

Exploring correlates of adolescent fertility in Malawi

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DECLARATION

I, Doni Joseph Mosimanekgosi, student number 20894473, hereby declare that “Exploring correlates of adolescent fertility in Malawi” is my own work, supervised by Prof. N. Ayiga and that all sources that I have used or quoted have been acknowledged by means of references. This work has not previously been submitted for the award of a degree at any other institution of higher learning save the North-West University on this day.

D.J. Mosimanekgosi

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ABSTRACT

Adolescence is a period in the life cycle during which females experience major transitions characterized by physical, psychological, emotional and sexually changes (United Nations, 2013). During this period, adolescents seek new identities and explore their sexuality which sometimes lead to unplanned pregnancy and childbearing or marriage. These challenges are common in many sub-Saharan African countries including Malawi. The objectives of the study were therefore to estimate the prevalence and identify significant predictors of adolescent fertility (women aged 15-19 years of age) in Malawi. The study used cross-sectional data obtained from the 2010 Malawi Demographic and Health Survey (MDHS). The chi-square statistic was used to examine the differentials of fertility by socio-demographic characteristics of the adolescents and and the Poisson Regression was used to identify the significant predictors of the same.

The results show that the prevalence of adolescent fertility in Malawi, with TFR of 2.3, is high. Additionally, the median age of women at sexual debut was 16 years, and marriage was also 16 years, which were comparatively low and could explain the high adolescent fertility in Malawi. The study also found that apart from region and ethnicity, all other nine socio-economic and demographic factors including current age of women, educational attainment, type of residence, religion, working status, wealth index, age at first intercourse, age at first marriage, and contraceptive use were significantly associated with adolescent fertility at the bivariate analysis. Furthermore, the multivariate results revealed that current age of women, educational attainment (at primary level only), age at first intercourse, age at first

marriage, and contraceptive use were significant predictors of adolescent fertility in Malawi.

From the results, it can be concluded that adolescent fertility is prevalent and high in Malawi, which could have serious negative health and socio-economic impact on young women and their children. It is recommended that policies and programmes that could improve the situation of young women by empowering them through education as a means to reducing adolescent marriages and fertility should be continued in Malawi. Additionally, policies and regulations that could increase age at sexual debut and first marriage should be put in place; interventions aimed at delaying sexual activity, through encouraging virginity pledges and abstinence education, should be developed and implemented; policies and programmes to increase contraceptive knowledge and uptake by sexually active adolescent women should be in place, especially in rural communities.

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List of Abbreviations

CEB	Children ever born
TFR	Total Fertility Rate
ABR	Adolescent Birth Rate
MDHS	Malawi Demographic and Health Survey
PRB	Population Reference Bureau
MEPD	Ministry for Economic Planning and Development
MPDS	Malawi Population Data Sheet
HIV/AIDS	Human Immuno-deficiency Virus/Acquired Immune Deficiency Syndrome
STI	Sexually Transmitted Infections
STD	Sexually Transmitted Diseases
WHO	World Health Organization
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNPD	United Nations Population Division
GLM	Generalized Linear Models
SPSS	Statistical Package for Social Sciences
RRR	Relative Risk Ratio
ANC	Antenatal Care
WHS	World Health Statistics
SSA	Sub Saharan Africa
NSO	National Statistical Office
CHSU	Community Health Sciences Unit

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Chapter One

Introduction and Background of the Study

1.1 Introduction

The adolescent birth rate, also referred to as the age-specific fertility rate, for women aged 15-19 years, is a major health and social problem. The main health challenges arising from adolescent motherhood are increased morbidity and mortality among mothers and children born to adolescent mothers (McQueston, Silverman & Glassman, 2012). Additionally, there are also negative social consequences arising from early childbearing by adolescents. These include poor educational attainment of adolescent mothers which is characterized by high school dropout rate (Karabo and Ayiga, 2014) and higher levels of poverty which dictate that children born to adolescent mothers are taken care of in impoverished conditions that are difficult to improve (Gyesaw and Ankomah, 2013). The present study identified the prevalence of adolescent childbearing in Malawi and assessed the factors associated with it.

Global teenage childbearing is high. The World Health Organization (WHO) estimated that of all births that occur annually, nearly 11% occur to adolescent mothers (WHO, 2014). The rate of adolescent childbearing is lower in developed countries and highest in the least developing countries. Of the developing countries, the majority of all adolescent childbearing instances occur in sub-Saharan Africa (Najati and Gojazadeh, 2010). Recent data suggests that adolescent childbearing is on the decline globally in general and more specifically in sub-Saharan Africa. In 2014, the proportion of births occurring during adolescence declined to about 2% in China, 18% in Latin America and the Caribbean and more than 50% in sub-Saharan

Africa (WHO, 2014). However, despite the decline in proportional terms, the absolute number of births by adolescent declined quite modestly, which has been attributed to the increase in the absolute number of adolescents. Additionally, the proportion of births that occur to all women during adolescence has increased mainly because of fertility decline associated with fewer births in older ages (WHO, 2014).

There are a number of factors associated with adolescent childbearing. These include early age at marriage, which is an indicator of engaging in socially accepted childbearing for a longer time post-adolescence (Jain and Kurz, 2007); lack of sexual autonomy among adolescents married to older men; and lack of access to family planning services, religious and cultural value systems that impede uptake of abortion (Ayiga and Rampagane, 2013). Other factors are structural in nature and these include lack of or low level of education, unemployment, poverty and dependence on men for financial and material support; and residing in rural areas with no or limited access to health facilities capable of providing family planning services. Among the never married adolescents, the risk of childbearing is high because of peer pressure to have sex, having multiple sexual partners and engaging in erratic sexual activities influenced by use of alcohol and drugs.

Most adolescent childbearing takes place in marriage, a phenomenon called child marriage. Child marriage is a common problem in Asia and sub-Saharan Africa, where it occurs mostly in rural and poor settings. In many of these settings, marrying off adolescents is considered a source of financial and material wellbeing for parents and a source of money that increases access to services such as education for the male siblings of these young women (Mbirimtengerenji, 2007) especially in rural sub-Saharan Africa and South Asia. For instance, in South Asia, nearly half of young

women are married before 18 years, while in sub-Saharan Africa more than one third of young women are married before 18 years. Data from 10 countries with the highest rates of child marriages indicate that most of them are in sub-Saharan Africa and they include Niger, (75%); Chad and Central African Republic,(68%); Mozambique, (56%); Mali, (55%); Burkina Faso and South Sudan, (52%); and Malawi, [50%] (WHO,2014).

In Malawi, although adolescent childbearing has reduced from 172 live births per 1000 in 2000, to 162 live births per 1 000 in 2004 and recently to 152 live births per 1000 in 2010 (MDHS, 2000, 2004 & 2010), compared to other countries in the Southern Africa region such as Botswana, Namibia and South Africa, adolescent childbearing is still high in Malawi. The high rate of adolescent childbearing in Malawi is attributed to early age at marriage caused by low levels of education, household poverty and cultural values that support early marriage for adolescent women. In addition, United Nations Women (UN Women, 2015), indicates that in 2012, approximately 1 in 2 girls in Malawi was already married before 18 years. For example among women aged 40-44, the majority gave birth to their first child at adolescence which is consistent with the childbearing experience of women aged under 20 years in 2010 (MDHS, 2010). Additionally, sexual debut in Malawi coincides with age at first marriage, suggesting that most women who initiate sexual activity at adolescence are likely to become mothers soon after sexual debut, regardless of whether or not the age at first sex is age at first marriage. This is also consistent with the high rate of adolescent childbearing in Malawi, estimated at 18%, which compares poorly to other sub-Saharan African countries such as Rwanda (0.3%) and Mozambique (12.2%) (WHO, 2014). In addition, contraceptive use

among adolescents in Malawi is low, estimated at only 26% (Malawi Youth Data Sheet, 2014). This partly explains the high rate of adolescent childbearing in Malawi.

Despite our knowledge of the high health and social problems associated with adolescent childbearing, Malawi, which is one of the poorest countries in sub-Saharan Africa and with extremely limited capacity to deal with the health and social outcomes of adolescent childbearing, continues to experience one of the highest rates of childbearing at these ages. The question that needs to be answered is therefore “why does Malawi have a high rate of adolescent childbearing”?. The literature reviewed offers little or no insight into the individual and structural factors sustaining the high childbearing rate among adolescents in Malawi. The present study therefore explored the correlates of adolescent childbearing in Malawi in a bid to add to the literature and extend the knowledge horizons in this sorely under-researched area.

1.2 The research problem

The report by World Health Organization (WHO, 2014) shows that 16 million girls aged 15-19 years as well as some 1 million girls under 15 give birth every year, mostly in low and middle income countries. Adolescent childbearing has been associated with adverse health and social problems. The main health problems identified include complications during pregnancy and childbirth leading to maternal mortality. Furthermore, babies born to adolescent mothers are also at significantly higher risk of dying at infancy.

In the case of Malawi, although the Malawi Demographic and Health Surveys (MDHS, 2004; 2010) revealed that there has been a decline in adolescent childbearing rate from 162 to 152 births per 1 000 women between 2004 and 2010,

adolescent mortality ratio was 510 in 2013; infant mortality rate among children born to adolescents has remained high, estimated at 97 deaths per 1000 live births. Adolescent childbearing is also associated with high HIV prevalence among young women in Malawi, estimated at 4.2% which increased by 2% between 2004 and 2010. Many adolescents also fail to complete basic education because they are either married off to start childbearing early in their marriages or get pregnant and consequently dropout of school.

Despite the many health and social problems associated with adolescent childbearing in Malawi, the factors sustaining the high rate of adolescent childbearing in Malawi are not well understood. This study therefore explored the factors associated with adolescent childbearing in Malawi. Emphasis was placed on the individual predisposing and structural factors that may have contributed to the high rate of adolescent childbearing in Malawi.

1.3 The significance of the study

Despite the downward trend of adolescent childbearing between 2004 and 2010, the phenomenon remains very prevalent in Malawi. More specifically, adolescent childbearing has adverse consequences not only on health issues as highlighted in the problem statement, but also on individual, social, psychological and economic aspects. This study is important because its findings could help in providing information on the determinants of adolescent fertility in Malawi, thereby providing guidance on strategies and programmes aimed at addressing not only the phenomenon, but also its poor health and social outcomes on adolescents and their children in particular and society at large.

The study also provides recommendations that could help the government of Malawi in particular, and other stakeholders including cultural groups, non governmental organizations, faith-based organizations, civil society organizations and the private sectors who are working in the area of children and child health and development to advocate for better policies and legislation. These could improve the health and social well-being of adolescents in Malawi and enhance the potential of young women, thereby enabling them to grow into productive members of society. In addition, the findings could complement other existing studies which help in creating additional information and knowledge that could serve as a guide for further research and scholarship on adolescent childbearing, its predictors and its impact.

1.4 The objectives of the study

The main objective of the study is to assess the prevalence of the factors associated with adolescent fertility in Malawi and subsequently explore their social and health impact. Specifically, in the study, the following objectives are addressed:

- i. to estimate the prevalence of adolescent fertility in Malawi;
- ii. to examine demographic and socio-economic differentials in adolescent fertility in Malawi; and
- iii. to identify the significant predictors of adolescent childbearing in Malawi.

1.5 The scope of the study

The study explores the correlates of adolescent fertility in Malawi. Specifically the study estimates the prevalence of adolescent fertility and identifies the significant socio-economic predictors of adolescent fertility in Malawi. In doing so, the proximate determinants of fertility and their impact on fertility was not estimated. This was mainly because the proximate determinants are more appropriate for estimating

completed fertility. They are not suitable for estimating the fertility of a population at the beginning of their childbearing careers.

1.6 The organization of the study

The current study comprises of a total of five chapters. Chapter 1 is made up of a the following sub-sections, which are: Introduction and background information of the study, the research problem, the significance of the study, the objectives of the study, and the scope of the study. Chapter 2 is the literature review which discusses what has been previously done in this research area. Chapter 3 discusses the research methodology and data adapted in this current study; Chapter 4 presents analyses of data and results and lastly Chapter 5 provides discussions, draws conclusions and gives recommendations.

Chapter Two

Literature Review and Theoretical Framework

2.1 Introduction

This chapter presents an overview of the literature on determinants of adolescent fertility measured as the number of children ever-born (CEB). The determinants explored include age of respondents, educational attainment, type of residence, geographical region, religion, ethnicity, working status, wealth index, age at marriage, and contraceptive use. In reviewing such literature, this chapter also discusses the conceptual framework for this study.

2.2 Overview of determinants of adolescent fertility

2.2.1 Fertility levels in developed regions

From the 1990s there has been a discernible signal indicating that the global decline in adolescent childbearing was evident (WHO, 2014). This decline was also noted in countries that previously reported high adolescent childbearing rates in Asia and sub-Saharan Africa. Some of the direct factors for the decline were identified as increasing age at sexual debut and increasing usage of effective contraceptives by sexually active adolescents (Boonstra, 2014). These factors, mentioned above, have cumulatively reduced the global adolescent birth rate to 49 per 1 000 and country specific rates varied from 1 to 299 births per 1000 adolescents. However, countries in sub-Saharan Africa continued their lead as high adolescent fertility countries (Haub, 2013).

2.2.2 Regional differentials in adolescent fertility

Achieving significant declines in adolescent childbearing in sub-Saharan African countries serves as an important indicator of reduced fertility and high population growth. It could also lead to achieving the millenium goals 4 and 5 which are set to reduce childhood births and improve maternal health, areas in which sub-Saharan Africa leads the world. The rate of adolescent fertility reduced from 134 to 115 between 1995-2000 period to 2005-2010 period respectively which amounts to a 13 percent decline. It reduced further to 12 percent in 2010. Despite the observed decline, Haub (2013) estimates that it could take sub-Saharan Africa about 50 years to reduce the adolescent fertility rate in this region to the European current rate of 19. Although still higher than reported in developed countries, survey data indicates that some countries in sub-Saharan Africa have experienced faster declines in adolescent childbearing. These countries include Algeria in the north (11), Djibouti (45) in the north east, South Africa (47) in the south, Seychelles (58), Burundi in the east (29), Equatorial Guinea in the west (110) and Malawi in the South (137) have experienced no or marginal decline in adolescent fertility (The World Bank Data, 2014).

In the Asia region, the adolescent childbearing rate in the poorest countries was also high. Data from the 2005-2010 indicate that the countries with high rates were: Afghanistan with 118, Bangladesh with 88.7, and Bhutan with 50.9. The countries with lower rates included Sri-Lanka with only 22.3 and Pakistan with 30.9 (United Nations, 2013). Similar data provided by Haub (2013) in South Asia shows that India experienced a faster decline in adolescent fertility and the decline was attributed to novel maternal and child health programmes. Bangladesh and Pakistan have also experienced declines from the early 1990s.

However, the decline was particularly notable in Pakistan where the rate fell by 31 percent from 74 in the 1990s to 51 in 2007. However, the decline in Bangladesh was only 16 percent over the same period.

In Latin America and the Carribeans, adolescent fertility remains relatively higher than that in the developed countries, but lower than those in South Asia and sub-Saharan Africa. Overall, the continental average of adolescent childbearing for Latin America was less than 50 per 1000 women. The countries with the highest rates were the Dominican Republic followed by Guatemala with adolescent fertility rates of 98 and 92 respectively. The countries with the lowest rates of adolescent fertility in Latin America were Haiti with 66 and Peru with 64.

2.2.3 Adolescent fertility levels in Malawi

According to MDHS report of (2010), Malawi, just like many other countries in the whole world, has experienced a decline in adolescent childbearing. Notably, the rate has marginally dropped from 162 births per 1 000 in 2004 to 152 births per 1 000 women in 2010. In other words, this means that Malawi has seen an adolescent fertility decline of about 6.6% over the same period. This decline is an important indicator of several contingent experiences amongst adolescent women and these are the subject of this investigation in the subsequent segments.

2.4 Determinants of adolescent fertility

2.4.1 Age

In a recent study (Alemayehu, Haider & Habte, 2010), posits that older teenagers are more likely to be fertile than younger ones. In addition, the same study argues that as the age increases, the risk of exposure to pregnancy and childbearing also

increases, because of the higher probability of getting sexual intercourse within the marriage establishment.

2.4.2 Education

Although a number of studies on adolescent childbearing and young mothers' educational attainment have been conducted in developed and developing worlds, a lot still needs to be done in sub-Saharan Africa, especially in Malawi. It is generally accepted in the research literature that early childbearing prevents girls from successful educational transitions (Marteleto, Lam & Ranchohod ., 2006). Other previous studies (Bigala, 2004) posit that females that are found to be attending school are well positioned to decrease their chances of having early births and thus postpone childbearing to later stages in their lives. For instance, some previous studies on adolescent fertility (Alemayehu *et al.*, 2010; Nwogwugwu, 2013), all reveal similar findings that postulate education to be a strong determinant of adolescent fertility, that is, women who have completed primary or secondary education are less likely to get pregnant and thus giving birth later in life than those having no education.

Furthermore, the other most recent study by Nyarko (2012) established that female adolescents who have primary school education as well as those who have secondary school education or higher have a lower probability of giving birth compared to female adolescents who have not completed some critical stage of formal education. Thus, the probability of adolescent fertility apparently decreases with the increase in the level of education of female adolescents. Conversely, female adolescents who have no formal education are more vulnerable to giving birth as a result of lack of or no knowledge of sexual and reproductive health issues.

The 2010 Malawi Demographic and Health Survey (MDHS, 2010) indicates that education is a key determinant of the lifestyle and societal status enjoyed by individuals. Additionally, educational attainment is strongly associated with sexually healthy behaviours and attitudes. According to Malawi Population Data Sheet (2012), there is evidence to suggest that there is a positive relationship between fertility and educational attainment. The report indicates that women having tertiary education have lower fertility than women having no or primary education.

2.4.3 Ethnicity

In looking at the impact of ethnicity on adolescent fertility, research by Martinez, Daniels & Chandra (2012), suggests that fertility levels are known to be influenced by population subgroups such as race, ethnicity and educational attainment. More specifically in the United States, racial and ethnic variations play an important role in the timing of fertility and total fertility. It has been observed in the United States that the Hispanic and non-Hispanic black population have earlier and higher fertility compared to other racial and ethnic groups. But other previous studies conducted in California (Berglas, Brindis & Cohen, 2003) argue that birth rates in California vary by, among other things, age, race, ethnicity, and geography. It has been established also that the birth rate is higher among adolescent girls aged 18-19 years (at 76.6 births per 1000) compared to adolescent girls aged 15-17 years (24.4 births per 1000). In addition, the rate is disproportionately higher for Hispanic (86.2 births per 1 000 teens) and African American (53.3) adolescent girls than for white (20.2) or Asian/Pacific Islander (12.6) adolescent girls, aged 15-19 years.

2.4.4 Working status

With regard to the relationship between adolescent fertility and working status, the findings in the research work conducted by Nyarko (2012) indicate a significant association between the working status of women and adolescent fertility. In addition, the likelihood of giving birth by female adolescents who were not working is higher than that of their working counterparts. Furthermore, the same study suggests that working women are more likely to postpone their pregnancy compared to women who are not working, because non-working women may not delay child bearing due to the fact that they often find modern contraceptives or induced abortion unaffordable, thus getting exposed more to child bearing and nurturing. Hence, they are more likely to give birth than working female adolescents. But other studies conducted in Bangladesh (Kamal, 2009) find the women's work to have a very minimal impact on adolescent fertility.

Other demographic studies conducted elsewhere (Bratti, 2015) indicate that postponed childbearing can have important consequences not only for the mother but also, at the macro level, the country as a whole. That is, postponing the first birth could raise a mother's participation in labour and wage engagements but may have an adverse impact on overall fertility, particularly in the absence of supportive family policies. Significantly, the same study further found that postponing childbearing plays an important role in helping women to accumulate more work experience and also enhancing their likelihood of being attached to the labour market, thereby raising their wages rather than child bearing. Conversely, postponing childbearing may have negative effects on women's overall total fertility.

While some literature (Nahar and Min, 2008) argues that there is sparse evidence of linking the effect of income or economic status and adolescent childbearing than that of education and place of residence, other studies (Boonstra, 2014) suggest that many adult women postpone childbearing during periods of economic downturn, when there are fewer job opportunities and increased competition for those jobs that are available. But whether teens are affected by these downturns is less clearly delineated in this literature.

2.4.5 Wealth status

When looking at the relationship between wealth status and adolescent fertility, the findings of a study conducted in Bangladesh (Kamal, 2009) reveal that wealth index, as expected, reflected a significantly negative effect on adolescent motherhood, implying that the poorer the female individual, the more the likelihood of childbearing during adolescent period. Notably, approximately three out of four women within the poorest wealth quintile started childbearing before they reached the age of nineteen, while slightly over half of the women within the richest wealth quintile had had experience of teenage motherhood. Moreover, it is reflected in the study by (Olausson, Haglund, Weitof & Cnattingius, 2001) that some other studies conducted in the United States indicate that growing up in a low socio-economic status household, living with a single parent and having low educational and career aspirations have all been revealed to be strongly associated with the likelihood of teenage childbearing. Similarly, Rutaremwa (2013) argues that adolescent girls in Uganda who become pregnant are often unable to complete a secondary education, which in turn makes it very challenging for them to find employment. Notably, education and economic status are amongst the critical determinants of adolescent

pregnancy. Nonetheless, some researchers such as (Singh, Darroch & Frost, 2001) argue that in the United States and Great Britain, which have archived data on adolescent fertility according to economic status, there is a strong negative relationship between economic status and having a child before age 20.

Other studies (Williamson, 2013) posit that teenagers who have completed secondary school are better placed to have low pregnancy rates compared to adolescents who have no secondary education. In an economic sense, this may suggest that adolescents from poor households have a higher likelihood of becoming pregnant compared to adolescents from wealthier families.

2.4.6 Type of place residence

According to Flórez and Núñez (2001), place of residence has been regarded, in previous studies and literature, as the most important factor exerting influence upon adolescent fertility and behaviour. Notably, this means that adolescent women living in an urban place of residence have a higher probability of having lower rates of childbearing compared to adolescent women living in rural places. This latter notion is consistent with empirical evidence from a study conducted by the United Nations, as cited by Flórez and Núñez (2001), which argues that urban women have lower fertility because they marry later, desire smaller families and they are more likely to use family planning as compared to their rural counterparts. For instance, findings from the work done by Khan (2009) in Bangladesh reveal that childbearing patterns also vary by type of place of residence; that is, in rural areas childbearing tendency is higher than in urban areas. Other similar studies conducted in Uganda indicate that adolescents residing in rural areas get frequent pregnancies than adolescents residing in urban areas; hence type of residence is significantly associated with peer

influence on pregnancy matters (Moses, 2009). In South Africa, a study conducted by Kara and Maharaj (2015) reveals a significant linkage between place of residence and childbearing among women aged 15-24 years. The results indicate that women who reside in rural formal areas have a higher likelihood of experiencing earlier childbearing, while women who reside in urban areas are least likely to experience early childbearing.

2.4.7 Religion

A study in Nigeria (Odimegwu, 2005) is consistent with other previous studies and claims that there is positive relationship between religion and adolescent sexuality, attitudes and behaviour, and adolescent childbearing. This is because religious values and beliefs prolong the age at sexual debut, which increases the age at first birth. The practices of attending religious services frequently, daily involvement in bible reading and prayer, evangelisation, preaching and distribution of religious materials are the main instruments through which the sexual behaviour adolescents could be deferred and therefore influenced.

Furthermore, because all religions discourage premarital sexual activity, they help to prevent premarital and adolescent childbearing (McFarland, Uecker & Regnerus, 2011). Another study (Adebawale, Fagbamigbe & Adebayo, 2016) found that regardless of gender Christian adolescents are less likely to have given birth as adolescents than Muslim adolescents. This is primarily because Islamic society encourages early marriage as a means of preventing premarital sexual activity and premarital childbearing more than Christianity. This has been used to explain the prevalence of early child marriages in Islamic settings in Africa, especially in Northern Nigeria and Niger (Braimah, 2014; UNICEF, 2012).

Another previous study alludes that there is a strong association between religion and adolescent childbearing (De Andrade Verona, 2011). The above study argued that religion is an important and highly influential factor in the lives of many young adults in Brazil. In this regard, Pentecostal churches and Catholic charismatic churches use their resources to create space for their young followers to participate actively in religious environments, creating for them opportunities that impede engaging in sexual activities and thereby reducing the risk and prevalence of adolescent childbearing. These religious groups also discourage early marriage by creating opportunities for education which directly increase the age at marriage for women remain in school longer. In these ways, adolescent childbearing is reduced among Pentecostal and Catholic charismatic communities.

This is further exacerbated by the teaching that premarital sex is sinful and use of contraceptives to prevent pregnancy and infections are discouraged (Caldwell, as cited in Chimbiri, 2007). For instance, Catholics do not allow the use of modern family planning methods among married couples and the unmarried as well. Muslims too view procreation and using protective measures as unimportant but it preaches that it is better if people get married and have sex while in marriage. In the same study, adolescents reported that parents told them to get married and have children rather than using family planning methods.

2.5. Proximate variables

Age at marriage is one of the most important proximate determinants of fertility (Bongaarts & Lesthaeghe, 1984). The fertility rate among adolescents in high fertility countries is attributed to early childbearing in marriage. This is because in these societies marriage at a young age is universal. It is the young age at marriage that

explains adolescent childbearing countries with high fertility such as Uganda, Niger and Zambia (Ayiga and Lwanga, 2014: 204-205). Even without being married, societies in which sexual debut is early in teenagers, the prevalence of adolescent childbearing is high.

A previous study in Uganda (Ayiga, 2015) revealed that many young women become pregnant and bear children because they initiated sexual activity early in life. This study estimated non-marital adolescent childbearing at 25% in 2011. In societies where adolescent sexual debut and childbearing occur before marriage, the rate of adolescent marriages and repeat childbearing is likely to be high. This could explain why in 34 of 36 countries with available data, a higher proportion of young women who have a birth during adolescent period do so within marriage. This suggests that reducing adolescent fertility can only be achieved by increasing the age at sexual debut and age at first marriage. This suggestion is consistent with the view of previous research (United Nations, 2013) which posits that a rising age at first marriage could be the most important way in reducing adolescent childbearing.

Another study conducted elsewhere (Yavuz, 2010) shows that in Morocco, Egypt and Turkey marriage is a key determinant of women's exposure to the risk of childbearing. Early marriage often leads to a higher total number of lifetime births due to a longer period of exposure to the risk of pregnancy. The problem of early marriage and its effect on fertility has been observed in many developing countries, where early marriage is common and socially valued and an accepted form of relationships for girls (Agaba, Atuhaire & Rutaremwa, 2011). In addition, the report by Hervish and Clifton (2012) reveals that in Malawi, nearly 5 in 10 women in the 20-24 age group married before 18 years and had children soon thereafter. This was

supported by a report (MEPD, 2014) which revealed that early marriage is common for girls in Malawi. The same report indicated that a large number of girls in the 20-24 age group were married by 18 years. The report also revealed that the risk of marrying in adolescence was higher in rural areas than in urban areas.

Another proximate determinant of fertility that is important in understanding adolescent fertility is contraception. The low uptake of contraceptives is in part due to the many barriers in using contraceptive services and doing so consistently. These barriers vary significantly between different settings within and between countries. Some of the commonly mentioned barriers to adolescent contraceptive use are lack of or limited knowledge about contraception and types of contraceptive methods (Nyarko, 2015); lack of access to appropriate contraceptives that fit the needs and financial ability of adolescents (Chandra-Mouli, McCarraher, Phillips & Hainsworth , 2014); poor distribution of contraceptives within countries; and frequent stock outs of contraceptives especially for adolescents in the low socioeconomic group who predominantly live in rural areas (Ochako, Mbondo, Aloo, Kaimenyi, Thompson, Temmerman & Kays , 2015). The fear of being reprimanded by health workers, whenever adolescents present at family planning clinics for contraceptives, has also been frequently reported as a major barrier to the use of contraceptives ((Chandra-Mouli *et al.*, 2014; Alemayehu, Belachew & Tilahun, 2012).

Another barrier that has featured prominently in the literature is fear of side effects associated with certain contraceptive methods (Westoff, 2007). A previous study found that women who have never used contraceptives and said they do not intend to do so any time in the future, cited fear of side effects as a main reason (Sedgh, Hussain, Bankole & Singh, 2007). Cultural norms and values that impede discourse

on sexual matters between adolescents and parents are also barriers to the effective use of contraceptives (Nalwadda, Mirembe, Byamugisha, Faxelid, 2010). These norms and values have only helped to keep adolescents in the dark and deny them access to expert information on sexual matters and contraceptive methods. As a result, sexually active adolescents do not use contraceptives, leading to unintended premarital childbearing.

2.6 Conceptual Framework

The theoretical framework explains how socio-demographic factors affect adolescent fertility through proximate variables. Proximate variables and socio-demographic variables are the two groups of determinants of fertility (Bongaarts and Potter, cited in Nwogwugwu, 2013). According to this framework, the socio-demographic or background variables operate through the proximate determinants to affect fertility. The proximate determinant has a direct influence on fertility; it helps in understanding how socio-demographic variables affect fertility.

This study is based on Bongaart's fertility model in order to understand adolescent fertility. Fertility is different among populations due to the following proximate determinants: proportion of women married, contraception, induced abortion, postpartum infecundity and primary sterility (Bongaarts *et al.*, as cited in Nwogwugwu, 2013). For the purpose of this study, age at sexual intercourse, first marriage and contraception are used as proximate determinants (intermediate variable) of adolescent fertility. The dependent variable (outcome variable) is adolescent fertility - measured as the number of children ever born (CEB). The background factors are the selected socioeconomic characteristics of the adolescent women. The conceptual framework operationalized below shows the mechanisms

through which the background characteristics of adolescents operate through the proximate determinants to affect fertility.

Higher educational attainment influences age at first intercourse, age at first marriage and contraceptive use in a sense that women who have completed primary or secondary education are more likely to have a higher age at sexual debut; are more likely to marry at older ages; and are more likely to have knowledge of and take up contraception. These mechanisms of education are more likely to reduce the probability of adolescent childbearing, compared to their counterparts who do not have any or have low educational attainment.

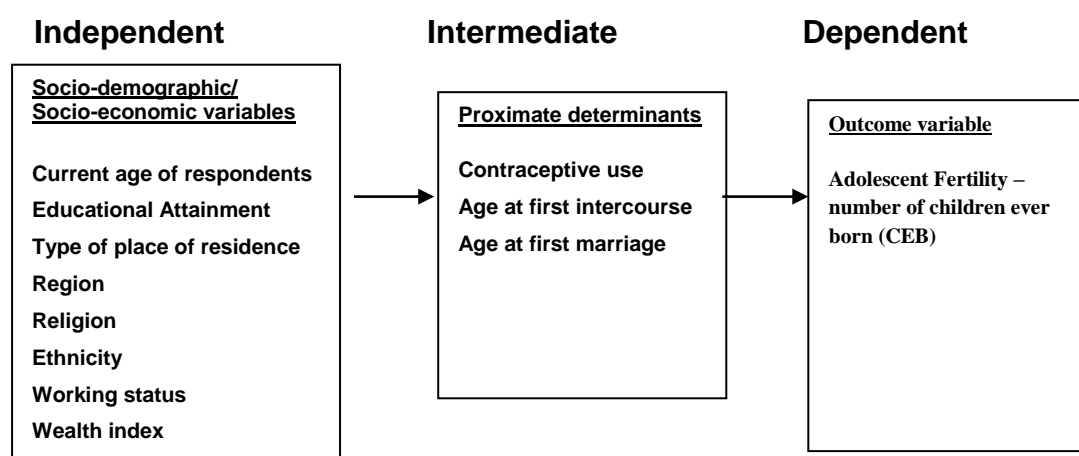
Wealth index is also expected to influence age at sexual debut, first marriage and uptake of contraception and contribute to reducing the risk of early childbearing. Women who belong to the poor wealth index group are more likely to have a lower age at sexual debut and marry at young ages. They are also more likely not to know about contraception and not use any contraceptive methods, which increases their risk of teenage childbearing compared to the women in the higher wealth index groups.

Furthermore, women who work are more likely to postpone early marriage and pregnancy; are more likely to have primary, secondary and higher education and have more knowledge about modern contraceptives than their non-working counterparts. As a result, the likelihood of giving birth at adolescence by women who are not working is higher compared to their working counterparts.

Current age of women is linked to age at first intercourse, age at first marriage and contraceptive use in the sense that, women who marry before the age of 20 have a

higher risk of exposure to early sexual debut, and are less likely to use contraceptives, which in turn increases the likelihood of childbearing compared to their counterparts who marry at older ages. With regard to religion, Christian and Muslim women are more likely to initiate sexual activity later and less likely to engage in premarital sexual activity and therefore less likely to experience adolescent childbearing compared to followers of Traditional African religions. This is because the moral values of these religious groups prevent premarital sexual activity. Additionally, place of residence is expected to influence the risk of adolescent fertility. Adolescents in urban areas are less likely to experience premarital childbearing because they initiate sexual activity at older ages, and even if sexually active, they are more likely than rural adolescents to adopt contraceptives. The combined effect of delay in age at first sex and uptake of contraceptive significantly reduces the risk of childbearing adolescents for women in urban areas.

Figure 2.6: The adopted framework of linkages between adolescent fertility, socio-demographic, socio-economic and proximate determinants (Bongaarts *et al.*, 1984).



Furthermore, region and ethnicity impact on adolescent fertility. Malawi is generally a rural country. In this regard, adolescents from primary rural regions are more likely to have no or lower levels of education, have lower wealth index, which in turn entails

lower age at first sexual intercourse. Women in rural regions also have lower knowledge of and access to contraceptives, which subsequently increases their risks of premarital adolescent childbearing in rural regions. In addition, ethnicity as an important determinant of fertility is expected to influence the risk of adolescent childbearing in Malawi. This is because some ethnic groups have the tendency of forcing women into marrying at an early age, which exposes them to higher risk of having sexual debut at an early age. In addition, the disapproval of contraceptives for unmarried women increases the risk of adolescent childbearing.

Chapter Three

Methodology

3.1 Introduction

This chapter provides a detailed account of the research methods employed and the analysis of results necessary to fulfil the objectives of this study. The data analyses were conducted by use of the statistical package called SPSS - version 21. The remainder of the chapter is structured as follows: Section 3.2 elaborates on the study design while section 3.3 discusses the data sources. Section 3.4 explores the study population and sample while section 3.5 focuses on data collection and instruments. Section 3.6 focuses on data analysis, that is, sub section 3.6.1 looks at the units of analysis while sub section 3.6.2 gives definitions of study variables. Sub section 3.6.3 looks at dependent variables while sub section 3.6.4 explores the independent variables and sub section 3.6.5 discusses the intermediate or proximate variables.

3.2 Study design

This was a cross-sectional study using the quantitative approach to explore factors influencing adolescent fertility in Malawi. The data were collected by the use of a standard and structured Demographic and Health Survey questionnaire for women. The data were collected on the background, fertility, reproduction, antenatal care, post natal care, breastfeeding and nutrition characteristics. Also collected were data on contraception, HIV and AIDS and gender based characteristics of the women. The data analysed were in respect of adolescent women aged 15-19 years in Malawi.

3.3 Data source and sample design

The data used in this study were obtained from the 2010 Malawi Demographic and Health Survey (2010 MDHS). The MDHS was a large and nationally representative sample survey conducted by the National Statistical Office (NSO) in partnership with the Ministry of Community Health Sciences Unit (CHSU) of the Republic of Malawi. It was the fourth survey of its kind to be conducted in Malawi and comprised of 27 000 households in which 24 000 females were interviewed. The sample for the study was obtained by the use of the two cluster sample design. In this design, the first stage involved the selection of enumeration areas (EAs) and the second stage involved the selection of households from the selected EAs. Eligible women aged 15-49 who usually resided in the selected households, and women who visited but spent the previous night in the households were interviewed. For the purpose of this study only women aged 15-19 comprising of 2197 were analysed.

3.4 Methods of data analyses

3.4.1 Univariate Analysis

This section discusses the descriptive statistics used in the examination of the relationship between each of the socio-economic and demographic characteristics and fertility constructs among adolescent females aged 15-19 years in Malawi. Under the descriptive analysis, the results were summarized in tables showing adolescents by socio-economic and demographic characteristics, adolescents by reproductive characteristics, and fertility of adolescents by age.

3.4.2 Bivariate analysis

The focus of this section was to assess whether there is an association between each of the socio-economic and demographic (independent) variables and the level of fertility (dependent variable), measured as the number of children ever born (CEB) among adolescent women aged 15-19 years in Malawi. Furthermore, given the categorical nature of the explanatory variables, the Pearson's Chi-Square test was chosen to conduct the highlighted assessment of association between each of the socio-economic and demographic characteristics and adolescent fertility. According to Field (2013: 722) the Pearson's Chi-Square statistic is given by:

$$\chi^2 = \sum \frac{(\text{observed}_{ij} - \text{model}_{ij})^2}{\text{model}_{ij}} \quad 3.1$$

The analysis was performed through the crosstabs technique, at 95% confidence interval and a 0.05% level of significance.

3.4.3 Multivariate analysis

This section of the study explores the critical determinants of fertility levels among adolescent women aged 15-19 years in Malawi. It is prudent to state that only explanatory variables which were found to be significantly associated with adolescent fertility (defined by the number of CEB) at the bivariate analysis are further explored in this section. Therefore, given the count nature of the response variable, a family of Generalized Linear Models (GLM) with a natural logarithmic link

function - Poisson regression - was selected to examine the critical predictors of the level of fertility among adolescent women aged 15-19 years in Malawi.

Moreover, according to Korosteleva (2013), the Poisson regression model specifies that the dependent variable Y , given independent variables x_1, x_2, \dots, x_k , follows a Poisson distribution with the probability function

$$P(Y = y | x_1, x_2, \dots, x_k) = \frac{\lambda^y e^{-\lambda}}{y!}, y = 0, 1, 2, \dots, \quad 3.2$$

where the rate $\lambda = \text{Exp}(\beta_0 + \beta_1 x_1 + \dots + \beta_k x_k)$, 3.3

Or, equivalently,

$$\ln \lambda = \beta_0 + \beta_1 x_1 + \dots + \beta_k x_k. \quad 3.4$$

where, $\ln \lambda$ = natural log of the response variable

β_0 = Intercept

$\beta_0, \beta_1 \dots \beta_k$ = Regression coefficients

x_1, \dots, x_k = Explanatory variables

Consequently, the Poisson regression model coefficients can be interpreted as follows

- i. If x_1 is continuous, then the quantity $\left(\text{Exp}(\hat{\beta}_1) - 1 \right) * 100\%$ represents the estimated percentage change in mean response when x_1 is increased by one unit, and the other x variables are held fixed.

- ii. If x_1 is a categorical variable with several levels, then $\text{Exp}\left(\hat{\beta}_1\right)*100\%$ represents the estimated percentage ratio in mean response for the level $x_1 = 1$ and that for the reference level, provided the other x variables are unchanged.

Goodness of Fit Test

- i. A goodness test of fit of the Poisson regression model is obtained by computing the deviance statistic for a base model against the full model. A base model includes only the intercept, while the full model includes the intercept and all the x variables. The deviance is measured as -2 multiplied by the log-likelihood ratio,
- a. $-2(\ln L(\text{base model}) - \ln L(\text{full model})).$ 3.5
- ii. The deviance is used as a test statistic for testing H_0 : the base model has a good fit against H_1 : the full model has a good fit. Under H_0 , the deviance has a chi-squared distribution with the degrees of freedom = number of x -variables in the full model.
- iii. If the deviance is large (formally, $p\text{-value} < 0.05$), then H_0 is rejected and the conclusion is that the full model, which is the alternate hypothesis, has a good fit.

3.5 Definition of variables

3.5.1 Dependent variable

The main variable in this study is the level of fertility measured as the total number of children ever born by women aged 15-19 years. It is the count response variable in nature.

3.5.2 Independent variables

The independent variables, also referred to as explanatory variables, comprise socio-economic and demographic characteristics of the respondents. These explanatory variables are divided into three categories. Firstly, the intermediate/proximate determinants of fertility – which are a set of behavioural variables which directly determine fertility. Bongaarts and Potter (1983) posit that the differences in fertility among populations are mostly determined by four (4) proximate determinants namely: (1) marriage, (2) contraceptive use, (3) induced abortion and (4) postpartum infecundity. Nonetheless for the sake of this study, the focus is on three proximate variables: age at first intercourse, age at first marriage, and contraceptive use. Secondly, the socio-economic characteristics referred to in this study are educational attainment, type of place of residence, working status and wealth index, that is, there is an evidence of linkages between education and labour market productivity and earnings. In other words, individual females who fail to complete high school face a very limited and diminished employment prospect as adults. As a result, these female individuals get exposed to a risk of being impoverished and becoming dependent on government assistance (Ribar, 1993). Conversely, individuals residing in urban areas are likely to have completed

secondary education that positively impacts upon their socio-economic status. And thirdly, the demographic characteristics are current age of women, region, religion, and ethnicity. These variables are expected to be linked to fertility.

In addition, current age of respondents is categorized in single ages, ranging from 15-19. Educational attainment is grouped as no education, primary and secondary. Type of place of residence is classified as urban and rural. Region is classified into Northern, Central and Southern, which are the geographical and administrative regions in Malawi. With regard to religion, the respondents are categorized as Catholic, CCAP, Anglican, Seventh Day and Baptist, Other Christians and Muslim. In terms of ethnicity, the respondents are grouped as Chewa, Tumbuka, Lomwe, Tonga, Yao, Sena, Nkhonde, Ngoni, and other. In relation to working status, these adolescent women were classified as either not working or working. Wealth status is conveniently categorised into three descriptors: Poor, Middle, and Rich. Age at first intercourse comprised respondents below the age of 18 and those who were 18 and above. Age at first marriage was categorized as respondents below the age of 18, or else 18 and above and those who had never married. Contraceptive use as a category grouped respondents as either using or not using contraceptives.

Some variables were re-coded from their original codes as reflected in the MDHS data into a form that is relevant to the objectives of the current study. Notably, the following variables were re-coded, educational attainment (No education, Primary, Secondary+), current age of women (15, 16, 17, 18, 19), ethnicity (Chewa, Tumbuka, Lomwe, Tonga, Yao, Sena, Nkhonde, Ngoni, Other), wealth index (Poor, Middle, Rich), Working status (No, Yes), age at first intercourse (Below 18, 18+), age at first marriage (Below 18, 18+, Never married); contraceptive use (Using, Not using).

Table 3.1: Definition and coding of variables

Variable	Coding
Dependent variable	
Adolescent fertility (measured as, number of children ever born (CEB))	
Independent variables	
Current age of women	1 = 15 2 = 16 3 = 17 4 = 18 5 = 19
Education attainment	0 = No education 1 = Primary 2 = Secondary+
Type of place of residence	1 = Urban 2 = Rural
Region	1 = Northern 2 = Central 3 = Southern
Religion	1 = Catholic 2 = CCAP 3 = Anglican 4 = Seventh Day Advent/Baptist 5 = Other Christian 6 = Muslim
Ethnicity	1 = Chewa 2 = Tumbuka 3 = Lomwe 4 = Tonga 5 = Yao 6 = Sena 7 = Nkhonde 8 = Ngoni 9 = Other
Working status	0 = No 1 = Yes
Wealth index	1 = Poor 2 = Middle 3 = Rich

Table 3.1 Continued

Variable	Coding
Age at first intercourse	1 = Below 18 2 = 18+
Age at first marriage	1 = Below 18 2 = 18+ 3 = Never married
Contraceptive use	0 = Using 1 = Not using

3.6. Definition of key concepts

Adolescence

Adolescence is viewed as a transitional period from childhood to adulthood characterized by significant physiological, psychological and social changes. Furthermore, World Health Organization defines the age group 10-19 and 15-24 years of age as adolescents and youth respectively (Alemayehu, *et al.*, 2010). For the purpose of this study the age range for women takes all those aged 15-19 years as adolescents due to the fact that the Malawi Demographic and Health Survey does not collect data on adolescents between ages of 10 to 14 years.

Fertility

Fertility is referred to as the number of live births women have. It differs from fecundity, which refers to a physiological capability of women to reproduce (Haupt, Kane & Haub, 2011).

Adolescent fertility

Adolescent fertility, also referred to as teenage fertility, is known as a condition in which a woman has given live birth before the age of 20 years. Adolescent fertility in this study is calculated as the proportion of women aged 15-19 who have ever given live birth by the time of interview (Alemayehu *et al.*, 2010).

Total Fertility Rate

Total fertility rate (TFR) is referred to as the average number of children that would have been born to a woman by the time she ended childbearing if she were to pass through all her childbearing years conforming to the age specific fertility rates of a given year (Haupt *et al.*, 2011).

Children ever born

The number of “children ever born” is one of the measures of fertility which gives the number of children born alive to women in a particular age group (Haupt *et al.*, 2011).

Adolescent birth rate

Adolescent birth rate is one of the measures of adolescent fertility which is the annual number of births to women aged 15-19 years per 1 000 women in that age group (Haupt *et al.*, 2011).

3.7 Limitations of the study

Although the study identified some significant predictors of adolescent fertility, the results and conclusions could have been biased by a number of aspects. Firstly, social desirability biases are associated with under reporting of premarital fertility which is culturally discouraged. Secondly, sample variations between the surveys could affect the comparison of rates of young motherhood. Thirdly, the cross-sectional nature of the data could have affected results due to censoring of women who become pregnant soon after the surveys. Lastly, the estimation of young premarital motherhood as a point indicator could misclassify the event for variables on which data were collected at the time of interview, putting the temporality of the event for transient variables in question. This might explain why women who have ever tested for HIV were more likely to have had a premarital birth, yet HIV testing is a requirement during pregnancy to which non-pregnant women are usually exempted.

Chapter Four

Results

4.1 Introduction

This chapter presents the results of the study. It comprises univariate, bivariate and multivariate analyses of selected socio-economic and demographic characteristics of female adolescents (aged 15-19 years) in Malawi. The rest of the chapter is arranged as follows: Section 4.2 presents the bivariate - Chi Square analysis which examines the association between fertility (measured as the number of children ever born) and selected independent variables; Section 4.3 focuses on identifying predictors of fertility using multivariate – Poisson regression analysis to establish the critical determinants of number of children ever born among adolescent females aged 15-19 years in Malawi while Section 4.4 closes the chapter by discussing the odds ratios in relation to the dependent and independent variables identified in this study.

4.2 Univariate analysis of background characteristics

Table 4.1 presents the descriptive (frequency) analysis of socio-economic and demographic characteristics of the respondents who participated in this study. The results show that a majority (28.8%) of respondents were 19 years at the time of the survey, with 18 years as their related median age. Table 4.1 further reveals that the highest percentage (76.5) of these adolescents had received only up to primary level education compared to 3.3% and 20.3% who had no education and secondary and higher education respectively. In relation to type of place of residence, a majority (87.7%) of the respondents came from rural areas compared to only 12.3% of their urban counterparts. In terms of the region, again a majority of the respondents

(50.8%) came from the Southern region, and the second highest (29.9%) region was the Central region of Malawi. In as far as religion is concerned, Table 4.1 depicts that the highest percentage (38.8%) of respondents were affiliated to other Christian denominations, followed by 21.6% who were Catholics. It is reflected in the same Table 4.1 that in terms of ethnicity, Chewa had the majority (25.2%) of respondents, followed by Lomwe and Ngoni ethnic groups with 17.2% and 14.4% respectively. Regarding working status and wealth index, the results in Table 4.1 show that 58% of respondents were not working, compared to only 42% of those who were working. A majority (37.1) of the respondents fell into the category rich in comparison to (14%) who were identified as living in the poor index.

In looking at age at first intercourse, Table 4.2 shows that the majority of the respondents (76.1%) had their first sexual intercourse before the age of 18, with the corresponding median age of 16 years. In relation to age at first marriage, Table 4.2 reveals that the majority (50.3%) of adolescents had their first marriage before the age of 18, with a corresponding median age of 16 years. Furthermore, Table 4.2 shows that the majority (77.5%) of respondents were using contraceptives at the time of first sexual encounter, compared to only 22.5% of those who were not using.

Table 4.1: Adolescents by socioeconomic and demographic characteristics, Malawi DHS, 2010 (n=2197)

Characteristics	Frequency	Percent
Current age		
15	220	10.0
16	355	16.2
17	419	19.1
18	570	25.9
19	633	28.8
Mean = 17.5 Median = 18.0 Std Deviation = 1.3		
Educational Attainment		
No education	72	3.3
Primary	1680	76.5
Secondary+	445	20.3
Type of residence		
Urban	271	12.3
Rural	1926	87.7
Region		
Northern	423	19.3
Central	658	29.9
Southern	1116	50.8
Religion		
Catholic	474	21.6
CCAP	357	16.2
Anglican	69	3.1
Seventh Day Advent/ Baptist	167	7.6
Other Christian	852	38.8
Muslim	278	12.7

Table 4.1 Continued

Characteristics	Frequency	Percent
Ethnicity		
Chewa	554	25.2
Tumbuka	236	10.7
Lomwe	377	17.2
Tonga	78	3.6
Yao	285	13.0
Sena	124	5.6
Nkhonde	48	2.2
Ngoni	317	14.4
Other	178	8.1
Working status		
No	1275	58.0
Yes	922	42.0
Wealth index		
Poor	901	14.0
Middle	479	21.8
Rich	817	37.1
Total	2197	100

**Table 4.2 Adolescents by reproductive characteristics, Malawi DHS, 2010
(n=2197)**

Characteristics	Frequency	Percent
Age at first intercourse		
Below 18	1671	76.1
18+	526	23.9
Median = 16.0 Std Deviation = 30.9		
Age at first marriage		
below 18	1104	50.3
18+	207	9.4
Never married	886	40.3
Mean = 16.0 Median = 16.0 Std Deviation = 1.5		
Contraceptive use		
Using	1703	77.5
Not using	494	22.5
Total	2 197	100.0

4.3 Total Fertility Rate and Age Specific Fertility Rate

The results in Table 4.3 show that on average, an adolescent woman in Malawi aged 15-19 would in all probability have 2.3 children by age 19 if she experiences the given age specific fertility rate (ASFR) as reflected in the Malawi Demographic and Health Survey of 2010.

Table 4.3: Fertility of adolescents by age (n=2197)

Current Age	Total Number of Women	Number of births	Age specific of birth fertility rates
15	220	21	0.1
16	355	97	0.3
17	419	161	0.4
18	570	352	0.6
19	633	557	0.9
	2 197	1 188	2.3

4.4. Bivariate Analysis of socio-economic and demographic characteristics

This section of the study uses Chi Square statistics to assess whether there is an association between the dependent variable - adolescent fertility - measured as number children ever born (CEB), which is synonymous with parity, and the selected socio-economic and demographic variables. It is significant that parity is defined as the total number of live births a woman has ever had at the time of the interviews conducted during this study. At 0.05 level of significance, Table 4.4 reveals that nine (9) out of eleven (11) socio-economic and demographic variables are statistically associated with adolescent fertility (CEB). These independent variables consist of current age of women, educational attainment, type of place of residence, religion, working status, wealth index, age at first intercourse, age at first marriage, and contraceptive use. However, only significant associations are reported in this segment. In relation to current age of women, Table 4.4 reveals that 90.5% of adolescents aged 15 years had no children, 9.5% had 1 child and none of them had 2 or 3 children. For those aged 16 years, 73.5% were without a child, 25.6% had 1 child, 0.8% had 2 children and none of them had 3 children. Looking at the 17 year olds, 63.7% had no children, 34.1% had 1 child, 2.1% had 2 children and none of them had 3 children. For age 18, 45.3% had no child, 48.6% had 1 child, 5.3% had

2 children and 0.9% had 3 children. Lastly, for the adolescents aged 19 years, 28.1% had no children, 56.7% had one child, 14.2% had 2 children and 0.9% had 3 children. It is significant to observe that a cumulative total of 70.9% had between 1 and two children, showing the high pattern of female adolescent fertility in Malawi.

With regards educational attainment, Table 4.4 shows that 47.2% of adolescents who had no education were childless, 44.4% had 1 child, 6.9% had 2 children and 1.4% had three children. As far as those who had primary education is concerned, 49.4% of them had no children, 43.0% had 1 child, 7.1% had 2 children and 0.5% had 3 children. For those who had secondary and higher education, 67.2% of them had no children, 30.8% had 1 child, 1.8% had 2 children and 0.2% had 3 children. This evidence seems to confirm the hunch that the higher the girl receives an education, the lesser the chances of early childbirth as seen in the 67.2% who did not have a child at the time of the interviews in this study.

When looking at the type of place of residence, Table 4.4 shows that 64.9% of adolescents who resided in urban areas had no children, 29.5% of them had 1 child, 5.5% had 2 children and none of them had 3 children. In relation to those who resided in rural areas, 51.2% of them had no children, 42.1% had 1 child, 6.1% had 2 children and 0.6% had 3 children. These statistics apparently confirm that location and place of residence are critical determinants of the possibility of adolescent girls in rural areas falling into the trap of early childbirth compared to their urban counterparts in the same age groups.

With regard to religion, it is reflected in Table 4.4 that 54.4% of adolescents who are Catholic affiliates were childless, 39.7% had 1 child, 5.1% had 2 children and 0.8% had 3 children. For CCAP affiliates, 60.2% of them had no children, 37.0% had 1

child, 2.5% had 2 children and 0.3% had 3 children. As for Anglican affiliates, 52.2% of them had no children, 42.0% had 1 child, 4.3% had 2 children and 1.4% had 3 children. For Seventh Day Adventist and Baptist affiliates, 54.5% of them were childless, 39.5% had 1 child, 5.4% had 2 children and 0.6% had 3 children. For adolescents affiliated with Other Christian religions, 46.8% of them were childless, 45.2% had 1 child, 7.7% had 2 children and 0.2% had 3 children. For Muslim affiliates, 59.0% had no children, 32.7% had 1 child, 7.6% had 2 children and 0.7% had 3 children. This religious affiliation factor apparently reveals a pattern where non-Catholics are prone to higher incidences of early child birth than those who have no apparent religious affiliation.

The results in Table 4.4 further reveal that in as far as working status is concerned, 55.6% of adolescents who were not working had no children, 39.9% had 1 child, 4.1% had 2 children and 0.4% had 3 children. But for those who were working, 49.2% of them had no children, 41.4% had 1 child, 8.7% had 2 children and 0.7% had 3 children. In the domain of wealth index, Table 4.4 reports that 47.7% of poor adolescents were childless, 45.2% had one child, 6.2% had 2 children and 0.9% had 3 children. For those who are neither poor nor rich, but in the middle, 49.3% of them had no children, 42.6% had 1 child, 8.1% had 2 children and none of them had 3 children.

Table 4.4 further shows that for age at first intercourse, 55.4% of adolescents who are below the age of eighteen (18), had no children, 38.7% had 1 child, 5.6% had 2 children and 0.4% had 3 children. For those who are above the age of eighteen (18), 45.2% of of them had no children, 46.6% had 1 child, 7.4% had 2 children and 0.8% had 3 children.

In relation to age at first marriage, 28.8% of adolescents below the age of 18 had no children, 58.9% had 1 child, 11.3% had 2 children and 1.0% had 3 children. For those who are above the age of eighteen, 54.1% of them had no children, 44.0% had 1 child, 1.9% had 2 children and none of them had 3 children.

For those who never got married, 82.7% of them had no children, 16.9% had 1 child, 0.3% had 2 children and none of them had 3 children. Furthermore, when looking at contraceptive use, Table 4.4 reflects that 62.7% of adolescents who were using contraceptives were childless, 33.2% had 1 child, 3.8% had 2 children and 0.3% had 3 children. For those who were not using contraceptives, 19.2% of them had no children, 66.0% had 1 child, 13.6% had 2 children and 1.2% had 3 children.

Table 4.4: Differentials in children ever born by selected socio-economic and demographic characteristics of women

Characteristics	Number of children ever born					
	0	1	2	3	Total	χ^2
Current age of women						
15	90.5	9.5	0.0	0.0	100.0	421.889; p = 0.000
16	73.5	25.6	0.8	0.0	100.0	
17	63.7	34.1	2.1	0.0	100.0	
18	45.3	48.6	5.3	0.9	100.0	
19	28.1	56.7	14.2	0.9	100.0	
Educational attainment						
No education	47.2	44.4	6.9	1.4	100.0	52.971; p = 0.000
Primary	49.4	43.0	7.1	0.5	100.0	
Secondary +	67.2	30.8	1.8	0.2	100.0	
Type of place of residence						
Urban	64.9	29.5	5.5	0.0	100.0	19.367; p = 0.001
Rural	51.2	42.1	6.1	0.6	100.0	
Region						
Northern	49.6	42.6	7.6	0.2	100.0	7.410; p = 0.290
Central	56.2	38.3	5.0	0.5	100.0	
Southern	52.2	41.1	6.0	0.6	100.0	
Religion						
Catholic	54.4	39.7	5.1	0.8	100.0	39.743; p = 0.002
CCAP	60.2	37.0	2.5	0.3	100.0	
Anglican	52.2	42.0	4.3	1.4	100.0	
Seventh Day Advent/Baptist	54.5	39.5	5.4	0.6	100.0	
Other Christian	46.8	45.2	7.7	0.2	100.0	
Muslim	59.0	32.7	7.6	0.7	100.0	
Ethnicity						
Chewa	52.5	41.9	5.2	0.4	100.0	24.606; p = 0.428
Tumbuka	52.1	40.7	7.2	0.0	100.0	
Lomwe	51.5	40.1	8.0	0.5	100.0	
Tonga	57.7	37.2	5.1	0.0	100.0	
Yao	58.6	34.4	6.3	0.7	100.0	
Sena	51.6	43.5	3.2	1.6	100.0	
Nkhonde	45.8	41.7	10.4	2.1	100.0	
Ngoni	53.3	42.0	4.1	0.6	100.0	
Other	49.4	43.8	6.7	0.0	100.0	

Table 4.4 Continued

Characteristics	Children ever born					χ^2
	0	1	2	3	Total	
Working Status						
No	55.6	39.9	4.1	0.4	100.0	23.944; p = 0.000
Yes	49.2	41.4	8.7	0.7	100.0	
Wealth Index						
Poor	47.7	45.2	6.2	0.9	100.0	40.697; p = 0.000
Middle	49.3	42.6	8.1	0.0	100.0	
Rich	60.8	34.3	4.5	0.4	100.0	
Age at first intercourse						
Below 18	55.4	38.7	5.6	0.4	100.0	17.117; p = 0.000
18+	45.2	46.6	7.4	0.8	100.0	
Age at first marriage						
Below 18	28.8	58.9	11.3	1.0	100.0	599.908 p = 0.000
18+	54.1	44.0	1.9	0.0	100.0	
Never married	82.7	16.9	0.3	0.0	100.0	
Contraceptive use						
Using	62.7	33.2	3.8	0.3	100.0	305.466; p = 0.000
Not using	19.2	66.0	13.6	1.2	100.0	

Level of significance: p < 0.05

4.5 Multivariate analysis of variables: Critical determinants of adolescent fertility

4.5.1 Poisson regression

Table 4.5 gives a summary of Poisson regression results. According to these results, although bivariate analysis revealed a significant association between adolescent fertility (measured as the total number of children ever born) and nine (9) of the eleven (11) socio-economic and demographic variables including current age of women, educational attainment, type of place of residence, religion, working status, wealth index, age at first intercourse, age at first marriage, and contraceptive use, Poisson regression analysis through the execution of a family of Generalized Linear Models reflects that variables including current age of women, primary education, age at first intercourse, age at first marriage, and contraceptive use are statistically

associated with adolescent fertility because their related p-value is less than 0.05 level of significance.

In terms of age of respondents, Table 4.5 shows that the relative risk of having children for adolescents aged 15 and 18 years is 81% and 30% less likely than adolescents aged 19 years. In relation to educational attainment, Table 4.5 reveals that the relative risk of having children is 1.216 higher among adolescents who have primary education compared to those who have secondary education. In as far as age at first intercourse is concerned, Table 4.5 reflects that adolescents who had sexual intercourse for the first time before the age of eighteen (18) are 15% more likely to have children than those who had sexual intercourse for the first time after the age of eighteen (18). With regards age at first marriage, Table 4.5 reveals that the relative risk of having children is 3.182 and 1.531 higher for adolescents who got married for the first time before the age of eighteen (18) and for those who got married for the first time after the age of eighteen (18) compared to those who never got married.

Looking at contraceptive use, the results in Table 4.5 indicate that the adolescents who are using contraceptives are 36% less likely to have children than those who are not using contraceptives in both rural and urban locations in Malawi.

Table 4.5: Results of the Multivariate Generalized Poisson Regression model showing the critical determinants of adolescent fertility

Parameter Estimates								
Variable	B	95% Wald CI		Hypothesis Test		Exp(B)	95% Wald CI for Exp(B)	
		Lower	Upper	Wald Chi-Square	Sig.		Lower	Upper
(Intercept)	-0.934	-1.267	-0.600	30.129	0.000	0.393	0.282	0.549
Current age of women								
15	-1.682	-2.130	-1.235	54.350	0.000	0.186	0.119	0.291
16	-0.890	-1.116	-0.664	59.629	0.000	0.411	0.328	0.515
17	-0.689	-0.871	-0.507	55.207	0.000	0.502	0.419	0.602
18	-0.355	-0.492	-0.218	25.818	0.000	0.701	0.612	0.804
19 (Ref)	0.0					1.000		
Educational Attainment								
No education	0.081	-0.268	0.430	0.205	0.650	1.084	0.765	1.537
Primary	0.196	0.007	0.385	4.130	0.042	1.216	1.007	1.469
Secondary+ (Ref)	0.0					1.000		
Type of place of residence								
Urban	-0.037	-0.153	0.116	0.770	0.380	0.910	0.737	1.123
Rural (Ref)	0.0					1.000		
Religion								
Catholic	0.004	-0.207	0.214	0.001	0.973	1.004	0.813	1.239
CCAP	-0.074	-0.307	0.160	0.382	0.537	0.929	0.736	1.173
Anglican	0.115	-0.245	0.476	0.395	0.530	0.122	0.783	1.609
Seventh Advent/Baptist	0.054	-0.216	0.325	0.154	0.695	1.056	0.805	1.384
Other C Christian	0.026	-0.163	0.215	0.071	0.790	1.026	0.849	1.239
Muslim (Ref)	0.0					1.000		
Working status								
No	-0.037	-0.153	0.079	0.396	0.529	0.964	0.858	1.082
Yes (Ref)	0.00					1.000		

Table 4.5 Continued

Parameter Estimates								
Variable	B	95% Wald CI		Hypothesis Test		Exp(B)	95% Wald CI for Exp(B)	
		Lower	Upper	Wald Chi-Square	Sig.		Lower	Upper
Wealth index								
Poor	-0.003	-0.150	0.145	0.001	0.971	0.997	0.861	1.156
Middle	-0.008	-0.173	0.157	0.009	0.923	0.992	0.841	1.170
Rich (Ref)	0.0					1.000		
Age at first intercourse								
Below 18	0.140	0.009	0.271	4.370	0.037	1.150	1.009	1.311
18+ (Ref)	0.0					1.000		
Age at first marriage								
below 18	1.157	0.969	1.346	145.323	0.000	3.182	2.636	3.840
18+	0.426	0.154	0.698	9.434	0.002	1.531	1.167	2.009
Never married (Ref)	0.0					1.000		
Contraceptive use								
Using	-0.454	-0.576	-0.333	53.814	0.000	0.635	0.562	0.717
Not using (Ref)	0.0					1.000		

Ref: indicates the reference variables in each category

4.6 Summary

In this chapter, the results of the study were presented. The results presented included the profile of the study population, the differentials in adolescent fertility and the predictors of adolescent fertility in Malawi. The profile of the study population shows that the median age of the women was 18. However, the median age at sexual debut and first marriage were both 16 years which was low. The age specific fertility rate was 2.3, which was high for the age group under study.

The differentials in adolescent fertility shows that the number of children born increased with age; decreased with the higher level of education; was higher for

adolescents in rural areas and those who are not working. Adolescent fertility was also higher among those in the poorer wealth index group; among Muslims, African traditionalists and Catholics; is higher for those who had sexual debut and married under 18 years; and adolescents who never used contraceptives. The multivariate results show that current age, those with only primary education, age at sexual debut, age at first marriage and uptake of contraceptives were significant predictors of adolescent fertility.

Chapter Five

Discussions, conclusion and recommendations

5.1 Discussion of results

This study explored the relationship between adolescent fertility (measured as number of children ever born) and socio-economic and demographic variables among Malawian adolescents aged 15-19 years. The socio-economic and demographic variables were current age, educational attainment, type of place of residence, region, religion, ethnicity, working status, wealth index, age at first intercourse, age at first marriage, and contraceptive use. The objectives of the study were to estimate the prevalence of and identify the significant socio-economic determinants of adolescent fertility in Malawi. Furthermore, the study objectives were addressed through employing univariate (descriptive) analysis, bivariate (chi-square statistic), and multivariate (Generalized Poisson regression) analysis.

The bivariate findings of this study revealed that there is a statistical association between current age of women and adolescent fertility. More specifically, the results displayed that 0.9% of adolescents aged 18 and 19 years had three (3) children at the time of the survey, compared to 0.0% of those aged 15, 16 and 17 years. In other words, this showed that none of the adolescents aged 15, 16 and 17 had three (3) children as opposed to those aged 18 and 19. This finding is consistent with the study by Alemayehu *et al.* (2010), which reflected that older teenagers are more likely to be fertile than younger ones. In addition, the same study argues that as the age increases, the risk of exposure to pregnancy and childbearing also increases, because of a higher probability of getting sexual intercourse inside a marriage.

In relation to educational attainment, it was found by the bivariate analysis of this study that educational attainment and fertility levels among adolescents were statistically associated. The findings further showed that about 1.4% of adolescents with no education had three (3) children at the time of the survey, in comparison to 0.5% and 0.2% of those who had primary, secondary and higher education. This finding shows that only a few adolescents with primary and secondary and higher education had three (3) children, compared to their counterparts who had no education at all. This finding is corroborated by the existing literature of Bigala, (2004) which argues that females attending school are well positioned to decrease their chances of having early births and thus postpone child bearing to the latter, and Alemayehu *et al.* (2010); Nwogwugwu, (2013), who identify education to be a strong determinant of adolescent fertility, that is, women who have primary or secondary education are less likely to get pregnant and thus giving birth than those having no education.

With regards the relationship between type of place of residence and religion on adolescent fertility, the results of bivariate analysis reflect that type of place of residence and religion were significantly associated with adolescent fertility. The results further showed that none (0.0%) of the adolescents living in urban areas had three (3) children, compared to 0.6% of their counterparts in rural areas. This finding is consistent with other previous studies by Cleland and Wilson as cited in Dickson (2003) which suggest that fertility levels are more likely to be lower in urban areas than in rural areas. Because women in urban areas have better knowledge of and access to modern contraception than women in rural areas, they are more likely to bear fewer children than their rural counterparts (Cohen as cited in Oyefara, 2012). In addition, the results on religion showed that a majority (1.4%) of adolescents who

were affiliated to Anglican religion had three (3) children, compared to 0.2% of their counterparts who were affiliated to other Christian religions that are apparently less strict in adherence to sexual abstinence promulgations.

Furthermore, the bivariate findings found that working status and wealth index were statistically associated with adolescent fertility. Contrary to some other previous studies (Nyarko, 2012), which argue that the likelihood of giving birth by female adolescents who are not working is higher than their working counterparts, the results in this study display that majority (0.7%) of adolescents who were working had three (3) children, compared to 0.4% of their counterparts who were not working. However, looking at wealth index, the results revealed that a majority (0.9%) of adolescents with a poor wealth index had three (3) children, compared to 0.4% of their rich counterparts. This finding is substantiated by other previous studies (Kamal, 2009) which suggests that the lower the wealth index, the higher the probability of child bearing during the adolescent period. In addition, in developing and developed countries, adolescent pregnancies and child bearing are more likely to occur among girls from lower-income households compared to those with lower levels of education and those living in rural areas (Williamson, 2013).

Regarding age at first intercourse, and consistent with past studies (Mahy and Gupta, cited in Shinyemba, 2014), this study established that early exposure to sexual intercourse leads to female adolescents becoming vulnerable to early child bearing. In addition, the univariate results of the current study revealed that 76.1% of adolescents who have had their first sexual encounter before the age of eighteen (18) with the corresponding median age at first intercourse of 16 years old, implying that a majority of female adolescents engage in sexual activities early and this

triggers early childbearing. In contrast, the bivariate results of the study showed that more adolescents (0.8%) who had sexual intercourse for the first time after the age of eighteen (18) were found to have three (3) children, compared to only 0.4% of their counterparts who had their first sexual intercourse before the age of eighteen (18).

Concerning age at first marriage, the bivariate analysis of this study found a significant statistical association between fertility for adolescents and age at first marriage. More specifically, the findings showed that a majority (1.0%) of adolescents who were married for the first time before the age of eighteen (18) had three (3) children at the time of the survey, compared to 0% of those who married for the first time after the age of eighteen (18). This finding is consistent with the previous literature by Kaphuka (2004), which argues that women who marry early are often exposed to pregnancy for longer periods, and early childbearing often takes place, the combination of which generally results in large family sizes. Similarly, the same results are reflected in the study by Agaba *et al.* (2011) that suggest early marriage is significantly associated with early childbearing, particularly in developing countries, in which the main reason of marriage is to have children.

In terms of contraceptive use, the present study identified that contraceptive use and adolescent fertility are statistically associated. In more detail, the bivariate analysis displayed that only 0.3% of adolescents who were using contraceptives had three (3) children, compared to 1.2% of their counterparts who were not using contraceptives. This is broadly consistent with existing literature (Palamuleni, Kalule-Sabiti & Makiwane, 2007) which suggests that one of the reasons for low fertility in Southern Africa, and Malawi in particular, is relatively high contraceptive knowledge and use.

Despite the fact that bivariate analysis of this study indicated that independent variables such as current age of women, educational attainment, type of place of residence, religion, working status, wealth index, age at first intercourse, age at first marriage and contraceptive use had all shown some significant statistical association on fertility levels among adolescents, the multivariate results showed that the study failed to establish any associations between adolescent fertility and some of those variables including, type of place of residence, religion, working status, and wealth index. However, consistent with some previous literature, multivariate Poisson regression analysis showed five (5) variables are critical determinants of adolescent fertility – current age of women, educational attainment (but only at primary level), age at first intercourse, age at first marriage, and contraceptive use. More specifically, the multivariate findings showed that the relative risk of childbearing for adolescents aged 15 and 18 years was respectively, 81% and 30% less likely than adolescents aged 19 years. This is consistent with an earlier study by Ngalinda, (1998) which suggests that women who start child bearing at an early age particularly, in the non-contraception settings, have a higher probability of ending up with bigger family size compared to their counterparts who start at a later age.

In relation to educational attainment, the multivariate Poisson regression revealed that the relative risk of childbearing was 1.216 higher among adolescents who have primary education compared to those who have secondary education. But surprisingly and contradictory to many previous studies on the relationship between fertility and education, the current study showed at multivariate analysis there is no evidence of a relationship between fertility among adolescent women and educational attainment. In contrast, Nyarko (2012) found that female adolescents who have primary school education, as well as those who have secondary school

education or higher, are less likely to give birth than female adolescents who have no formal education. Furthermore, the past literature past by Ngalinda (1998) views women's education as having a significant effect on fertility, that is, when a woman's education increases, so does their age at first birth which subsequently leads to a decline in fertility.

Furthermore, in as far as age at first intercourse is concerned, the findings of multivariate Poisson regression in this study reflected that adolescent women who had their sexual debut for the first time before the age of eighteen (18) were 15% more likely to have more children than those who had sexual intercourse for the first time after the age of eighteen (18). Regarding age at first marriage, the multivariate results found that the relative risk of having children was 3.182 and 1.531 higher for adolescents who married for the first time before the age of eighteen (18) and for those who married for the first time after the age of eighteen (18) compared to those who never married. This finding is substantiated by Kaphuka (2004) who argues that women who marry early are more often exposed to pregnancy for a longer period, and early childbearing often takes place, the combination of which generally results in large family size. Looking at contraceptive use, the results further indicate that the adolescents who were using contraceptives were 36% less likely to have children than those who were not using contraceptives.

5.2 Conclusion

This study concludes that the prevalence of adolescent fertility in Malawi, with a TFR of 2.3 is high. This is evidence that adolescent marriage continues to be a common practice in Malawi, which could have serious impact on the health and socio-economic wellbeing of these young women. Additionally, overall the median age of

the women at sexual debut was 16 years and marriage was also 16 years which were low and could explain the high adolescent fertility in Malawi.

The study found that apart from region and ethnicity, all other nine socio-economic and demographic factors including current age of women, educational attainment, type of place of residence, religion, working status, wealth index, age at first intercourse, age at first marriage, and contraceptive use were significantly associated with adolescent fertility at the bivariate analysis. Furthermore, the multivariate results revealed current age of the women, educational attainment (at primary level only), age at first intercourse, age at first marriage, and contraceptive use were significant predictors of adolescent fertility in Malawi.

5.3 Recommendations

The findings of the study calls for continued programmes and policy initiatives aimed at improving the overall situation of young women by empowering them through education as a means to reducing adolescent marriages and fertility in Malawi. This requires adopting programmes and strategies that provide effective information about healthy sexual life, counseling on the risks of adolescent childbearing to both the young women themselves and their parents. It would also reduce the incidence of unintended pregnancies and enhance empowerment of adolescent women from using sex as a survival strategy. Additionally, policies and regulations that could increase age at sexual debut and first marriage should be put in place. Interventions aimed at delaying sexual activity, through encouraging virginity pledges and abstinence education should be developed and implemented; policies and programmes to increase contraceptive knowledge and uptake by sexually active adolescent should also be put in place, especially in rural communities.

It is also recommended that a study examining the impact of adolescent fertility in Malawi be conducted to inform on the adverse health and socio-economic impact of adolescent childbearing. This study is expected to change the attitudes of the population towards adolescent sexual activity and marriages that are primarily responsible for the high adolescent fertility in Malawi.

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