NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF STATISTICS AND OPERATIONS RESEARCH

A STATISTICAL ANALYSIS ON THE EFFECT OF CHILD MARRIAGE ON ACADEMIC PERFORMANCE ON FEMALE STUDENTS

by

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This project was submitted to the Department of Statistics and Operations Research of the National University of Science and Technology in partial fulfillment of the requirements for the Degree of BSc. in Statistics and Operations Research, Bulawayo, Zimbabwe

APRIL 2019

Approval Form

The undersigned certifies that he/she has read and recommends to the Department of Statistics and Operations Research for acceptance, a dissertation entitled:

A statistical analysis on the effect of child marriage on academic performance on female students

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Date 30 April 2019

Declaration

I, **SHUMIRAI MUSIWARWO**, declare that the project which is hereby submitted for the qualification of Bachelor of Science in Operations Research and Statistics at the National University of Science and Technology, is my own independent work and has not been handed in before for a qualification at/in another University/Faculty/School. I further declare that all sources cited or quoted are indicated and acknowledged by means of a comprehensive list of references. I further cede copyright of the dissertation to the National University of Science and Technology.

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Abstract

The study examined the effects of child marriage on the academic achievements of married female students in four provinces in Zimbabwe namely Mashonaland Central, Manicaland, Harare and Midlands. More specifically, the study sought to assess the educational and non-educational effects of child marriage on the academic achievements of married female students. The researcher used secondary data from Africa Girl Child Development and Survey Initiative (AGCDI). The purposive sampling technique was used to select 400 female students 200 married student and 200 unmarried students. Stepwise regression was used to determine the independent variable that affected child marriage. Data collected were analyzed by using Special Package for Social Science (SPSS). The data collected were subjected to the quantitative techniques of descriptive statistics and the chi-squared was employed to test the hypotheses at 0.05 significance level. The results from the research indicated that child marriage has a significant effect on early marriage. It was noted after modeling and running binary that the age they wrote O'level, number of children and attendance of lesson had a significant effect on academic performance. The researcher recommended that the government enforce a law that prohibits child marriage and for that that are already married to continue with their schooling.

Keywords: Academic performance and child marriage

Dedication

This project is dedicated to my mum and dad .

Acknowledgments

Firstly I give thanks to the Almighty God for taking me this far in my academic quest and for granting me with wisdom and understanding to carry out my studies, I could not have done it on my own. I would also like to sincerely thank my loving family for their support and motivation especially my grandmother for being my number one cheerleader and for his words of encouragement and wisdom that I treasure within my heart up to this day. My extended gratitude also goes to all AGCDSI staff especially Nobesuthu Mgutshini for their input and supervision which enabled me to carry out this research project. Last but not least, I would like to thank the entire staff and students in the Statistics and Operations Research Department at NUST for their intellectual support particularly Mrs F Ndlovu for supervising and guiding me in this research.

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List of Abbreviations and Acronyms

AGCDSI	Africa Girl Child Development Survey Initiative
DHS	Demographic Health Survey
MICS	Multiple Indicator Cluster Survey
SPSS	Special Package for Social Science
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization
USAID	United States Agency for International Development
ZIMSTAT	Zimbabwe Nations Statistics Agency

Chapter 1

Introduction

1.1 Introduction to the chapter

Child marriage is a violation of children's human rights. It has devastating impacts on the lives of children, particularly girls. These impacts are physical, psychological and emotional as well as social and economic in nature. Girls who are married as children are unlikely to be in school, are often treated as adult women and are generally burdened with the roles and responsibilities of adults – regardless of their age(UNICEF, 2014). Only a few women who get married early continue with their education. This research will assess the effect of child marriage on academic performance.

1.2 Background of research

UNFPA (2014) defines early marriage as "any marriage carried out below the age of eighteen, before the girl is physically, physiologically, and psychologically ready to shoulder the responsibilities of marriage and childbearing." UNICEF (2018) characterizes child marriage as marriage carried out below the age of eighteen. Many factors intact to place the girl child at risk of early marriage which include poverty and customary or religious law and many others.

The practice of child marriage have continued to decline around the world. During the past decade , the proportion of young women who married before the age of eighteen decreased by fifteeen percent from one in four girls to one in five girls(UNICEF, 2018). Child brides are most prevalent in sub-Saharan Africa with four in ten girls and then in South Asia with three in ten girls (UNICEF, 2018). Countries with the highest rates of child marriages in Europe include Georgia seventeen per cent, Turkey forty percent and Ukraine ten per cent. At least ten per cent of adolescents marry before the age of eighteen in Britain and France (UNICEF, 2014). Lower levels of child marriage are found in Latin America and Caribbean twenty-five per cent, the Middle East and North Africa seventeen per cent, and Eastern Europe and Central Asia eleven per cent(UNICEF, 2018). In Africa, countries like Niger, Chad, Mali, Bangladesh, Guinea and the Central African Republic (CAR) the rate of child marriages is sixty percent and over.Child marriage is most prevalent in places where where there is greater incidence of conflict and civil strife, and where there are lower levels of overall development, including education, employment and health care. It is especially prevalent in rural areas. Those most affected are among the most vulnerable and powerless: they are young, rural, uneducated, poor and female and their voices are rarely heard. The effects of child marriage on children, especially girls, are tremendous (UNFPA, 2014).

Despite the law enforcement prohibiting child marriages in Zimbabwe, the practice is still rampant in the country's rural areas. In rural areas, child marriage is high among girls compared to males. The report from Multiple Indicator Cluster Survey (MICS) carried out by ZIMSTAT in 2014 (UNICEF, 2016), states that Mashonaland Central province has the highest prevalence rate of adolescents getting married with fifty percent followed by Mashonaland West province with forty-two percent and Bulawayo has the least prevalence at ten percent. Figure 1.1 show a pictorial overview of other provinces in Zimbabwe.

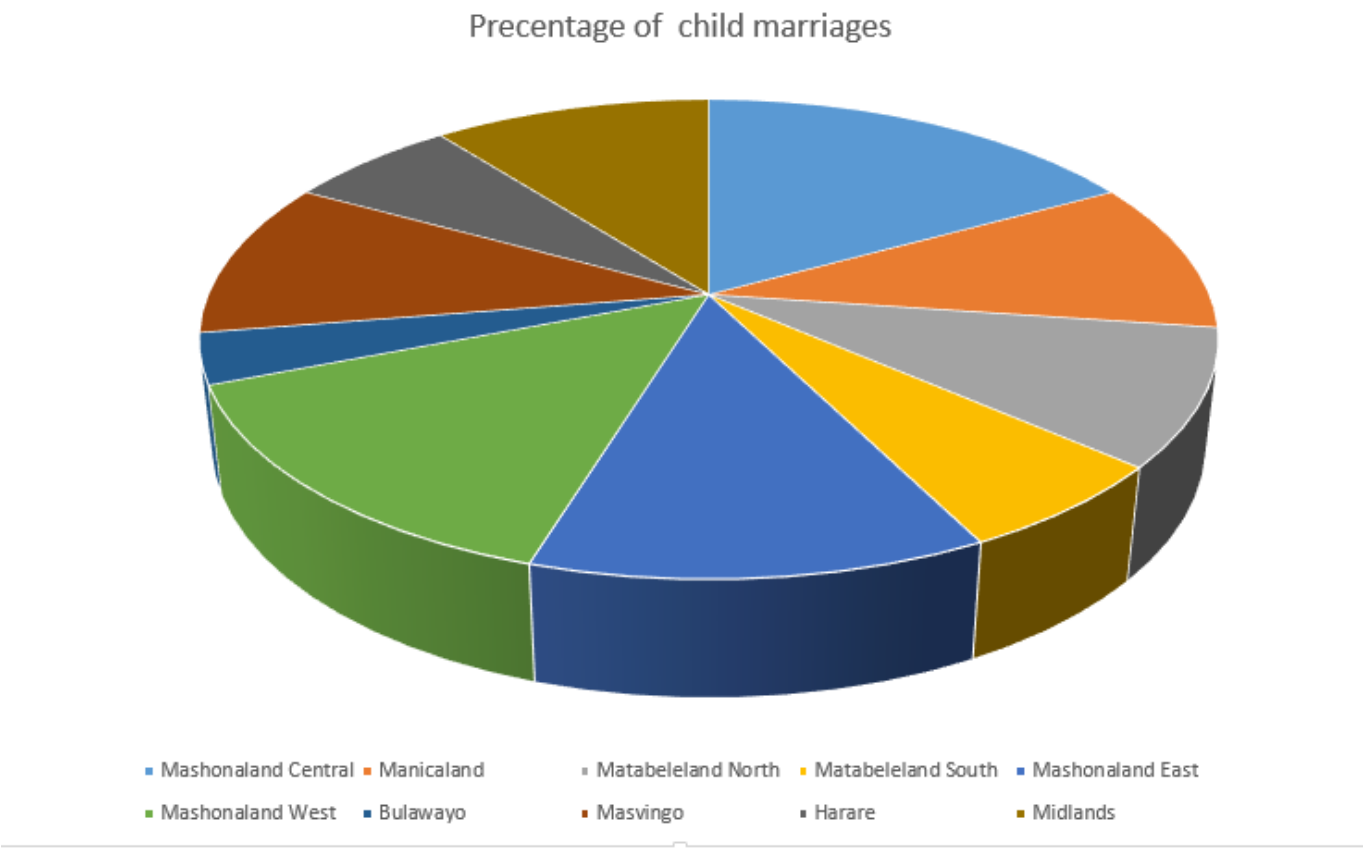

Figure 1.1: Child marriages statistics in Zimbabwe Provinces 2018

There are practical and legal obstacles on married girls' way back to school. Girls who live far or have children to look after may not be able to resume their education. Sometimes, the stigma of pregnancy keeps girls from returning to school. Some countries also forbid pregnant girls and young mothers from returning to school(Brides G.N, 2015).

1.3 Problem Statement

Throughout the world, marriage is regarded as a moment of celebration and milestone in one's life at the right age but sadly, the practice of child marriage involves the deprivation of fundamental human rights. One in every three girls in Zimbabwe is married by the age of eighteen, thirty-two percent of girls being married off before the age of eighteen and four percent married before they turn fifteen. Some young girls are coerced into marriage, while others are too tender to make an informed decision. which have led to high cases of school drop outs and only a few have continued with their education. There has been consensus in literature that child marriage disrupts, disturbs and distorts the academic performance of female students, but these does not imply that all students involved in child marriage perform poorly in education. Therefore the main purpose of the study is to investigate the

effects of child marriage practices specifically on education for girls in Zimbabwe.

1.4 Aim

The aim of research is to determine the effect of child marriage on the academic performance of girl child in Zimbabwe.

1.5 Objectives to this research are to:

- Identify the factors affecting academic performance
- Determine the relationship between child marriage and academic performance
- Examine the educational effects of child marriage on female academic performance

1.6 Significance of the research

This study through its findings is of immense benefits in the following areas: Female students will gain from this study by learning that education is the only way to achieving greater goals in life, and this will help them in correcting the instability that had existed in girl's education. Parents will gain a great deal in this study by getting to learn that women education is not a waste and not only educating a man, but if you educate a woman you educate a family, a nation, and this will help change their attitudes and ignorance towards girls' education. Government, both the Federal, State and Local levels will gain from this study by realizing from this study that funds, higher access education, poverty easing programmes should be made available for education at all levels. Educators, educational planners, the general public will gain from this study by learning that girls are in no way inferior to men, they also gain by learning how to educate, guide and counsel girls in carrier choices of educational courses.

1.7 Justification

Child marriage is defined by the World Health Organization (2016) as the period between 15 and 19 years of age when girls and boys contract a permanent sexual relationship. At both global and national levels, there has been growing concern about girl-child marriage

age (UNICEF, 2014). Although uncommon in most developed countries, child marriages are still prevalent in developing countries around the world. In Zimbabwe, marriages among young girls are still a very serious problem particularly in rural, coastal areas and among poor populations in urban areas. Hence the reason for this study.

1.8 Conclusion

Generally, in Chapter 1, the researcher introduced about child marriages, problems young women are facing which triggered the research and the aim of this study specifying main objectives. She also went on to state a brief background which helped us to achieve our aim of the the study. The methodology which will be applied on each objective of this research project will be stated in chapter 3 and they will help to accomplish the aim of this research.

Chapter 2

Literature review

2.1 Introduction to the chapter

This chapter presents a review of the literature relating to the effects of child marriage practices on student' education. It explores the concepts of child marriage, the prevalence of early marriages in Africa in general and Zimbabwe in particular, the reasons behind its perpetuation and its effects on girls' well being and how it constitutes a violation of their rights to education and lastly the factors that affect academic performance. Then lastly will discuss about the methodology that would be used

2.2 The Concept of Child Marriage

The term "child marriages" is used to refer to both formal marriages and informal engagement in which a girl lives with her spouse as if married before the age of 18 years (UNICEF 2014). For UNFPA (2014) early marriage is also known as Child marriage and is defined as "any marriage carried out below the age of 18 years, before the girl is physically, physiologically, and psychologically ready to embrace the responsibilities of marriage and childbearing." Child marriage, on the other hand, involves either one or both partners being a child and may take place with or without formal registration, and under civil, religious or customary laws.

The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), the most extensive universal bill of rights for ladies, expresses that any commitment or marriage of a kid ought not have any legitimate status. The Committee that screens this show states further in General Recommendation 21 article 16(2) that the base age for marriage for both male and female ought to be 18 years, the age when ”they have attained full development and ability to act”. Nonetheless, the greater part of early relational unions are arranged and dependent on the assent of guardians and frequently neglect to guarantee the best advantages of the young lady. Child marriage frequently incorporate a few components of force (UNICEF, 2014). Absence of an overall meaning of child marriage in universal shows has created some discussion. A few researchers and activists contend that as opposed to searching for a widespread age at which young ladies and young men ought not to wed, the spotlight ought to be put rather on wiping out the undesirable impacts of child marriage (WHO, 2014). For instance, a few observers propose that an all-inclusive time of marriage isn't fitting, to some degree since social orders have distinctive comprehension of being a tyke just as various socio - monetary and social substances. Bunting (2005) suggests that legislatures ought to be permitted to set the period of marriage beneath 18 years old, yet that the onus is on them to show that this lower age does not result in any segregation or unfriendly ramifications for ladies.

2.3 Prevalence of Early Marriages in Africa

How to understand the widespread of early marriages in Africa? What are the reasons behind its perpetuation in Africa? How does it affect girls' wellbeing and constitute a violation of their human rights? How does it undermine the development of societies? Those questions are posed today, when, despite national laws and international agreements forbidding early marriages, this phenomenon is still widespread in many developing countries with a high prevalence in Sub-Saharan Africa more particularly in Central and West Africa. According to UNICEF (2014), between 40 per cent and 49 per cent of girls younger than 19 years of age in Central and West Africa respectively are married compared to 27 per cent in East Africa and 20 percent in Northern and Southern Africa.

Sub-Saharan Africa has the highest rate of early marriages. 14.3 million Girls in the region become child brides (are married before they reach 18 years). Among the countries where the rate of early marriages exceeds 50 per cent like Niger, Chad and Mali adolescent fertility

and maternal mortality rates are also high. According to the population council (2008) the Francophone West African countries are among those with the most maternal deaths: the maternal mortality ratio (deaths per 100,000 live births) is 1,000 in Guinea Bissau, 820 in Mali, and 830 in Niger, and child mortality rates are also alarming. Surveys carried out in some Sahelian countries offer alarming examples. In Niger, for example, according to the 2015 Health and Demographic Survey (DHS), 28% of women aged between 20 and 24 were married before the age of 15, and 76% before the age of 18 . There are countries with very high rates of early marriage, such as Central African Republic 68% percent, Chad 67%, and Mozambique 57% percent, but others such as Togo in West Africa have a more moderate rate of early marriage 31 percent, while South Africa has a fairly small percentage of young women who marry early (Brides, 2015).

2.4 Reasons for early marriage in Africa

The factors which are presented below are not a particularity of African countries because they seem to be almost the same all over the world with very few disparities due to cultures.

2.4.1 Economic survival strategies

Poverty is one of the central point underpinning child marriage. Where poverty is cute, a young girl may be viewed as an economic burden where one less daughter is one less mouth to feed (Parsons et al,2015). Discussion on marriage and the privileges of women and Girls 2001; (Mathur 2003 and Nour 2006) notes that parents encourage the marriage of their daughters while they are still children in hope that the marriage will advantage them both monetary and socially, while also mitigating monetary burdens on the family. The marriage to a much older – sometimes even elderly – man is practice common in certain societies. In traditional societies in Sub-Saharan Africa, the bride's family may receive cattle from the groom, or the groom's family, as the bride price for their daughter, (UNICEF 2005). The following case of a Zimbabwean girl is one of many cases of girls who are married off at a very young age due to economic constraints. In August 2005, a ten-year-old girl in Zimbabwe was reported in a local newspaper as having been sold to be a wife to a 40-year-old man in order for the family to obtain cash for food. She was sold for $2000 Zim that is US$7. This whole would maybe have purchase two sacks of maize. The previous wife of the man the child was to marry had died of AIDS (Forum on marriage and the rights of women and Girls 2001:8). In traditional

societies – where infant mortality was extreme and survival depended on a family's ability to produce its own food or goods for sale – child marriage helped to maximize the number of pregnancies and ensure enough surviving children to meet household labor needs (Mathur 2003). Moreover, poor families tend to marry off girls at the same time to help lessen the burden of high marriage ceremony expenses.

2.4.2 Socio-cultural and religious values

In communities where child marriage is high, there is strong social pressure on families to conform. Failure to conform can often results in ridicule, disapproval or family shame. Invariably, local perceptions on ideal age for marriage, the desire for submissive wives, extended family patterns and other customary requirements are all enshrined in local customs or religious norms. In many contexts child marriage is legitimized by patriarchy, and related family structures, which ensure that marriage transfers a father's role over his gild child to her future spouse. the marriage or betrothal of children in parts of Africa and Asian is valued as a means of consolidating powerful relations between families, for sealing deals over land or other property, or even for settling disputes (UNFPA, 2014). The strong religious message also enforce the view that marrying early is best as supported by the following views of one priest representing Ethiopian's orthodox church. He argues that "these days, with western ideas spread everywhere; girls stay unmarried stay as late as 30. It is very scientific and modern, but in our church it is prohibited. Such girls are neither clean, nor blessed" (Smith, 2012).

2.4.3 Value of virginity and protection of young girls

Child marriage is one way to ensure that a wife is protected, or placed firmly under male control; that she is submissive to her husband and works hard for her in-laws' household; that the children she bears are legitimate, (UNICEF 2005). On the other hand, for many societies that prize virginity before marriage, child marriage can manifest itself in a number of practices designed to 'protect' a girl from unsanctioned sexual activity. In North-East Africa and parts of the Middle East in particular, control may also include the practice of female genital mutilation (FGM to restrict sexual pleasure and temptation(Nour, 2006). Some parents withdraw their girls from school as soon as they begin to menstruate; fearing that exposure to male pupils or teachers puts them at risk. These practices are all intended to shield the girl from male sexual attention, but in the eyes of concerned parents, marriage is seen to offer

the ultimate protection measure.

In Wars and civil conflicts parents or careers resort to child marriage as a protective mechanism or survival strategy. Displaced populations living in refugee camps may feel unable to protect their daughters from rape, and so marriage to a warlord or other authority figure may provide improved protection. For the young girls orphans or separated with their parents or relatives the only way to survive and to get protection is to get married (Wodon, Quentin,2016).

2.5 Key issues surrounding child marriage (Consequences)

There tends to be a relationship between age of marriage, level of education, poverty, and health: poorer, less educated girls tend to marry earlier and tend also to have poorer health. The following consequences tend to flow from child marriage:

2.5.1 Health and related outcomes

Early child bearing and unwanted pregnancies: Young girls who get married will most likely be forced into having sexual intercourse with their, usually much older, husbands. This has severe negative health consequences as the girl is often not psychologically, physically and sexually mature(Ahmed et al, 2014). Early marriage is associated with early child bearing. Young married girls are under tremendous pressure to prove their fertility in the first year of marriage. Girls, who marry young, inevitably have children early, and have many children, because their knowledge of contraception is poor and their power to negotiate its use is weak.

Domestic violence and sexual abuse: (R Kidman, 2016)As young girls are often married to men who are much older than themselves, the age difference tends to reinforce the powerlessness of the girl, who is thus at greater risk of abuse and less likely to assert herself. Young married girls are more likely to be beaten or threatened and more likely to believe that a husband might sometimes be justified in beating his wife. Women who believe that are more likely to have been married before age 18 than those who believe that there is never justification. Child brides are often more susceptible to domestic violence (USAID,2005). In Egypt, data indicates that 29% of married adolescents were beaten by their spouses—or their

spouses and others. Of these, 41% were beaten when they were pregnant (UNICEF, 2018).

High maternal mortality and morbidity: The World Health Organization estimates that the risk of death following pregnancy is twice as great for women between 15 and 19 years than for those between the ages of 20 and 24. The maternal mortality rate can be up to five times higher for girls aged between 15 and 19 than for women of about twenty years of age. Pregnant adolescents face far more health problems than older women, particularly single girls who often receive less prenatal care. Adolescents are far more susceptible to suffering from anemia than adults, which greatly increase the risk and complications linked to pregnancy. They are equally more at risk of malnutrition, high blood pressure linked to pregnancy for women who are over 20 (WHO, 2014).

Increased risk of contracting sexually transmitted diseases and HIV/AIDS: Fear of HIV infection, for example, has encouraged men in some African countries to seek young virgin – and therefore uninfected –partners. On top of pregnancy-related complications, young married girls are also at high risk of contracting sexually transmitted diseases and HIV/AIDS. (Parson et al,2015)Young married girls are even at higher risk because their older husbands may already be infected in previous sexual relationships. Furthermore, the age difference between the girl and the husband and her low economic status make it almost impossible for the girl to negotiate safe sex or demand fidelity. Early marriage usually means that young girls enter marriage without adequate information about critical sexual intercourse, contraception, sexually transmitted diseases, pregnancy and childbirth(Raj et al, 2012)

2.5.2 Lack of power

It is hypothesized that women who are married as children have less decision making power than women whose marriage is delayed until adulthood. They don't have ability to make decision on their own health care, contraception, household budget, daily household purchases, visit to family and friends etc, (UNICEF et al, 2018). They have little power in relation to their husbands and in-laws.

2.5.3 Divorce or abandonment and Early Widowhood

Some desperate girls and women who have been forced into marriage try to run away or take other avenues to leave their spouses; others are abandoned by their spouses. However, the

girls and women are usually left with the responsibility of raising children without the husband or family's financial support, thus making them more likely to live in poverty. In many cultures, husbands are often many years older than their young brides, and consequently die while the girl is still young. Traditionally, girls were not allowed to remarry or were passed onto their dead husbands' brothers. Furthermore, the girl's families are unlikely to accept her back once she has become widowed, (UNICEF 2014). In cultures that permit polygamy, the youngest co-wife is required to care for elder co-wives. This relationship is sometimes a daughter/mother relationship, but in many cases the elder wives view the younger with bitterness and resentment(Boyden 2012).

2.5.4 Consequences for children

The health problems linked to child marriage not only affect the pregnant mother and the fetus, but also continue after child birth. The consequences reach beyond the lives of young married girl themselves to the next generation. The immaturity and lack of education of a young mother undermines her capacity for nurture evidence shows that infant mortality among the children of very young mothers is higher – sometimes two times higher – than among those of older peers, (UNICEF,2014).

2.5.5 Reinforcement of gender stereotypes and roles

The lack of other opportunities and the powerlessness that often accompanies child marriage combine to perpetuate the gender roles of girls and women and reinforces cultural traditions that support early marriage as a desirable practice.

2.6 Factors that Influence Educational Performance

2.6.1 Socioeconomic status

Socioeconomic status (SES) can be defined as a person overall social position to which attainments in both the social and economic domain contribute (Corbu et al. 2013). When used in studies of children school achievement, it refers to the SES of the parents or family. Socio-economic status is determined by an individual achievements in: education; employment and occupational status; and income and wealth. Several comprehensive reviews of

the relationship between SES and educational outcomes exist (Mensah, 2013); These studies and reviews make it clear that children from low SES families are more likely to exhibit the following patterns in terms of educational outcomes compared to children from high SES families:

- have lower levels of literacy, numeracy and comprehension;
- have lower retention rates (children from low SES families are more likely to leave school early);
- have lower higher education participation rates (children from low SES families are less likely to attend university);
- exhibit higher levels of problematic school behavior (for instance truancy);
- are less likely to study specialized maths and science subjects;
- are more likely to have difficulties with their studies and display negative attitudes to school; and
- have less successful school-to-labor market transitions.

These results remain the same irrespective of how SES is measured and whether the studies are based on individual or aggregate level data (Corbu et al. 2013). Similarly, studies of children's education achievements over time have also demonstrated that social background remains one of the major sources of educational inequality. In other words, educational success depends very strongly on the socio-economic status of one's parents (Corbu et al. 2013).

The effect of parental SES on children's education outcomes may be neutralized, strengthened or mediated by a range of other contextual, family and individual characteristics. Parents may have a low income and a low-status occupation, for example, but nevertheless transmit high educational aspirations to their children. What family members have (material resources, for instance) can often be mediated by what family members do (for example parental support, family cohesion)(Djouguela, 2014). The social and the economic components of socio-economic status, in other words, may have distinct and separate influences on educational outcomes. While both components are important, social factors (for instance, parents' educational attainments) have been found to be more significant than economic factors, such as a family's capacity to purchase goods and services, in explaining different educational

outcomes. It is argued that families where the parents are advantaged socially, educationally and economically, foster a higher level of achievement in their children. They also may provide higher levels of psychological support for their children through environments that encourage the development of skills necessary for success at school (Suleman, 2012).

2.6.2 Family Structure

Socio-economic status may therefore also be linked to family structure. As sole parent families on average have lower levels of income, are headed by parents with lower educational attainment and are less likely to be in the labor force, children from these families are likely to have lower educational performance(Collins, 2014). Other factors in sole parent families that are likely to adversely affect educational outcomes of children compared to those from two-parent families are said to include:

- reduced contact between the child and non-custodial parent;
- the custodial parent having less time to spend with children in terms of supervision of school-work and maintaining appropriate levels of discipline(Titus et al,2016);
- the lack of an appropriate role model, especially for males;
- increased responsibilities on children such as childcare roles, domestic duties which impede the time available for school work; and
- the nature of parent-child relationships in sole parent families may cause emotional and behavioral problems for the child (Wanyama, 2013).

The influence of family structure has been found to be only weakly associated with educational attainment, however, once controlling for other variables . It is more detrimental when children in sole parent families also experience a range of other risk factors such as low income (Berkowitz, 2017).

2.6.3 Type of School

As well as socio-economic status, research has shown the importance of the type of school a child attends in influencing educational outcomes. While research in the US has found that SES variables continue to influence educational attainment even after controlling for different school types, the school context tends to affect the strength of the relationship between

SES and educational outcomes (Berkowitz, 2017). Similarly, research in Britain shows that schools have an independent effect on student attainment. While there is less data available on this issue in Australia, several studies using the Longitudinal Surveys of Australian Youth have found that students attending private non-Catholic schools were significantly more likely to stay on at school than those attending state schools (Wanyama, 2013). Students from independent private schools are also more likely to achieve higher end of school scores. While school-related factors are important, there is again an indirect link to SES, as private schools are more likely to have a greater number of students from high SES families, select students with stronger academic abilities and have greater financial resources. The school effect is also likely to operate through variation in the quality and attitudes of teachers. Teachers at disadvantaged schools, for instance, often hold low expectations of their students, which compound the low expectations students and their parents may also hold (Farooq, 2011).

2.6.4 Absences

Also related to poor educational performance is the level of truancy or unexplained absence among students. Truancy can be modeled both as an educational outcome and as a causal factor in explaining educational performance. Truancy tends to be higher among students from low SES backgrounds. Truancy, even occasional, is associated with poorer academic performance at school. Having high levels of unexplained absence at school has also been found to be associated with poorer early adult outcomes in the labor market for instance higher probability of being unemployed and poorer adult health relative to non-truants (Berkowitz, 2017).

2.6.5 Gender

Educational performance at school has also been found to vary according to the student's sex (Wanjai, 2018)). In particular, reviews of the evidence suggest that boys suffer an educational disadvantage relative to girls, especially in terms of performance in literacy (Abiodum et al, 2015). There are several explanations for this increasing gender gap which include: biological differences; gender biases (such as reading being seen as not masculine); teaching, curricula and assessment (for instance less structured approaches to teaching grammar may have weakened boys' literacy performance); and socioeconomic factors (Bayisene, 2010). The last explanation is of particular interest in the context of this paper, especially the find-

ing that the gender gap continues within each socio-economic level. That is, girls have been found to out-perform boys within high or low socio-economic groups. Furthermore, the performance of boys deteriorates more rapidly than the performance of girls as they move down the socio-economic scale (Considine, 2002). As was noted above, the relationship between the performance of boys and socio-economic status is often mediated or partially explained by family structure.

2.6.6 Ethnicity

The ethnic background or immigrant status of parents is also an important mediating variable on the influence of SES on children's eduacational performance. Studies of the academic performance of second-generation school students in the US have found that while their performance is also influenced by the SES of their parents and type of school, their national background plays a significant independent role (Berkowitz, 2017). The authors found that some first-generation immigrant parents (e.g., Cuban, Vietnamese) through the process of migration and subsequent incorporation in the host society, come to see education as a key means of upward mobility for their children, despite their own low levels of education and income (Chinyoka, 2013). Children from these communities did well despite coming from low SES backgrounds whereas the negative effects of SES were not ameliorated in the academic performance of children from immigrant communities with low levels of social capital (e.g., Haitian, Mexican). A series of studies based on Census data suggests that the second generation (especially those of European, Indian and Chinese origin) have achieved substantial educational mobility in terms of staying on at school, compared to those from British, German, Dutch and Australian origin (Collins, 2014). As a consequence, higher percentages of children from non-English speaking background (NESB) achieve tertiary qualifications compared to those from English-speaking background (Titus et al., 2016). As with the US research, however, there is a great deal of variation between different ethnic groups. Studies have found that it is more likely that people from Vietnamese, Chinese, Eastern European and Korean backgrounds are in higher education than people from ESB. Whereas those whose language group was Arabic, Khmer and Turkish were half as likely to be in higher education than those from ESB ((Berkowitz, 2017).

2.6.7 Geographical Location

Pupils from rural areas are bound to have lower educational results in terms of academic performance and repeating rates than pupils from urban areas. Despite an adequate number of educational facilities in rural and remote Australia, school children from these areas remain disadvantaged by other factors. Issues influencing access to education in provincial areas include costs, the accessibility of transport and levels of family income support. In addition, inequity exists with regard to the quality of the education that rural pupils receive, often as a result of restricted and limited subject choice. However, pupils may also have limited recreational and educational facilities within their school (Nyoni et al, 2017).

2.6.8 Housing Type

Lower educational attainment has also been found to be associated with children living in public housing compared to those in private housing (Bayisenge, 2010). This may be due to the effects of overcrowding, poor access to resources and a lack of social networks, and in this sense, housing type may also be a measure of neighborhood influence. A recent Australian study based on 171 Year 12 students from 10 state schools, found that neighborhood effects were an important influence on student's educational plans to continue further post-secondary education, after controlling for a range of individual and family socioeconomic characteristics (Collins, 2014). Measures of the neighborhood included the level of neighborhood income, the unemployment rate, an index of educational attainment and the percentage employed in professional fields. This study was unable to identify, however, the precise transmission mechanisms for such neighborhood effects. Whether, for instance, they were due to spillover effects such as peer group influence, the presence or lack of job networks and role models or whether the neighborhood variables were acting as proxies for school quality or housing type.

2.7 Other researches on the effect of child marriage on academic performace

Delprato et al, (2015) did a research that examined the effect of age of child marriage on women's educatinal results for 36 countries from Sub-Saharan Africa and South West Asia. The researchers used an instrumental variable approach to account for the endogeneity of

child marriage driven by socio-economic and cultural factors. Their results showed that delaying child marriage by one year is associated with an increase of half a year of education in Sub-Saharan Africa and nearly one third of a year of education in South West Asia as well as a lower chance of dropping out from secondary school of 5.5% in South West Asia.

Lukuba, (2015) did a research investigating the effects of the child marriage practices on the education for girls at Mkuranga district in Tanzania. Specifically the research looked in to the magnitude of c marriages, to establish its effects on girls' education, and to determine strategies used to prevent child marriages in Mkuranga District. Data were collected from 3 wards from which three primary schools were involved. The design used was cross-section survey design, which collected both qualitative and quantitative data. A sample for the research was drawn from four groups of the population; namely the District Education Officer, Ward Education Coordinators, Primary School teachers and pupils. Data were collected from a sample of 246 respondents including 1 District Education Officer, 3 Ward Education Coordinators, 188 Primary School Teachers and 54 Primary School Pupils. Data was collected using the questionnaire, interview, focus group discussions and documentary review methods. Data collected was analysed by using Special Package for Social Science (SPSS) and presented in frequencies, percentages, means and standard deviations while qualitative data were subjected to content analysis. The results revealed that child marriages in Mkuranga District were rampant. The finding further revealed that child marriages in Mkuranga District are caused by many factors one of them is low level of education among the community members. School drop out was reported to be the leading effect of early marriages in the area of study. The research also reported that there are efforts made to combat early in the area despite of a number of challenges. Different stakeholders have to work together in making sure that this practice is ended. The study concludes that early marriage is a real problem in Mkuranga district.

Titus et al,(2016) investigated the effects of social habits and girl-child marriage on students' academic performance in social studies. A total of five hundred students were selected through cluster and random sampling method from all junior secondary schools in Ogun state. Two self-developed instruments: Social Habits and Students' Academic Performance Questionnaire (SHSAPQ) and Girl-child Marriage and Academic Performance Questionnaire (GCMAPQ) were administered on the respondents with reliability co-efficient of 0.79 at 0.05 significant levels. An inferential statistics of Chi-square was used in testing the hypotheses

and the result of the study showed that modern technological advancement especially, addiction to social media on the internet has a great effect on students' academic performance. The researchers concluded that negative social habits among the students are to be discouraged in order for them to record good academic performance

2.8 Logistic regression for analysis

Many educational research problems call for analysis and prediction of a dichotomous outcome: whether a student will succeed in college, whether a child should be classified as learning disabled (LD), whether a teenager is prone to engage in risky behaviors, and so on(Chaoying joane peng et.al, 2002). Logistic regression is a widely used multi-variable method for modeling binary variables. Binary variables are variables codes with 0's and 1's. It aims to describe the relationship between one or more variables that may be continuous ,categorical and binary. The logistic regression model has many uses for developing models that will predict events in the physical sciences, economics, politics and medicine .Generally, logistic regression is well suited for describing and testing hypotheses about relationships between a categorical outcome variable and one or more categorical or continuous predictor variables (Banning, 2008).Peng(2008), applied the binary logistic regression model in analyzing.

Logistic regression makes use of regression to predict the outcome of its dependent variable using the explanatory variables (Hellevik, 2009). Single trial probable outcomes are modeled as a function of the explanatory variable using the logistic function. The logistic data may be binary or nominal. Binary logistic regression is performed when we have only two possible outcomes (e.g a "yes or no") and can be coded using 0 and 1. Nominal logistic regression is as well performed when we have more than two possible outcomes (e.g hair color may be black, brown, blonde, grey etc). Logistic regression can also be used to check if the probability of getting a particular value of the dependent variable is related to the independent variable. When there are more than one independent variables, multiple logistic regression is used.

From the above facts it is clear that binary Logistic regression is ideal in the analysis of data, with a response variable which is dichotomous.

2.9 Chapter Summary

The literature review covered mostly of the the reasons for child marriage and the factors that affect academic performance. This was an overview of what has been already done by other researchers. The methodology and analysis of the real data for this research shall be seen in following chapter.

Chapter 3

Methodology

3.1 Introduction to the chapter

This chapter explores in more detail the methodology that were used by the researcher. The research will focus on bivariate analysis, stepwise and logistic regression methods which will be elaborated further in this chapter.

The bivariate methods are key to this research. They will specify the statistical relationship that is believed to hold the academic performance and marital status and other independent variables. Hence this chapter will look at how the models are formulated, data collection procedures and the data analysis methods which will address the research objectives of this study. SPSS 16.0 was used by the researcher to do the analysis.

3.2 Data collection

The researcher is using quantitative data which was collected by the African Girl Child Development and Survey Initiative (AGCDSI) 2016. AGDSI is an Non-governmental Organisation that carries out interventional and conducts advocacy and research on issues that affect the Africa girl child. All in all it the sample consists of more than 400 respondents. Only women were interviewed starting from the age of 16-24 years. The survey collected information on

the respondents demographic characteristics, age they were married, age they wrote O'level, and many more.

Data was collected from both rural and urban areas for Zimbabwe's four provinces which are Mashonaland Central, Middlelands, Masvingo and Harare .This data provides very useful information that can be used in evaluating and designing programs for improving the health of the country's population and the vulnerable in the society.

3.3 Stepwise

To start with, stepwise regression gives direction as to which of a pool of candidate variables (including transformed variables) should be included in the regression model. The actual set of predictor variables used in the final regression model must be determined by analysis of data. Identifying this subset is called the variable selection problem. In-order to find this subset regressor (independent) variables, we want every regressor that is even remotely related to the dependent variable to be included. The need to include as few variables as possible is crucial and key because each irrelevant regressor decreases the precision of the estimated coefficients and predicted values. Likewise, the addition of extra variables increases the complexity of data collection and model maintenance. The goal is to achieve a balance between simplicity and fit.

3.3.1 Backward Elimination

Backward elimination involves starting with all independent variables , testing the omission of each variable using a chosen model fit criterion, deleting the variable (if any) whose loss gives the most statistically insignificant deterioration of the model fit, and repeating this process until no further variables can be deleted.

3.3.2 Steps in Backward elimination

1. Start with all variables selected as possible predictors and included in the regression equation.

2. Then compute partial F statistics for each of the variables remaining in the regression equation.

3. If this F is low enough to be below 5%, remove it from the model, and go back to step(2)

4. then continue until no partial F is found that is sufficiently low.

3.4 Cross tabulation

Bivariate analysis is a form of quantitative statistical analysis that involves two variables for the purpose of determining the empirical relationship between them. It is also used to test for homogeneity, goodness of fit and independence but in this research it will be used to test for independence.
The Chi-square statistic will reflect the strength of the empirical relationship between the two variables. The greater the Chi-square the stronger the relationship between the variables. In this study bivariate analysis is used to determine the whether physical, emotional and sexual abuse are associated with women empowerment indicators in the data set.
Steps for carrying out a chi square test

- state the hypothesis
  H_0 : Variable X and Variable Y are independent
  H_1 : Variable X and Variable Y are dependent

- Calculating the degrees of freedom

- Calculating the degrees of freedom

$$df = (r-1) * (c-1) \tag{3.1}$$

$r =$ number of categories in one variable

$c =$ number of categories in the second variable

- Calculating the expected frequencies
  The expected frequency are computed separately for each level of one categorical vari-

able. Compute the expected frequencies according to the following formula;

$$E_ij = \frac{T_i * T_j}{N} \tag{3.2}$$

Where :

$Ei_j =$ the expected frequency for the level r of variable A and level c of variable B

$T_i =$ the total number of sample observations at level r of Variable A

$T_j =$ the total number of sample observations at level c of Variable B

$N =$ the total sample size

- Calculate the Chi-square statistic which is given by:

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_r, c - E_r, c)^2}{E_r, c} \tag{3.3}$$

where:

$$x^2 = thePearsonChi - squareteststatistic$$

$Or; c = t$he number of observations of type i

$Er; c =$ the expected frequency for the level R of Variable A and level C of Variable B

$n =$ the number of cells in the table

- The Chi-square distribution calculator will be used to assess the probability associated with the test statistic .
- To interpret the results ,the P-value will help determine the significance of the results by rejecting or accepting either of the hypothesis when the P-value is either less significant or greater than significant the significant value.

3.5 Logistic Regression

The logistic regression was developed by a statistician David Cox in 1958 (Walker,SH;Duncan,DB(1 logistic model is used to estimate the probability of a binary response based on one or more predictor variables and it used when the data is binary. In this study the researcher will use the logistic model to examine the association between student's results and the age they were married and wrote the exams.

3.5.1 Dependent variable

The dependent variable will be the results. The dependent variable will be denoted by Y_i.

$$Y_i = 0, passed$$

$$Y_i = 1, failed$$

3.5.2 Independent variables

The independent variables will be denoted by X_i.They represent the inputs or the causes of variation. So the model will determine the effects that the independent variables have on the dependent variable. In this study the independent variables include the women empowerment indicators and socio-demographic factors .So our Xi's will be age, marital status, residence, attendence and the number of children. Selection of this variables was done using stepwise regression.

Table 3.1: Variables identification

Variables	Interpretation	Categories
x_1	Age	no boundaries
x_2	Number of children	no boundaries
x_3	Marital Status	1=Married, 2=Single
x_4	Residence	1=rural, 2=urban
x_5	Attendance	1=0.9-1, 2=0.8-0.89, 3=0.7-0.79, 4=below 0.7

3.5.3 Maximum likelihood Estimation

The binary logistic model is used to estimate the probability of a binary response based on one or more independent variables but before estimating the probabilities the researcher will have to identify the significant variables to results by maximizing the likelihood function. This will enable the researcher to find the estimates of the of the model parameters. The impact of the variables is expressed in terms of the odd ratios. The likelihood function for binary data is expressed as;

$$L(\theta) = \prod_{i=0}^{n} \pi_i^{Y_i}(1-\pi)^{1-Y_i} \tag{3.4}$$

Y_i from the above equation represents the probability of π_i is expressed as;

$$\pi_i = \frac{exp(\beta_0 + \beta_1 X + ... + \beta_k X_i)}{1 + exp(\beta_0 + \beta_i X + ... + \beta_k X_i)} \tag{3.5}$$

The equation expresses the probability that the respondent has gone back to school and in the data, such a response is coded as 1 since the data is binary. When $Y_i = 0$ the probability that $1 - \pi_i$

$$1 - \pi_i = \frac{1}{1 + exp(\beta_0 + \beta_i X + ... + \beta_k X_i)} \tag{3.6}$$

If both equations for π_i and $(1 - \pi_i)$ are substituted into our initial equation we get ;

The initial equation was;

$$L(\theta) = \prod_{i=0}^{n} \pi_i^{Y_i}(1-\pi)^{1-Y_i} \tag{3.7}$$

Process pf substitution;

$$L(\theta) = (\frac{exp(\beta_0 + \beta_1 X + ... + \beta_k X_i)}{1 + exp(\beta_0 + \beta_i X + ... + \beta_k X_i)})^{Y_i}(\frac{1}{1 + exp(\beta_0 + \beta_i X + ... + \beta_k X_i)})^{1-Y_i} \tag{3.8}$$

Which will simplify to;

$$L(\theta) = (\frac{exp(\beta_0 + \beta_1 X + ... + \beta_k X_i)^{Y_i}}{1 + exp(\beta_0 + \beta_i X + ... + \beta_k X_i)^{1-Y_i}}) \tag{3.9}$$

By taking the natural log of the equation above this equation will further simplify to;

$$lnL(\theta) = \sum_{i=0}^{n} Y_i(\beta_0 + \beta_1 X + ... + \beta_k X_i) - \sum_{i=0}^{n} log(1 + exp(\beta_0 + \beta_1 X + ... + \beta_k X_i)) \tag{3.10}$$

In order to interpret we need to use the odds ratio equation which is given as ;

$$exp(\beta_i) = \frac{e^{\beta_0 + \beta_1}}{e^{\beta_0}} \tag{3.11}$$

Where if OR ¡ 1 it will indicate a negative relationship if OR ¿ 1 it indicates a positive relationship and if the OR=1 it will indicate no association. The odds ratio will be converted to probabilities so as to make probability predictions for the model. The equations for the probabilities when $Y_i = 0$ and 1 are given below;
for $Y_i = 0$;

$$p = \frac{e^{\beta_0}}{e^{1+\beta_0}} \tag{3.12}$$

for $Y_i = 1$

$$exp(\beta_i) = \frac{e^{\beta_0 + \beta_1}}{e^{1+\beta_0+\beta_1}} \tag{3.13}$$

3.5.4 Model Specifications

The Logistic function is defined as :

$$Logistic(\pi(x)) = log\frac{\pi_i}{1 - \pi_i} = \beta_0 + \beta_1 X + ... + \beta_k X_i + \epsilon_i \tag{3.14}$$

Where β_k represent the coefficients related to each variable in the regression model. ϵ_i is assumed to the error term and it is assumed to be normally distributed with mean 0 variance 1, ϵ N(0; 1).

3.5.5 Model fitting

$$Logistic(Y) = \beta_0 + \beta_1 X + \beta_2 X_2 + \beta_3 X_3 + ::: + \beta_k X_i + \epsilon_i \tag{3.15}$$

The dependent variable will be denoted by Y which is the results. The independent variables will be denoted by X_i where i is gender, age, age when married, age when he/she wrote O'level, religion, highest level of education, province, residence, wealth index and the number of children.

3.6 Definitions of independent variables

- Marital status - it's weather the respondent is married or not.
- Age when married – this is the age of the respondent when the she got married It as taken as continuous data measured in years.
- Age wrote O'level – this is the age of the respondent when she wrote her O'level. It as taken as continuous data measured in years.
- Religion – it is based on the respondents religion where 1 represents pentecostal, 2 roman catholic and protestants and 0 represents the other religions.
- Number of living children–the number of living children the respondent has.
- Attendance- this is the fraction or percentage of the year the respondent attended lessons.
- Wealthy index - how wealthy the respondent is are based on the characteristics of their household -
- Husband level of education - this is the respondent's husband's highest level of education

3.7 Goodness of fit test

The Hosmer and Lemeshow test is used to test the goodness of fit of the logistic and probit models. It basically groups based to basing on the on the values of estimated probabilities. It is used to assess whether the number of expected events from the logistic regression reflect

the number of observed events in the data. The test statistic is calculated using the following equation ;

$$\text{Hosmer and Lemeshow test} = \sum_{j=1}^{10} \frac{O_j - E_j}{E_j(1 - E_j/n_j)} \chi_8^2 \tag{3.16}$$

Where: χ^2 = chi squared

n_j = number of observations in the j^{th} group

O_j = number of observed cases in the j^{th} group.

E_j number of expected cases in the j^{th} group.

Small significance values which are under the value 0.05 mean that the model is not a good fit whilst large values do not necessarily mean that the model is not a good model. So the values which are basically greater than 0.05 would mean a good fit of the models.

3.8 Chapter summary

This chapter outlined the tools which will necessary to accomplish the objectives of this research. The key tools are the Logistic regression models which will executed in SPSS 16.0 then followed by the interpretations of the models.

Chapter 4

Data Analysis and Results

4.1 Introduction to the chapter

The main objective of of this chapter is to apply the statistical models and tests which where specified in the methodology and to represent, describe, evaluate and interpret results from analysis so as to satisfy the objectives of this research. Data analysis was done using SPSS.

4.2 Data set

As the researcher has noted in chapter 3, the data for the analysis for this research project was from 2017 AGDSI. Only the female respondents with age that ranged from 17 to 24 were considered in this research. Data was collected from both rural and urban places of Zimbabwe's provinces namely Masvingo, Mashonaland Central, Harare and midlands. This data provides very useful information that can be used in evaluating and designing programs for improving education to early married young ladies in the country's population and of vulnerable society. In total sample population consisted of 400 respondents who participated in the survey. 200 being those that got married before they wrote their O'level and 200 were those that wrote before they were married. The data set also consists of information on other areas of interest like age when the got married, marital status, results and so much more. The researcher is only forcing with the early married women's O'level performance. This data set

is suitable for data analysis.

4.3 Stepwise regression using Backward Elimination

Backward elimination is a stepwise regression approach that initializes with a full model with all the predictors. At each step it eliminates variables from the regression model to find a reduced model that best explains the data. The researcher used stepwise approach because it reduces the number of predictors in response with their significance and it is one of the ways to resolve over fitting. The model starts with all variables included and variables were removed at each step. Variables with a p value greater than 0.05 were found to be statistically insignificant and were removed at each step in descending order.

The coefficients in the model represent the mean change in the response variable for one unit of change in the predictor variable while holding other predictors in the model constant. The Data Analysis size of the coefficient for each independent variable gives the size of the effect that variable is having in the dependent variable, and the sign on the coefficient(positive or negative) gives the direction of the effect.

Table 4.1: Backward Elimination

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-0.283574312	0.479435423		-0.59148	0.555
	Residence	-0.044910284	0.020242013	-0.10527	-2.21867	0.027
	Province	0.043081087	0.041410878	0.042716	1.040333	0.299
	Age	0.030759741	0.011310903	0.112672	2.719477	0.007
	Age when married	-0.007589891	0.038279171	-0.01297	-0.19828	0.843
	Marital status	-0.307952793	0.025235518	-0.51999	-12.2031	0.000
	Age when wrote 0'level	0.005937216	0.033396942	0.011731	0.177777	0.859
	Number of children	0.077899101	0.027955946	0.147152	2.786495	0.006
	Religion	-0.001490013	0.014613179	-0.00424	-0.10196	0.919
	Wealth index	0.030221744	0.031020434	0.040374	0.974253	0.331
	Husband level of education	0.011539388	0.024820647	0.019171	0.464911	0.642
	Attendance	0.08264123	0.021731095	0.158628	3.802902	0.000
	Education level	-0.067597947	0.047466135	-0.06978	-1.42413	0.155
2	(Constant)	-0.28314345	0.478803446		-0.59136	0.555
	Residence	-0.044616599	0.020010409	-0.10458	-2.22967	0.026
	Province	0.043054043	0.04135705	0.042689	1.041033	0.299
	Age	0.030686729	0.011273772	0.112405	2.721958	0.007
	Age when married	-0.007871129	0.038130824	-0.01345	-0.20642	0.837
	Marital status	-0.307796374	0.025156621	-0.51972	-12.2352	0.000
	Age when wrote 0'level	0.006077653	0.033325838	0.012008	0.182371	0.855

	Number of children	0.077708437	0.027857651	0.146792	2.789483	0.006
	Wealth index	0.030480285	0.030877075	0.04072	0.987149	0.324
	Husband level of education	0.011474025	0.024780623	0.019063	0.463024	0.644
	Attendance	0.082492969	0.021654654	0.158343	3.80948	0.000
	Education level	-0.067784691	0.047370106	-0.06997	-1.43096	0.153
3	(Constant)	-0.272946596	0.474934817		-0.5747	0.566
	Residence	-0.045385259	0.019537101	-0.10638	-2.32303	0.021
	Province	0.043383937	0.041265965	0.043016	1.051325	0.294
	Age	0.030736793	0.01125638	0.112588	2.730611	0.007
	Age when married	-0.002496488	0.02416531	-0.00427	-0.10331	0.918
	Marital status	-0.307493741	0.025070538	-0.51921	-12.2651	0.000
	Number of children	0.077503046	0.027800178	0.146404	2.787862	0.006
	Wealth index	0.030869899	0.03076468	0.04124	1.00342	0.316
	Husband level of education	0.011480457	0.024749707	0.019074	0.463862	0.643
	Attendance	0.083096039	0.021373997	0.159501	3.887716	0.000
	Education level	-0.067977651	0.047299253	-0.07017	-1.43718	0.151
4	(Constant)	-0.310672293	0.303276021		-1.02439	0.306
	Residence	-0.045349636	0.019509202	-0.1063	-2.32453	0.021
	Province	0.043479151	0.041203176	0.043111	1.055238	0.292
	Age	0.030599928	0.011163923	0.112087	2.740966	0.006
	Marital status	-0.307667406	0.024982287	-0.51951	-12.3154	0.000
	Number of children	0.07726609	0.027670143	0.145956	2.792399	0.005
	Wealth index	0.031070278	0.030664408	0.041508	1.013236	0.312
	Husband level of education	0.01168598	0.024638232	0.019415	0.474303	0.636
	Attendance	0.083215679	0.021315443	0.159731	3.904009	0.000
	Education level	-0.068235791	0.047173104	-0.07044	-1.4465	0.149
5	(Constant)	-0.265830169	0.287876531		-0.92342	0.356
	Residence	-0.044867659	0.019463351	-0.10517	-2.30524	0.022
	Province	0.042648022	0.041124973	0.042287	1.037035	0.300
	Age	0.030354225	0.011140811	0.111187	2.724597	0.007
	Marital status	-0.307694666	0.024957386	-0.51955	-12.3288	0.000
	Number of children	0.076621832	0.027609308	0.144739	2.775217	0.006
	Wealth index	0.029751462	0.030507724	0.039746	0.975211	0.330
	Attendance	0.083977612	0.021233693	0.161193	3.954923	0.000
	Education level	-0.068848293	0.047108546	-0.07107	-1.46148	0.145
6	(Constant)	-0.2106618	0.28224577		-0.74638	0.456
	Residence	-0.043655456	0.019422402	-0.10233	-2.24769	0.025
	Province	0.042216154	0.041120014	0.041859	1.026657	0.305
	Age	0.030914906	0.011125269	0.113241	2.778801	0.006
	Marital status	-0.308869962	0.024926709	-0.52154	-12.3911	0.000
	Number of children	0.076353347	0.027606207	0.144232	2.765804	0.006
	Attendance	0.08257384	0.021183519	0.158499	3.898023	0.000
	Education level	-0.069443178	0.047101647	-0.07168	-1.47433	0.141
7	(Constant)	-0.215770324	0.28222135		-0.76454	0.445
	Province	-0.042771255	0.019404634	-0.10025	-2.20418	0.028
	Age	0.031976249	0.011077898	0.117128	2.886491	0.004
	Marital status	-0.307527252	0.024894091	-0.51927	-12.3534	0.000
	Number of children	0.076539024	0.027607516	0.144583	2.772398	0.006
	Attendance	0.08365786	0.021158646	0.160579	3.953838	0.000
	Education level	-0.067445606	0.047064685	-0.06962	-1.43304	0.153
8	(Constant)	-0.362520792	0.263339199		-1.37663	0.169
	Residence	-0.048909065	0.018951397	-0.11464	-2.58076	0.010
	Age	0.033022846	0.011068604	0.120962	2.98347	0.003
	Marital status	-0.305941282	0.024902793	-0.51659	-12.2854	0.000
	Number of children	0.098396838	0.023042312	0.185872	4.270268	0.000
	Attendance	0.084688501	0.021174747	0.162558	3.999505	0.000

The Table 4.1 shows steps or procedure in backward elimination. On the model the first step in backward elimination shows all the entered variables in the model. On step two, religion is removed first because it had the highest p value which was greater than 0.05. After all the variables with great p values had been removed, residence, age, marital status, number of children and attendance remained. This means the independent variables are significant for the research.

From Table 5.1 in appendix, the model with the least coefficient of determination (R^2) is model 8 with residual of 41.023, meaning the the variables in that model are significant for the research.

4.4 Descriptive statistics

4.4.1 Age when married

The below histogram show the the ages when the women from the sample population got married.

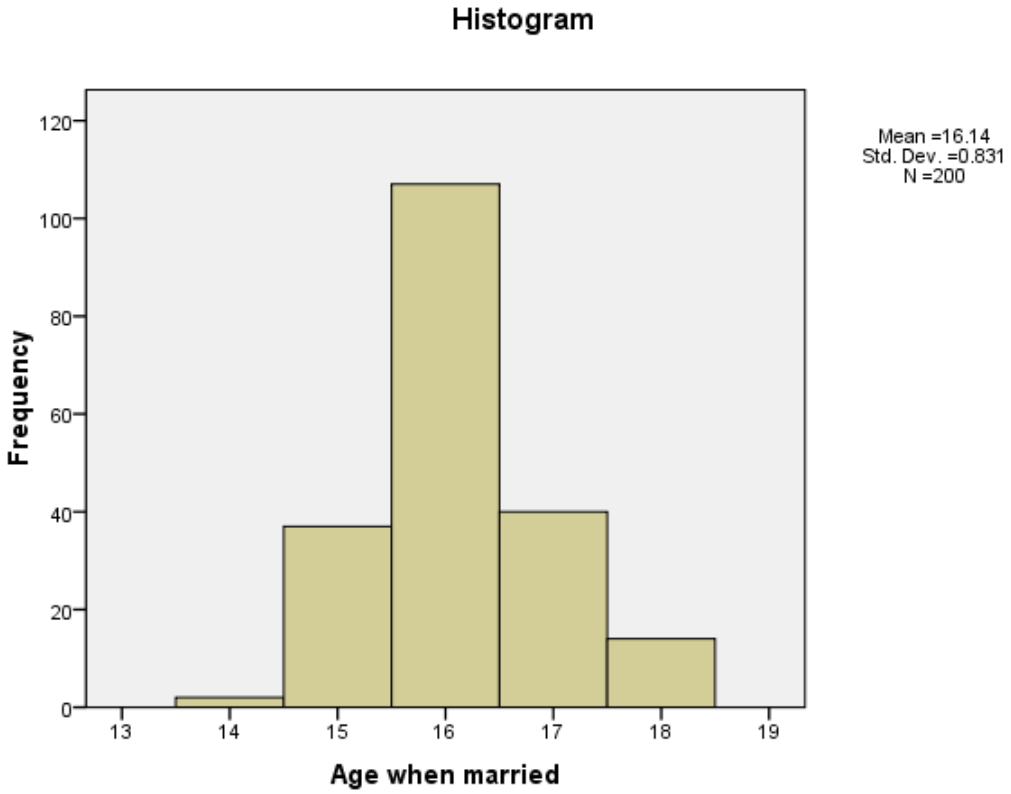

Figure 4.1: Age when married

Looking at Figure 4.1, shows that the mean average age of getting married was 16 years. This means that most the young women get married at the age of 16. Normally at this age in Zimbabwe, that's the age when people write their O'level. Which means these young women are married before they write their O'level.

4.4.2 O'level Results

The bar chart shows the proportions of the O'level results attained by the respondents. The respondents academic performance is categorized into two categories- "Pass" and "Fail". Those learners whose O'level results are greater or equal to 5 are categorized as "Pass", while those learners whose O'level results less than 5 are categorized as "Fail".

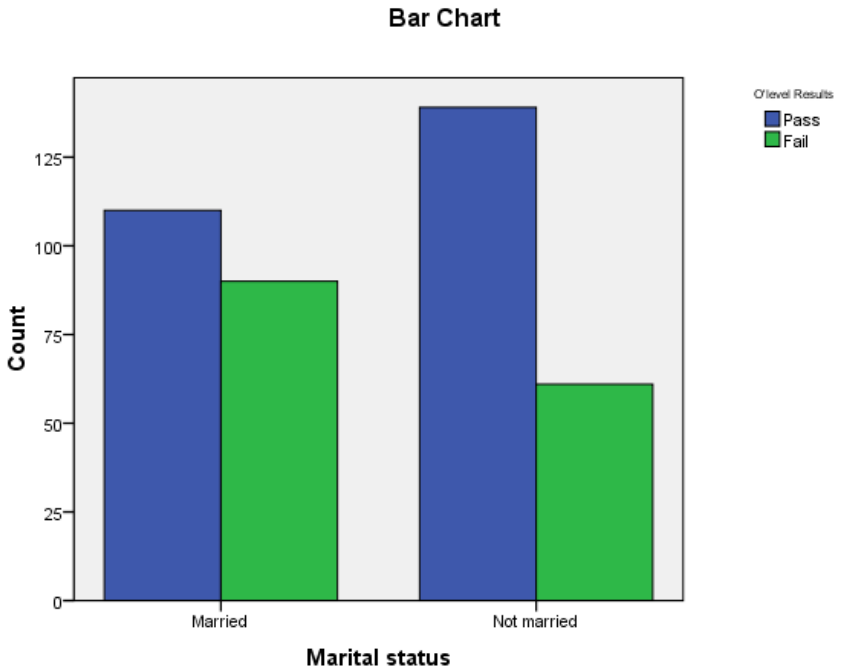

Figure 4.2: Results for that that wrote before marriage

From Figure 4.2, learners with O'level results above or equal to 5 are 55% of the total early married respondents and those in the category of less than 5 are 45%. Those that wrote their O' level before they were married , 69.5% passed and 30.5% failed.

This implies that those that write their O'level before they get married are more likely to pass than those that wrote their O'level after they are married. It also means that the probability of passing when you write after getting married is also high, its 0.55

4.4.3 Province*Residence

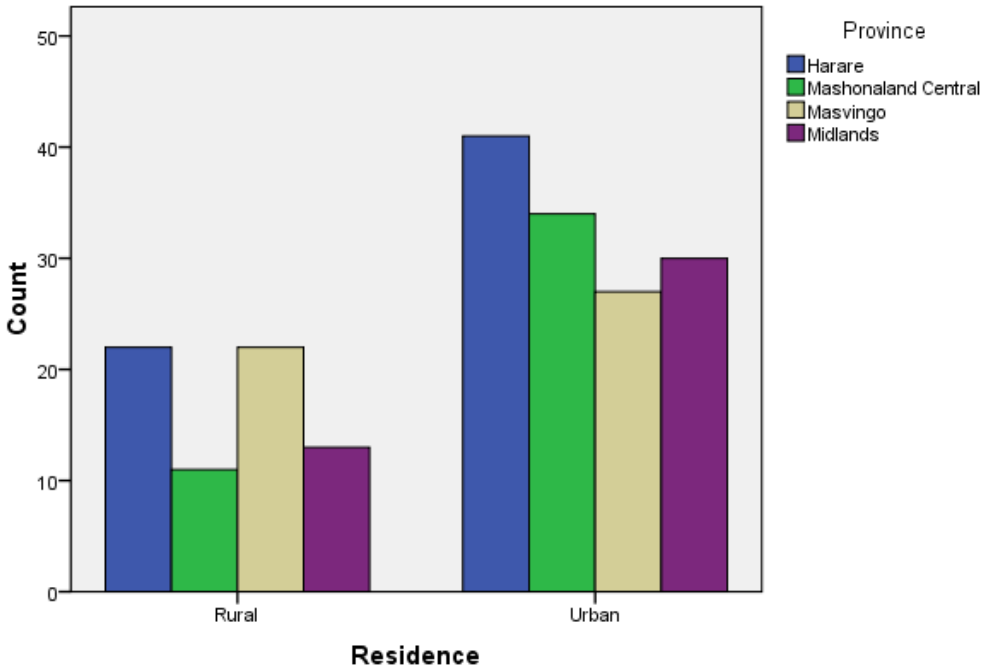

Figure 4.3: Wealth index

Figure 4.3 indicates that the most of the married women who go back to continue with their schooling from the provinces Harare, Mashonaland Central, Masvingo and Midlands, are from the urban areas than from the rural areas. Which means area of residence (rural or urban) has an effect on early married women going back to school.

4.4.4 Wealth index

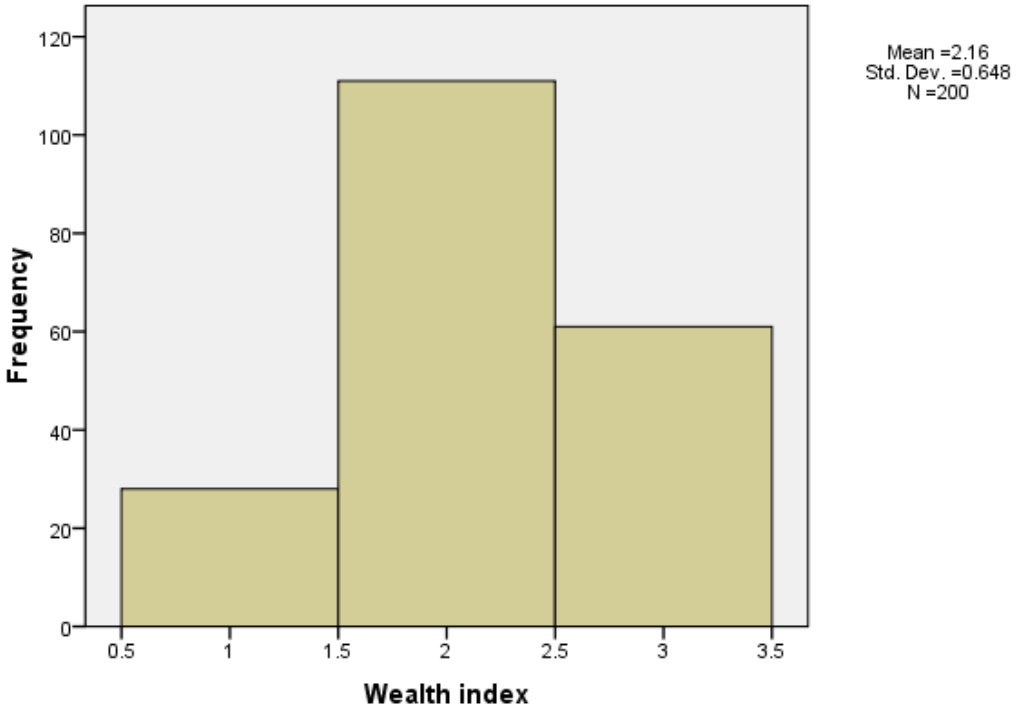

Figure 4.4: Wealth index

Figure 4.4 indicates that most of the women who go back to school after they are married are from privileged backgrounds and there are a few from poor backgrounds. 1 represents poor, 2 middle and 3 rich. This means that wealth index has a strong effect on the probability of a married women to continue or go back to school. Also on the same table those that are rich or in between, most of them resident in urban areas.

4.4.5 Province and Results

From Figure 4.5 it shows that Harare has the most number of women who went back to school as compared to other provinces. Also Harare has the most number of women who passed compared to those who failed. Four fifth of the population from Harare passed followed by Masvingo with almost three quarter of the population from Masvingo passed and a quarter failed. Last but not least is Midlands and lastly is Mashonaland central with almost half of its population passing and another half failing.

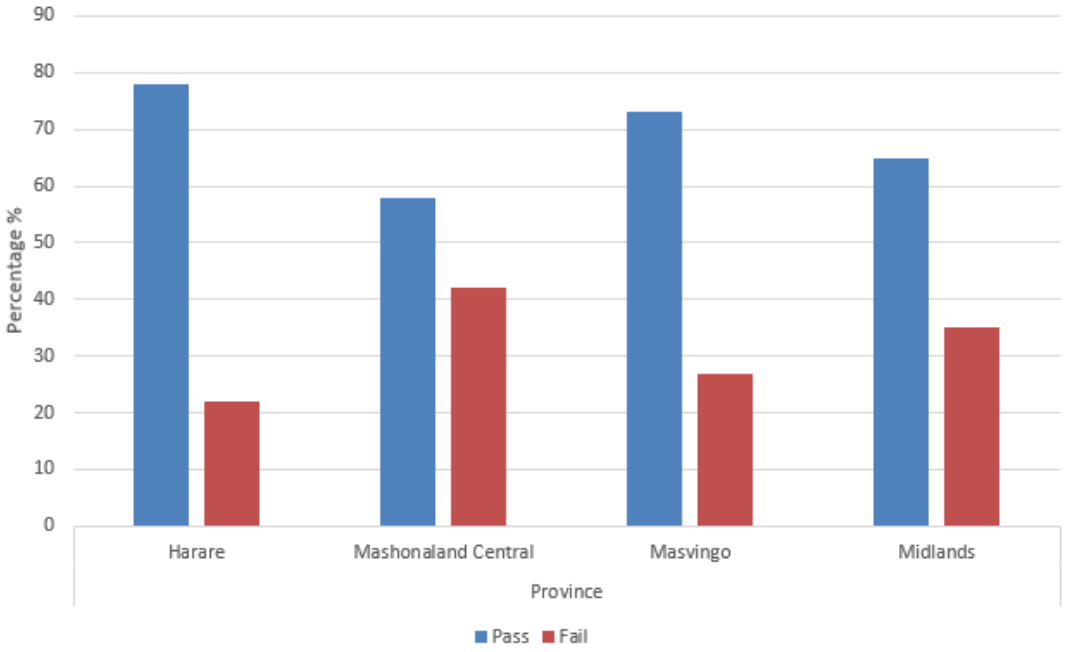

Figure 4.5: O'level Results and Province

4.5 Testing the hypothesis

In order to test the second objective, the researcher used chi square test to assess if there is a relationship between being early married and academic performance. The hypotheses to be tested were:

- H_0there exist no relationship between being early married and academic performance
- H_1there exist a relationship between being early married and academic performance

The variables put were marital status and O'level results.

Table 4.2: Chi-square tests

	Value	df	Asymp Sig 2-sided
Pearson Chi-Square	8.947	1	0.003
Likelihood Ratio	8.989	1	0.004
Linear-by-Linear Association	8.925	1	0.003
N of Valid Cases	400		

At 5% significant level, the p value is greater(p value = 0.003, $0.003 < 0.05$) hence we reject the null hypothesis and conclude that the independent variable has significant effect on the dependent variables. That is there being early married has an effect on academic performance.

The chi square values of the remaining variables make the null hypothesis to be adopted (Table 4.2).

4.6 Logistic regression

Binary logistics regression was done in order, to predict the academic for early married women performance.

Table 4.3: Correlation Matrix

		Constant	Age	Residence(1)	Number of children	Marital status(1)	Attendance(1)	Attendance(2)	Attendance(3)
Step 1	Constant	1	-0.80774	-0.05887	0.075196	0.369749	-0.55738	-0.53623	-0.53185
	Age	-0.80774	1	0.021594	-0.03962	-0.53542	-0.00617	-0.02748	-0.01987
	Residence(1)	-0.05887	0.021594	1	0.017034	-0.04294	-0.04227	-0.03561	-0.04204
	Number_of_children	0.075196	-0.03962	0.017034	1	-0.71495	-0.0737	-0.09196	-0.05066
	Marital status(1)	0.369749	-0.53542	-0.04294	-0.71495	1	0.047077	0.070213	0.03474
	Attendance(1)	-0.55738	-0.00617	-0.04227	-0.0737	0.047077	1	0.939389	0.922855
	Attendance(2)	-0.53623	-0.02748	-0.03561	-0.09196	0.070213	0.939389	1	0.916586
	Attendance(3)	-0.53185	-0.01987	-0.04204	-0.05066	0.03474	0.922855	0.916586	1

To test for multicollinearity, how strong two variables are (the dependent which is the results and the independent variables) the researcher correlated the parameters and got the above correlation matrix Table 4.3. The close the coefficient as to 1 the stronger the relationship. For this research we have correlated the independent variables and have shown a weak correlation which is good for the research.

Table 4.4: Iteration History

Iteration		-2 Log likelihood	Coefficients							
			Constant	Age	Residence(1)	Number_of_children	Marital_status(1)	Attendance(1)	Attendance(2)	Attendance(3)
Step 1	1	452.5408	0.426571	0.06021	-0.02644	0.965204	-1.35366	-2.45206	-2.52282	-2.3014
	2	449.585	0.894097	0.071949	-0.04042	1.128427	-1.61011	-3.23042	-3.32422	-3.04717
	3	449.462	1.107377	0.07271	-0.04176	1.137711	-1.62734	-3.46006	-3.55555	-3.27539
	4	449.461	1.130473	0.072718	-0.04178	1.137791	-1.62753	-3.48328	-3.57878	-3.2986
	5	449.461	1.130699	0.072718	-0.04178	1.137792	-1.62753	-3.4835	-3.579	-3.29883

From Table 4.4 the initial -2 log likelihood is 528.309 and from the table above Table 4.4 the -2log likelihood dropped to 449.462 which means that the independent variables are very significant for the research

Table 4.5: Variables in the equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
								Lower	Upper
Step 1a	Age	0.072718	0.05823	1.559519	1	0.211736	1.075427	0.959435	1.205
	Residence (1)	-0.04178	0.238958	0.030568	1	0.861208	0.959082	0.600419	1.532
	Number of children	-0.02582	0.25415	0.010321	1	0.91908	0.97451	0.59218	1.604
	Marital status (1)	1.138	0.558112	8.503824	1	0.003544	3.1205	0.065782	0.586
	Attendance			22.14854	3	6.07E-05			
	Attendance (1)	-3.4835	0.7626	20.86598	1	4.93E-06	0.0307	0.006887	137
	Attendance (2)	-3.579	0.768949	21.66352	1	3.25E-06	0.027904	0.006182	0.126
	Attendance (3)	-3.29883	0.780499	17.8638	1	2.37E-05	0.036927	0.007998	0.17
	Constant	1.130699	1.270217	0.792388	1	0.373379	3.097821		

The model indicates that out of the many variables identified as possible determinants of academic performance only seven independent variables that were statistically significant. They include; age, marital status, number of children, , residence, and attendance.

Numerical problems such as multicollinearity among the independent variables (constant excluded) are checked by examining the value of standard errors for the B-coefficients. Standard error larger than 2 indicates numerical problems. None of the independent variables in this analysis has a standard error larger than 2, indicating that there is no numerical problem of the model in the current study concerned regarding the academic performance.

The model is given by:

$$Logistic(Y) = 1.130 + 0.072X_1 - 0.041X_2 - 0.025X_3 + 1.138X_4 - 3.483X_5 - 3.579X_6 - 3.298X_7 \quad (4.1)$$

4.6.1 Interpretation of odds ratio

An odds ratio (OR) is a measure of association between a certain property A and a second property B in a population. Specifically, it tells you how the presence or absence of property A has an effect on the presence or absence of property B. It tell you the likelihood of an event occurring relative to an event not occurring and it's given by

$$OR = e^{\beta}$$

Odds ratio from 0 to just below 1 indicate the event is less likely to happen in comparison with the base group. Odds ratio from 1 to just below 2 indicate the the event is 3 times likely to happen , while odds ratio from 2 to infinity are many times more likely to happen in that

group than any other group.

As the number of children increases the less likely the woman is going to pass. β is given by -0.02582 hence $e^{\beta} = 0.9745$. This implies as the women have more children, it means more responsibility and less time to study which may lead to failure or less marks.

Those that leave in the rural areas are less likely to pass than those that leave in the urban areas. This may due to the condition of the school, in the rural ares there are less text-books and have no access to internet which may help them in their studies. The odds ratio is 0.959082.

From Table 4.5 for the section marital status those that are not married, β was found to be 1.138 and the odds ratio is equal to 3.1205 which means that women that are unmarried are more likely to pass than those that are married.

Attendance is categorized in to four group, first those that attend 90% to 100% of the classes, second those that attend 80% to 89%, third - 70% to 79% then lastly below 70% . The people that attend less classes are less likely to pass than those that attend more lesson. the odds ration for those that attend below 70% is 0.036927. Women who are married were found to attend lesser lessons and the reason was they had family emergencies or had to attend to their children or other responsibilities.

4.6.2 Predicted model

Table 4.6: Classification Table

			Predicted		
			O'level Results		Percentage correct
	Observed		Pass	Fail	
Step 1	O'level Results	Pass	224	25	90.5
		Fail	89	61	40.7
	Overall Percentage				71.4

From the above Table 4.6 it shows that the predicted percentage of passing is high than that

of failing. The model has a 71.4% overall prediction which means it is a good model

4.6.3 Significance test

Table 4.7: Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	78.848	7	.000
	Block	78.848	7	.000
	Model	78.848	7	.000

Omnibus test of model uses chi-square to see if there is a significant difference between the log-likelihoods (deviation) of the baseline and the new model. Given above Table 4.7 our chi-square is highly significant (chi - square = 78.848; df = 7; $p < 0.000$ at 5% significant) meaning that our new model is better.

Table 4.8: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R square
1	449.691	0.179	0.224

The most common assessment of overall model fit in logistic regression is the likelihood ratio test, which is simply the chi-square difference between the null model (i.e., with the constant only) and the model containing the predictors. Under Model Summary we see that the -2 Log Likelihood statistics is 449.691 (Table 4.8). This statistic measures how poorly the model predicts the student academic achievement in "'ok"' status, the smaller the statistic the better the model. The Cox and Snell or Nagelkerke R^2 is an analogous statistic in logistic regression to the coefficient of determination R^2 in linear regression, but not close analogy. The model summary provides some approximation of R2 statistic in logistic regression. Cox and Snell's R2 attempts to imitate multiple R^2 based on likelihood. The result of Cox and Snell R^2 from table 4.10 indicates that 17% of the variation in the dependent variable is explained by the predictor variable which is assumed to be good enough.The Cox & Snell R^2 can be interpreted like R^2 in a multiple regression, but cannot reach a maximum value of 1. The Nagelkerke R^2 can reach a maximum of 1.

4.6.4 Goodness of fit test

Table 4.9: Hosmer-Lemeshow test

Step	Chi-square	df	Sig.
1	3.401	8	0.907

P stands for probability, and the P-value is the probability that the test outcome would take a value as extreme or more extreme than that observed. As it is observed from Table 4.9, P-value is 0.907 at 5% level of significance, which is insignificant and therefore the fitted logistic regression model is a good fit.

4.7 Chapter summary

The chapter four was there to present and analyze data. The primary objective of the entire research project was to examine the effect of child marriage on academic performance

Chapter 5

Results

5.1 Introduction to the chapter

This chapter provides summary, conclusions and recommendations of the study that investigated the effects of early marriage practices on girls' education in Zimbabwe. The chapter has three major sections; the first provides summary of the study, the second presents conclusions of the findings and the final section put forward the recommendations.

5.2 Summary of research

In chapter 1, the researched introduced about child marriage and academic performance and the background of child marriage, problem statement, aim of the research and objective then came up with a hypothesis the research wanted to test. The researcher went on to look at the literature review (chapter 2) were she looked at the reasons for early marriage and the factors affecting academic performance. She then proceeded to talk about the methodology she was going to use to satisfy the objectives. She used stepwise to identify the factors affecting child marriage, then chi square test to test the hypothesis and the results were marital status has an impact on academic performance.

5.3 Conclusion

This research concludes that the practice of early marriages is a real problem in Zimbabwe districts. Unfortunately, girls less academically inclined, and those who do marry early, are less supported by family and existing programs to remain in school. Parents have been found to play a key role in the practice. This is due to the fact that most parents lack understanding of the importance of formal education for their children and after the young girls are married they will not find the reason for the young ladies to continue with school. Respondents noted that barriers to girls' education included social norms against girls' education and for early marriage, financial barriers, and poor value of education. However it is not always the case that the probability of performing well in school is less, one has to work hard, attend lessons and read more in order to pass. From the results there are few women who live in the rural areas are less likely to continue with their education than those that stay in the urban areas. Also, as the number of children reduces the likelihood of passing and may lead lead to less attendance of lessons due to more responsibilities.

Child marriage poses great threat to the academic performance of students coerced into it. Poor attendance to class, limited time to read and study, digressed focus from academics to families' welfare, withdrawal at times and poor time management. All these challenges have been identified in existing literature as the effects of child marriage on female academic performance.

5.4 Recommendation

Based on the findings from this study, the researcher recommends the following;

- There has been consensus in literature that child marriage disrupts, disturbs and distorts the academic performance of female students, but these does not imply that all students involved in child marriage perform poorly in education which lead to schools dropouts. Therefore encourages early married women to continue with their school.
- Social norms of child marriage, financial burden of school fees, and minimal opportunity for girls beyond marriage affect girls' education. Nevertheless, some girls demonstrate psychological resilience in these settings and are able to stay in school and delay mar-

riage with the support of parents and teachers. Unfortunately, girls less academically inclined, and those who do marry early, are less supported by family and existing programs to remain in school; programmatic efforts should be expanded to include educational support for married and childbearing girls as well as options for women and girls beyond marriage.

- Social support from parents and teachers is also important, as was social support from in-laws and husbands to continue school subsequent to marriage. Hence spread awareness to all parts of Zimbabwe to encourage husbands, family and in-laws to take to educate their wives or daughter.

- For those that are not married, the government should enforce the law that prohibits child marriage.

- Since the main reason for school dropouts and child marriage is poverty, government should either make education free or cheap for everyone at the primary and secondary levels for everyone, even the poor to afford it.

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Appendix

Table 5.1: Anova

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.317	12	0.693	3.179	.000
	Residual	41.183	189	0.218		
	Total	49.5	201			
2	Regression	8.317	11	0.756	3.484	.000
	Residual	41.183	190	0.217		
	Total	49.5	201			
3	Regression	8.316	10	0.832	3.852	.000
	Residual	41.184	191	0.216		
	Total	49.5	201			
4	Regression	8.303	9	0.922	4.291	.000
	Residual	41.197	192	0.215		
	Total	49.5	201			
5	Regression	8.282	8	1.035	4.838	.000
	Residual	41.218	193	0.214		
	Total	49.5	201			
6	Regression	8.214	7	1.173	5.509	.000
	Residual	41.286	194	0.213		
	Total	49.5	201			
7	Regression	7.993	6	1.332	6.254	.000
	Residual	41.507	195	0.213		
	Total	49.5	201			
8	Regression	8.477	5	1.695	8.11	.000
	Residual	41.023	196	0.209		
	Total	49.5	201			