myometrial function and greater tissue elasticity (Jolly et al., 2000).

Usta, et al. (2008), concluded in their study that nulliparous teenagers have a quicker progress of labour while multiparous teenagers require vacuum extraction less frequently as compared with their older counterparts. In another study, El-Gilany andHammad (2012) also concluded that teenage pregnancy in Saudi Arabia is not associated with bad obstetric outcomes. They found in their study that instrumental delivery (vacuum extraction) did not differ between teenage mothers and their adult counterpart. A research conducted in Policlinico Umberto I Hospital in Rome to assess the obstetric and perinatal outcomesof teenage pregnant women revealed that, 3 (1.6%) respondents needed the aid of instruments (vacuum extractor) (Derme, et al.,2013). Other studies found similar results: (Gupta, Kiran, & Bhal, 2008; Lewis, Hickey, Doherty, & Skinner, 2009; Thato, Rachukul, & Sopajaree, 2007; Thaithae, & Thato, 2011).

A study to quantify the age-related risks of adverse pregnancy outcomes in primigravid women aged less than 20 years in Hong Kong revealed that teenage subjects had higher rates of augmented labour (Liu, & Cheung, 2011).Ebeigbe and Gharoro (2007), reported that there were no significant differences in the incidence of pregnancy complications, induction or augmentation of labour between teenage pregnant mothers and the adults mothers.

Perinatal Outcomes of Pregnancy among Teenage Mothers

Adverse pregnancy outcomes like preterm deliveryhave been associated with teen mothers (Chen, et al., 2007; Goonewardene et al.,2005; Kumar et

al.,2007; Shah, et al, 2011). Ezegwui et al.(2012) found that, pre-term delivery was not significantly different in teenage and non-teenage mothers.Sagili, Pramya and Prabhu (2012), conducted a 3-year retrospective study at a Malaysian university hospital. They showed that nearly a quarter of the teenage mothers had preterm deliveries (24.3%).Khairani et al.,(2010), published data on the outcomes of teenage pregnancies have variably shown an association of teenage with preterm labor.Hogue and Hogue (2010), reported that incidence of preterm delivery rates were similar in teenagers and adults.Jivrag et al. (2010) found that teenage pregnant mothers were not at risk of having a preterm delivery.Usta et al. (2008), concluded in their study that teenagers are more likely to deliver preterm babies than older women. Saxena et al. (2010) found in their study conducted at Safdarjung tertiary Hospital that there was no significant association between maternal age and preterm births. Briggs, et al. (2005), also found that young maternal age is not a significant factor for preterm delivery. Chahande, Jadhaoand Wadhva (2002) point to the contrary, they found in their study that the incidence of preterm labour was significantly higher in the teenage group. One possible cause could be the immaturity of the organs of young women. Studies have reported that premature births was significantly greater among teenage mothers (Kongnyuy, et al., 2008; Mukhopadhyay, Chaudhuri, & Paul, 2010; Usta et al. 2008) and teenagers were more likely to deliver preterm, than older women. Finding of a study conducted by Edessy, Gaber and Maher (2014), revealed that there was significantly increased preterm labor more in teenage group than the adult group.

Yadav et al.(2008), Sherna et al.(2008) and Smith and Pel (2001) found that, compared with older women, teenage pregnant women, were not at risk of having stillbirth delivery. A study to determine the influence of antenatal care on perinatal outcome in teenage pregnancies in Calabar, presented that the incidence of macerated stillbirth among unbooked teenage mothers was significantly high (Iklaki, Inaku, Ekabua, Ekanem, & Udo, 2012).A study in South Africa, reported that, teenage pregnancy is not associated with excess still birth. (Hogue, & Hogue, 2010).According to Mukhopadhyay et al. (2010), the proportion of stillbirths was higher (5.1%) among teenage pregnant mothers. Hogue, et al.(2014) found that still birth rates were found to be similar between teenage and adult mothers. This finding is in line with other South African study (Hogue, & Hogue, 2010).

Pregnancy in teenagers is not free of risks. The risk of low birth weight (LBW) is particularly high among teenagers than the adults. LBW is significantly higher in young teenagers aged 13–19 years (Edessy et al., 2014).Hoque and Hoque (2010) undertook a study to estimate and compare the incidence of adverse obstetric and perinatal outcomes of teenage women with older women, and to identify specific health needs of teenage mothers during pregnancy and delivery in South Africa. The study showed that the rate of low birth-weight was significantly lower for teenagers than for older women. It was concluded that although there was a higher rate of teenage pregnancy, it did not appear that it was associated with extra perinatal negative outcome such as low birth-weight delivery. A study by Omole-Ohonsi and Attah (2010) showed ahigh incidence of low birth weight babies among teenagers when compared with the adult.

A study conducted by Sulaiman et al.(2013) on teenage pregnancies at two major hospitals in Klang Valley,found that teen mothers had significantly lower birth weight babies and risk of perinatal complications within one day after delivery. Rudra, Bal and Singh(2013), found that various parameters of neonatal outcome like Intra-uterine Growth Retardation (IUGR) and preterm birth among teen mothers were poorer in comparison to adults. The proportion of low birth weight or very low birth weight babies was also high among teenage mothers when compared withthe older mothers. (Abu-Heija, Ali,& Al-Dakheil, 2002;Derme et al., 2013), also found that the rate of low birth weight babies born to teenagers was significantly higher than that of babies born to the adult mothers. Kayastha and Pradhan(2012), established in a study conducted in Nepal Medical College Teaching Hospital that the proportion of babies with intrauterine growth restriction was higher in the teenage mothers than in the adults. Gordon and Jill (2001) found similar results.Ago et al. (2012) also reported that teenagers delivered more low birth weight babies.

According to Shah et al. (2011), mean Apgar scores were similar for both teenage mothers and their adult counterpart.Studies have shown that teenagers have babies with low Apgar score at five (5) minutes (Kongnyuy et al., 2008; Gupta et al.,2008;Tyrberg, Blomberg and Kjølhede (2013).Sulaiman et al., (2013), showed in their study that there was no difference in the risk of severe asphyxia in teenage mothers as compared with the women in the older age group.A study conducted in a university hospital in India to assess the outcome of teenage pregnancy revealed that teenage mothers had increased incidence of neonatal morbidities like perinatal asphyxia (Kumar et al.,2007). A study to

compare the incidence of adverse perinatal outcomes in nulliparous teenagers and nulliparous women aged 20-24 years in Calabar Nigeria revealed that the teenagers were associated with significantly higher incidence of birth asphyxia (Udo, Ekott, &Ekanem, 2013). Mukhopadhya et al. (2010),reported that birth-asphyxia was significantly higher in the teenage-group compared to the adult primigravida women. This could be due to the more number of premature births.

Studies have found that neonatal complications of teenage pregnancy may include congenital malformations, admission in neonatal nursery and perinatal death (Chen et al., 2007; Goonewardene et al., 2005; Kumar etal., 2007).Kayastha, & Pradhan(2012), found in a study conducted in Nepal Medical College Teaching Hospital that the rate of foetal congenital anomaly was high in teenagers as compared with the adult mothers. Udo, Ekott, &Ekanem.(2013) observed that teenage pregnancy is not associated with birth defects (congenital anomalies).

Birth trauma or perinatal trauma refers to injury suffered by the newborn during delivery or at any point during entire birth process (Uhing, 2004; Papanagiotou et al., 2009). Prospective observation of 4741 live births in singleton pregnancies was carried out at a Tertiary Care Teaching and Maternity Hospital. Higher maternal age, shorter height, higher birth weight, prolonged labor (with associated instrumental delivery), malpresentations, and delivery during risk hours were identified as significant risk factors (Ray et al., 2016). A study conducted by Abedzadeh-Kalahroudi, Talebian, Jahangiri, Mesdaghinia and Mohammadzadeh (2015) revealed that The incidence of trauma in their study was 22 per 1000 births (Normal Vaginal Delivery and Cesarean Section). This

rate of trauma was lower in their study than in others (Awari, Al-Habdan, Sadat-Ali, & Al-Mulhim, 2003; Borna, Rad, Borna, & Mohseni, 2010;Warke, Malik, Chokhandre, & Saboo, 2012; Sauber-Schatz et al, 2010; Rezaei, Ghafarian, Balaghi,& Hashemi, 2009). It can be due to a higher incidence of Cesarean Section, not using vacuum and forceps for delivery, and lack of Normal Vaginal Delivery for breech and face presentations in maternity hospitals in Kashan City. They found that the most common types of injuries were consecutively cephalohematoma (57.2%) and asphyxia (16.8%). Abedzadeh-Kalahroudi et al., (2015), also reported that it seems birth trauma might occur during uncomplicated deliveries because neonates face a lot of pressure during passage through the birth canal, which would make them susceptible to trauma. On the other hand, they suggested that factors such as inadequate birth attendant skill could be a reason for birth trauma.

Conceptual Framework

Conceptual framework is used in research to outline possible courses of action or to present a preferred approach to an idea or thought. It can act like a map that gives coherence to empirical inquiry (Jeffels, 2013). The conceptual framework is presented in a model. A conceptual model represents human intentions, and is a necessary means researchers employ to think and solve problems. It is used to help know and understand the subject matter they represent (Jeffels, 2013).

The study adapted the Fishbone model proposed by Kaoru Ishikawa. Ishikawa diagrams (also called fishbone Diagrams, HerringboneDiagrams, Cause-

and-Effect Diagrams, or Fishikawa).These are causal diagrams created by Kaoru Ishikawa (1968) that show the causes of a specific event. Common uses of the Ishikawa diagram are product design and quality defect prevention, to identify potential factors causing an overall effect. Each cause or reason for imperfection is a source of variation. Causes are usually grouped into major categories to identify these sources of variation. Ishikawa diagrams were popularized by Kaoru Ishikawa in the 1960s, who pioneered quality management processes in the Kawasaki shipyards, and in the process became one of the founding fathers of modern management (Ishikawa, 1968).

The Fishbone model, also known as "Cause and Effect" model or "Ishikawa" diagram, is used to systematically list all the different causes that can be attributed to a specific problem (or effect).

Conceptual Framework

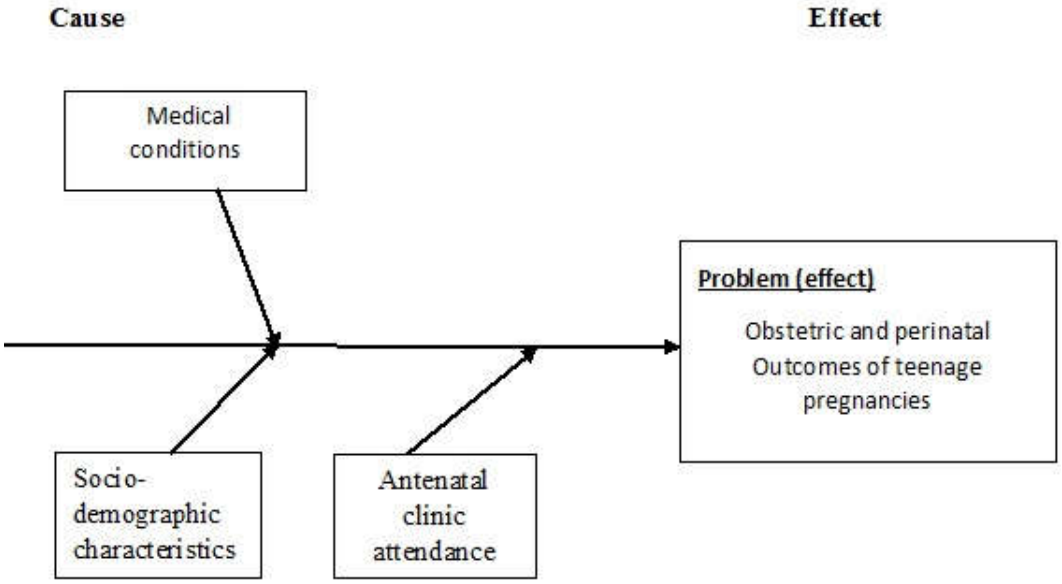

Figure 1: Fishbone Framework (Cause and effect diagram)

Source: Adapted from Ishikawa (1983).

According to Ishikawa (1983), the Fishbone model helps to identify, sort, and display possible causes of a specific problem. It graphically illustrates the relationship between a given outcome and all the factors that influence the outcome. Using the Fishbone model helps a researcher to;

1. Identify the possible root causes, the basic reasons, for a specific effect, problem, or condition.
2. Sort out and relate some of the interaction among the factors affecting a particular process or effect.
3. Analyse existing problems so that corrective action can be taken.

This model was chosen for the study because it captures all the variables needed for the study. It also suits the study and will help achieve the objectives of the study. The model, as shown in Figure 1, would assist the researcher to explore how the independent variables; socio-demographic factors, medical conditions, antenatal clinic attendance, influence the dependent variable; obstetric and perinatal outcomes of pregnancy among teenagers, and subsequently suggest solutions to the problem from the findings of the study.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents an overview of the methods that were used to conduct the study. It covers the research design, study area, population, sample and sampling procedure, and research instrument. Others are pilot-testing of the research instrument, data collection procedure and data analysis.

Research Design

This study employed the observational design. In epidemiology and statistics, according to Porta (2008), an observational study draws inferences about the possible effect of a treatment on subjects, where the assignment of subjects into a treated group versus a control group is outside the control of the investigator. Rosenbaum (2009), mentioned five different types of observational studies, including the case-control, cross-sectional, cohort/panel, and ecological studies. After a careful assessment and comparison of the various observational studies, the case-control study was used.

The study is a "retrospective" study. This means that (like a detective) the researcher begins at the end, with the disease, and then works backwards, to hunt for possible causes. According to Hulley, Cummings and Browner (2001), case-control studies identify subjects by outcome status at the outset of the investigation. Outcomes of interest may be whether the subject has undergone a specific type of surgery, experienced a complication, or is diagnosed with a disease. Once the outcome status is identified and subjects are categorized as

cases, controls (subjects without the outcome, but from the same source population) are selected. Data about exposure to a risk factor or several risk factors are then collected retrospectively, typically by interview, abstraction from records, or survey.

Other researchers posited that case-control studies are well suited to investigate rare outcomes or outcomes with a long latency period because subjects are selected from the outset by their outcome status(Elwood 2007;Merril, & Timmreck, 2007). Thus, in comparison to cohort studies, case-control studies are quick, relatively inexpensive to implement, require comparatively fewer subjects, and allow for multiple exposures or risk factors to be assessed for one outcome. The advantages are that a case-control study can be done faster and more cheaply than a cohort study (Benson,&Hartz, 2000).

However, it may be difficult to collect the information required on past exposures, and there may be other *ways* in which the cases and controls differ. Case-control studies may be "matched" and "unmatched." It is generally recommended that for a greater comparability between the two groups, and thereby to avoid confounding, the controls could be matched for sex and age to the cases (Hulley et al., 2001). Therefore, to achieve high level of accuracy and robustness, this study intended to recruit equal sample sizes for both groups. Thus, the "matched" case-control study.

Study Area

The study was carried out in three major health care facilities situated in the Cape Coast Metropolis, namely, the Cape Coast Teaching Hospital (CCTH), Pedu, the Cape Coast Metropolitan Hospital (CCMH), Bakaano and the University of Cape Coast Hospital (UCCH), UCC. The Cape Coast Metropolis is bounded to the south by the Gulf of Guinea, west by the Komenda-Edina-Eguafo-Abrem (KEEA) Municipality at Iture Bridge, East by the Abura-Asebu-Kwamankese (AAK) District and to the north by the Twifo-Heman-Lower-Denkyira District. The metropolis occupies an area of approximately 122 square kilometres, with the farthest point at Brabadze, about 17 kilometres from Cape Coast, the capital of the metropolis, and the Central Region (Cape Coast Metropolitan Planning Coordinating Unit, 2012).

The CCTH popularly known as "Interberton" is located at Pedu Estate. The facility serves as a referral centre in the Central Region. The hospital is endowed with modern medical equipment that enhances diagnosis and treatment of special cases. CCTH is the largest health facility in the region. CCMH is located on the Bakaano and Saint Augustine's College road. Behind this facility is Fosu Lagoon. Standing in front of the hospital, one can have a full view of the Gulf of Guinea. The facility has machines for the following X-rays, Scanning, and a standardized laboratory. UCCH is located at Old Site of the University of Cape Coast. It is situated on a small hill in front of the University Primary School. Facilities available in this hospital are similar to what can be found at CCMH.

The population of the region had increased by 38.1% between years 2000 and 2010. The total population as at 2010 stood at 2,201,863 with 52.3% being

females and 15.3% being teenagers (Ghana Statistical Service 2012).The 2010 Population and Housing Census (PHC), estimated the region's intercensal growth rate to be 3.1%. There have been increases in successful deliveries in the Central Region due to pragmatic strategies by Government, Ghana Health Service and other relevant stakeholders to reduce considerably maternal deaths in order to meet the Millennium Development Goal (MDG 5).The teenage pregnancy rate of 14.9% in 2012 increased slightly to 15% in 2013, and then reduced slightly to 14.8% in 2014, in the Central Region (Family Health Report, 2014).

Population

Population is the entire collection of people who have common characteristics (Polit&Hungler, 2003). The target population for the study comprised all mothers who delivered in any of the three hospitals in Cape Coast from January 1 to December 31, 2014. Data available from the Ghana Health Service's *District Health Information Software 2*(*DHIS 2*) showed that there were 4,589 mothers. There were 582 cases (mothers aged 13-19 years) and 4,007 controls (mothers aged at least 20 years) within the period. Table 1 presents the detailed breakdown of the data according to age and facility.

Table 1: *Deliveries from January to December (2014)*

	Age Group		
Facility	**13-19**	**20-34**	**Total**
Cape Coast Teaching Hospital	305(13.8%)	1903(86.2%)	**2208(100%)**
Cape Coast Metro Hospital	252(17.8%)	1166(82.2%)	**1418(100%)**
UCC Hospital	25(2.6%)	938(97.4%)	**963(100%)**
Total	**582(12.7%)**	**4007(87.3%)**	**4589(100%)**

Source: Field Survey, 2015

Inclusion and Exclusion Criteria

The study participants were women who delivered (live or still births) at any of the three health facilities (i.e., Cape Coast Teaching Hospital, Cape Coast Metropolitan Hospital and University of Cape Coast Hospital) within January 1 and December 31, 2014. Mothers with incomplete records in their folders or missing delivery records were not included.

Sample and Sampling Procedure

The study did the computation of sample size using the G-Power Software (version 3.1). According to Cunningham and McCrum-Gardner (2007), basic concepts are examined before utilising the statistical software package to illustrate the use of alpha level, beta level and effect size in sample size calculation involving, for example, case-control studies, t-tests, Analysis of Variance (ANOVA) and Chi-square tests, among others. With the following assumptions:

1. **Assumptions:**

Odds ratio	=	2
Exposed controls	=	5%
Alpha risk	=	5%
Power	=	80%
Probability of an exposure-discordant pair	=	13.5714%

Matched subjects

2. **Estimated sample size (number of pairs):**

Number of exposure discordant-pairs	=	69
Number of pairs	=	503
Total sample size	**=**	**1006**

Half of the subjects (503) would be cases, while the remaining half (503) would be controls. The number of participants to be studied from each facility was arrived at based on the following formula, $f = \frac{n}{N}$. The considered sample size is *n*, the population size is *N* and *f* is the sample fraction of the sample size.

For example, with regard to the case group, the formula below was applied,

$$n = \frac{503}{582}$$

$$n = 0.8643$$

The sample fraction of 0.8643 was multiplied with the size of each stratum to obtain the following sample for the Cape Coast Teaching, Cape Coast Metro and UCC hospitals as 263, 218 and 22, respectively. Similarly, the control sample sizes from the various facilities were determined by multiplying the respective

totals by the sampling fraction of 0.1255. This gave sample of 239, 146 and 118 for the Cape Coast Teaching, Cape Coast Metro and UCC hospitals, respectively. The summarised information on the sample of the strata are contained in Table 2.

Table 2: *Facility-Based Sample for Case and Control Groups*

Facility	Age Group		Total
	13-19 (Case)	20-34 (Control)	
Cape Coast Teaching Hospital	263	239	**502**
Cape Coast Metro Hospital	218	146	**364**
UCC Hospital	22	118	**140**
Total	**503**	**503**	**1006**

Source: Researcher's own computations

In selecting the respondents for the groups, purposive sampling technique was used to select the health facilities for the study. In purposive sampling, the researcher 'hand picks' or selects the group of study by personal management (Creswell, 2009). Thus the researcher selects sample due to some specific or peculiar characteristics of the group. The researcher selected the 3 health facilities because they are the most popular and most patronized health facilities in the Cape Coast Metropolis. The researcher employed the lottery method of the simple random sampling technique. This was to ensure that each person was given an equal chance of selection to become a participant. In achieving this, the researcher obtained the maternity registers of the various facilities and sorted the names into the two respective groups based on their ages. Then the researcher assigned numbers to the names, wrote them on a piece of paper and put them in a container. The folded strips of papers were shuffled, and with the assistance of other persons, one strip was randomly selected at a time. After every selection, the

rest of the strips in the container were re-shuffled. This continued till the total number of cases was obtained, the same procedure was carried out to select the sample for the control group.

Research Instrument

A Data Extraction Form was designed for the collection of the relevant data from client's folders, antenatal register, and labour ward report book. For each participant, the form was completed for her byeither the researcher or any of the research assistants by either ticking or writing the information. A copy of the instrument is attached as appendix.

The instrument had five parts, namely, demographic information,status of antenatal attendance, obstetrics outcomes of pregnancy, perinatal outcomes of pregnancy and medical condition. Part one, contained the demographic information, the following variables; age (in years), educational background, religion, marital status, occupation ethnicity and parity. The second part presented antenatal status.The obstetric outcomes were listed under part three, this part had the following conditions under pregnancy complications; PIH, eclampsia, gestational diabetes, antepartum haemorrhage, PROM, anaemia, and the following under modes of delivery, spontaneous vaginal, augmentation, vacuum, and caesarean section deliveries.

Perinatal outcomes were listed under part four and the following were under perinatal outcomes; birth outcome, gestational age, birth weight, and Apgar scores, severe asphyxia, birth trauma, and congenital anomalies. The fifth part which is medical conditions, had variables such as; diabetes, UTI, Hepatitis B,

HIV/AIDS and syphilis status of the participants. The form was designed with the sole aim of gathering only the relevant and required data necessary to address the various research questions posed in chapter one.

Pilot-Testing of Instrument

Polit and Hungler (2003), regarded pilot-testing as a small-scale version or trial run done in preparation for the actual study. The purpose of a pilot-testing is to ensure the level of validity and reliability of the data collection instrument. One of the advantages of conducting a pilot-test is that it might give advance warning about where the main research project could fail, where research protocols may not be followed or whether proposed methods or instruments are inappropriate or too complicated. The content validity of the instrument was established when it was reviewed by the supervisor and the University of Cape Coast Institutional Review Board.

The review brought to the fore some constructive suggestions, which were effected in the final questionnaire. To ensure that the research instrument was reliable, it was pilot-tested at the Saltpond Government Hospital, Saltpond in the Mfantsiman Municipality. This hospital was chosen because it shares similar characteristics and facilities with those used for the actual study, as proposed by Sarantakos (2005). It involved extracting data from the maternity booklets of 25 case and 25 control subjects which was done within two (2) working days from Monday, January 12 to Tuesday, January 13, 2015. The 15 minutes estimated time allotted to a client was found to be inadequate since between 30-45 minutes was spent filling each form. The results from the pilot-testing revealed that although the form was able to collect several data, some issues pertaining to

medical condition were conspicuously missing. A section on medical conditions was therefore added, and the form was considered good for use to collect data for the study.

Data Collection Procedure

The researcher personally participated in the gathering of the data with the assistance of two trained research assistants recruited from theBiostatistics/Records Departments of the various health facilities. This was after obtaining ethical clearance and a letter of introduction from the School of Nursing and Midwifery, University of Cape Coast. The researcher first paid courtesy calls on the Medical Superintendents and the In-Charge at the Maternity Wards of the hospitals to discuss the significance of the study and agreed on a convenient time to do the data extraction with them. With their permission, one month was spent extracting the data. A research assistant was assigned to a facility and the researcher did the supervision and data validation. Specifically, the data were collected between February 1, 2015 and February 28, 2015. The engagement of the services of the research assistants and the supervision exercise paid off as all the needed information on all the 1006 subjects were accurately captured. Therefore, the study recorded a 100% return rate.

Ethical Considerations

The ethical approval was granted by the University of Cape Coast Institutional Review Board (UCCIRB) for approval. All principles of research ethics were followed rigidly. The researcher assured the managements of the

hospitals of strict adherence, to the principle of confidentiality.The heads of the three hospitals consented, on behalf of the participants whose records were used in the study.

Data Analysis

Data collected were first cleaned, coded, entered and analysed using the Statistical Product and Service Solutions (SPSS) version 21.0. Data were analysedusing both descriptive andinferential statistical tools like frequencies, percentages, means, Chi-square test, and odds ratios.Frequencies, pie chart and percentageswere used to analyse research questions 1, 3, 4 and 5, whilst chi-square test and odd ratios were used to analyse research questions 2 and 6. After statistical considerations of the variables involved, the study answered all the research questions at a .05 significance level. This implies that the study gave only 5% chance to error, which is statistically insignificant. In addition, tables and graphs were used to summarise the results from the study.

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter presents the results and discussion of the data gathered from the respondents.The main purpose of the study was to determine the obstetric and perinatal outcomes of pregnancy among teenage mothers in the Cape Coast metropolis. In order to address the objective, the researcher assessed the socio demographic characteristics of teenage pregnant mothers, the influence of antenatal clinic attendance on obstetric and perinatal outcomes of teenage pregnancy and medical conditions among teenage pregnant mothers. It also assessedthe obstetric outcomes of pregnancy among teenagers,and the perinatal outcomes of pregnancy among teenage mothers in the Cape Coast Metropolis.

The study involved 1,006teenage mothers aged 13-19 years and adult mothers aged 20-34 years who delivered in the Cape Coast Teaching Hospital, Cape Coast Metropolitan Hospitaland UCC HospitalwithinCape Coast from January 1 to December 31, 2014. Data were obtained using data extraction guide on all 1,006 mothers from their folders, delivery record book, antenatal register, and labour ward report book.The data gathered were analyzed using both descriptive and inferential statistical methods.

Research Question 1: What are the socio-demographic characteristics of teenage pregnant mothers in the Cape Coast Metropolis?

Data on the characteristics of the respondents were collected to help have an understanding of the socio-demographic background of the respondents in the study. The characteristics examined included age, educational background, religion, marital status, parity andemployment status. Others wereethnicity and facility attended as well as spouse's age, educational level andemployment status. Figure 2, and Tables 4 and 5 present the summary of results on these variables.

Figure 2: Distribution of teenage and adult respondents

The analysis in Figure 2 shows that there was almost an equal split between the teenage and adult respondents in this study. Thus, whilst 505 (50.2%) of the 1,006 respondents were teenage mothers, and 501 (49.8%) were adult mothers. This implies that the exposure and control groups were fairly represented, in the study.

Table 3 gives the cross-tabulation of the socio-demographic characteristics of the respondents. The segregation variable is age (thus, teenage and adult

mothers). Respondents aged 13-19 years constituted teenagers, while those aged 20-34 years were regarded as adult mothers.

Table 3: *Socio-DemographicCharacteristics of Respondents*

Socio-demographic variables	Teenagers (n=505)		Adults (n=501)		Total (N=1,006)	
	Freq.	%	Freq.	%	Freq.	%
Age (in years)						
13 – 14	20	3.96	0	0.0	20	2.0
15 – 19	485	96.04	0	0.0	485	48.2
20 – 25	0	0.0	191	38.1	191	19.0
26 – 30	0	0.0	202	40.3	202	20.1
31 – 34	0	0.0	108	21.6	108	10.7
Educational Status						
No formal education	81	16.0	81	16.1	162	16.1
Basic	333	65.9	226	45.1	559	55.6
Secondary	88	17.5	90	18.0	178	17.7
Tertiary	3	0.6	104	20.8	107	10.6
Religion						
Christianity	453	89.7	437	87.2	890	89.5
Islam	42	8.3	55	11.0	97	9.6
Others	10	2.0	9	1.8	19	1.9
Marital status						
Married	85	16.8	430	85.8	515	51.2
Single	395	78.2	61	12.2	456	45.3
Divorced	0	0.0	1	0.2	1	0.1
Non-response	25	5.0	9	1.8	34	3.4
Parity						
1 – 2	495	98.0	307	61.2	802	79.7
3 – 4	9	1.8	157	31.4	166	16.5
5 and above	1	0.2	37	7.4	38	3.8
Occupational status						
Employed	170	33.7	429	85.0	599	59.5
Unemployed	335	66.3	72	15.0	407	40.5
Ethnicity						
Akan	417	82.6	400	79.8	817	81.2
Guan	0	0.0	1	0.2	1	0.1
Ewe	11	2.2	17	3.4	28	2.8
Ga/Dangme	7	1.3	6	1.2	13	1.3
Others	70	13.9	77	15.4	147	14.6
Facility						
Cape Coast Teaching Hosp.	262	51.9	245	48.9	507	50.4
Cape Coast Metro Hosp.	220	43.6	146	29.1	366	36.4
UCC Hospital	23	4.5	110	22.0	133	13.2

Source: Field Study, 2015

With regard to age, out of the 505 teenage mothers, 20 (3.96%) and 486 (96.4%) were between the ages of 13-14 and 15-19 years, respectively. The mean age of the teenage mothers was 16.9 years. On the other hand, 191 (38.1%) of the adult mothers were aged 20-25 years, 202 (40.3%) were between 26-30 years, whilst 108 (21.6%) were aged 31-34 years. The average age of the adult mothers was 26.9 years, and the overall mean age of the respondents was 21.8 years. This means that the respondents were generally young. According to the Ghana Living Standards Survey (GLSS round 5), the mean age at first marriage is 22.5 years being four years earlier than their male counterparts. In the rural areas, the mean age at first marriage is 21.9 years compared with 23.3 years in the urban areas (Ghana Statistical Service, 2014).

The results also indicate that 162 (16.1%) of the respondents had no formal education. However, amajority (83.9%) is at least formally educated. Almost 11% of them had attained tertiary education, although more than half of the entire respondents (almost 66% of teenage mothers and 45% of adults) had only basic education. Additionally, there had been highly educated mothers amongst the adults (38.8%) compared to the teenagers (18.1%). In terms of their religious affiliation, the respondents were largely Christians (89.5%) and 97 (9.6) being Muslims. Statistics from the 2010 Population and Housing Census conducted by the Ghana Statistical Service revealed that both at the national and within the Cape Coast Metropolis, Christians dominated.

On the whole, a little over half of the respondents were married, while substantial proportions were not. Specifically, the unmarried mothers were mainly teenagers. Thus, 395 (78.2%) of them were single, whiles16.8% were married.

Among the adult mothers, as much as 430 (85.8%) were married compared to 71 (14.2%) who were not. Again, 802 (79.7%) of the respondents were found to have had 1-2 children, 166 (16.5%) had between 3 or 4 children, whiles the remaining 38 (3.8%) had at least 5 children. There is however a vast difference in the parities between teenage and adult mothers.

The results further showed that 170 (33.7%) of the teenage mothers were employed as against 429 (85.0%) of their adults counterparts. On the whole, majority of them (59.5%) were employed. The respondents were mainly dominated by Akans (81.2%), followed by Ewes (2.8%), Ga/Dangme (1.3%), Guans (0.1%) and others (14.6%). This result corroborates that of the 2010 Population and Housing Census that Akans made up of Ashantis and Fantis are most dominant population in the entire country as well as in the metropolis under study.

In terms of the health facilities where the respondents delivered their babies, the analysis indicated that about half of them delivered at the Cape Coast Teaching Hospital. Also, 366 (36.4%) of them accessed antenatal care from the Cape Coast Metropolitan Hospital, whiles the remaining 133 (13.2%) were at the University Hospital. Among the teenage mothers,262 (51.9%) attended the Cape Coast Teaching Hospital compared to 245 (48.9%) adult mothers. Similarly, 220 (43.6%) teenagers compared to 146 (29.1%) adults received antenatal care from the Cape Coast Metro Hospital. Meanwhile, 23 (4.5%) of the teenagers compared to 110 (22.0%) had their health care at the University of Cape Coast Hospital.

Research Question 2: How does attendance of antenatal clinic influence obstetric and perinatal outcomes of pregnancy among teenagers in the Cape Coast Metropolis?

The aim of this research question was to assess the influence of attending or not attending antenatal clinics by teenagers on obstetric and perinatal outcomes of pregnancy. Antenatal care is an important intervention for the wellbeing of the pregnant mother and the expected infant(Tayie, & Lartey, 2008). It is said that early and frequent antenatal care during pregnancyis important to identify and mitigate risk factors in pregnancy and to encourage womento have a skilled attendant at childbirth (Tayie, & Lartey, 2008).

Figure 3 reveals that a substantial majority of the respondents (88.0% of 1,006) attended antenatal clinics, whiles the remaining (12.0%) did not. Further analysis of data showed that out of the 505 teenage mothers involved in the study, 441 representing 87.3% attended antennal clinic. Among the adult mothers, 444 (88.6%) had antenatal care, whiles the remaining 57 (11.4%) did not.

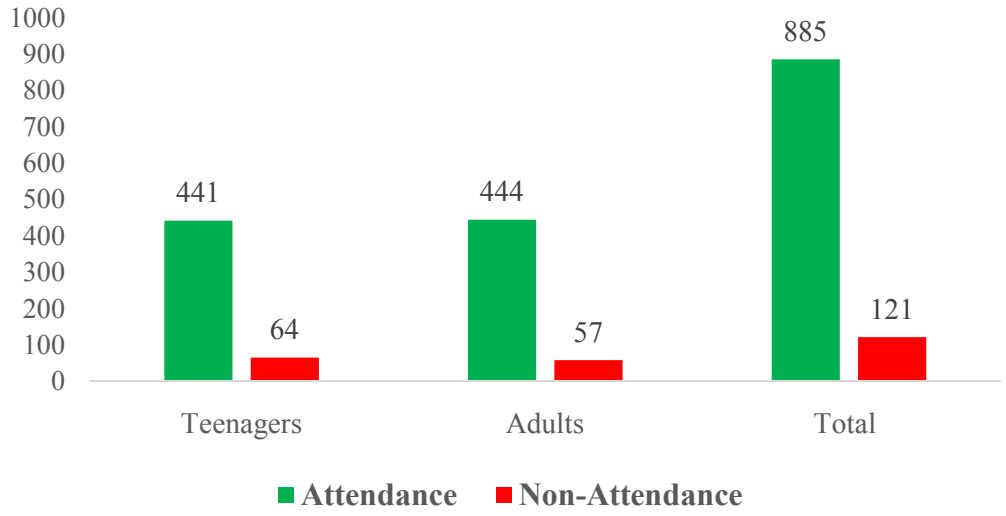

Figure 3:Status of antenatal attendance among respondents

Furthermore, the researcher sought to identify whether theattendance of antenatal clinic or otherwise, among teenage mothers had any statistical influence on obstetric and perinatal outcomes of pregnancy.A client is considered to have attended antenatal clinic if the attendance is four or more. As shown in Figure 3, majority of the teenage mothers (441 out of 505) had attended antenatal clinics throughout their pregnancies. However, the remaining of them were identified to have not attended antenatal clinics. Using the Chi-square test with a significance level of .05, Table 4 presents the results.

Table 4: *Influence of Antenatal Clinic Attendance on Obstetric and perinatal Outcomes of Pregnancy among Teenagers*

Obstetric Outcomes	**Attendance (n=441)**	**Non-Attendance (n=64)**	**Chi-square value**	**df**	***p*-value**
Complications Of Pregnancy					
PIH (BP>140/90)					
Yes	16	2	0.041	1	0.839
No	425	62			
Eclampsia					
Yes	9	2	0.308	1	0.579
No	432	62			
Gestational Diabetes					
Yes	1	0	0.145	1	0.703
No	440	64			
Antepartum Haemorrhage					
Yes	5	2	1.621	1	0.203
No	436	62			
Post-partum Haemorrhage					
Yes	21	3	0.000	1	1
No	420	61			

Table 4 continued

PROM					
Yes	19	3	0.019	1	0.889
No	422	61			
Anemia (Hb<11) at Registration					
Yes	7	1	0.000	1	1
No	434	63			
Anemia (Hb<11) at 36 weeks					
Yes	12	1	0.299	1	0.584
No	429	63			
Modes of Delivery					
Spontaneous vaginal delivery					
Yes	363	43	8.113	1	0.004
No	78	21			
Augmentation					
Yes	48	11	2.152	1	0.142
No	393	53			
Vacuum					
Yes	16	3	0.173	1	0.677
No	425	61			
Caesarean Section					
Yes	67	20	10.105	1	0.001
No	374	44			
Perinatal Outcomes					
Birth outcome (Live birth)					
Yes	427	60	1.538	1	0.215
No	14	4			
Birth outcome (Stillbirth)					
Yes	12	6	7.199	1	0.007
No	429	58			
Gestational age (Pre-Term)					
Yes	36	12	7.282	1	0.007
No	405	52			
Gestational age (Term)					
Yes	387	46	11.529	1	0.001
No	54	18			
Gestational age (Post-Term)					
Yes	16	5	2.455	1	0.117
No	425	59			

Table 4 continued

Birth weight (<2500g)					
Yes	95	17	0.816	1	0.366
No	346	47			
Birth weight (≥2500g)					
Yes	340	53	1.058	1	0.304
No	101	11			
Apgar in first 1 minute (≤3)					
Yes	57	12	1.607	1	0.205
No	384	52			
Apgar in first 1 minute (4-7)					
Yes	367	49	1.706	1	0.191
No	74	15			
Apgar in first 1 minute (>7)					
Yes	13	7	9.38	1	0.002
No	428	57			
Apgar in first 5 minutes (<7)					
Yes	136	29	5.322	1	0.021
No	305	35			
Apgar in first 5 minutes (≥7)					
Yes	302	38	2.107	1	0.147
No	139	26			
Severe Asphyxia					
Yes	54	5	1.064	1	0.302
No	387	59			
Birth Trauma					
Yes	0	0	-	-	-
No	439	36			
Congenital Anomalies					
Yes	0	0	-	-	-
No	440	36			

Source: Field Study, 2015

The analysis shows that there was a significant relationship between attendance of antenatal clinic and some modes of delivery, and outcomes of pregnancy of teenage mothers, whiles there was no such relationship between

antenatal clinic attendance and any of the pregnancy complications. Specifically, with regard to modes of delivery,the spontaneous vaginal delivery (SVD) (n= 441, df= 1, χ^2=8.113)and Caesarean section(n= 441, df= 1, χ^2= 10,105) were seen to be statistically related with attendance or non-attendanceof antenatal. This implies that antenatal clinic attendance has influence on (increased)Spontaneous Vaginal Delivery and (decreased)Cesarean delivery among teenage pregnant mothers.

Similarly, among the perinatal outcomes, birth outcome (stillbirth), gestational age (pre-term), gestational age (term), Apgar score in first 1 minute (>7), and Apgar score in first 5 minutes (<7) were significantly related to attendance or non-attendance of antenatal among the teenage mothers. For example, the results indicate that the non-attendance of antenatal clinics by teenage mothers could results in stillbirth.The results revealed that none ofthe infants delivered by the respondents had birth trauma or congenital anomalies. This may be due to the fact that majority (441) of the teenagers were antenatal attendants and had skilled delivery.

Research Question 3: What medical conditions affect teenage pregnant mothers in the Cape Coast Metropolis?

The research also aimed at identifying medical conditions which may affect the teenagepregnant mothers in the metropolis. The medical conditions explored included diabetes, UTI, hepatitis B, syphilis, and HIV/AIDS.

Table 5: *Medical Conditions among Respondents*

Medical conditions	Teenagers (n=505)		Adults (n=501)		Total (N=1,006)	
	Freq.	%	Freq.	%	Freq.	%
Diabetes						
Yes	0	0.0	2	0.4	2	0.2
No	505	100.0	499	99.6	1004	99.8
UTI						
Yes	2	0.4	8	1.6	10	1.0
No	503	99.6	493	98.4	996	99.0
Hepatitis B						
Yes	12	2.4	18	3.6	30	3.0
No	493	97.6	483	96.4	976	97.0
Syphilis						
Yes	2	0.4	6	1.2	8	0.8
Table 5 continued	503	99.6	495	98.8	998	99.2
HIV/AIDS						
Yes	2	0.4	8	1.6	10	1.0
No	503	99.6	493	98.4	996	99.0
Total	**505**	**100.0**	**501**	**100.0**	**1,006**	**100.0**

Source: Field Study, 2015

The results in Table 5 showed that most of these medical conditions were not common among the respondents, especially the teenage mothers. For instance, none of the teenagers experienced diabetes, and very few of them recorded UTI 2(0.4%), hepatitis B 12(2.4%), syphilis 2(0.4%) and HIV/AIDS 2(0.4).

Research Question 4: What are the obstetric outcomes of pregnancy among teenagers in the Cape Coast Metropolis?

The aim of this research question was to assess the obstetric outcomes of pregnancy, among the teenage mothers in the Cape Coast Metropolis. The obstetric outcomes examined are categorized into pregnancy complications and mode of delivery. Table 6 presents the results of the analysis.

Table 6: *Obstetric Outcomes of Pregnancy among Teenagers*

	Yes		No	
Obstetric Outcomes	Freq.	%	Freq.	%
Complications of Pregnancy				
PIH (BP>140/90)	18	3.6	487	96.4
Eclampsia	11	2.2	494	97.8
Gestational Diabetes	1	0.2	504	99.8
Antepartum haemorrhage	7	1.4	498	98.6
Post-partum haemorrhage	24	4.8	481	95.2
PROM	25	5	480	95
Anaemia (Hb<11) at registration	8	1.6	497	98.4
Anaemia (Hb<11) at 36 weeks	13	2.6	492	97.4
Modes of Delivery				
Spontaneous vaginal delivery	406	80.4	99	19.6
Augmentation	59	11.7	446	88.3
Vacuum	19	3.8	486	96.2
Caesarean section	87	17.2	418	82.8

Source: Field Study, 2015

A few of the teenage pregnant mothers had pregnancy complications in this study. PROM (5.0%), post-partum haemorrhage (4.8%), Eclampsia (2.2%), Anaemia (Hb<11) at 36 weeks (2.6%), PIH (BP>140/90) (3.6%), Anaemia (Hb<11) at registration (1.6%), Antepartum haemorrhage (1.4%), and gestational diabetes (0.2%) were experienced by the teenagers.

Among the modes of delivery, it was realized that spontaneous vaginal delivery was the most common amongst the teenage mothers. This is because 406 (80.4%) out of the 505 teenagers delivered spontaneously, Caesarean section (17.2%), augmentation (11.7%) and vacuum (3.8%).

Research Question 5: What are the perinatal outcomes of pregnancy among teenage mothers in the Cape Coast Metropolis?

This research question sought to assess perinatal outcomes of pregnancy which are predominant among teenagers in Cape Coast Metropolis. The perinatal outcomes of pregnancy examined are the following: birth outcome, gestational age, birth weight, apgar score, severe asphyxia, birth trauma and congenital anomalies. Table 7 presents the results of the analysis.

Table 7: *Perinatal Outcomes of Pregnancy among Teenagers*

	Yes		No	
Perinatal Outcomes	Freq.	%	Freq.	%
Birth Outcome				
Birth outcome (live birth)	487	96.4	18	3.6
Birth outcome (stillbirth)	18	3.6	487	96.4
FSB (n=18)	10	55.6	8	44.4
MSB (n=18)	8	44.4	10	55.6
Gestational age				
Gestational age (Pre-Term)	48	9.5	457	90.5
Gestational age (Term)	433	85.7	72	14.3
Gestational age (Post-Term)	21	4.2	484	95.8
Birth weight				
Birth weight (<2500g)	112	22.2	393	77.8
Birth weight (≥2500g)	393	77.8	112	22.2
Apgar score in first 1 minute				
Apgar score is < 3	69	13.7	436	86.3
Apgar score is 4-7	416	82.4	89	17.6
Apgar score is > 7	20	4	485	96
Apgar score in first 5 minutes				
Apgar score is <7	165	32.7	340	67.3
Apgar score is ≥7	340	67.3	165	32.7
Severe Asphyxia	59	11.7	446	88.3
Birth trauma	0	0	505	100
Congenital anomalies	0	0	505	100

Source: Field Study, 2015

In terms of birth outcomes, 487 (96.4%) compared to 18 (3.6%) recorded live births. This means that only 3.6% of the teenage mothers lost their children

during delivery (still birth). With regard to gestational age, it was found that a large majority (85.7%) delivered within the normal periods of 38-42 weeks. However, others experienced varied delivery dates. Forty-eight respondents representing 9.5% and 21 (4.2%) delivered pre-term and post-term respectively. According to the results, whereas 112 (22.2%) of the teenage mothers delivered babies weighing less than 2,500g, majority of them however had their babies having normal weight; attainting at least 2500g.

Also, a larger majority of teenage mothers delivered babies with Apgar score of 4-7(82.4%) within 1 minute of delivery. This requires that the baby is given adequate resuscitation. Meanwhile, a substantial proportion of the babies to teenagers (13.7%) were also found to have obtained less than3(asphyxia); implying that they need immediate lifesaving measures. Also, only very few teenagers (4%) gave birth to babies who were considered to have been in good shape and did not need more than routine post-delivery care, since their Apgar score after a minute was at least 7. In sum, it can be concluded that for the first 1 minute after delivery, about 96% of the teenagers had their babies requiring prompt medical attention. However, in first 5 minutes after delivery, more than half of the teenage mothers had their babies obtaining 7 or more Apgar score. This implies that most of the neonates got stabilized in five minutes after delivery.

In addressing the research question, the results showed that the most prevalent perinatal outcomes of pregnancy among teenage mothers in the metropolis were live birth (96.4%), term gestational age (85.7%), Apgar score of 4-7 in the first 1 minute (82.4%), birth weight of at least 2500g (77.8%), Apgar score of at least 7 in first 5 minutes (67.3%), and severe asphyxia (11.7%).

Research Question 6: What are the differences in obstetric and perinatal outcomes of pregnancy between teenagers and adults in the Cape Coast Metropolis?

This research question aimed at comparing the obstetric and perinatal outcomes experienced by the teenage mothers to those of the adult mothers. This is to find out whether or not there were significant differences in their experiences of obstetric and perinatal outcomes in the metropolis. Here, the researcher used the Chi-square test with odds ratio (OR). Tables8 and 9 present the details of the results.

Table 8:*Differences in Obstetric Outcomes of Pregnancy between Teenagers and Adults*

Obstetric outcomes	Yes	No	Chi-square value	df	*p*-value	OR
Complications of pregnancy						
PIH (BP>140/90)						
Teenager	18	487	3.735	1	0.053	0.56
Adults (Ref.)	31	470				
Eclampsia						
Teenager	11	494	0.394	1	0.530	0.78
Adults (Ref.)	14	487				
Gestational Diabetes						
Teenager	1	505	2.715	1	0.099	0.2
Adults (Ref.)	5	496				
Antepartum Haemorrhage						
Teenager	7	498	1.382	1	0.239	0.57
Adults (Ref.)	12	489				
Post-partum Haemorrhage						
Teenager	24	481	1.601	1	0.206	1.51
Adults (Ref.)	16	485				
PROM						
Teenager	25	480	1.239	1	0.266	0.74
Adults (Ref.)	33	468				
Anemia (Hb<11) at Registration						
Teenager	8	497	2.797	1	0.094	0.49
Adults (Ref.)	16	485				
Anemia (Hb<11) at 36 weeks						
Teenager	13	492	2.964	1	0.085	0.55
Adults (Ref.)	23	478				
MODE OF DELIVERY						
Spontaneous vaginal delivery						
Teenager	405	99	13.841	1	0.000	1.73
Adults (Ref.)	351	150				
Augmentation						
Teenager	59	446	1.384	1	0.239	0.8
Adults (Ref.)	71	430				
Vacuum						
Teenager	19	486	2.803	1	0.094	1.92
Adults (Ref.)	10	491				
Caesarean Section						
Teenager	87	418	5.483	1	0.019	0.69
Adults (Ref.)	116	385				

Source: Field Study, 2015

The results in Table 8 showed that there were significant differences with respect to some of the obstetric outcomes of pregnancy among both teenage and adult mothers. The differences were seen in cases of spontaneous vaginal delivery (SVD) and Caesarean sectionWith respect to SVD, surprisingly, it was observed that the teenagers were 1.73 times more likely to have SVD than the adults. This means that teenagers were about 73% likely to experience spontaneous vaginal deliveries when compared with their adult counterparts. However, adult mothers had higher risk (31.0%) of undergoing the Caesarean section relative to the teenage mothers. Thus, an odds ratio of 0.69 was recorded in favour of teenage mothers. It can also be seen that teenagers were less likely to have augmentation when compared with the adult mothers. However, teenagers were 1.92 times more likely to have vacuum than the control group. This could be explained that the less developed reproductive structures of the teenagers could result in cephalo-pelvic disproportion which will end up in instrumental deliveries such as vacuum extraction. It was however revealed that there were no significant differences among the two groups with respect to pregnancy complications, including PIH, Eclampsia, gestational diabetes, PROM and anaemia. Despite the fact of insignificant differences, adult mothers were at higher risk of experiencing most of the maternal obstetric complications when compared with the teenagers. It was only in the case of post-partum haemorrhage that teenagers had higher risk (OR=1.51) relative to adult mothers.

Table 9 presents analysis of differences in perinatal outcomes of pregnancy teenagers and adults.

Table 9:*Differences in Perinatal Outcomes of Pregnancy between Teenagers and Adults*

Perinatal outcomes	Yes	No	Chi-square value	df	*p*-value	OR
Severe Asphyxia						
Teenager	59	446	0.206	1	0.650	1.1
Adults (Ref.)	54	447				
Birth Trauma						
Teenager	0	505	1.009	1	0.315	0
Adults (Ref.)	1	500				
Congenital Anomalies						
Teenager	0	505	1.009	1	0.315	0
Adults (Ref.)	1	500				
Birth outcome (Live birth)						
Teenager	487	18	0.945	1	0.331	1.36
Adults (Ref.)	477	24				
Birth outcome (Stillbirth)						
Teenager	18	487	0.945	1	0.331	0.73
Adults (Ref.)	24	477				
Gestational age (Pre-Term)						
Teenager	48	457	0.942	1	0.332	1.24
Adults (Ref.)	39	462				
Gestational age (Term)						
Teenager	433	72	7.364	1	0.007	1.58
Adults (Ref.)	397	104				
Gestational age (Post-Term)						
Teenager	21	484	22.431	1	0.001	0.31
Adults (Ref.)	62	439				
Birth weight (<2500g)						
Teenager	112	393	9.698	1	0.002	1.67
Adults (Ref.)	73	428				
Birth weight (≥2500g)						
Teenager	393	112	1.592	1	0.207	0.82
Adults (Ref.)	406	95				
Apgar in first 1 minute (≤3)						
Teenager	69	436	0.018	1	0.893	1.03
Adults (Ref.)	67	434				

Table 9 continued

Apgar in first 1 minute (4-7)						
Teenager	416	89	29.784	1	0.001	2.25
Adults (Ref.)	338	163				
Apgar in first 1 minute (>7)						
Teenager	20	485	54.841	1	0.001	0.18
Adults (Ref.)	94	407				
Apgar in first 5 minutes (<7)						
Teenager	165	340	0.008	1	0.930	0.99
Adults (Ref.)	165	336				
Apgar in first 5 minutes (≥7)						
Teenager	340	165	0.008	1	0.930	1.02
Adults (Ref.)	336	165				

Source: Field Study, 2015

The results showed that there were significant differences with respect to some of the perinatal outcomes of pregnancy among both teenage and adult mothers. The differences were seen in cases of gestational age (term) (P= 0.007), gestational age (post-term) (P<0.001), birth weight (<2500g) (P= 0.002). Apgar score in first 1 minute (4-7) (P<0.001), and Apgar score in first 1 minute (>7) (P<0.001).

With respect to birth outcomes, although there was no statistically significant difference, the results showed that teenage mothers stood a higher chance (36%) of having live births than their adult counterparts. Also, on the gestational ages, teenagers were 1.58 times morelikely to deliver within the normal period than the adult mothers. However, adults stood higher risk of having post-term deliveries compared to the teenage respondents. The analysis also pointed out that teenage mothers had a higher risk (OR=1.67) of delivering babies with less than 2500g weight relative to their adult counterparts. Meanwhile,

whiles teenage mothers were 2.25 times more likely to have their babies obtaining Apgar score of 4-7 in first 1 minute than the adult mothers, the reverse was the case in terms of Apgar score of at least 7 in first 1 minute. Thus, teenage mothers had 82% less likelihoodof having their babies obtaining Apgar score of 7 in first 1 minuteas compared to their adult counterparts.

Some insignificant factors identified were severe asphyxia ($p = 0.650$), birth trauma ($p = 0.315$), vacuum ($p = 0.094$), live birth ($p = 0.331$), and Apgar score in first 5 minutes ($p = 0.930$), among others.

Discussion

This study examined the socio demographic characteristics of respondents (teenage pregnant mothers). With regard to age, this study found that, out of the 505 teenage mothers, 20(3.96%) and 486 (96.4%) were between the ages of 13-14 and 15-19 years respectively. The mean age of the teenage mothers was 16.9 years. Since majority of the teenage mothers were between ages of 15-19, it implies that the teenage mothers were older teenagers. This is consistent with what has been reported earlier (Kamini & Avvaru 2014; Izugbara2015; Sultana et al. 2009)since their finding revealed that, older teenagers were more likely to become pregnant.

Majority of the study mothers have had at least 9 years of formal education.This is consistent with the findings of other studies (Khairani et al. 2010; Sharma et al. 2002; Wasuna, & Mohammed, 2002; Isa, & Ghani, 2012; Wellings et al. 2001), found out that, teenagers who had given birth had formal education.

On religion, the respondents were found to be largely Christians. Out of the 505 teenagers, 453 (89.7%) were Christians, 42 (8.3%) were muslims, and 10(2%) were members of other religions. This is not surprising because the 2010 population and housing census conducted by the Ghana Statistical Service revealed that both at the national and within Cape Coast metropolis, Christians dominated. One would expect that because Christianity discourages pre-marital sex among young adults, teenage pregnancy would not be found among Christian teenagers. Christianity frowns upon sex before marriage. This means that the Christian value of frowning upon sex before marriage is not upheld by the young men and women in the Christian community because this study found that majority of the respondents were Christians. Islam has no guidelines concerning the age for marriage either for boys or girls. Islam guides against sexual activity before and outside marriage. So if the person is married, age is not an issue (Ayup,2016). This study showed that religion appears to be associated with teenage pregnancy. This is consistent with earlier finding (Brenon et al. 2005; Hardy & Raffaelli. 2003; Dodge et al. 2005).

Several studies have reported that majority of teenage pregnant mothers are not married (Isa, &Gani, 2012;Wasuna, & Mohammed,2002;Naseen et al. 2013). This finding is consistent with the present finding.Contrary to this finding, a study conducted by Kamini and Avvaru (2014) revealed that, teenage mothers were married.Out of the 505 teenagers who took part in the study, 495 (98.0%) had given birth to 1-2 children, 9(1.89%) had given birth to 5 and above children. Earlier studies have reported that majority of the teenage pregnant mothers are

primigravida (Wasuna & Mohammed 2002; Ezegwui et al, 2011; Naseen et al, 2013).The present study is consistent with their findings.

The finding of the current study revealed high unemployment rate among teenagers (335 (66.3%)). This is congruent with the findings of other studies (Isa & Gani 2012; Wasuna & Mohammed 2012; Mayor, 2014;Shaikh et al. 2012). Most of the teenagers were Akans 417 (82.6%). Cape Coast is dominated by the Akans. This result, corroborates that of the 2010 population and housing census that Akans are the most dominant population in the country as well as in the Metropolis under study. (Ghana Statistical Service, 2012).

With respect to facility where respondents delivered, majority, 262(57.9%) of the teenagers delivered at the Cape Coast Teaching Hospital, followed by Cape Coast metro Hospital 220 (43.6%) and UCC hospital 23(4.5%). These results could be that Cape Coast Teaching hospital is a referral center and as such, a lot of cases are referred there. Cape Coast Metro Hospital is the Metro hospital and because of that, the indigenes would visit there. The UCC Hospital by its location is in an elite community, it serves mostly staff and students of the University and it is understandable that one would not expect many teenagers patronizing the place. Families in this community take good care of their teenagers. The few teenagers may come from the surrounding villages.The finding is consistent with the finding of Liu and Cheung(2011),which reported that teenage pregnancy; tend to occur in communities where individuals receive less attention and family care. The university community is made up of elite group. It is expected that children within this community will remain in school for

learning. Awarenessof sexual and reproductive health would b higher among this group.

Several studies have emphasized the importance of antenatal care and there seems to be an improvement in attendance of antenatal clinic among pregnant women (Hogue & Hogue, 2010). The findings of the present study are consistent with this where majority of the studied women have access to antenatal care. The rate of antenatal attendance has improved largely due to improved education, counselling, availability and accessibility of health facilities and social support for pregnant women in the Metropolis. According to Lawn and Kerber (2006), there is a high antenatal attendance rate of 71%among women worldwide; industrialised countries – 95%, South Asia – 54%, and Sub-Saharan Africa – 64%. On the contrary other studies found that majority of the teenagers were unbooked (non-attendant of ANC) (Suan et al. 2015; Sulaiman et al. 2013; and Khariani et al. 2010).Reynolds et al. (2006)also found in five of fifteen countries that younger women were less likely than middle aged women to use antenatal care.

The findings of this study revealed that antenatal clinic attendance has positive influence on spontaneous vaginal delivery, stillbirth, term delivery and Apgar score in first 1 minute. The study also found that teenagers who attended ANC are likely not to have caesarean section. These results corroborate that of Bensussen and Saewyc (2001). They found that teens who received care at the teen clinic and received significantly more maternity support visits on average, were less likely to have caesarean section or forceps/vacuum-assisted deliveries, and had infants with significantly higher birth weights than teens seen at the adult

clinic. This implies that antenatal clinic attendance is important in teenage pregnancy and more important if it is specially organized for teenagers alone.Boss et al, (2001) also found that sufficient prenatal care was associated with improved apgar score. Studies have attributed the poor pregnancy outcome of teenage pregnancy to lack of Antenatal care rather than maternal age (Isaranurug et al, 2006; Taffa, 2003). The finding of this study revealed that no infant had birth trauma and congenital anomalies. Lack of birth trauma could be attributed to the fact that skilled delivery has improved tremendously in the metropolis. For lack of congenital anomalies, the increased antenatal clinic attendance could be a contributing factor.

The prevalence of medical conditions among teenagers was low. Comparatively, no teenager was found to have diabetes compared to two adults, and this finding is consistent with Kovavisarach et al. (2010) who found that diabetes mellitus is higher among adults than teenagers. However, a few incidences of some medical conditions were recorded among teenagers. For example, UTI (0.4% vrs 1.6%), Hepatitis B (2.4% vrs 3.6%), Syphilis (0.4% vrs 1.6%) and HIV/AIDS (0.4% vrs 1.6%) for teenagers versus adults. In contrast findings of a study conducted in Finland suggesteda higher risk of UTI among teenagers. The researchers speculated that teenagers might be sexually more active during pregnancy compared with older women(Mittal & Wing, 2005; Farkash et al, 2012). Although majority of the teenagers in this study did not experience UTI, Mazor –Dray et al.(2009) found that UTI may be asymptomatic or symptomatic and if untreated can lead to serious obstetric complications.

According to Siakwa et al. (2014), UTI in pregnancy in Ghana is challenging because it is sometimes asymptomatic and hospitals only do laboratory tests for patients who have symptoms. Many clients book for care too late for effective diagnosis and treatment to be achieved. It should be a concern of service providers especially midwives to request for bacteria in urine for all pregnant women especially teenagers. HIV/ AIDS among teenagers in this study is low (0.4%). On the contrary astudy in South Africa reported high incidence of HIV among teenagers (6.9%) (Shisana et al.,2009).

Consistent with the finding of the current study, a study conducted in Pakistan revealed low incidence of HBV among young mothers aged 11 to 20 years (Khan et al, 2011). Contrary to the finding of the present study,Mbaawuaga et al., (2008) reported that HBV is higher among teenagers (10 – 19 years).Siakwa et al., (2014)conducted a study among 512 pregnant women attending antenatal clinic in the Cape Coast Teaching Hospital, Ghana. They obtained 262(51%)HBsAg positive and 250(48.8%) HBsAg negative and concluded that babies born to mothers with positive HBsAg status could have a higher risk for vertical transmission as well as adverse neonatal consequences. This means that herpatitis B is highly prevalent in Ghana and Cape in particular, and it is risky for pregnant mothers'and their neonates'especially teenage pregnant mothers. It is therefore advisable for the general public especially sexually active teenagers to test for their HBsAg status. Depending on the results they should ether receive vaccination for the negative results or treatment for positive results.

The study revealed that, the risk of obstetric complications is significantly low in teenagers in the metropolis.A few of the teenage pregnant mothers had

pregnancy complications in this study. This is contrary to the findings of several studies (Al-haddabi et al., 2014; Dutta and Joshi, 2013; Gupta et al., 2008; Edesay et al, 2014; Phupong, & Suebnukarn, 2007),who found anaemia prevalence to be high among teenage pregnant mothers.

Similarly, studies conducted in Malaysia did not find significant associations between teenage pregnancy and pregnancy-induced hypertension, (Siraj, & Ismail, 2000: Khairani, Suriati, & Azimah, 2010; Sulaiman et al.,2013).However a study from Lahore, Pakistan reported higher rates of pregnancy-induced hypertension in teenage mothers (Iqbal, Azad,&Tayyab, 2004). Contrary to the results of this study (Usta,Naassan, &Nassar,2008), concluded in their studythat teenagers are more likely to suffer from pre-eclampsia and eclampsia than the adults. Conde-Agudelo et aI, (2005) also reported that, there was a clear trend towards increasing rates of pre-eclampsia and eclampsia, as maternal age decreased.

Congruent to the finding of the present study,El-Gilany and Hammad (2012), concluded that gestational diabetes mellitus, was less among teenagers.The reason could be that there is a decrease in the function of B cells of pancreas and cell sensitivity to insulin with age increase (Kayastha & Pradhan, 2012).). The function and structure of hemoglobin and the means of glaciations is changed with increase in age. This can be another reason for the increasing of gestational diabetes under the influence of age Mayor (2004)

Studies conducted in Malaysia did not find significant associations between teenage pregnancy and antepartum haemorrhage (Siraj, & Ismail, 2000: Khairani, Suriati, & Azimah, 2010; Sulaiman, Othman, Razali, & Hassan,

(2013).This is consistent with this study. Meanwhile, a study from Lahore, Pakistan found opposing results,ofhigher rates of postpartum haemorrhage among teenage mothers (Iqbal, Azad &Tayyab, 2004). Adeyinka et al., (2010), also reported that postpartumhaemmoraghe, was one of the obstetrics complications found among the teenagers. The findings of Kongnyuy et al., (2008) revealed that teenage pregnancy carry less risk of PROM. With the current study, adequate prenatal care could be the reason why the teenagers had less risk of obstetric outcomes.

Among the modes of delivery, it was realized that spontaneous vaginal delivery was the most common amongst the teenage mothers. This is because 406 (80.4%) out of the 505 teenagers delivered spontaneously, Caesarean section (17.2%), augmentation (11.7%) and vacuum (3.8%). As revealed by Ezegwui et al. (2012) in their retrospective review of all teenage pregnancies at University of Nigeria Teaching Hospital, Enugu over a 6-year period (2000-2005), they found that caesarean section (19%) was uncommon among teenagers. This finding is consistent with the finding of this study, where 17.2% delivered through caesarean section. That is, teenagers have higher probability of delivering normally than undergoing caesarean section. These findings are congruent with the finding of Sulaiman et al.'s (2013) study which showed that the adolescents had a significantly higher rate of normal vaginal delivery. Contrary to the result of the current study several findings (Tufail, & Hashmi, 2008; Sulaiman et al. 2015)revealed that teenage pregnancy is associated with increased risk of cesarean section than their adult counterpart. Meanhwile, finding of a study

conducted by (Kayastha, & Pradhan, 2012; Ezegwui et al. 2012) showed that the rate of cesarean delivery was similar in both teenagers and adults.

There could be several reasons that may be underpinning the finding of the present study. This may include good family support, early booking and adequate antenatal care. The findings from this study corroborate that of Sagili, Pramya and Prabhu (2012), which did not support the assumption that "teenage pregnancy'' is associated with severe adverse obstetric outcome.The current study found that in terms of birth outcomes, 487 (96.4%) compared to 18 (3.6%) recorded live births. This means that only 3.6% of the teenage mothers lost their children during delivery (still birth). This is consistent with the finding of a study by(Yadav et al, 2008; Sheina et al, 2004; Smith, & Pel, 2001)whichfound that, teenage pregnant women were not at risk of having stillbirth delivery. On the contrary,Iklaki et al., (2012) reported that macerated still birth among unbooked teenage mothers was significantly high. The reason for the finding of this present study could be that because majority of teenagers in this study, attendedantenatal clinic.

Usta et al., (2008) and Chahande, Jadhao, & Wadhva, (2002), concluded in their study that teenagers are more likely to deliver preterm babies. They found that possible cause could be the immaturity of the organs of young women.This is contrary to the findings of this present study which reported that a majority (85.7%) delivered within the normal periods of 38-42 weeks. However, others experienced varied delivery dates. Forty-eight respondents representing 9.5% and 21 (4.2%) delivered pre-term and post-term respectively. Consistently, Saxena et al, (2010) andJivrag et al (2010) found that teenage pregnant mothers were not at

risk of having a preterm delivery.This could be explained that the teenagers in this study were mostly older teenagers so their organs are a bit matured.

According to the results, whereas 112 (22.2%) of the teenage mothers delivered babies weighing less than 2,500g, majority of them 393(77.8%) however had their babies having normal weight; attainting at least 2500g. The result is not consistent with a study conducted by Sulaiman, Othman, Razali andHassan (2013)on teenage pregnancies in two major hospitals in Klang Valley,whichfound that teen mothers had significantly lower birth weight babies. The finding of a study by Rudra, Bal and Singh(2013), also revealed that various parameters of neonatal outcome like IUGR and preterm birth among teen mothers were poorer.

Majority of teenage mothers delivered babies with Apgar score of 4-7(82.4%) within 1 minute of delivery. This requires that the baby is given adequate resuscitation. Meanwhile, a substantial proportion of the babies to teenagers (13.7%) were also found to have obtained less than 3 (asphyxia); implying that they needed immediate lifesaving measures. Also, only very few teenagers (4%) gave birth to babies who did not need more than routine post-delivery care, since their Apgar score after a minute was at least 7. In sum, it can be concluded that for the first 1 minute after delivery, about 96% of the teenagers had their babies requiring prompt medical attention. However, in first 5 minutes after delivery, more than half of the teenage mothers had their babies obtaining 7 or more Apgar score. This implies that most of the neonates got stabilized in five minutes after delivery. This is incongruous to the finding of previousstudies conducted by (Kongnyuyet al. 2008; Gupta, Kiran, & Bhal,

2008;Tyrberg,Blomberg, &Kjølhede, 2013), which found that teenagers have babies with low Apgar score at 5 minutes. The explanation to this could be that infant resuscitation in the metropolis is done well.

It was however revealed that there were no significant differences among the two groups with respect to pregnancy complications, including anaemia, PIH, Eclampsia, gestational diabetes and PROM. Sulaiman et al., (2013) found similar results in their study which shows that there was no difference in the risk of anaemia when the teenagers were compared with the adults. The reason could be that the teenagers in the studies received adequate prenatal care.Contrary to this finding (Ziadeh, 2001; Kore et al. 2004; Tufai, & Hashmi, 2008) reported that anaemia is higher among teenagers as compared with adults. Usta et al, (2008) also reported that teenagers are more likely to suffer from anaemia than their adult counter parts.

Concerning PIH, studies conducted in Malaysia also did not find significant association between teenage pregnancy and pregnancy-induced hypertension. (Siraj, & Ismail, 2000: Khairani, Suriati, & Azimah, 2010; Sulaiman et al., 2013). Shah, et al, (2011)discovered that PIH, was not significantly different in teenage and non-teenage mothers.However a study from Lahore, Pakistan reported higher rates of pregnancy-induced hypertension in teenage mothers than adult mothers (Iqbal, Azad,&Tayyab, 2004).

The current study results which revealed that, adult mothers are more likely to experience eclampsia than the teenage mothers, contradict the results of several studies.A study conducted by Kongnyuy et al. (2008), revealed that teenage pregnancy had higher rates of pre-eclampsia and eclampsia as compared

with the adults. (Usta, et al. 2008; Conde-Agudelo et al.2005;Tufail, & Hashm, 2008) and concluded in their studies that teenagers were more likely to suffer from pre-eclampsia than the adults. The higher rates of antenatal clinic attendance could be the reason for the finding of this present study.

Shah, et al, (2011)found that gestational diabetes was not significantly different in teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan. This finding is consistent with the current result. Contrary to the current result, El-Gilany and Hammad (2012), concluded that gestational diabetes mellitus, was more frequent among older mothers as compared with the teenagers. This is in congruous with reports of (Chibber, 2004; Clearly-Goldman et al, 2005; Ragee et al, 2010; Yogev et al 2010; Aghamohammadi, & Nooritajer, 2011).A study showed that there is a decrease in the function of B cells of pancreas and cell sensitivity to insulin with age increase (Al- Turki, Abu-Heija, & Al- Dakheil, 2003) thatexplain the increase of gestational diabetes with an increase in age of women. The function and structure of hemoglobin and the means of glaciations is changed with increase in age. This can be another reason for the increasing of gestational diabetes under the influence of age. (Jacobsson, Ladtors & Milson, 2004).

Consistent with the result of this study, Ezegwui et al, (2012) found that, premature rupture of membranes was not significantly different in teenage and non-teenage mothers. Contrary to the current result, Derme et al, (2013) observed that premature rupture of membranes (PROM) and oligohydramnios were the most common pregnancy complications among teenage mothers.It was only in the case of post-partum haemorrhage that teenagers had higher risk (OR=1.51)

relative to adult mothers. The less matured pelvic structures of the teenagers could cause cephalo-pelvic disproportion which would lead to injury to the pelvic structures, thereby causing bleeding after delivery.The resultsalso showed that there were significant differences with respect to some mode of delivery among both teenage and adult mothers. The differences were seen in cases of spontaneous vaginal delivery (SVD) and Caesarean section.

With respect to SVD, it was observed that the teenagers were 1.73 times more likely to have SVD than the adults. This means that teenagers were about 73% likely to experience spontaneous vaginal deliveries when compared with their adult counterparts. This could be attributed to the fact that the teenagers were mostly in the upper age range so majority had matured pelvis. The result of this study is congruent withthe findings ofseveral studies, which reported that teenage mothers had a significantly higher incidence of spontaneous vaginal delivery (Derme et al, 2013; Thato , et al, 2007; Keskinoglu et al, 2007; Lewis et al 2009; Thaethae & Thao, 2011; Mukhopadhyay et al, 2010). This is consistent with (Sulaiman et al, 2013; Derme, et al., 2013). The better predisposition of teenage pregnant women to have a spontaneous vaginal delivery is due to better myometrial function and greater tissue elasticity (Jolly et al, 2000).

However, adult mothers had higher risk (31.0%) of undergoing Caesarean section relative to the teenage mothers.Thus, an odds ratio of 0.69 was recorded in favour of teenage mothers.Congruent to the findings of the current study, previous (Ezegwui, Ikeako&Ogbuefi, 2012; Smith & Pell, 2001; Jivrag et al, 2010) found that the rate of emergency caesarean section is lower among teenage mothers as compared with the adult mothers. Most of them explained that their

result could be attributed to improved antenatal care to the teenagers. In their study, Hoque and Hoque (2010)also reported that caesarean delivery was significantly lower among teenagers. Meanwhile, most literature reported that teenagers has increased risk of cepalo-pelvic disproportion leading to high cesarean section rate as compared to their adult counterpart (Tufail &Hashmi, 2008; Rudra, Bal, and Singh, 2013; Sulaiman, et al, 2013). Contrary to the result of the current study and what other researchers have reported, Kayastha and Pradhan, (2012), found in a study conducted in Nepal Medical College Teaching Hospital that the rate of cesarean delivery was similar 10.2% and 10.7%, in both teenagers and adults. Inconsistently, Briggs, et al (2005), reported that majority of adults had cesarean section than the teenagers.Though the analysis of site of the cesarean section was not done, the reason could be that because Cape Coast Teaching Hospital is a referral center most of the adults' referred there, had indication for cesarean section.

With respect to birth outcomes, although there was no statistically significant difference, the results showed that teenage mothers stood a higher chance (36%) of having live births than their adult counterparts. This is consistent with the findings of studies conducted by(Smith & Pel, 2001; Yadev et al, 2008), which revealed that teenage mothers were not at risk of having still birth delivery. Increased antenatal attendance could be the reason for the current result. Studies have reported that adverse pregnancy outcomes like preterm delivery have been associated with teen mothers (Chen, et al, 2007; Goonewardene et tal., 2005; Kumar, et al,2007). The current study found otherwise, it demonstrates that teenagers were 1.58 times more likely to deliver within the normal period than the

adult mothers.However, adults stood higher risk of having post-term deliveries compared to the cases. This could be attributed to the less ability of the uterine muscles of the adults to initiate contractions.

The analysis also pointed out that teenage mothers had a higher risk (OR=1.67) of delivering babies with less than 2500g weight relative to their adult counterparts. It could be apossible explanation for the high rates of normal vaginaldeliveryamong teenage mothers. Meanwhile, whiles teenage mothers were 2.25 times more likely to have their babies obtaining Apgar score of 4-7 in first 1 minute than the adult mothers, the reverse was the case in terms of Apgar score of at least 7 in first 1 minute. Thus, teenage mothers were 82% less likely ofhaving their babies obtaining Apgar score of 7 in first 1 minute as compared to their adult counterparts. Delay in seeking skilled care during delivery could be the contributing factor. Teenagers are more likely to delay more than their adult counterparts, because most of them are unemployed and depend on,their parents or guardians.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the study and the most important findings highlighted from the data analysis. It also highlights the conclusions drawn based on the findings as well as recommendations offered to draw attention to some obstetric outcomes of pregnancy among teenagers and adults in the Cape Coast Metropolis. Areas for further research are also suggested.

Summary

The study examined some influential factors in obstetric and perinatal outcomes of pregnancy among teenagerscompared with adults. Attempt were also made by the researcher to assess the socio-demographic characteristics of teenage pregnant mothers,how attendance of antenatal clinic influence obstetric outcomes of pregnancy among teenagers, the medical conditions among teenage pregnant mothers, obstetric outcomes of pregnancy among teenage pregnant mothers, perinatal outcomes of pregnancy among teenagers and the differences in obstetric and perinatal outcomes of pregnancy between teenagers and adults in the Cape Coast Metropolis.

The study employed an observational design involving 1,006 respondents, including 505 teenagers and 501 adults. Data, spanning January 1 to December 31, 2014, were collated fromclients' folders, labour ward registers, labour

chartsand report books from three public hospitals within the Cape Coast Metropolis. The hospitals were the Cape Coast Teaching Hospital, Cape Coast Metro Hospitaland UCC Hospital. Inanalysing the data, the researcher used frequency, percentage, mean, Chi-square test and odds ratio (OR), whiles statistical conclusions were drawn at 5% significance level.

On the socio-demographic characteristics of the respondents, the results revealed that the respondents were generally young. About 84% of the respondents were found to have obtained some level of formal education. In terms of their religious affiliation, the respondents were largely Christians. On the whole, a little over half of the respondents were married.Again, majority of the respondents were found to have had 1-2 kids. The results further showed that 170 (33.7%) of the teenagers were employed as against 429 (85.0%) of their counterparts. The respondents were mainly dominated by Akans. In terms of the health facilities where the respondents delivered their babies, the analysis indicated that about half of them delivered at the Cape Coast Teaching Hospital. Majority of the respondents accessed antenatal health care. It was observed that the teenagers were more likely to have SVD than the adults.

Key Findings

The following were the major findings that emerged from the study:

1. The study revealed that a majority of the teenage mothers 485 (96.4%) were 15-19 years, and the mean age was 16.9 years. The average age of the adult mothers was 26.9 whilst the overall mean age of the respondents was 21.8 years. The results also indicated that majority (83.9%) of the

respondents had formal education. Furthermore, the result revealed that, 395 (78.2%) of the teenagers were single, (33.7%) of the teenage mothers were employed as against 429 (85.0%) of their adult counterparts.

2. The results revealed that majority of the respondents (88.0% of 1,006) attended antenatal clinics.Out of the 505 teenage mothers, 441(87.3%) attended antennal clinic as against 444(86.6%) of their adult counterparts. Birth outcome (stillbirth), gestational age (pre-term), gestational age (term), Apgar score in first 1 minute (>7), and Apgar score in first 5 minutes (<7) were significantly related to attendance or non-attendance of antenatal among the teenage mothers. For example, the results indicate that the non-attendance of antenatal clinics by teenage mothers could results in stillbirth. The results revealed that none of the infants delivered by the respondents had birth trauma or congenital anomalies
3. The results showed that medical conditions were not common among the respondents, especially the teenage mothers. For instance, none of the teenagers had diabetes, a very few of them recorded UTI 2(0.4%), 12(2.4%) had hepatitis B, 2(0.4%) had syphilis, and 2(0.4%) had HIV/AIDS.
4. A few of the teenagers experienced pregnancy complications such as, PROM (5.0%), post-partum haemorrhage (4.8%), Eclampsia (2.2%), Anaemia (Hb<11) at 36 weeks (2.6%), PIH (BP>140/90) (3.6%), Anaemia (Hb<11) at registration (1.6%), Antepartum haemorrhage (1.4%), and gestational diabetes (0.2%). Spontaneous vaginal delivery was the most common mode of delivery amongst the teenage mothers. This is because

406 (80.4%) out of the 505 teenagers delivered spontaneously, followed by Caesarean section (17.2%), augmentation (11.7%) and vacuum (3.8%).

5. The finding revealed that 487 (96.4%) teenage mothers delivered live births. With regard to gestational age, it was found that majority (85.7%) delivered within the normal period of 38-42 weeks. According to the results, whereas 112 (22.2%) of the teenage mothers delivered babies weighing less than 2,500g, majority of them however had their babies having normal weight; attainting at least 2500g. Also, majority of teenage mothers delivered babies with Apgar score of 4-7(82.4%) within 1 minute of delivery. Meanwhile, a substantial proportion of the babies to teenagers (13.7%) obtained less than 3(asphyxia).
6. The results revealed that there were significant differences with respect to some of the obstetric outcomes of pregnancy among both teenage and adult mothers. The differences were seen in cases of spontaneous vaginal delivery (SVD) and Caesarean section with respect to SVD, surprisingly, it was observed that the teenagers were 1.73 times more likely to have SVD than the adults. However, adult mothers had higher risk (31.0%) of undergoing Caesarean section relative to the teenage mothers. It was however revealed that there were no significant differences among the two groups with respect to pregnancy complications, including PIH, Eclampsia, gestational diabetes, PROM and anaemia.
7. The results revealed significant differences with respect to some of the perinatal outcomes of pregnancy among both teenage and adult mothers. With respect to birth outcomes, although there was no statistically

significant difference, the results showed that teenage mothers stood a higher chance (36%) of having live births than their adult counterparts. Also, on the gestational ages, teenagers were 1.58 times more likely to deliver within the normal period than the adult mothers. However, adults stood higher risk of having post-term deliveries compared to the teenage respondents. The analysis also pointed that teenage mothers had a higher risk (OR=1.67) of delivering babies with less than 2500g weight relative to their adult counterparts. Meanwhile, teenage mothers were 2.25 times more likely to have their babies obtaining Apgar score of 4-7 in first 1 minute than the adult mothers, but had 82% less likelihood of having their babies obtaining Apgar score of 7 in first 1 minute.

Conclusions

The study examined obstetric and perinatal outcomes of pregnancy among teenagers. Pregnant women in general are exposed to some degree of adverse obstetric and perinatal outcomes of pregnancy. However, teenage pregnant mothers in the Cape Coast metropolis seem to have less risk. This is probably due to improved obstetric and neonatal care. This revelation does not in any way call for complacency; strategies targeted at teenagers for healthy pregnancy outcome should be encouraged.With reduced maternal and child mortality rates being one of the essential Sustainable Development Goals (SDGs), it is importantthat attention is given to care provided for all pregnant women, especially teenagers.

Certain socio-demographic factors are risk factorsin pregnancy outcomes. Hence, they represent important pointers to possible causes of pregnancy

complications, which should be well noted. Mitigating these risks is paramount to having a less complicated and successful delivery. This requires the consented effort from the pregnant women, husbands and health care providers. The underlying factor to all these is a regular attendance of antenatal clinics, skilled delivery and effective neonatal care.Clearly, having less or no obstetric complications is a shared responsibility between the woman, family and health care providers.

Recommendations

The following recommendations were made for practice, policy and further research:

Practice

1. Health authorities should continue to pursue intervention programmes (including encouraging early antenatal clinic attendance, adolescent reproductive health, sensitisation against stigmatisation of teenage pregnancy, nutrition and personal hygiene) targeted at pregnant women (especially teenagers) for further reductions in obstetric and perinatal complications in the metropolis.
2. Health authoritiesshould make adequate preparations in terms of resource allocation and training of more midwives, for high anticipated antenatal clinic attendance, spontaneous vaginal deliveries, live birth deliveries, term gestational age, Apgar score of 4-7 in the first minute and the experience of severe asphyxia of some neonates of teenagers in the

metropolis. Birth weight of at least 2500g (77.8%), Apgar score of at least 7 in first 5 minutes should be encouraged in the metropolis.

3. All pregnant women, especially teenagers should be advised by health workers to access regular antenatal care. This is because it has effects on their modes of delivery and perinatal outcomes of pregnancy.
4. Family planning should be made available, accessible, affordable, and acceptable to all women of reproductive age to reduce the incidence of unplanned and unwanted pregnancies to which teenagers are more vulnerable.
5. Despite the fact that the medical conditions were not common among the teenagers, teenage pregnant mothers should be screened of medical conditions such as UTI, hepatitis B and syphilis so that early diagnosis and prompt treatment could be achieved early in order toreduce (if not avoid) triggering some of the obstetric and perinatal complications among them.
6. Women should be advised to have early child-bearing plans because giving birth in old age is associated with some high obstetric risks or complications.
7. There should be regular in–service training of health workers especially midwives on how to handle obstetric and perinatal complications, especially among teenagers.

Policy

8. A policy of compulsory and free antenatal care should be drafted and passed into law. This is to compel all pregnant women to access antenatal

care in order to avoid or reduce the obstetric and perinatal complications identified in this study.

9. There should be a policy to make family planning free, available, accessible, affordable, and acceptable to all women of reproductive age especially teenagers to reduce the incidence of unplanned and unwanted pregnancies.

Suggestions for Future Research

The scope of this study could be expanded to include more respondents from health facilities across the country for more generalised conclusions about obstetric and perinatal outcomes of pregnancy among teenagers.A study could be undertaken on pregnant women's knowledge and understanding of obstetric complications and medical conditions.Perceptions and barriers to the attendance of antenatal clinics among pregnant women (especially teenagers)should be explored.

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APPENDIX A

DATA EXTRACTION GUIDE

UNIVERSITY OF CAPE COAST

COLLEGE OF HEALTH AND ALLIED SCIENCES

SCHOOL OF NURSING AND MIDWIFERY

This study seeks to examine the obstetric and perinatal outcomes of teenage pregnancies and compare with adults aged 20 to 34 years in three hospitals in Cape Coast Metropolis. This Data Extraction Form seeks to collate data in this regard. The names of the mothers would however not be needed, and also all data captured would be treated confidentially.

Please tick [√] or write where applicable.

PART 1: SOCIO-DEMOGRAPHIC INFORMATION

1. Age (in years):

   A. 13 – 14 [ ] B. 15 – 19 [ ] C. 20 – 25 [ ]

   D. 26 – 30 [ ] E. 31 – 34 [ ]

2. Educational background:

   A. No Formal Education [ ] B. Basic [ ]

   C. Secondary [ ] D. Tertiary [ ]

3. Religion:

   A. Christianity [ ]

   B. Islam [ ]

   C. Other (specify) …….……..…….....

4. Marital Status

   A. Married [ ] B. Single [ ]

   C. Divorced [ ] D. Widow [ ]

E. Other specify……..…….....

5. Parity ……..…….……

6. Occupation : Employed [ ] Not Employed [ ]

7. If employed specify……

8. Ethnicity : Akan [ ] Guan [ ] Ewe [ ] Ga/Dangme [ ] Others [ ]

PART 2: STATUS OF ANTENATAL CLINIC ATTENDANCE

A. Attendant [ ] B. Non-attendant [ ]

PART 3: OBSTETRIC OUTCOMES OF PREGNANCY

COMPLICATIONS OF PREGNANCY	**YES**	**NO**
PIH (BP> 140/90)		
Eclampsia		
Gestational Diabetes		
Antepartum Haemorrhage		
PROM		
Anemia (Hb<11) At registration		
Anemia (Hb<11) At 36 weeks		
MODE OF DELIVERY		
Spontaneous Vaginal Delivery		
Caesarean Section		
Augmentation		
Vacuum		

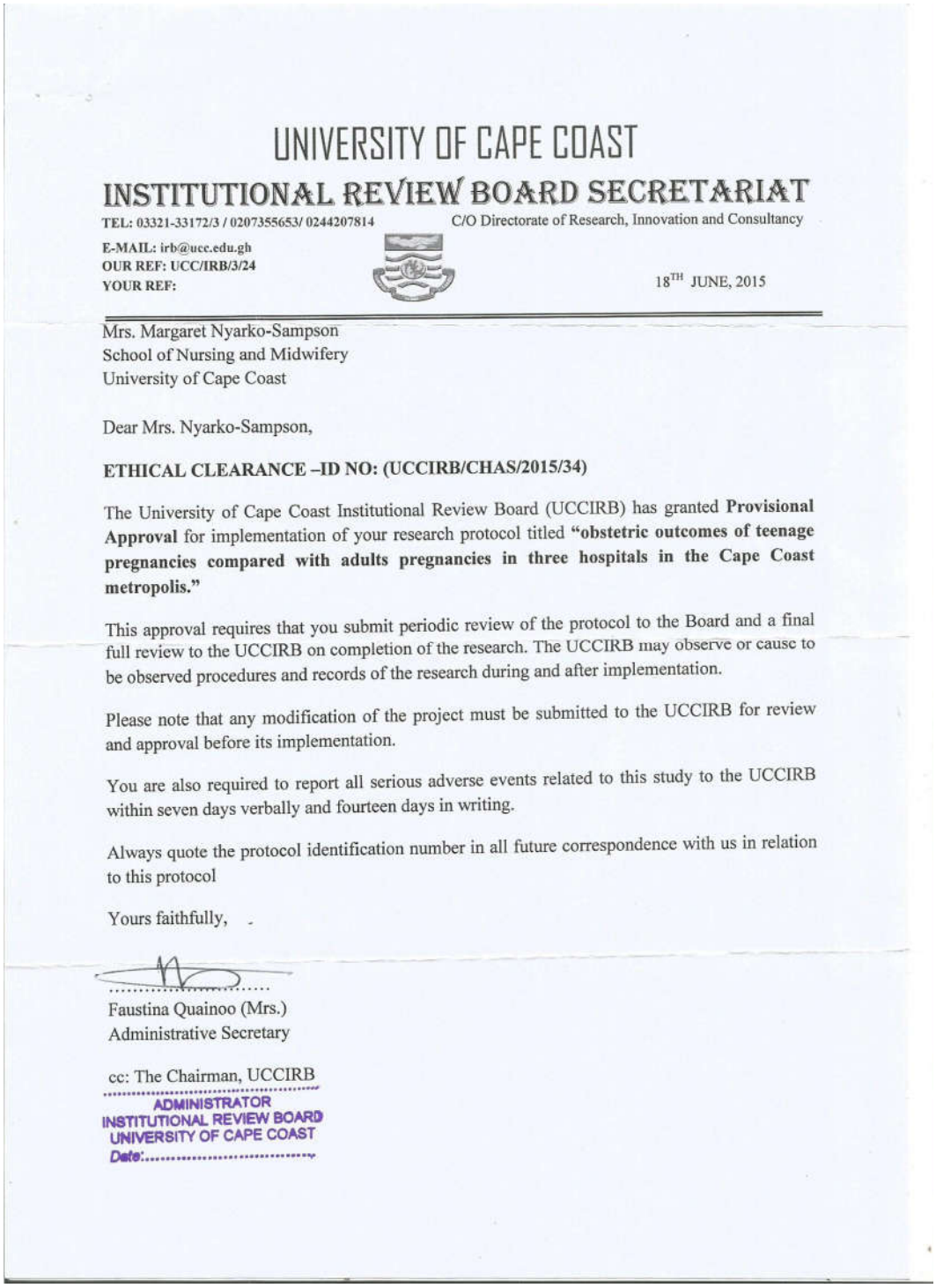
PART: 4 PERINATAL OUTCOMES OF PREGNANCY

OUTCOME OF DELIVERY	LEVELS	YES	NO
Birth outcome	Live birth		
	Stillbirth		
If Stillbirth?	FSB		
	MSB		
Gestational age	Pre-term		
	Term		
	Post-term		
Birth weight	<2500g		
	≥2500g		
Apgar in first 1 minute	≥3		
	4 -7		
	>7		
Apgar in first 5 minutes	<7		
	≥7		
Severe Asphyxia			
Birth Trauma			
Congenital Anomalies			

PART: 5 MEDICAL CONDITIONS

CONDITION	YES	NO
Diabetes		
UTI		
Hepatitis B		
Syphilis		
HIV/AIDS		

APPENDIX B



UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 03321-33172/3 / 0207355653/ 0244207814

C/O Directorate of Research, Innovation and Consultancy

E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRB/3/24
YOUR REF:

18TH JUNE, 2015

Mrs. Margaret Nyarko-Sampson
School of Nursing and Midwifery
University of Cape Coast

Dear Mrs. Nyarko-Sampson,

ETHICAL CLEARANCE –ID NO: (UCCIRB/CHAS/2015/34)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted **Provisional Approval** for implementation of your research protocol titled **"obstetric outcomes of teenage pregnancies compared with adults pregnancies in three hospitals in the Cape Coast metropolis."**

This approval requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol

Yours faithfully,

.....
Faustina Quainoo (Mrs.)
Administrative Secretary

cc: The Chairman, UCCIRB

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
Date:.....

APPENDIX C

UNIVERSITY OF CAPE COAST
SCHOOL OF NURSING

Telephone: 233-3321-33342/33372
Telegrams & CablesUniversity, Cape Coast
Email: nursing@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA.

Our Ref: SNM/77/Vol.2/80

Your Ref:

18th March, 2015

19 MAR 2015

The Chief Executive Officer
Cape Coast Teaching Hospital
Cape Coast

Dear Sir/Madam,

INTRODUCTORY LETTER

This is to introduce **Mrs. Margaret Nyarko-Sampson** a level 850 Master of Nursing student of school of Nursing and Midwifery, University of Cape Coast, who is conducting a research on the topic: ***"Determinants of obstetric Outcomes among teenagers and adults from the three Public Hospitals in the Cape Coast Metropolis".***

We would be grateful if you could grant her the necessary assistance and support.

Thank you.

Yours faithfully,

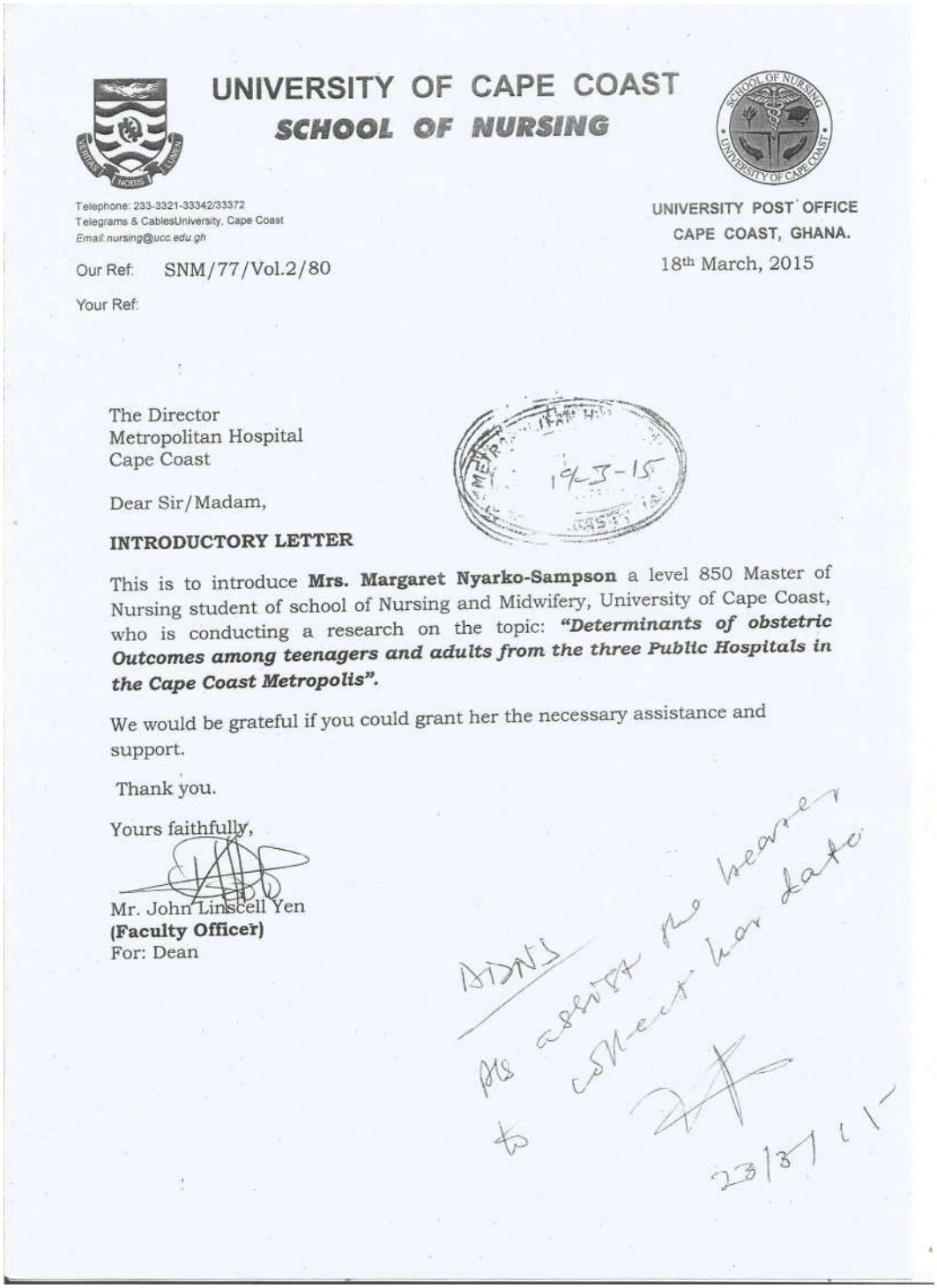
Mr. John Linscell Yen
(Faculty Officer).
For: Dean

Director of Nursing Services
Please give her the necessary assistance.
22/3/15

Kindly assist the bearer of this note gather her data. Thank you

Nursing Manager
CENTRAL REGIONAL HOSPITAL
CAPE COAST

APPENDIX D



UNIVERSITY OF CAPE COAST
SCHOOL OF NURSING

Telephone: 233-3321-33342/33372
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Email:nursing@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA.

Our Ref: SNM/77/Vol.2/80

Your Ref:

18th March, 2015

The Director
Metropolitan Hospital
Cape Coast

MET 14-3-15

Dear Sir/Madam,

INTRODUCTORY LETTER

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We would be grateful if you could grant her the necessary assistance and support.

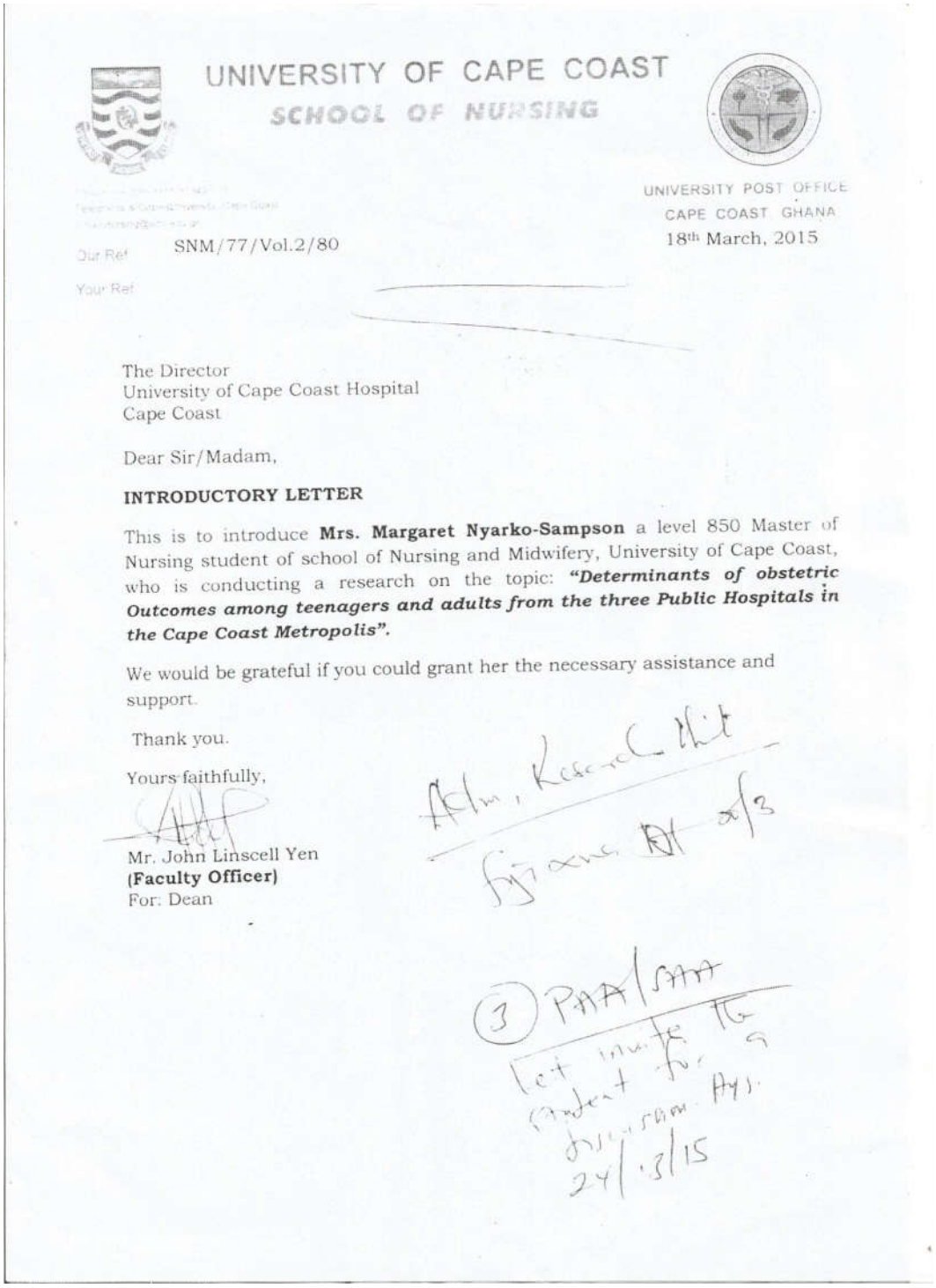
Thank you.

Yours faithfully,

Mr. John Linscell Yen
(Faculty Officer)
For: Dean

ADMS
Pls assist the bearer to collect her data
23/3/15

APPENDIX E



UNIVERSITY OF CAPE COAST
SCHOOL OF NURSING

UNIVERSITY POST OFFICE
CAPE COAST GHANA

Our Ref SNM/77/Vol.2/80

Your Ref

18th March, 2015

The Director
University of Cape Coast Hospital
Cape Coast

Dear Sir/Madam,

INTRODUCTORY LETTER

This is to introduce **Mrs. Margaret Nyarko-Sampson** a level 850 Master of Nursing student of school of Nursing and Midwifery, University of Cape Coast, who is conducting a research on the topic: ***"Determinants of obstetric Outcomes among teenagers and adults from the three Public Hospitals in the Cape Coast Metropolis".***

We would be grateful if you could grant her the necessary assistance and support.

Thank you.

Yours faithfully,

Mr. John Linscell Yen
(Faculty Officer)
For: Dean