SCHOOL OF PUBLIC HEALTH

COLLEGE OF HEALTH SCIENCES

UNIVERSITY OF GHANA

TRENDS ANALYSIS OF CONTRACEPTIVE USE AND TEENAGE PREGNANCY AMONGST ADOLESCENTS IN GHANA USING THE DEMOGRAPHIC AND HEALTH SURVEY 1998, 2003, 2008 AND 2014

BY

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THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE MASTER OF PUBLIC HEALTH DEGREE

OCTOBER 2020

DECLARATION

I, Ayesha Kadiri-English, hereby declare that apart from specific references which have duly been acknowledged, this project is my original research under supervision. No part of it has been presented for another degree in this university or elsewhere.

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Supervisor's name: Dr. Agnes M. Kotoh

Date: 28/10/20

DEDICATION

This work is dedicated to my late mother Hajia Memuna Pendah Futa, my late grandmother Hajia Ayesha Lami Futa and my father, Chief Alhaji Mohammed Kabiru Kadiri-English.

ACKNOWLEDGEMENT

My first thanks goes to the Almighty Allah for His guidance and protection throughout the period of this study.

I wish to express my sincere gratitude to my supervisor Dr. Agnes M. Kotoh who meticulously scrutinized my work to a successful completion.

A special thank you to Dr Ibrahim Baba, the medical superintendent of St Martins Memorial Hospital, Shukura for his advice and support for this research.

I wish to express my appreciation to the Ghana Statistical Service, ICF International and the Demographic and Health Survey Program for granting me access to the dataset for this study.

My profound gratitude to my family, especially my husband, for their understanding, kindness, generosity and moral support throughout this research.

To all individuals who contributed in one way or another, I say thank you all for your assistance.

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LIST OF ABBREVIATIONS

AOR	-	Adjusted Odds Ratio
CPR	-	Contraceptive Prevalence Rate
CU	-	Contraceptive Use
DHS	-	Demographic Health Survey
EA	-	Enumeration Area
GDHS	-	Ghana Demographic Health Survey
HBM	-	Health Belief Model
ICPD	-	International Conference on Population and Development
IUD	-	Intra-Uterine Device
IR	-	Individual Recode
LARC	-	Long-Acting Reversible Contraceptive
LAM	-	Lactational Amenorrhea
MDG	-	Millennium Development Goal
NPC	-	National Population Council
SRH	-	Sexual and Reproductive Health
STI	-	Sexually Transmitted Infection
SDG	-	Sustainable Development Goal
SPSS	-	Statistical Package for the Social Sciences
TP	-	Teenage Pregnancy
UNICEF	-	United Nations Children's Fund

ABSTRACT

Background: Teenage Pregnancy and Contraceptive use are issues of concern both nationally and internationally. They are also integral aspects of achieving sustainable development by 2030. Despite interventions to reduce teenage pregnancy and increase contraceptive use, there are still high and increasing teenage pregnancy rates alongside low contraceptive use.

General objective: To analyse the trend and factors associated with contraceptive use and teenage pregnancy in Ghana using the 1998 to 2014 Demographic and Health Surveys (DHS).

Methodology: A cross-sectional study using secondary data from the Ghana Demographic and Health Surveys (GDHS) of 1998, 2003, 2008, and 2014. The GDHS employed a stratified two-staged cluster sampling method. Only quantitative data was used. Data were analysed using Microsoft Excel 2019 and Statistical Package for the Social Sciences (SPSS) version 20. Pearson Chi-Square was used to determine the association between teenage pregnancy or the use of a contraceptive method (dependent variables) against independent variables which were age, educational level, religion, place of residence, region, age at first sex, marital status, ever given birth, and heard family planning on radio/TV/newspaper. Statistically significant variables were further analysed using a binary logistic regression and an adjusted odds ratio (AOR) at 95% confidence interval (CI) was calculated to determine the strength of the association. The first and second binary logistic regression model was fitted with the data with contraception use and teenage pregnancy respectively being the response variables and predictors being age, region, religion, place of residence, educational level, age at first sex, year of survey, and heard family planning on radio/TV/newspaper. Permission was sought from the DHS program for access and use of the datasets for the analysis. Sample weights were applied to obtain representative data at the national level.

Results: After applying sample weights, there was a total of 910, 1148, 1025, and 1625 respondents for 1998, 2003, 2008, and 2014 surveys respectively. The mean age of the respondents was 17 and a standard deviation of 1.4. The adolescent girls had high knowledge of contraceptives starting from 86.9% in 1998 to 96% in 2014. There was only a 0.1% increase in contraceptive use over the survey years (8.6% in 1998 and 8.7% in 2014) and a 1.5% increase in modern contraceptive use (4.8% in 1998 and 6.3% in 2014).

The use of any contraceptive method had a decreasing pattern from 1998 to 2008 and increased in 2014. The use of a modern contraceptive method however had a fluctuating pattern over the survey years. The condom was the modern contraceptive method of choice among the adolescents in all the surveys. Whiles the use of oral contraceptive pills had a decreasing pattern, the use of IUD and injectables had an increasing trend. Radio was the commonest source of information on contraceptives followed by television then newspaper. Age and age at first sex were significantly associated with contraceptive use in all four surveys ($p < 0.001$). Source of information from television and being a teenage mother were significantly associated with contraceptive use in three of the surveys whiles religion, educational level, region, and source of information from radio and marital status were significant in two surveys ($p < 0.05$). Teenage pregnancy was also significantly associated with modern contraceptive use in all four surveys ($p = 0.000$). For the logistic regression, region, educational attainment, and source of information from the newspaper were determinants of contraceptive use ($p < 0.05$). Those with no education were 45% less likely to use contraceptives as compared to those with at least secondary level education.

There was a 0.6% increase in teenage pregnancy over the survey years with the odds of teenage pregnancy decreasing over the years. There was an increase in TP from 2003 to 2014 whiles there was a reduction from 1998 to 2003. Age, educational level, rural/urban residence, and age at first sex were significantly associated with teenage pregnancy in all four surveys ($p < 0.05$). For the logistic regression, age, age at first sex, region and educational level were determinants of teenage pregnancy ($p < 0.05$) Those who had their first sex from 15-17 years and below 15years were 84% and 37% respectively less likely to be pregnant as teens as compared to those who had their first sex from 18-19 years. For the highest educational level, those who had no education and those with only primary education were each 2.3 times more likely to be pregnant as teens as compared to those with secondary education.

Conclusion: There was low contraceptive use despite high knowledge throughout the survey years. This study suggests that keeping girls in school at least to the secondary level, improving access to and use of modern contraceptive methods, as well as provision of sexual and reproductive health information on radio, television, and newspaper can support the fight in addressing high teenage pregnancy rates and low contraceptive use.

CHAPTER ONE

INTRODUCTION

This chapter looks at the study background, problem statement, the significance of the study, conceptual framework, research questions, and the study objectives.

1.1 Background of the study

United Nations Children's Fund (UNICEF) defines teenage pregnancy as "conceiving between 13 to 19 years of age" whiles the Cambridge Advanced Learner's Dictionary & Thesaurus refers to contraceptives as "any of the drugs or devices intended to prevent pregnancy." The global population of adolescents is estimated to be 1.2 billion which is the highest so far in history (United Nations Department of Economic and Social Affairs, 2019b).

Adolescence is marked by major physical, social, and psychological developments with the individual's thoughts, perception, and response becoming sexually-oriented (Kar et al., 2015). This puts them at risk of engaging in risky sexual behaviors which may result in unwanted pregnancies and contraction of Sexually Transmitted Infections (STIs). Such pregnancies are associated with pregnancy and childbirth-related complications such as post-partum haemorrhage, which is the number two leading cause of mortality in adolescent girls; maternal mortality and anaemia are also highest amongst teenagers (Al-Akaishi et al., 2017; Cook & Cameron, 2020). Whiles neonatal and infant mortality is highest amongst babies born to teen mothers, such babies are also more likely to suffer from complications such as low birth weight, and prematurity (Al-Akaishi et al., 2017; Azevedo et al., 2015).

The first international summit which discussed contraceptive use (CU) and teenage Pregnancy (TP) was the 1994 International Conference on Population and Development

(ICPD) held in Cairo (UNFPA, 2013). It increased the global awareness of people to the issues of adolescent health of which CU and TP were part. They were also key components of the Millennium Development Goals (MDGs) which were not fully achieved by the end of 2015. MDGs 1, 4, and 5 were aimed at eradication of extreme poverty, reduction of infant mortality, and improving maternal health respectively and were all linked to TP and CU (World Health Organisation, 2008).

From 2015, TP and CU became integral parts of the Sustainable Development Goals (SDGs) which succeeded the MDGs in 2015. The SDGs form part of the agenda 2030 for sustainable development and addressing issues of contraceptive use and teenage pregnancy have been agreed upon by international stakeholders and policymakers to be major areas to help achieve sustainable development. Four main targets have been dedicated to contraceptives. Goal 3 of the SDGs talks about good health and well-being and goal 5 focuses on gender equality. Contraceptive use can help achieve gender equality because adolescents and women can continue their education and empower themselves while still achieving sexual satisfaction. Family planning can help achieve good health and well-being by reducing maternal and infant mortality especially, amongst adolescents. Other SDGs linked to contraceptives are no poverty, zero hunger, quality education, and decent work and economic growth which correspond to goals 1, 2, 4, 5, and 8 respectively (Dockalova et al., 2016). Target 5.3 also relates teenage pregnancy by addressing child marriage. This is so because the elimination of child marriage will drastically reduce teenage pregnancy (Nkhoma et al., 2020). Achieving the desired contraceptive prevalence rate especially amongst adolescents will address teenage pregnancy as well.

In Ghana, the National Population Council (NPC) was established in 1969 to implement policies that would address issues such as teenage pregnancy and contraceptive use. The adolescent reproductive health policy was also instituted in 2000 to address all matters

relating to adolescent health, especially Sexual and Reproductive Health (SRH). The alarming increasing rate of teenage pregnancy in Ghana resulted in the institution of a five-year strategic plan to address teenage pregnancy from 2017 to 2022. Its mission is to provide adolescents, especially girls, with the right knowledge, information, skills, and services to protect them from unplanned pregnancies. This is to be achieved through empowerment, access to gender-balanced adolescent health services, community involvement, and quality education beyond junior high school (MoGCSP, 2017)

Socioeconomic consequences of teenage pregnancy include poverty, stigmatization, partner violence and, school dropout which will lead to unfulfillment of dreams and aspirations. International organizations and nations have spent resources to address this issue over the years, which could end up putting a strain on the economic resources of the country, especially in developing countries if the high rates continue (Sundaram, Vlassof, Bankole, Remez & Gebrehiwot, 2010).

The trend of contraceptive use and teenage pregnancy in Ghana, together with their associated factors need to be explored for a better understanding of the low contraceptive use and high TP rates, despite interventions.

1.2 Problem statement

Contraceptive use and teenage pregnancy are issues of concern, both nationally and internationally, and have been of focal interest to the media.

About 11% of all pregnancies worldwide are from teenage mothers and 95% of these occur in developing countries (Cook & Cameron, 2020; Morris & Rushwan, 2015). Also, 12 million girls aged 15-19 years become pregnant in developing countries yearly and over 80% of these are unintended (WH0, 2018). Over 2 million childbirths worldwide are

by adolescents aged 12-15 years, the majority found in Sub-Saharan Africa (Neal et al., 2012).

Teenage mothers in Ghana were 22% in 1993, reduced to 13% in 2008, and increased again to 14% in 2014 (UNFPA & National Population Council, 2016). In 2017, 14% of adolescent girls had already started childbearing, of which 12% already had a live birth whiles 3% were currently pregnant (Ghana Statistical Service et al., 2018). Adolescents having their first sexual encounter reduced from 12% in 1993 to 7% in 1998 and increased back to 12% in 2014 (UNFPA & National Population Council, 2016)

Modern CU amongst adolescent girls was 5%, 4.8%, 6.4% 5.2% and 6.3% in 1993, 1998, 2003, 2008 and 2014 respectively (UNFPA & National Population Council, 2016). The contraceptive prevalence rate (CPR) for Ghana was 18.75% in 2003 which reduced to 15.75% in 2008 and increased to 21.53% in 2014 (Aviisah et al., 2018). According to the world bank, the 2017 CPR in Ghana was 30.8% and this is less than half of the global rate which was 68% in 2015. In 2019, the CPR of Ghana for any contraceptive method was 26.4% and that for a modern method was 22.6% and this rate is low compared to Zimbabwe, another developing country (50.3% for any method and 49.% for a modern method) (United Nations Department of Economic and Social Affairs, 2019a). At this rate, the targeted 50% CPR by 2020 projected for Ghana by the NPC will not be achieved (Ghana Statistical Service, 2014).

Interventions put in place to address teenage pregnancy and low use of contraceptives among teenagers include the Adolescent Reproductive Health Policy instituted in 2000 that targeted increasing age at first sex by 2010 and to reduce TP by 80% by 2020 by increasing access to and availability of modern contraceptive methods (UNFPA & National Population Council, 2016). Others include the establishment of the National

Population Council in 1969 and the institution of a five-year strategic plan in 2017 (MoGCSP, 2017). The Children's Act of 1998 (Act 560) provides the legal framework that seeks to protect the welfare of children which includes having access to quality healthcare and basic education which indirectly helps address issues of CP and TP (MoGCSP, 2014). National Adolescent Sexual and Reproductive Health Policy and the National Youth Policy also focused on adolescent sexual and reproductive health whiles the National Adolescent Health and Development Programme (ADHD) focused on providing comprehensive healthcare, age, and sex appropriate counseling as well as life skills to the adolescents (Ghana Health Service, 2016). That several interventions have been implemented, the rates are still unsatisfactory as stated above.

There is a paucity of literature on the trends of contraceptive use and teenage pregnancy among adolescent girls on a national scale in Ghana. Even though Appiah, Seidu, Opoku, Baatiema, & Kwabena (2020) researched on determinants and trends of contraceptive use among adolescent girls in Ghana using data from 2003 to 2014 Ghana Demographic and Health Surveys (GDHS), the 1998 dataset as well as the trend of teenage pregnancy and its association to contraceptive use were not included.

This study aimed at filling the literature gap in teenage pregnancy and contraceptive use among adolescent girls in Ghana. It examined the trend and associated factors of teenage pregnancy and contraceptive use among female adolescents using datasets from 1998, 2003, 2008, and 2014 GDHS.

1.3 Significance of the study

The findings from this study would be of immense benefit to several stakeholders such as adolescents, governments, parents, policymakers, and academicians. This study outcome will help design and monitor strategies aimed at increasing patronage of contraceptive

services among adolescents which will help address the increasing population with its associated pressure on socio-economic amenities of the nation. It will also help design and monitor programmes aimed at decreasing the adolescent pregnancy rate and ensure effective use of contraceptives among teenagers in Ghana to prevent the increasing rates of unwanted pregnancies. All these will help improve the quality of life of adolescents and children born as well as the overall economy of the country. Furthermore, the findings of the study will add up to the existing body of literature.

1.4 Research questions

1. What is the trend of contraceptives use in Ghana from 1998 to 2014?
2. What is the trend of teenage pregnancy in Ghana from 1998 to 2014?
3. Is there any association between contraceptive use and teenage pregnancy in Ghana?
4. What factors influence the use of contraceptives among teenagers in Ghana?
5. What is the commonest source of information on contraceptives for teenagers in Ghana?
6. What factors are associated with teenage pregnancy among teenagers in Ghana?

1.5 Objectives

1.5.1 General objective

To analyse the trend and factors associated with contraceptive use and teenage pregnancy in Ghana using the 1998 to 2014 demographic and Health Surveys.

1.5.2 Specific objectives

1. To examine the trend of adolescent contraceptive use in Ghana from 1998 to 2014
2. To examine the teenage pregnancy trend in Ghana from 1998 to 2014

3. To analyse the association between contraceptive use and teenage pregnancy in Ghana
4. To assess factors associated with contraceptive use among teenagers in Ghana
5. To determine the commonest source of information on contraceptives for teenagers in Ghana
6. To determine the factors associated with teenage pregnancy among teenagers in Ghana

1.6 Conceptual framework summary

The Health Belief Model (HBM) which was developed by Irwin Rosenstock, Godfrey Hochbaum, Stephen Kegeles, and Howard Leventhal in the 1950s was adapted in addition to other literature sources for this section in concerning contraceptive use and teenage pregnancy. This model asserts that an individual's likelihood of adopting a particular health-related behavior is based on the perception of the following: perceived susceptibility, perceived severity, perceived benefits perceived barriers, cue to action, and self-efficacy (Fertman & Allensworth, 1982). These are known as constructs of the model.

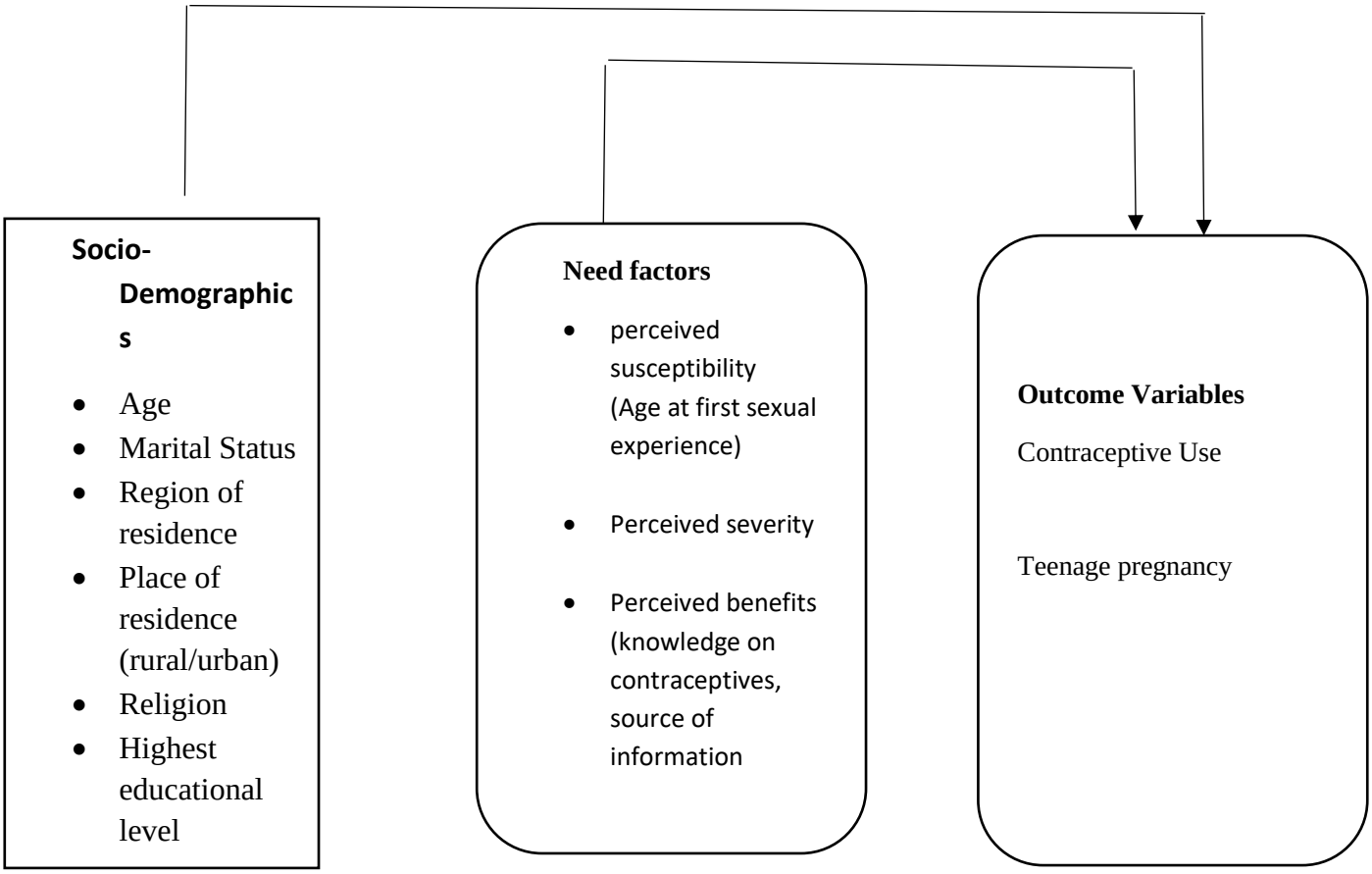
Perceived susceptibility refers to the individual's perception of being at risk of contracting the disease or threat. In this regard, it is based on whether they feel susceptible to contracting STIs or becoming pregnant as teens. Perceived severity can be explained as the person's subjective feelings on the seriousness of contracting the disease or consequences of not treating should he or she contract it. For this study, it is whether the adolescents feel the STIs or teenage pregnancy is severe enough to affect their lives negatively. Perceived benefit is having enough knowledge and from the right source on contraceptives to weigh the benefits against any side effects. Perceived barriers refer to anything that prevents the use. Cue to action is being exposed to an event that could prompt action and, in this context, could be knowledge of contraceptives and or advice

from friends or relatives. Self-efficacy is the individual's belief in his or her ability to effectively perform or undergo the behavioral change. For this study, the perceived barriers and self-efficacy were not considered.

The simplicity of the constructs has made the model desirable in explaining many cognitive behaviours for health workers and has also been used for many health interventions. However, like any model, it comes with its weaknesses and these include not taking into account cultural and environmental factors that may influence behavioral change. Also, it is based on the assumption that all individuals have adequate knowledge or information on the threat or disease (Abraham & Sheeran, 2014). These constructs are usually helpful depending on the health outcome. However, due to the limitations of the HBM, it is recommended to use it with other models where the HBM falls short.

The constructs of the model were grouped as need factors. Socio-demographic characteristics and the need factors were the independent variables. Teenage pregnancy and contraceptive use were the dependent variables. Socio-demographic characteristics included age, educational level, marital status of respondents, religion, place, and region of residence. Educational level, work, marital status, and age were found to be determinants of contraceptive use (Marrone et al., 2014; Nyarko, 2015). According to Indongo (2020), contraceptive use, educational level, and age at sexual debut were significantly associated with teenage pregnancy. Teenage pregnancy was strongly associated with educational level below the secondary school, rural residence, and inadequate knowledge on contraceptives (Sezalio et al., 2016).

Figure 1.1: Conceptual Framework



Source: Adapted from the Health Belief Model by Rosenstock et al

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature related to teenage pregnancy, contraceptive use, and trends. The literature was sourced from original articles, journals, and books. It is based on specific objectives and related topics.

2.2 Contraceptive methods

2.2.1 Types

Contraceptive methods can be divided into modern and traditional. Modern contraceptive methods can also be divided into short-acting, long-acting reversible contraceptives (LARC), and permanent methods. The short-term methods include oral contraceptive pills, injectables (one or three months), and barrier methods (condom, diaphragm); the LARC include implants (three and five years) and the intrauterine device (IUD) which can last up to 10 years while the permanent methods are vasectomy for males and bilateral tubal ligation for females (World Health Organization (WHO), 2014). Condoms are the only method effective against STIs. Both pills and the injectables are hormone-based. All of the above if used effectively can provide 99% protection against pregnancy. The most effective are the LARC and permanent methods with less than 1/100 pregnancy while the least effective being the condoms with 18/100 pregnancy if not used effectively (Centers for Disease Control and Prevention (CDC), 2011). Despite being the least effective at preventing pregnancy, condom use is the most common contraceptive method used by adolescents worldwide, with Ghana not excluded (Boamah et al., 2014; Skrzeczkowska et al., 2018). Traditional contraceptive methods include withdrawal, fertility awareness methods (use of signs and symptoms of ovulation to predict safe and unsafe periods as well as the calendar-based methods), and lactational amenorrhea (LAM) (Stewart et al.,

2013). Not all the traditional methods are as effective as the modern methods. LAM and the calendar-based methods, if used appropriately by following all the recommended guidelines can be as high as 98% effective (Stewart et al., 2013)

The choice of contraceptives for many women depends on their age and the stage of life they are in. Most of them want to postpone their pregnancy and at the same time remain fertile. Teenagers and adult females wish to prevent pregnancy until their target goals are achieved, be it financial, educational, or social. Women have a basic right to decide when or if they ever want to have children, but in 2014, more than 200 million in developing countries had an unmet need for contraceptives (Sedgh et al., 2016).

2.2.2 History

The earliest sources of contraception were in 1550 BC where recipes of preparing contraceptives such as use honey, acacia leaves, and lint as a cervical cap were found in the Egyptian Papyrus; abstinence and withdrawal methods have been used from ancient times with the withdrawal method having being mentioned in a Bible chapter which is in the book of Genesis (Potts & Campbell, 2009). The earliest illustration of condom dates at least 12,000 years ago and has undergone changes from when it was first made from animal gut to linen and finally to rubber whiles the IUD started being made from metal pessaries to silkworm gut to silver wire to copper which is currently made from (Knowles, 2012).

Early birth control movements were spearheaded by three main groups which are the feminists, Eugenicists, and Neo-Malthusians. Feminists believed it was the woman's fundamental right to decide to have children or not and when to have them; eugenicists saw fertility control as means of influencing genetic quality as whites and the rich were seen to be more superior than the blacks and the poor respectively whiles Neo-Malthusians

advocated for fertility control to help address poverty and to improve individual and a family's quality of life (Carey, 2012). An example of a feminist is Margaret Sanger who coined the term birth control and helped legalize contraceptive use especially for females in the United States of America. The interplay between these three groups have played a leading role in modern contraceptives and in developing new technologies (Klausen & Bashford, 2010)

2.2.3 Adolescents' knowledge and source of information on contraceptive methods

According to the findings of Agyemang, Newton, Nkrumah, Tsoka-Gwegweni, & Cumber (2019), 95% of the adolescents could explain what contraceptives were and even mention a type whiles 50% knew contraceptives helped to prevent unintended pregnancies. This study was conducted in the Atwima Kwanwoma District of Ghana. This high rate of the adolescents' knowledge could be attributed to the majority of the respondents having at least secondary education where these teenagers will be more exposed to contraceptives.

Another study conducted in Ghana among in-school adolescents of the central region also had a majority (81%) of the respondents knowing contraceptive methods with the commonest source of information on contraceptives being from the media (Buxton, 2012).

Another study with a majority of respondents knowing contraceptive methods was recorded in the South African province of Limpopo. A 75% rate, though not as high as the first two studies were recorded. However, when it came to the various methods, only 10% knew the IUD and only 17% also knew the emergency contraceptive but did not know how it was supposed to be taken. Their major sources of information were from their parents and the media (Ramathuba et al., 2012).

Friends were the major source of information on contraceptives, however, were not significantly associated with contraceptive use. Information on contraceptives sought from

doctors was however significantly associated with use, p-value < 0.05 (Japaridze, Kristesahivili, & Imadze, 2015). This study was done using secondary data from the 2010 reproductive health survey of Georgian women. The women in this study had easier access to doctors for information on sexual and reproductive health.

Contrary to the above, adolescents' knowledge of contraceptives was very poor, limited,, and in some cases misinformed (Munakampe et al., 2018). This was a systematic review of 21 studies on contraceptives and abortion knowledge, attitude and practices among adolescents of low and middle-income countries. The countries involved were India and most Sub-Saharan African countries including Zambia, Kenya, Ghana, and Nigeria.

In another study, the majority of the respondents who knew about contraceptives reported the television as the main source of information (45%), followed by the radio with 35% (Tayo et al., 2011). This study was conducted amongst in-school adolescents in Lagos, Nigeria.

2.2.4 Trend of contraceptive use

A study assessing the changing patterns of contraceptive use and teenage pregnancy of 19-year-olds in four generations of Swedish teenagers in 1981, 1991, 2001, and 2011 found the highest contraceptive use of 78% in 2011 followed by 69% in 2001. There was an upward trend from 1981 to 2001 and a downtrend trend in 2011. COCPs were the commonest method used throughout with a p-value of <0.001 whiles the use of LARC saw an upward trend over the period, a p-value of <0.01 (Lindh et al., 2016). This result could be due to the increased efforts of the Swedish government to make contraceptives widely available to all. The year 2011 which recorded the highest percentage of the teenagers' use of LARC also recorded the least teenage pregnancy rate among the cohort

of adolescent girls. This could be attributed to the effectiveness of the LARC at preventing pregnancy (Centers for Disease Control and Prevention (CDC), 2011)

A multilevel analysis of the trends, patterns, and determinants of contraceptive use amongst Zambian adolescents aged 15 to 19 years between 1996 to 2014 using the Zambian DHS showed a 3.3% increase over the entire 18-year period. It was 7.6% in 1996 and 10.9% in 2014. Current contraceptive use was higher in 2001 and 2011 with 78% and 69% respectively compared with 60% in 1981 and 62% in 1991. This was statistically significant with a p-value of < 0.05. Age, marital status, and educational level were significantly associated with the trend of contraceptive use with a p-value of <0.05 (Chola et al., 2020)

In a study conducted in the Ashanti Region of Ghana, only 18% of the adolescents were using a contraceptive method with a majority of 53.66% attributing their non-use to perceived health effects and another 33% due to promiscuity associated with persons who use them (Agyemang et al., 2019). The above is similar to another study from the Central Region of Ghana showing a low contraceptive use of 20.5% and out of this 4.4% use them only to prevent pregnancy. Of those who were not using any contraceptive method, their reason was that they were not sexually active as at the time of the study. Another important aspect of this study was that, of those who were sexually active, a significant 82.2% of them were not using any method, their reason sadly being that they were not bothered (Buxton, 2012).

According to findings from Witwer, Jones, & Lindberg (2018), there was no change in the trend of contraceptive use by female high school students over the five-year study period. This study examined the recent patterns in sexual behavior and contraceptive use among high students in the United States of America by analyzing data from 2013, 2015, and

2017 Youth Risk Behaviour Surveys. This pattern of result could be attributed to a short survey interval of five years, which might not allow for any obvious change in pattern to be observed. Also, for the survey, contraceptive use was assessed by use of contraceptive method during the last sexual encounter of the adolescents and some sexually active adolescents may choose to conceal such information which could affect the real contraceptive use picture. The survey is also limited to in-school adolescents; hence, national adolescent contraceptive use cannot be concluded.

In Ghana, a study by Abdul-Rahman et al. (2011) assessing the contraceptive use of sexually active female adolescents using the GDHS for 2003 and 2008 showed a significant increase from 23.7% in 2003 to 35.1% in 2008 for use of any contraceptive method. However, that of traditional methods had a 7.8% increase more than that of modern methods over the period.

In another study also using GDHS to assess contraceptive use among sexually active adolescents, but from 2003 to 2014, the results were contrary to the above. Contraceptive use among adolescent females decreased from 22.1% in 2003 to 21.1% in 2008 and further declined to 20.4% in 2014 (Appiah et al., 2020).

2.2.5 Factors that influence the use of contraceptive methods

A Zambian study on contraceptive use amongst adolescent girls from 1996 to 2014 found age as a determinant of contraceptive use. The likelihood of contraceptive use in 19-year-olds was five times compared to 15-year-olds in the 1996 survey and twice in the 2007 survey (Chola et al., 2020). Adolescent girls aged 15-19 years were less likely to use a modern contraceptive method as compared to older women in Sub-Saharan Africa (Ahinkorah, 2020). These findings are likely as a result of knowledge of the consequences of engaging in sexual intercourse as one age.

An adolescent's educational level can be a determining factor in accepting and using a modern contraceptive method. According to the findings of Islam, Mondal, Khatun, Rahman, Islam, Mostofa & Hoque (2016), women who were working and had higher educational levels had higher chances of contraceptive use in comparison to their unemployed counterparts of lower educational status. Adolescents who had higher educational levels had a higher probability to use modern contraceptives than those who were less educated (Chandra-Mouli, Camacho & Michaud, 2013).

The type of residence has also been found to have a significant association with contraceptive use. According to results obtained from Chandra-Mouli, Camacho & Michaud (2013), adolescents in the rural areas were not using modern contraceptives even though they were more than those living in the urban areas. The rural-urban difference was associated with contraceptive use in the early survey years but not significantly associated with contraceptive use in later years. This is from a Zambian multilevel analysis research among adolescent girls from 1996 to 2014 (Chola et al., 2020).

Religious belief was found to be significantly associated with contraceptive use (Pandey & Singh, 2015). Data from the third National Family Health Survey in India were analysed to find determinants of contraceptive use among females including adolescents found the above to be significant associations. Contraceptive use was commoner among Christian adolescents than adolescents belonging to other religions in Southern Mozambique (Agadjanian, 2013). This is most likely due to the higher percentage of Christians within the study population.

In Namibia, a study conducted showed age at first sexual experience being associated with adolescent contraceptive use as an early sexual debut is associated with increased use of contraceptives (Indongo, 2020). Adolescents in the America whose sexual debut was less

than 15 years had gaps in contraceptive use as compared to those who had their debut above 15 years. Young adolescents are usually not likely to be armed with information regarding matters of their sexual and reproductive health, hence affecting their use of contraceptives (Magnusson et al., 2012).

Adequate knowledge on contraceptive methods is linked to use and this was found in Nepal where adolescents who had inadequate knowledge on contraceptives did not use contraceptives as compared to those who did (Subedi et al., 2018).

2.3 Teenage pregnancy

2.3.1 Trend of teenage pregnancy

A significant downward trend in pregnancy was observed from 4.4% in 1981 to 1.6% in 2011 among 19-year old Swedish women in 4 different generations, a p-value of <0.01 (Lindh et al., 2016). This was mainly as a result of a reduction in pregnancies that were carried to term from 34% in 1981 to 11% in 2011 (p-value <0.001).

A similar pattern was discovered in a study in Ethiopia using their DHS. Over 16 years, there was a 3.8% decrease in teenage pregnancy from 16.3% in 2000 to 12.5% in 2016, a p-value of <0.0001 (Kassa et al., 2019)

In the United States of America, the National Survey on Family Growth conducted a study which showed an increase in teenage pregnancy (both wanted and unwanted) from 10.8% in 1995 to 18.6% in 2002, a p-value of <0.01 (Kissin, Anderson, Kraft, Warner & Jamieson, 2008)

According to Fagbamigbe, Afolabi, & Yusuf (2019) which assessed the prevalence of teenage pregnancy in Nigeria from 1961 to 2013, the rate of TP in 1961 was 39.2%, peaked at 58.9% in 1978 before an unsteady decline to 39.6% in 2012, and then rose

sharply to 55.6% in 2013. This pattern reflects both an upward and downward trend throughout the study period.

In Ghana, the average pregnancy rate in 2014 was 13.89%, increased to 14.07% in 2015, and reduced slightly to 13.89% in 2016. For these three years, the Upper East Region recorded the highest teenage pregnancy rates whiles Greater Accra Region recorded the least (GHS, 2016).

2.3.2 Factors associated with teenage pregnancy

In Ghana, Boamah et al. (2014), in their research on the use of contraceptives among adolescents in Kintampo had teenage pregnancy being high in adolescent girls who were not using contraceptives consistently, opposed to those who did and this association was significant with a p-value of <0.01. According to Habitu, Yalew, & Bisetegn (2018), contraceptive nonuse was significantly associated with teenage pregnancy. This was a community-based cross-sectional study amongst 514 teenagers in Wogedi, North Eastern part of Ethiopia. The study determined that adolescent girls who were not using contraceptives were 10 times more likely to be pregnant as compared to those who were using contraceptives.

Teenage pregnancy was found to be strongly associated with poor contraceptive knowledge among adolescents delivering at the Mbara Regional hospital in Uganda. Adolescent girls with limited contraceptive knowledge were 7 times more likely to be pregnant compared to those with adequate knowledge, a p-value of <0.0001 (Sezalio et al., 2016).

A Namibian study using secondary data of their 2013 DHS to identify the determinants of teenage pregnancy had the age at first sex being a significant association with teenage pregnancy and adolescent girls who had sex earlier were more likely to be pregnant as

teens (Indongo, 2020). There was a similar finding for Kassa et al., (2019) where age at first sex was also a significant association with TP. The odds of TP were higher amongst those who experienced first sex before their eighteenth birthday.

According to the findings of Fagbamigbe et al. (2019) whose research was on adolescent girls in Nigeria, place of residence was significantly associated with TP, where the odds of teenage pregnancy was four and five times higher amongst teenage girls in the North Eastern and the North-Western Regions respectively compared to the South Western parts of the country. Rural/urban residence was also statistically significant in terms of association with teenage pregnancy in a systematic review to assess the prevalence and determinants of TP in Africa. Adolescents in rural areas were twice likely to be associated with teenage pregnancy as compared to those in urban areas. (Kassa et al., 2018).

Educational level was associated with teenage pregnancy according to findings of Mohr et al. (2019). This was a systematic review assessing the influence of education on teenage pregnancy in low- and middle-income countries. The study revealed adolescent girls who stayed in school longer delayed pregnancy compared to their counterparts with no or little education. Teenage girls in such countries also ended up dropping out of school after getting pregnant. In Ghana, a study conducted in Sunyani to determine factors associated with teenage pregnancy found that adolescent girls who were into an apprenticeship were 9 times more likely to be pregnant as teens compared to their counterparts in school (Asare et al., 2019). This shows being in school is a protective factor against TP.

According to Kidan, Ayele et al. (2018), in a study on determinants of TP in Northern Ethiopia, being married as a teenager was associated with teenage pregnancy with odds of being pregnant higher amongst those married as compared to the unmarried teenage girls.

For the age, the odds of being pregnant as a teen or a teen mother was higher among those in the late adolescent's age group (18-19 years) as compared to those in the middle adolescent's age group (15-17 years) (Kassa et al., 2019). This was in a study conducted using secondary data of the Ethiopian DHS from 2000 to 2016.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

Description of the study area, study design, sampling, study variables, and sources of data analytical tools was discussed in this chapter. Ethical issues are also discussed.

3.2 Study area

The study area was Ghana. Ghana is a West African country bounded to the east by Togo, Ivory Coast to the west, Gulf of Guinea and the Atlantic Ocean to the south, and Burkina Faso to the North. With a growth rate of about 21% over the past 10 years, the current population is estimated to be at least 30 million people and adolescents represent a quarter of this (Ghana Statistical Service, 2013; Plecher 2020).

Ghana is a democratic country with a president elected every four years. The 10 regions are Central, Western, Ashanti, Brong-Ahafo, Volta, Eastern, Upper East, Northern, Upper West Greater Accra Region (GAR). Its capital is Accra which is in the GAR. The major languages spoken are Akan, Ga, Ewe, Dagaare, and Dagbani. Ghana is one of the major exporters of Cocoa, Gold, and Timber worldwide.

Concerning health infrastructure, Ghana has five tertiary hospitals, of which Korlebu Teaching Hospital is the largest and oldest and also serves the needs of neighboring countries. At the regional level, each region has a regional hospital. Each district and the sub-district also have a district hospital and a health centre respectively. The communities, especially in the rural areas have Community Health Planning and Preventive Services (CHPSS) compound. Other supporting facilities include clinics, polyclinics, Adolescent Reproductive Health Centres, and other private and Non-Governmental Organisations (NGOs.)

3.3 Study design

The study adopted a cross-sectional study design for the DHS datasets which were collected at different points in time. This was ideal because it allowed for time efficiency as well as the collection of information on both the independent and dependent variables at the same time. The respondents were selected based on the inclusion and exclusion criteria.

3.4 Study population

In this study, the population of interest was adolescent girls aged 15 to 19 years who participated in the Ghana DHS from 1998 to 2014.

3.4.1 Inclusion criteria

- All the female adolescents aged 15 to 19 years in the households

3.4.2 Exclusion criteria

- Female adolescents aged 15 to 19 years, not within households

3.5 Sampling

For the DHS, a stratified two-stage cluster sampling method was used. Households were enlisted before the survey. The 2010 Population and Housing Census was used as a sampling frame for the 2014 survey (Ghana Statistical Service, 2014). For the 1998 DHS, the 1984 Population and Housing Census (PHC) was used as a sampling frame whiles the 2000 PHC was used for 2003 and 2008 surveys**.** The sample frame is made up of enumeration areas (EAs.) The sample frame was then stratified into strata of the 10 regions and also rural and urban areas. Several EAs were drawn from each stratum, with the number selected proportionate to the population size. For the 1998 survey, a total of 400 EAs were selected, 138 urban and 262 rural (Ghana Statistical Service, 1999). For 2003 and 2008, 412 EAs were selected. For the 2014 survey, 427 EAs were selected out of

which 216 were urban and 211 rural. Systematic sampling was then used to select a specified number of already enlisted households from the selected EAs.

3.6 Source of Data

The study used secondary data from 1998, 2003, 2008 and, 2014 Ghana Demographic Health Surveys (GDHS). The DHS are national surveys conducted every five years since 1984 by the Ghana Statistical Service and ICF International on households to enable monitoring and evaluation purposes on aspects of population, nutrition, and health. The data used for this study was the Individual Recode (IR) files which were downloaded from the DHS database for the survey years 1998, 2003, 2008, and 2014 contained data of the complete interviews for the women. Each file contained information on women aged 15-49 years. The focus of this study was adolescents aged 15-19 years, thus data for this age group of women was filtered and the resulting data was used for the analysis.

3.7 Study Variables

The variables in this study are categorized into dependent and independent variables with each having some factors which are listed below. Except for age and age at first sex which are continuous, all the other variables are categorical.

3.7.1 Dependent Variable:

- Teenage Pregnancy: This was captured in the questionnaire as “are you pregnant now?” and “ever given birth?”.
- Contraceptive use: This was captured in the questionnaire as “are you currently doing something or using any method to delay or avoid getting pregnant”. There were two follow-up questions. The first was “which method are you using” and the second was “where did you obtain the current method the last time”. There were options to choose from for those using, which was captured in the questionnaire.

3.7.3 Independent Variables

The independent variables include the socio-demographics of the study population which are:

- Age: This was captured in the questionnaire as age at last birthday
- Marital Status: This was captured as “are you currently married or living with a partner?”
- Region of residence: This was captured under the identification section as the region
- Place of residence: This was also captured under the identification section as urban or rural. Urban was recorded as “1” while rural was “2”.
- Religion: For religion, the question asked in the questionnaire was “what is your religion?”
- Highest educational level: This was captured as “what is the highest level of school you attended”. The options were recoded into never attended, primary, and secondary/higher.

The other independent variables are

- The source of information on contraceptives
- Knowledge on contraceptive methods: The question used to assess this from the questionnaire was “have you ever heard of a method?” (the methods were listed)
- Age at first sexual experience was captured in the questionnaires as “How old were you when you had sexual intercourse for the very first time?”

3.8 Data Analysis

Only quantitative data was used for this study. The study used Microsoft Excel 2019 and Statistical Package for the Social Sciences (SPSS) version 20 for its data analysis. Datasets

were cleaned by SPSS and exported onto an SPSS file. Descriptive statistics were used to run appropriate tables and graphs to represent the data. Standard deviation and mean were used for the age analysis. The frequency table was used to show percentages of the demographical characteristics of the respondents. A bar chart was used to present the results of teenagers with knowledge of contraceptive methods. The line graph was also used to display the trends in teenage pregnancy, contraceptive use, and teenage mothers.

Pearson Chi-Square was used to determine associations between those currently pregnant or using a contraceptive method (dependent variables) against independent variables which were age, educational level, religion, place of residence, region, age at first sex, marital status, ever given birth, and heard family planning on radio/TV/newspaper. A p-value of </= 0.05 was deemed statistically significant.

Statistically significant variables were further analysed using a binary logistic regression and an adjusted odds ratio (AOR) at 95% confidence interval (CI) was calculated to determine the strength of the association. The first and second binary logistic regression model was fitted with the data with contraception use and teenage pregnancy respectively being the response variables and predictors being age, region, religion, place of residence, educational level, age at first sex, year of survey, and heard family planning on radio/TV/newspaper.

Contraceptive knowledge was assessed by asking the respondents “which ways or methods have you heard about?” and the responses were no method, traditional method, and modern method. The number of contraceptive methods mentioned was not considered for this study. The data for this variable can be found in the women’s data file IR under the variable name V301.

Contraceptive use was calculated by tallying the number of "yes" responses for the question "are you currently doing something or using any method to delay or avoid getting pregnant". This was expressed as a percentage of the total number of adolescents within the ages of 15-19 years. Adolescents using more than one method of contraceptive was not taken into consideration for this research.

The teenagers were sub-divided into the age groups 15-17 and 18-19 years. Teenage Pregnancy was captured in the questionnaire as "are you pregnant now?". This had a "yes" or "no" response and using a cross-tabulation between that and the age variable was generated. From that, the number of teenagers in each age group who were currently pregnant and their corresponding percentages were presented in Table 4.3. For the total percentage of teenage pregnancy, those already mothers were included to those currently pregnant. Those who were already mothers were assessed by tabulating from the study population those who answered "yes" to the question "ever given birth?"

Sample weights were applied to obtain representative data at the national level.

3.9 Ethical Consideration

Permission was sought from the DHS Program to use data from the Demographic and Health Surveys for the periods of 1998, 2003, 2008, and 2014. The authorization letter was dated September 7th, 2020. Access to the data was limited to only the principal researcher.

CHAPTER FOUR

RESULTS

4.1 Introduction

The results of the study are presented in this chapter.

4.2 Background of the data

This section covers the demographic characteristics of the respondents. The distribution of the age group considered, the region, religion, marital status, and the place of residence are assessed between 1998 and 2014.

The DHS in 1998 covered 889 female respondents between the ages of 15-19 years. There were 1113, 1037, and 1756 female respondents in the years 2003, 2008, and 2014 respectively. After weights were applied to the samples, the total respondents became 910, 1148, 1025, and 1625 female respondents in the years 1998, 2003, 2008, and 2014 respectively. All four surveys revealed an estimated mean of 17 years and an approximate standard deviation of 1.4

(Table 4.1).

In the 1998 survey, Greater Accra recorded the highest percentage of teenage females while the Upper East recorded the lower. The Ashanti Region recorded the highest percentage, 22.3% (out of 1148), 19.7% (out of 1025), and 18.9% (out of 1625) of teenage females in the year 2003, 2008, and 2014 respectively. The Upper West Region recorded the least percentages of females compared to the other regions in the four DHSs.

The majority of the teenage girls had some level of formal education in all the four consecutive DHSs, of which more than half had at least secondary education. About 13.9% of teenagers had no education in 1998, which was high as compared to 12.3%, 7.1%, and 4.3% of teenagers in 2003, 2008, and 2014 respectively.

More than half of the teenagers lived in the rural areas in the surveyed DHSs except the 2003 survey where a majority of 54.8% lived in the urban areas. The 1998 survey had the

highest percentage (65.4%) of teenagers in the rural areas. Those who did not belong to any religious group represented 4.0%, 2.3%, 1.9%, and 1.3% for the years 1998, 2003, 2008, and 2014 surveys respectively. Christians formed the majority for all the surveys. The rest belonged to either Islam, the Traditional religion, or had no religion.

Concerning the teenagers' marital status, the percentage of never-married respondents increased between 1998 and 2014 while the percentages of married and divorced decreased.

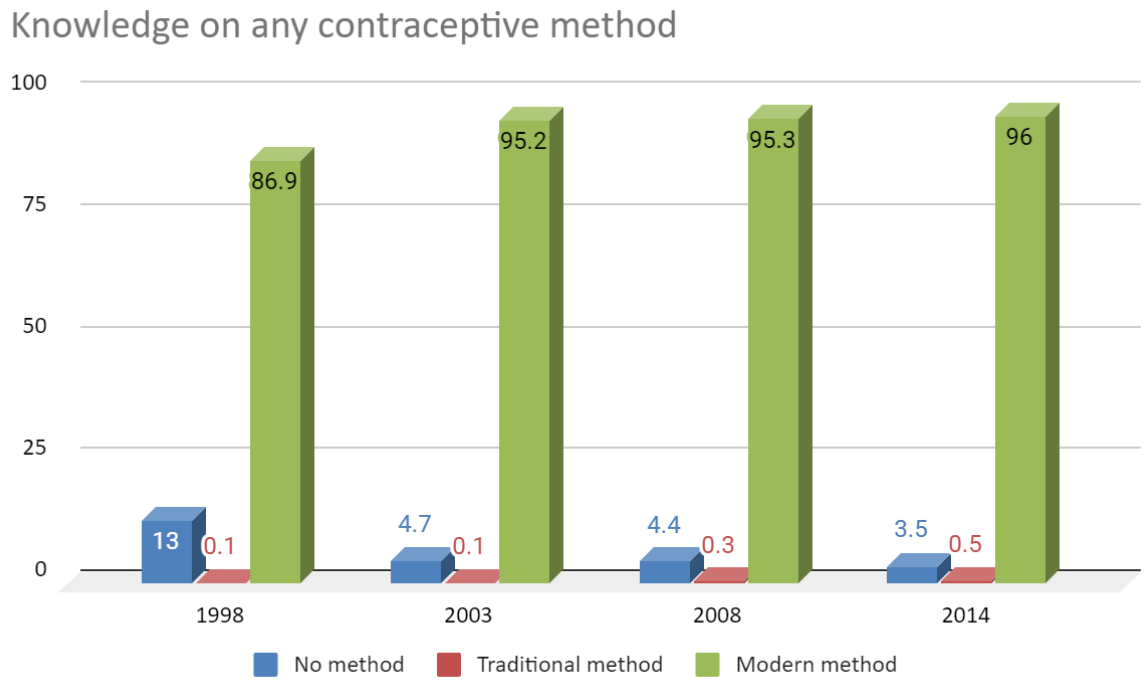
Table 4. 1 Demographic characteristics of respondents

Characteristics	1998 N = 910	2003 N = 1148	2008 N = 1025	2014 N = 1625
Age in years, M (SD)	16.9 (1.4)	16.9 (1.3)	17.0 (1.4)	16.9 (1.4)
Region %				
Western	13.6	10.6	9.2	12.1
Central	12.3	8.1	9.9	9.4
Greater Accra	17.8	17.7	15.8	15.2
Volta	11.2	7.7	8.9	7.5
Eastern	11.4	9.4	10.3	9.3
Ashanti	13.4	22.3	19.7	18.9
Brong Ahafo	9.2	9.8	7.8	10.3
Northern	3.5	6.6	9.9	9.0
Upper East	5.3	5.4	5.4	5.5
Upper West	2.2	2.5	2.9	2.9
Place of residence %				
Urban	37.4	54.8	48.1	49.0
Rural	62.6	45.2	51.9	51.0
Level of education %				
No education	13.9	12.3	7.1	4.3
Primary	18.6	23.4	21.7	22.6
Secondary +	67.5	64.3	71.2	73.1
Religion %				
No religion	4.0	2.3	1.9	1.3
Catholic	16.5	16.4	13.2	11.0
Anglican	0.8	0.9	1.4	0.8
Methodist	11.5	9.3	8.5	6.9
Pentecostal/Charismatic	-	-	34.7	39.9
Other Christians	51.5	54.8	37.1	20.7
Islam	12.2	15.8	15.1	18.0
Traditional/Spiritualist	3.6	0.5	3.6	1.3
Marital Status				
Single	83.6	86.3	90.6	92.8
Married/living together	13.4	12.0	8.3	6.4
Divorced/Separated	2.9	1.7	1.1	0.8

4.3 Contraceptive knowledge

Teenagers' knowledge of modern contraceptives was high in all four surveys. The frequencies in increasing order were 790 (86.9%) in 1993, 1092 (95.2%) in 2008, 976 (95.3%) in 2003, and 1561 (96.0%) in 2014. Respondents who know only traditional methods were less than 1% in all the surveys. The percentage of teenagers who did not know of any contraceptive method dropped from 13.0% in 1998 to 4.7% in 2003. This percentage decreased slightly (4.4%) in 2008 and dropped further to 3.5% in 2014.

Figure 4.1 Teenagers' knowledge of any contraceptive method

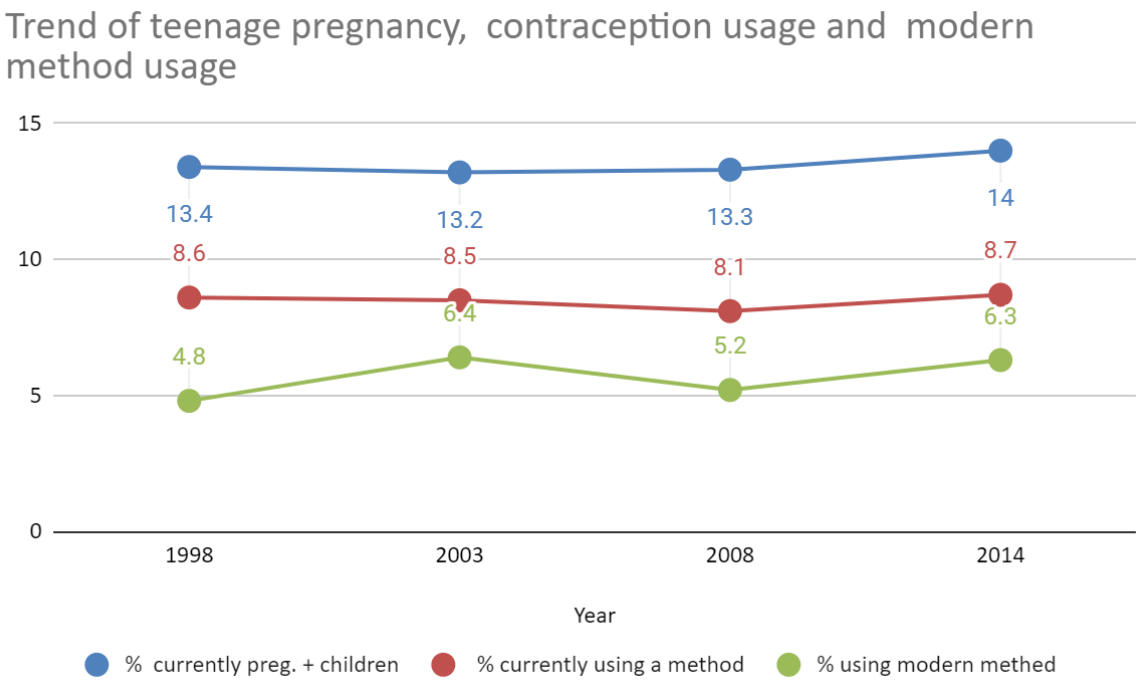


4.4 Trend of contraceptives use

The percentage of teenagers using any contraceptive methods over the years had only a 0.1% increase from 1998 to 2014. It was observed that there was a steady decline from 1998 to 2008 and an increase in 2014. There was a decrease from 8.6% in 1998 to 8.5% in 2003 which further decreased to 8.1% in 2008 and finally increased to 8.7% in 2014. For modern contraceptive method use, however, it was 4.8% in 1998 and 6.3% in 2014, providing a 1.5% increase over the years. Use of a modern contraceptive method was

almost less than half of any method in 1998 (4.8%) but increased to more than half of any method in 2014 (6.3%) leading to the observed 2.4% difference between the use of any contraceptive method and use of a modern contraceptive method in 2014. The observed trend from 1998 to 2014 was a fluctuating one. This is shown in figure 4.2 below.

Figure 4.2: Trend of contraceptive use and teenage pregnancy

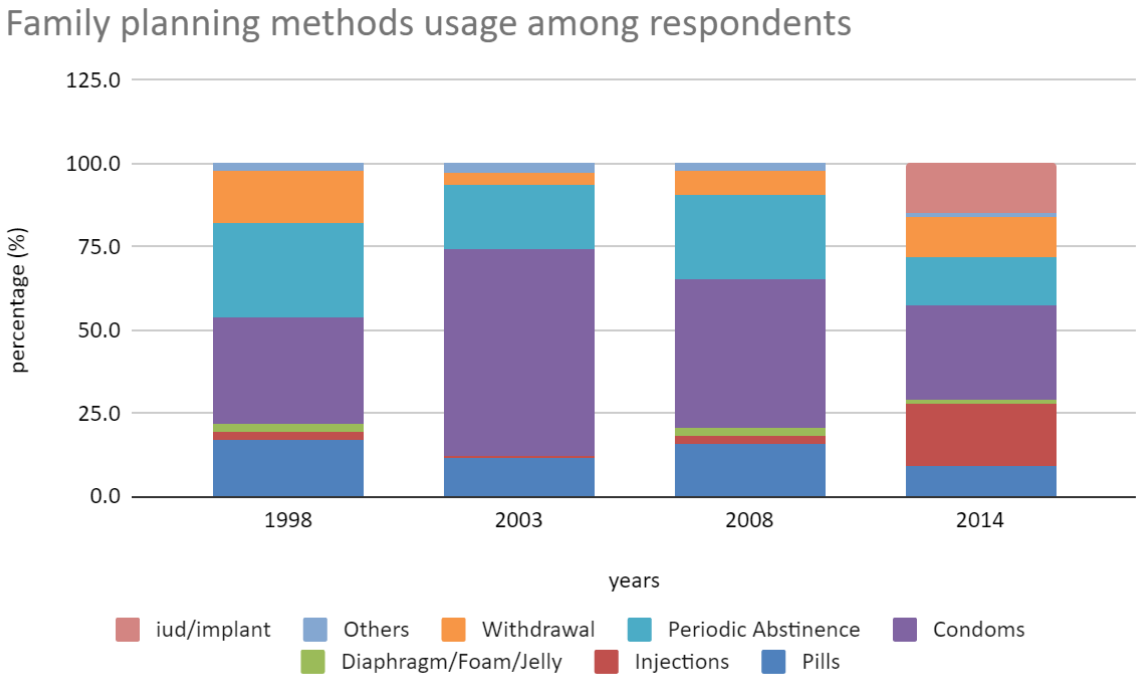


4.5 Modern contraceptive methods used by the teenagers

Figure 4.2 showed the type of contraceptive method which was being used by the respondents. These percentages are of the total contraceptive use of any method recorded. It was observed that the use of condoms was the commonest amongst the respondents over the years (32.1%, 61.9%, 44.6%, and 28.8% in 1998, 2003, 2008, and 2014 respectively) among those who use contraceptives. It is also observed that the use of the IUD and injectables increased whiles that of the pills decreased over the survey years. IUD was not used by any adolescent in the first three surveys and had 15.1% of them using it in the 2014 survey. The use of injectables was 2.6% in 1998 and increased to 18.7% in 2014 whiles that of the pills was 16.7% in 1998 and reduced to 9.4% in 2014**.** The other

methods indicated in Figure 4.2 represent male / female sterilization, lactational amenorrhea method, and emergency contraception.

Figure 4.3: Family planning methods usage among respondents



4.6 Trend of teenage pregnancy

Teenage pregnancy for this study was a combination of those currently pregnant and those who have already started child-bearing. Figure 4.3 shows that teenage pregnancy in households increased from 13.4% in 1998 to 14.0% in 2014. In between, there was a decrease to 13.2% in 2003 and a slight increase to 13.3% in 2008. Overall, there was a 0.6% increase in teenage pregnancy in households from 1998 to 2014.

4.7 Trends of teenage pregnancy and contraceptive use

Figure 4.2 shows that the teenage pregnancy rate in 1998 was 13.4 whiles that of contraceptive use for any method was 8.6%. In 2003, both contraceptive use and teenage pregnancy decreased to 8.5% and 13.2% respectively. In 2008, the use of any method was further reduced to 8.1% as the teenage pregnancy rate increased to 13.3%. In 2014, both

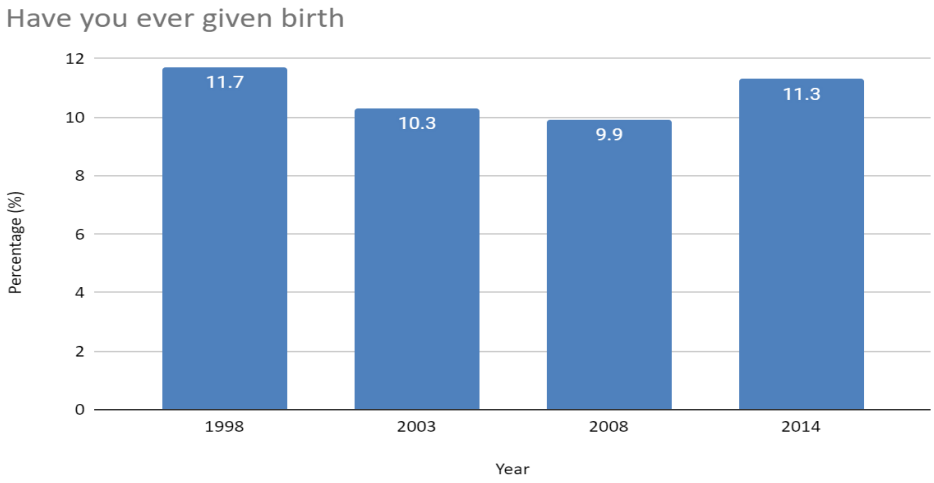
teenage pregnancy rates and contraceptive use increased appreciatively to 14.0% and 8.7% respectively.

For the comparison between the use of a modern contraceptive method and teenage pregnancy, there was a reduction of teenage pregnancy from 13.4% to 13.2% as the use of modern methods increased from 4.8% to 6.4% in 1998. When the use of a modern method reduced from 6.4% in 2003 to 5.2% in 2008, teenage pregnancy also had increased slightly from 13.2% in 2003 to 13.3% in 2008. Between 2008 and 2014, both teenage pregnancy and the use of a modern method increased from 13.3% to 14% and 5.2% to 6.3% respectively.

4.8 Teenage mothers

The teenagers who were already mothers were at least double the number of currently pregnant for all the surveys. When the teenagers were asked "Ever given birth?", 11.7% of them said they were pregnant in 1993. In the following surveys, 10.3% in 2003, 9.9% in 2008 and, 11.3% in 2014 agreed that they have ever given birth as shown in Figure 4.4.

.Figure 4.4: Trend of teenage mothers



4.9 Association between teenage pregnancy and contraceptive use

The scatter plot in Figure 4.5 below, showed a positive relationship between the percentage of teenage pregnancy, and the percentage of teenagers using any contraceptive method. The graph had an associated Pearson correlation value of 0.323 and a p-value of 0.677. Since the p-value is not <0.05, we conclude that the relationship between teenage pregnancy and the use of a contraceptive method is not significant. However, Figure 4.5 showed a strong positive relationship between the percentage of teenage pregnancy, and the percentage of teenagers using a modern contraceptive method. With a Pearson correlation value of 1.000 which was significant at a p-value of 0.000, it is concluded that there is a significant association between teenage pregnancy and use of a modern contraceptive method.

Figure 4.5 The correlation between pregnant adolescents and contraceptive use of any method

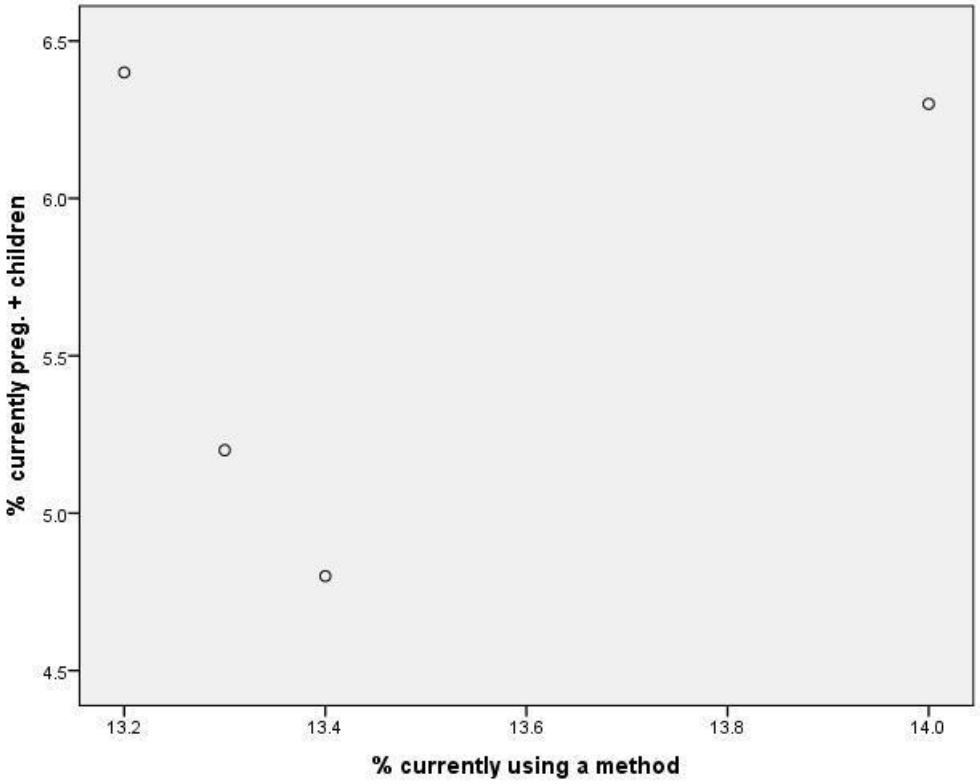
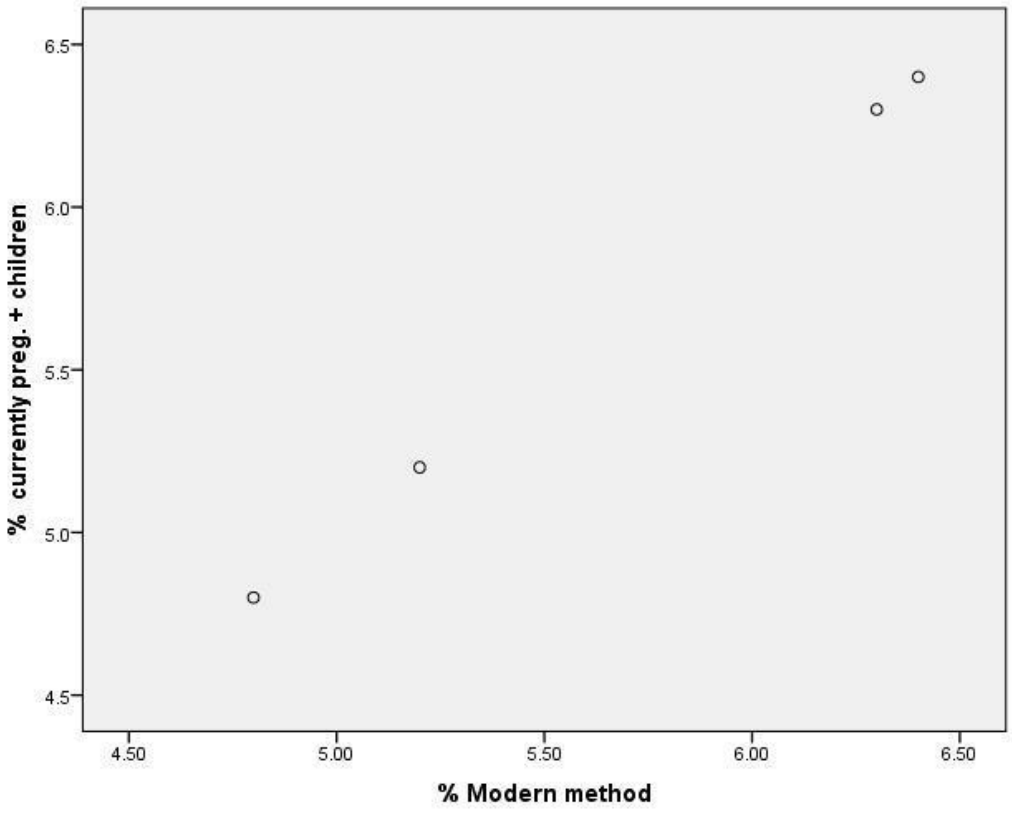


Figure 4.6 The correlation between teenage pregnancy and modern method of contraceptive use



4.10 Factors associated with contraceptive use

For this section, the variables used that satisfied all the assumptions for the analytical tool (Pearson Chi-square) were age, age at first sex, highest educational level, region religion, residence, source of information, marital status, and being a teenage mother. A p-value of < /= 0.05 was deemed significant.

Table 4.2 shows that there has been an increase in the proportion of teenagers aged 18-19 years using contraceptives between 1998 and 2014. Contraceptive use increased with increasing age and it was highest among those within 18-19 years. The age group was significantly associated with contraceptive use (p = 0.000) across the years. The age at first intercourse was also significantly associated with contraceptive use over the four surveys (p=0.000), with the age group 15-17 recording the highest frequencies. Those who had their first sex between 15-17 years used contraceptives the most.

Being a teen mum was significantly associated with contraceptive use with *p*-values 0.010, 0.000, and 0.000 for 2003, 2008, and 2014 surveys. Having heard of contraceptives from the television was statistically significant with contraceptive use for the first three survey years with *p*-values of 0.0014, 0.001, and 0.001 for years 1998, 2003, and 2008 respectively.

That of radio was significant for 2003 and 2008 survey years with *p*-values of 0.000 and 0.000 respectively whiles that of the newspaper was only significant for the 2008 survey. The region was significantly associated with contraceptive use for the 2003, 2008, and 2014 surveys while religion was significant for the 2003 and 2014 surveys. The association between contraceptive use and educational attainment was statistically significant in the 2003 and 2008 surveys.

The association between contraceptive use and marital status in 1998 and 2014 were statistically significant with *p*-values 0.002 and 0.000 respectively. Generally, the percentage of never-married increased from 5.4% in 1998 to 7.0% in 2014. Also, the percentages of the currently married and divorced decreased between the 1998 survey and the 2014 surveys.

The association with place of residence was not significant for any of the surveys.

Contraceptive use amongst adolescents in the urban areas had a decreasing pattern throughout whiles those in the rural areas which initially also assumed a decreasing pattern in the first three surveys increased during the last survey. The percentage of teenagers in the rural areas who were currently using contraceptives decreased from 4.7% in 1998 to 4.1% in the year 2008 but increased to 5.3% in the 2014 survey.

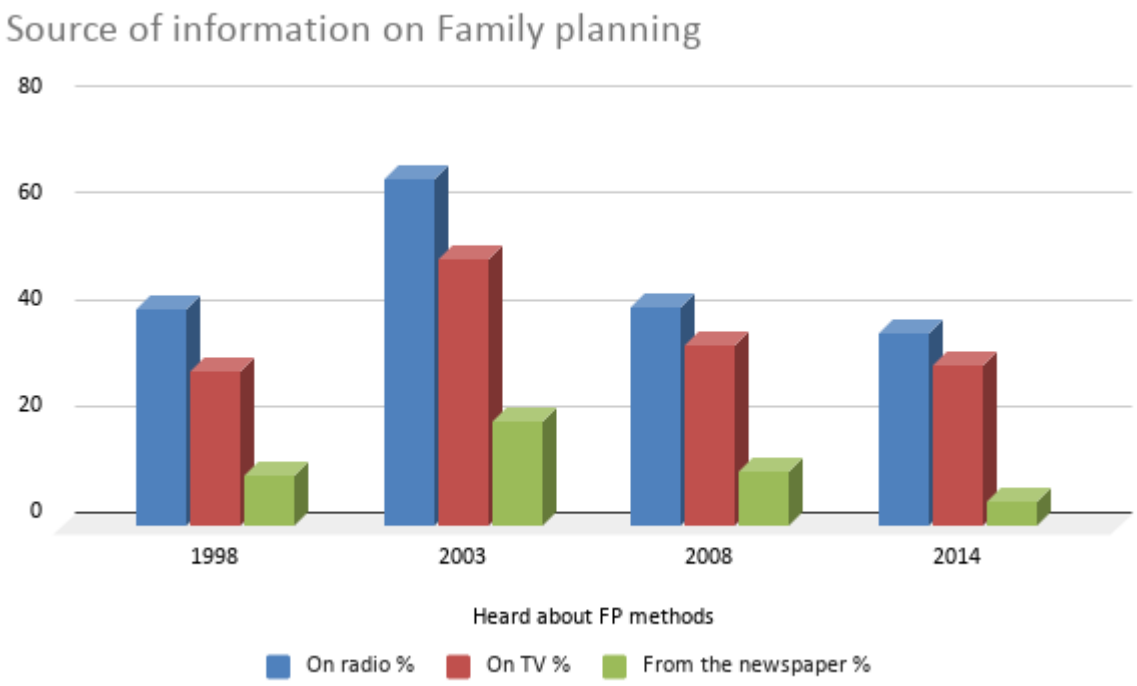
Table 4. 2: Pearson Chi-square analysis of contraceptive use and associated factors

	Current Contraceptive use							
	1998 (N=910)		2003 (N=1148)		2008 (N=1025)		2014 (N=1625)	
	n	%	n	%	n	%	n	%
Age (years)	78	8.6	98	8.5	82	8.0	140	8.6
15-17	32	3.5	34	3.0	28	2.7	49	3.0
18-19	46	5.1	64	5.5	54	5.3	91	5.6
P-value	0.000		0.000		0.000		0.000	
Highest education level	79	8.7	98	8.5	83	8.1	141	8.7
No education	8	0.9	7	0.6	0	0.0	5	0.3
Primary	12	1.3	15	1.3	15	1.5	38	2.3
Secondary+	59	6.5	76	6.6	68	6.6	98	6.0
P-value	0.348		0.016		0.015		0.418	
Religion	79	7.87	98	8.5	83	8.1	141	8.7
Catholic	13	1.4	18	1.6	10	1.0	19	1.2
Other Christians	53	5.8	74	6.4	59	5.8	106	6.5
Muslim	9	1.0	4	0.3	12	1.2	14	0.9
Others	4	0.4	2	0.2	2	0.2	2	0.1
P-value	0.380		0.009		0.560		0.039	
Place of residence	78	8.6	97	8.5	83	8.1	141	8.7
Urban	31	3.4	54	4.7	43	4.2	63	3.9
Rural	47	5.2	43	3.7	40	3.9	78	4.8
P-value	0.665		0.915		0.494		0.292	
Region	78	8.6	97	8.55	83	8.1	140	8.6
Western	11	1.2	12	1.0	6	0.6	33	2.0
Central	11	1.2	6	0.5	11	1.1	8	0.5
Greater Accra	13	1.4	11	1.0	19	1.9	13	0.8
Volta	7	0.8	7	0.6	6	0.6	14	0.9
Eastern	6	0.7	15	1.3	16	1.6	5	0.3
Ashanti	15	1.6	28	2.4	16	1.6	20	1.2
Brong Ahafo	12	1.3	11	1.0	5	0.5	37	2.3
Northern	1	0.1	2	0.2	0	0.0	1	0.1
Upper West	0	0	3	0.3	3	0.3	3	0.2
Upper East	2	0.3	2	0.2	1	0.1	6	0.4
P-value	0.229		0.082		0.004		0.000	
Age at first sex (years)	75	8.4	98	8.6	83	8.1	140	8.6
Below 15	15	1.7	10	0.9	14	1.4	48	3.0
15-17	54	6.0	74	6.5	60	5.9	89	5.5
18-19	6	0.7	14	1.2	9	0.9	6	0.2
P-value	0.000		0.000		0.000		0.000	
Marital status	76	8.4	98	8.6	82	7.9	140	8.6
Single	52	5.7	79	6.8	70	6.7	123	7.00
Married	22	2.4	17	1.6	12	1.2	23	1.31
Divorced	2	0.3	2	0.2	0	0.0	2	0.11
P-value	0.002		0.526		0.136		0.000	
Ever given birth %	70	7.9	95	8.5	190	18.3	148	8.4
No	63	7.1	77	6.9	146	14.1	104	5.9
Yes	7	0.8	18	1.6	44	4.2	44	2.5
P-value	0.416		0.010		0.000		0.000	
Heard FP on radio %	78	8.6	97	8.5	83	8.1	140	8.6
No	37	4.1	15	1.3	32	3.1	79	4.9
Yes	41	4.5	82	7.1	51	5.0	61	3.8
P-value	0.055		0.000		0.000		0.203	
Heard FP on TV %	78	8.6	97	8.5	83	8.1	140	8.6
No	44	4.80	28	2.4	35	3.4	94	5.8
Yes	34	3.7	69	6.0	48	4.7	46	2.8
P-value	0.014		0.001		0.001		0.462	
Heard FP in the newspaper %	78	8.6	97	8.5	83	8.1	140	8.6
No	66	7.3	68	6.00	68	6.6	135	8.3
Yes	12	1.3	29	2.40	15	1.5	5	0.3
P-value	0.087		0.039		0.075		0.545	

4.11 Source of information on contraceptives

For source of information on family planning, radio was the commonest source followed by television and newspaper. However, the percentage of teenagers who have heard family planning information on the radio and television decreased over the years. The year 2003 recorded the highest percentages of respondents who had heard information on contraceptives on the radio, television, and in the newspaper. Generally, it was observed that information on family planning on radio, on television and in the newspaper in the survey years except in 2003 which increased.

Figure 4.7 Source of information on Family Planning



4.12 Factors associated with teenage pregnancy

For this section, the variables used that satisfied all the assumptions for the analytical tool (Pearson Chi-square) were age, age at first sex, highest educational level, region, religion, source of information on contraceptives, and residence. A p-value of < / = 0.05 was deemed significant. Table 4.3 describes the proportions of teenage girls including the teen

mothers aged 15-19 years who were currently pregnant including the teen mothers at the time the surveys were conducted, and the p values of the independent variables listed above.

Over the survey periods, age was statistically associated with adolescent pregnancy (p 0.000). Adolescent girls aged 18-19 years had a higher teenage pregnancy rate. The proportion of pregnant girls aged 18-19 years increased over time. The proportion of girls aged between 15-17 years who were pregnant increased from 3.7% in the 1998 survey to 3.8% in the 2014 survey.

Age at first sex was also significantly associated with teenage pregnancy in all the surveys (p=0.000). Over the period of 1998 and 2014, pregnancy increased among girls who first had sexual intercourse within 15-17 years.

Educational level was also significantly associated with teenage pregnancy in all the surveys (p 0.000). The proportion of pregnant teenagers and mothers who had secondary education and above increased between 1998 to 2014.

The place of residence and region, just as age, age at first sex, and highest educational level was also significantly associated with teenage pregnancy in all four surveys (p <0.05). The proportion of pregnant teenagers concerning the type of residence generally decreased across all the surveys.

The Ashanti region had the highest rate of pregnant teens and mothers in the 1998, 2003, and 2014 survey while the Central region had the highest rate in the 2008 survey. The Upper West region recorded the lowest rate of teenage pregnancy and teen mothers in all four surveys.

Religion was also only significantly associated with teenage pregnancy for the 1998 and 2014 surveys ($p < 0.05$).

For source of information on contraceptives, having heard of contraceptives in the newspaper was significantly associated with teenage pregnancy in 1998, 2003 and 2014 whiles hearing of contraceptives on the television was also significant for 2003, 2008, and 2014 surveys. There was no association with that of the radio for any of the surveys ($p > 0.05$).

Table 4. 3: Pearson Chi-square analysis of teenage pregnancy and associated factors

	Teenage pregnancy							
	1998 (N=910)		2003 (N=1148)		2008 (N=1025)		2014 (N=1625)	
	n	%	n	%	n	%	n	%
Age (years)	122	13.4	152	13.2	136	13.3	228	14.0
15-17	34	3.7	48	4.2	33	3.2	62	3.8
18-19	88	0.7	104	9.1	103	10.1	166	10.2
P-value	0.000		0.000		0.000		0.000	
Highest education level	121	13.3	152	13.2	136	13.3	227	14.0
No education	25	2.7	35	3.0	22	2.1	16	1.0
Primary	37	4.1	53	4.6	58	5.7	69	4.2
Secondary+	59	6.5	64	5.6	15	5.5	142	8.7
P-value	0.000		0.000		0.000		0.000	
Region	122	13.4	150	13.1	135	13.2	228	14.0
Western	9	1.0	17	1.5	6	0.2	24	1.5
Central	20	2.2	22	1.9	23	2.2	33	2.0
Greater Accra	9	1.0	18	1.6	11	1.1	20	1.2
Volta	11	1.2	15	1.3	14	1.4	26	1.6
Eastern	21	2.3	14	1.2	8	0.8	25	1.5
Ashanti	23	2.5	23	2.0	22	2.1	37	2.3
Brong Ahafo	14	1.5	15	1.3	18	1.8	34	2.1
Northern	5	0.5	15	1.3	23	2.2	15	0.9
Upper West	3	0.3	3	0.3	4	0.4	5	0.3
Upper East	7	0.8	8	0.7	6	0.6	9	0.6
P-value	0.006		0.013		0.000		0.000	
Religion	121	13.3	150	13.1	137	13.4	228	14.0
Catholic	18	2.0	22	1.9	18	1.8	23	1.4
Other Christian	76	8.4	101	8.8	81	7.9	172	10.6
Islam	10	1.1	19	1.7	26	2.5	22	1.4
Others	17	1.9	8	2.7	12	1.2	11	0.7
P-value	0.023		0.115		0.128		0.001	
Place of residence	122	13.4	151	13.2	136	13.3	227	14
Urban	29	3.2	44	3.80	53	5.2	90	5.5
Rural	93	10.2	107	9.3	83	8.1	137	8.4
P-value	0.001		0.000		0.022		0.002	
Age at first sex (years)	118	13.0	149	13.0	135	13.2	222	13.7
Below 15	24	2.6	34	3.0	35	3.4	64	4.0
15-17	87	9.6	112	9.8	90	8.8	149	9.2
18-19	7	0.8	3	0.3	10	1.0	9	0.6
P-value	0.000		0.000		0.000		0.000	
Heard FP on the radio	122	13.4	152	13.3	136	13.3	228	14.0
No	62	6.8	55	4.8	79	7.7	133	8.2
Yes	60	6.6	97	8.5	57	5.6	95	5.8
P-value	0.086		0.312		0.778		0.262	
Heard FP on TV	122	13.4	152	13.3	136	13.3	228	14.0
No	90	9.9	96	8.4	104	10.1	160	9.8
Yes	32	3.5	56	4.9	32	3.1	68	4.2
P-value	0.232		0.000		0.000		0.038	
Heard FP in the newspaper	120	13.2	151	13.2	136	13.3	227	14.0
No	118	13.0	143	12.5	125	12.2	225	13.8
Yes	2	0.2	8	0.7	11	1.1	2	0.1
P-value	0.001		0.000		0.157		0.002	

4.13 Determinants of contraceptive use

All variables which were significant statistically with contraceptive use for each survey were merged and put in a binomial logistic regression model. The reference groups were given an AOR of 1.00. After adjusting for the effects of other variables, age, region, source of information from the newspaper, and educational attainment were still significantly associated with contraceptive use ($p < 0.05$) (Table 4.4).

Contraceptive use increased with age. However, the odds of contraceptive use among the 15, 16 17, and the 18-year group was not statistically significant ($p > 0.05$).

The teenage girls in the Northern Region are 75% less likely to use contraceptives compared to the Upper East Region and this association is significant (AOR 0.252, 95% CI 0.074-0.852 p-value 0.027). This is the only significant association for the region. Though not statistically significant, the teenage girls in the Western region were 1.5 times more likely to use contraceptives as compared to those in the Upper East region.

The odds of teenage girls using contraceptives in urban areas was 1.2 times that of rural areas. However, this association is not statistically significant (AOR 1.156, 95%CI 0.896-1.492, p-value 0.265).

The use of contraceptives increased with an increase in educational attainment. Teenage girls without any education were 45% less likely to use contraceptives compared to those with secondary level education and this was significant (AOR 0.554, 95% CI 0.323-0.951, p-value 0.032).

The odds of contraceptive use among teenagers who were Catholics was 1.4 times that of teenagers who use contraceptives and belonged to other religions (except Islam and other Christians). The odds of contraceptive use among teenagers who were Christians (except Catholics) was 1.3 times that of teenagers who use contraception. The odds of

contraceptive use amongst Muslim teens who used contraceptives was 1.1 times that of other religions. These associations however were not statistically significant ($p > 0.05$)

Teenagers whose age at first sex was below 15 years were 6% less likely to use contraceptives as compared to teenagers whose age at first sex was between 18-19 years. The odds of contraceptive use among those who had their first sex between 15-17 years was 29% less compared to 18-19 years. These associations were also not statistically significant ($p > 0.05$)

The odds of using contraceptives among teenagers who have not heard about family planning on the radio are 19% less likely compared to those who have heard about it on the radio. The odds of using contraceptives among teenagers who have not heard about family planning on TV are also 19% less likely compared to those who have heard about it on TV. These odds were not significant ($p >0.05$). The odds of using contraceptives among teenagers who have not heard about family planning in the newspaper are 34% less likely compared to those who have heard about it in the newspaper and this association was statistically significant ($p < 0.05$).

The odds of contraceptive use in the years 1998, 2003, and 2008 is more than one time that of the use of contraception in 2014. These associations were not statistically significant ($p > 0.05$).

Table 4. 4 Adjusted odds ratio (AOR) from Binary logistic regression analysis of contraceptive use and associated factors

	Contraceptive use (N=4795)			
	OR	**p-value**	**[95%**	**CI]**
Age				
19	1.000			
15	0.716	0.211	0.424	1.208
16	0.763	0.190	0.510	1.144
17	0.826	0.287	0.581	1.174
18	0.876	0.378	0.653	1.175
Region				
Upper East	1.000			
Western	1.499	0.327	0.667	3.369
Central	0.933	0.872	0.402	2.166
Greater Accra	1.318	0.513	0.409	2.729
Volta	1.093	0.839	0.466	2.563
Eastern	0.997	0.995	0.431	2.309
Ashanti	1.210	0.644	0.540	2.708
Brong Ahafo	1.930	0.111	0.860	4.334
Northern	0.252	0.027	0.074	0.852
Upper West	1.012	0.982	0.365	2.805
Type of place of residence				
Rural	1.000			
Urban	1.156	0.265	0.896	1.492
Highest education level				
Secondary+	1.000			
No education	0.554	0.032	0.323	0.951
Primary	0.783	0.107	0.581	1.055
Religion				
Others	1.000			

Catholic	1.462	0.314	0.698	3.061
Other Christians	1.347	0.398	0.675	2.688
Islam	1.096	0.814	0.511	2.349
Heard FP on the radio				
Yes	1.000			
No	0.813	0.139	0.618	1.069
Heard FP on TV				
Yes	1.000			
No	0.811	0.149	0.609	1.078
Heard FP in the newspaper				
Yes	1.000			
No	0.658	0.028	0.454	0.955
Age at first sex				
18-19	1.000			
Below 15	0.938	0.682	0.690	1.275
15-17	0.709	0.189	0.425	1.184
Year of survey				
2014	1.000			
1998	1.251	0.189	0.895	1.749
2003	1.020	0.903	0.739	1.409
2008	1.133	0.446	0.823	1.559
constant	0.372	0.092		

4.14 Determinants of Teenage Pregnancy

All variables which were significant statistically with teenage pregnancy for each survey were merged and put in a binomial logistic regression model. The reference groups were given an AOR of 1.00. After adjusting for the effects of other variables, age at first sex,

region, type of residence, educational attainment, FP information on radio, TV, and in the newspaper were still significantly associated with teenage pregnancy (Table 4.5).

For the age, all the female adolescents who were 15-18 years were less likely to become pregnant or teenage mothers as compared to those who were 19 years and this association was significant (p = 0.000)

The odds of teenage pregnancy in the Central region was 1.4 times that of the Upper East Region but was not significant in the logistic regression (p >0.05). Teenage pregnancy in the Western region was 52% less likely to occur as compared to the Upper East region, this association was significant (AOR 0.478, 95%CI 0.239-0.955, p-value = 0.037).

The odds of teenage pregnancy was inversely proportional to educational attainment. The odds of teenage pregnancy among teenagers with no education was 2.2 times that of those with at least secondary level education (AOR 2.238, 95%CI 1.511-3.312, p = 0.000) whiles that of those with primary education is 2.3 times that of teenagers with at least secondary level education (AOR 2.305, 95%CI 1.781-2.983, p = 0.000). Both associations were statistically significant.

Those who had first sex between 15-17 were 84% less likely to become pregnant as teenagers compared to those who had their first sex between 18-19 years (p = 0.000). Adolescents who also had their sexual debut below 15 years were 27%less likely to end up pregnant or as teen mothers and this association was significant (p=0.001).

Also, it was observed that the teenager in an urban area is 15% less likely to be a teenage mother as compared to the rural area but was not significant (p = 0.180).

Teenagers who were Muslims, Catholics, and other Christians were 65%, 45%, and 41% respectively, less likely to be pregnant or teen mothers as compared to other religious groups and this was statistically significant ($p < 0.05$).

The odds of a teen who has not heard about FP on TV is 1.8 times more likely to become a teenage mother or get pregnant compared to a teen who has heard about FP on the TV. The probability of an adolescent who has not read about FP in the newspaper become pregnant or a teen mum 2.4 times more compared to a teen who has read about FP in the newspaper. Teenagers who have not heard of FP on the radio are 26% less likely to become pregnant as compared to those who have heard of FP on the radio. All three associations were significant ($p > 0.05$).

Table 4. 5 Adjusted odds ratio from Binary logistic regression analysis of teenage pregnancy and significant associated factors

Currently Pregnant & Teenage Mothers (N=4795)				
	AOR	P-value	[95%	CI]
Age				
19	1.000			
15	0.082	0.000	0.046	0.146
16	0.221	0.000	0.150	0.324
17	0.367	0.000	0.265	0.508
18	0.547	0.000	0.419	0.714
Region				
Upper East	1.000			
Western	0.478	0.037	0.239	0.955
Central	1.416	0.322	0.711	2.820
Greater Accra	0.729	0.382	0.359	1.480
Volta	1.004	0.991	0.496	2.032
Eastern	0.705	0.326	0.351	1.416
Ashanti	0.858	0.655	0.439	1.679
Brong Ahafo	1.032	0.929	0.523	2.033
Northern	1.134	0.728	0.559	2.298
Upper West	0.574	0.190	0.250	1.316
Type of place of residence				
Rural	1.000			
Urban	0.847	0.180	0.664	1.080
Highest education level				
Secondary+	1.000			
No education	2.238	0.000	1.511	3.312
Primary	2.305	0.000	1.781	2.983
Religion				
Others	1.000			
Catholic	0.546	0.038	0.308	0.968

Other Christian	0.587	0.043	0.351	0.983
Islam	0.347	0.000	0.196	0.615
Age at first sex				
18-19	1.000			
Below 15	0.634	0.001	0.481	0.837
15-17	0.161	0.000	0.096	0.269
Heard FP on the radio				
Yes	1.000			
No	0.737	0.017	0.573	0.947
Heard FP on TV				
Yes	1.000			
No	1.775	0.000	1.349	2.336
Heard FP in the newspaper				
Yes	1.000			
No	2.432	0.000	1.500	3.946
Year of survey				
2014	1.000			
1998	0.872	0.390	0.638	1.192
2003	1.069	0.660	0.793	1.441
2008	1.052	0.737	0.784	1.410
constant	0.934	0.892		

CHAPTER FIVE

DISCUSSION

5.1 Introduction

This chapter presents a detailed discussion of the findings presented in the previous chapter with literature.

5.2 Socio-Demographic characteristics of respondents

This section discusses the results of the demographic characteristics of the data. The percentage of teenagers in the Central Region is less than 10% in all four surveys. This difference may be because the respondents of the DHS were people living in a household. Hence, teenagers living on the street were excluded from this analysis. The Ashanti region recorded more than 10% of the teenagers taking part in the DHSs. This may be since parents and families in that region embrace childbirth regardless of age at pregnancy and also take care of their pregnant teenagers to the best of their capacity as childbirth ensures continuity of ancestral line (Keller et al., 1999). The percentage of teenagers with no education tends to decrease as the years go by. This decrease may be associated with the implementation of a free basic education policy by the government of Ghana (Education Act 2008, Act 778). This policy also affected the percentage of teenagers who were able to attend secondary school in the long run.

5.3 Contraceptive Knowledge

From the study, more than 80% of the respondents in all four surveys knew modern contraceptive methods. This is consistent with findings of several studies on adolescents' contraceptive use in Ghana and other Africa countries including South Africa where a majority of the adolescents had adequate contraceptive knowledge (Agyemang et al., 2019; Buxton, 2012; Ramathuba et al., 2012). This is a result of the effort made by several African countries to increase the contraceptive prevalence rate, especially amongst

teenagers. This result, however , contradicted the findings of Munakampe et al. (2018) where adolescents in low and middle-income countries had poor and limited knowledge of contraceptives. Percentage of teenagers who did not know any method dropped from 16.1% in 1998 to 3.9% in 2014. This can be attributed largely to interventions aimed at increasing awareness of contraceptive methods such as the introduction of adolescent SRH into the educational curriculum and the adolescent teenage pregnancy strategic plan (MoGCSP, 2017)

5.4 Trend of Contraceptive Use

Contraceptive use amongst the adolescents remained low for all the surveys despite a high level of knowledge amongst the respondents. This is consistent with many studies in Ghana where a majority of the adolescents did not use contraceptives, though sexually active (Agyemang et al., 2019; Buxton, 2012). The study by Agyemang et al. (2019) found 95% of adolescents in the Atwima Kwanwoma district of the Ashanti Region with knowledge of contraceptives but only 18% used them. Factors that could explain this include lack of adolescent SRH services, the stigma associated with contraceptive use amongst adolescents, perceived health effects, ignorance, and poor parent-child communication on sex and sexual health (Agyemang et al., 2019; Buxton, 2012; Chernick et al., 2016; Othman et al., 2016).

For this study, the use of any contraceptive method had a steady decline from 1998 to 2003 and increased slightly in 2014. From 1998 to 2014, there was only a 0.1% increase. This increase could be associated with the intensification of interventions to address the decrease in the 2008 survey. The use of a modern method was even less, starting from 4.8% in 1998 to 6.3% in 2014 (1.5% increase). This increased to 6.4% in 2003 and decreased to 5.2% in 2008. This increase in trend is similar to that observed in Guinea where there was only a 4.4% increase in modern contraceptive use over 19 years from

1999 to 2019 (Sidibé et al., 2020). This trend however contrasts with findings of Appiah et al. (2020) where there was a steady decline of contraceptive use among sexually active female adolescents in Ghana, starting from 22.1% in 2003 to 20.4% in 2014. Another contrasting study also was among adolescents in Ethiopia where their use of contraceptives has experienced a steady and sharp increase of 19% from 5% in 2003 to 24% in 2013 (Hounton et al., 2015).

Based on the interventions and policies that have been implemented, this trend should rather follow an increasing pattern with a significant difference such as observed according to the results of Abdul-Rahman et al. (2011) on the trend of CU among adolescents in Ghana. Abdul-Rahman et al. (2011) however focused on sexually active adolescents only, hence the observed trend. Adolescents worldwide have indicated barriers hindering their contraceptive use and this includes confidentiality, the poor attitude of health providers at the various facilities, poor parent-child communication, limited knowledge on contraceptives, religion, socio-cultural norms, misconceptions, access and affordability of some of the contraceptive methods (Agyemang et al., 2019; Daniel et al., 2014; Kumar & Brown, 2016; Subedi et al., 2018)

5.5 Factors associated with contraceptive use

This study revealed the age of respondents and age at first sex as statistically significant ($p < 0.05$) for the four surveys. Being statistically significant means there is a plausible relationship between two variables**.** Contraceptive use was higher amongst the 18-19-year group ($p = 0.000$) and also amongst adolescents whose sexual debut was between 15- 17 years. The above result is similar to findings of various studies where it was found out that older adolescents (18-19 years) used contraceptives more than the younger ones (Chandra-Mouli et al., 2013; Indongo, 2020, Islam et al., 2016). Also, the use of contraceptives increased with increasing age (p-value <0.05). This could be attributed to the fact that

those 19 years are classified as adults and can easily get these contraceptives without any backlash from the community. Older adolescents usually have higher education or in a union and would probably use contraceptives because they appreciate their usefulness (Chola et al., 2020).

Being a teenage mother and having heard of contraceptives on television were significantly associated with contraceptive use in three of the surveys. Teenage mothers can get pregnant again if they engage in unprotected sex and would not want to be pregnant again for some years to either continue their education or engage in a means of income-earning to support themselves and their child (ren) (Yidana et al., 2015). There is also an increase in knowledge on contraceptives after becoming pregnant as an adolescent female and this is confirmed by these studies (Machira & Palamuleni, 2017; Wilson et al., 2011).

The region, religion, educational level, marital status, and source of information on contraceptives from radio were found to be significant for two of the surveys, p-value <0.005. Those in the Northern region were 75% less likely to use contraceptives compared to those in the Upper East Region, which was significant with a p-value <0.05.

It was also observed that contraceptive use was highest amongst older adolescents and those who had attained secondary level education and above. Contraceptive use was also the least amongst those with no education in all the surveys. Those with no education were 45% less likely to use contraceptives compared to those with at least secondary level education ($p < 0.05$). This result follows a similar pattern as Adjei, Sarfo & Asiedu (2014) where adolescents in Ghana with primary education were less likely to be currently using contraceptives compared to those with higher education. According to Islam et al (2016) and Chandra-Mouli et al (2013) women with higher educational levels were more likely to

use contraceptives compared to those with lower educational attainment. This could be as a result of information on SRH provided in the various schools, especially at the junior and senior high schools. Also, as part of initiatives to increase adolescent contraceptive use, there has been formation of the Adolescent Health Club in various secondary schools as well as the provision of health and non-health mentors in the various secondary schools (GHS, 2015).

The place of residence, be it rural or urban, was found to not be significant for any of the surveys ($p > 0.05$). This is inconsistent with findings from Chola et al. (2020) where rural/urban residence was significant for the early surveys among adolescent girls in Zambia, but consistent with results from Tsehave et al. (2016) where rural/urban residence was identified to not be significantly associated to contraceptive use in a study among adolescents in Ethiopia.

Adolescents in the rural areas that used contraceptives also increased over the survey years. The increase could be attributed to having more adolescents in the rural areas for this study. It could also be as a result of an increase in distribution and accessibility of electricity in the rural areas allowing the adolescents have access to radio and television (for information on contraceptives) which was found to be statistically significant with contraceptive use (Kumi, 2017). Even though there were more adolescents using contraceptives in the rural areas, those in the urban areas were 1.2 times more likely to use contraceptives than those in the rural areas, though not statistically significant with a p value of 0.265. This can be explained as a result of an increase in the accessibility and affordability of these methods, especially the modern methods

5.6 Source of information on contraceptives

From the results, the commonest source of information for adolescents on contraceptives all through the four surveys was the radio, followed by television then newspaper. This is consistent with findings from a study by Ramathuba et al. (2012) where media was one of the two major sources of information on contraceptives among in-school adolescent girls in Limpopo province. However, this order did not follow the results from Tayo et al. (2011) where television was the main source of information before the radio among secondary school girls in Lagos. This study also contradicted Skrzeczkowska et al. (2018) where Polish girls reported other sources which were the internet and peers as their major sources of information on contraceptives. The trend on information on contraceptives from these sources had a declining pattern and this is not surprising due to the advancement of technology and the influence of social media over the years (Twenge et al., 2018). Findings from Twenge et al. (2018) showed that adolescents in the United States of America now spend most of their time on their phones and laptops and hardly watch television or read books and newspapers though source of information from newspaper was a determinant of CU ($p = 0.028$)

5.7 Modern contraceptive method of choice

Throughout the four surveys, the condom was the most used method amongst the adolescents. The condom is the commonest modern contraceptive method used all over the world (Boamah et al., 2014; Kusunoki & Upchurch, 2012; Skrzeczkowska et al., 2018; Witwer et al., 2018). Study results from Boamah et al (2014) had 82% of adolescents within the households of Kintampo North District using condoms whiles Skrzeczkowska et al. (2018) had 72% of Polish adolescent girls use a condom. According to Kusunoki & Upchurch (2012), condom use was higher amongst adolescents who are in new relationships whiles the use of injectables, implants, or the pills is found in adolescents

with established relationships. Condom use, being the only one out of the many that can be used to prevent both STIs and unplanned pregnancies could be a reason why it is most preferred. It could also be as a result of the increase in awareness and health promotion activities which often leads to free distribution and its accessibility. Condom use is also easier and requires no intensified knowledge and process to be able to use it as compared to some other methods.

The use of oral contraceptive pills which was high (16.7%) in the 1998 survey saw a decline (9.4%) in the 2014 survey. This result however contrasts the findings of Lindh et al. (2016) which rather found an increase in the use of oral contraceptive pills among four generations of Swedish adolescent girls over the periods of their study. This decline may be due to having to take them daily, weight gain, menstrual irregularities, and availability of other alternatives.

This study results also showed an increase in IUD and injectables over the survey periods. An increase in the use of IUD, a LARC was also found amongst adolescent females over a period (Lindh et al., 2016; Witwer et al., 2018). This could be as a result of the increase in awareness and availability of these modern contraceptive methods,

5.8 Trends in teenage pregnancy and factors associated with teenage pregnancy

Ideally, there should be a decline in teenage pregnancy in response to interventions that have been implemented. However, that was not the observed trend for this study. There was a 0.6% increase in TP from 1998 to 2014. From 1998 to 2003, there was a 0.1% decrease from 13.4% to 13.2% and increased to 13.3% in 2008 and increased again by 0.7% to 14% in 2014. This showed a fluctuating trend from 1998 to 2014. This trend follows results according to (Fagbamigbe et al., 2019). Fagbamigbe et al (2019) did a trends analysis of TP in Nigeria from 1961 to 2013 and TP in 1961 was 39.2% and

increased to 55.6% in 2013. In between 1961 and 2013, the results fluctuated. This trend can be explained as a result of persistent inadequate access to SRH services, child marriages, and normalization of early pregnancy especially in the rural areas despite the interventions to address them (Vanphanom, Sychareun, Viengnakhone, et al., 2018).

The age, age at first sex, region, rural/urban residence, and educational level were significantly associated with teenage pregnancy in all four surveys. Having heard of FP on the television or the radio was also significantly associated with teenage pregnancy in two of the surveys while religion was significant for only one survey year.

For the age, teenagers who were 18-19 years had more teenage pregnancy rates and odds of teenage pregnancy increased with increasing age and this association was significant. This result was similar to that found according to findings of Kassa et al. (2019) in which older adolescents were more likely to be pregnant compared to the younger age groups. This could be attributed to exposure of the older adolescents. The majority of teenagers within that age would have completed secondary school or gotten married, throwing wind to caution and engaging in more unprotected sex.

The region had a significant association with TP in all the surveys. From this study, it was found that teenagers in the Ashanti region had the highest teenage pregnancy rates in all the surveys. This however contrasts findings of GHS (2016) where the Upper East region recorded the highest rates of TP in 2014, 2015, and 2016.

The adolescents who had sex below 15 years in this study were more than those whose sexual debut was between 18-19 years and there was an increasing trend in their numbers over the four surveys. For the age at first sex, the earlier one starts to have sex, the higher the exposure to being pregnant because of the frequency and duration. For this study, however, those who had their sexual debut after 18 years were more likely to be pregnant

or become teenage mothers as compared to those who had their sexual debut before 18 years and this was significant statistically. This is dissimilar to the findings of Kassa et al. (2019) where those who had their sexual debut before 18 years were more likely to be pregnant compared to those who had theirs after 18 years. The reason could be that when you start having sex at 18 or 19 years, the likelihood of being pregnant would be higher because those in that age group are probably married and not likely to use any contraceptive method.

For this study, more teenagers in the rural areas were pregnant and this increased over the survey years from 1998 to 2014. Also, though not significant, adolescent girls in the urban areas were 15% less likely to be pregnant compared to those in the rural areas. Aside from the increase in the prevalence of child marriages in the rural areas which could account for high teenage pregnancy in the rural areas, poverty and peer influence are also factors (Mutanana & Mutara, 2015). Poverty causes these teenagers to engage in sex, especially with older men, for money and other favors (Mutanana & Mutara, 2015).

Teenagers who had secondary-level education had fewer teenage pregnancy rates. Also, those who had no education and only primary education were each 2.3 times more likely to be pregnant as teens as compared to those with secondary education ($p = 0.000$). School is a protective factor against teenage pregnancy because education provides knowledge on various issues on SRH, teaches where to get contraceptives, equips the adolescents on social skills so that they can negotiate for safe sex, and also provides an individual with hopes of a brighter future, thereby delaying the onset of sex (Mohr et al., 2019). Also, various interventions have been implemented in various Ghanaian secondary schools to address issues of SRH including teenage pregnancy (GHS, 2015).

5.9 Teenage pregnancy and contraceptive use

Despite there being a positive relationship between teenage pregnancy and the use of any contraceptive method, the p-value was 0.677 making it not significant. However, there was a significant association between teenage pregnancy and the use of a modern method with a p-value of 0.000. This is reflected in the trend of teenage pregnancy and the use of modern contraceptives as shown in figure 4.2. There was an inversely proportional relationship between teenage pregnancy and modern contraceptive use from 1998 to 2008 whiles it was directly proportional from 2008 to 2014. When modern CU increased from 4.8% in 1998 to 6.4% in 2003, TP decreased by 0.2% from 1998 to 2003 and when modern CU decreased to 5.2% in 2008, TP also increased in 2008. According to Habitu et al. (2018) and Indongo (2020), teenage pregnancy is significantly associated with modern contraceptive use just as was found in this study. This trend shows that in fighting TP, there is the need to increase adolescents' access and use of modern contraceptive methods.

5.10 Strengths and Limitations

5.10.1 Strengths

This study provides information on the trends and associated factors of teenage pregnancy and contraceptive use amongst female adolescents aged 15-19 years on a national scale which would contribute to the improvement of existing interventional policies. This study also re-emphasizes the contribution of modern contraceptive use in dealing with teenage pregnancy. It also shows the importance of the media and higher educational levels in addressing contraceptive use and teenage pregnancy. Application of sample weights made findings of this study a national representation of the study population.

5.10.2 Limitations

The cross-sectional design of this study does not allow for a cause-effect relationship to be established. Also, there is a possibility of recall bias as respondents provided information

that happened years prior to the study. There is also the possibility of not giving the right information especially in the areas of sexual relations because of perceived socially acceptable behaviors such as abstaining from sex before marriage.

CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Contraceptive use is generally low even though knowledge about the methods is high. The adolescent girls had high knowledge of contraceptives starting from 86.9% in 1998 to 96% in 2014whiles there was a 0.1% and 2.5% increase in CU and modern CU respectively over the survey years. The use of any contraceptive method had a declining pattern from 1998 to 2008 and increased in 2014 whiles the use of a modern contraceptive method had a fluctuating pattern for the survey years. The radio was the commonest source of information on contraceptives for adolescents followed by television then newspaper. Condom use was also the modern contraceptive method of choice among female adolescents. Whiles the use of oral contraceptive pills had a decreasing pattern, the use of IUD and injectables had an increasing trend. Age and age at first sex and were significantly associated with CU in all four surveys. Being a teenage mother and source of information from television were significantly associated with CU three of the surveys whiles religion, region, highest educational level, source of information on radio and marital status were significantly in two surveys. Whiles the source of information from the newspaper was significant in association with CU in only one survey, rural/urban residence was not significant in any of the surveys. Educational level, source of information from newspapers, and region were determinants of CU. Those with no education were 45% less likely to use contraceptives compared to those with at least secondary level education. Though the newspaper was the least common source of information on contraceptives, it was a significant determinant of CU. Whiles TP was not significantly associated with the use of any contraceptive method, it was however significantly associated with the use of a modern contraceptive method.

There was a 0.6% increase in TP over the survey years with the odds of TP decreasing over the years. From 2003 to 2014, there was an increase in TP but from 1998 to 2003, there was a decrease. Age, age at first sex, educational level, region, and rural/urban residence were significantly associated with TP in all four surveys. Source of information on FP and the newspaper were also significant in association with TP in three surveys. Religion was significantly associated with TP in two of the surveys. Age, age at first sex, region, educational level, and source of information on contraceptives were determinants of TP after controlling for all other variables Those who had their first sex from 15-17 years and below 15 years were 84% and 37% respectively less likely to be pregnant as compared to those who had their first sex from 18-19 years. For the highest educational level, those who had no education and those with only primary education were each 2.3 times more likely to be pregnant compared to those with at least secondary education.

6.2 Recommendation

Based on the findings of this study, the researcher recommends the following

- The Ghana Education Service, Ministry of Education, and other stakeholders should ensure the sustainability of the free senior high school education to help keep girls in school since there was a positive association between secondary education and above with teenage pregnancy and contraceptive use.
- The Ministry of Health, Communications Ministry, and the Cyber Security Unit must collaborate so that adolescents obtain information on SRH on radio, television, and newspapers.
- Ministry of Education and Ghana Education Service should aim at incorporating SRH education into the educational curriculum from the primary level so that these adolescents are sensitized early on the dangers of early and unprotected sexual intercourse.

- Subsequently, the DHS program, Ghana Statistical Service, and ICF International should aim at including adolescents not in households to get a clearer picture of teenage pregnancy and contraceptive use on a national scale in future surveys.

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APPENDIX: ETHICAL CLEARANCE

Sep 07, 2020

Ayesha Kadiri-English
University of Ghana School of Public Health
Ghana
Phone: +233556583503
Email: ajkenglish@yahoo.com
Request Date: 09/06/2020

Dear Ayesha Kadiri-English:

This is to confirm that you are approved to use the following Survey Datasets for your registered research paper titled: "Trends analysis of contraceptive use and teenage pregnancy in Ghana using the Demographic and Health Survey from 2004 t0 2018":

Ghana

To access the datasets, please login at: https://www.dhsprogram.com/data/dataset_admin/login_main.cfm. The user name is the registered email address, and the password is the one selected during registration.

The IRB-approved procedures for DHS public-use datasets do not in any way allow respondents, households, or sample communities to be identified. There are no names of individuals or household addresses in the data files. The geographic identifiers only go down to the regional level (where regions are typically very large geographical areas encompassing several states/provinces). Each enumeration area (Primary Sampling Unit) has a PSU number in the data file, but the PSU numbers do not have any labels to indicate their names or locations. In surveys that collect GIS coordinates in the field, the coordinates are only for the enumeration area (EA) as a whole, and not for individual households, and the measured coordinates are randomly displaced within a large geographic area so that specific enumeration areas cannot be identified.

The DHS Data may be used only for the purpose of statistical reporting and analysis, and only for your registered research. To use the data for another purpose, a new research project must be registered. All DHS data should be treated as confidential, and no effort should be made to identify any household or individual respondent interviewed in the survey. Please reference the complete terms of use at: https://dhsprogram.com/Data/terms-of-use.cfm.

The data must not be passed on to other researchers without the written consent of DHS. However, if you have coresearchers registered in your account for this research paper, you are authorized to share the data with them. All data users are required to submit an electronic copy (pdf) of any reports/publications resulting from using the DHS data files to: references@dhsprogram.com.

Sincerely,

Bridgette Wellington

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Data Archivist
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