

National University of Lesotho
Department of Statistics and Demography

The Impact of Diabetes on Infant Mortality in Lesotho

**A research proposal submitted to the Department of
Statistics and Demography in partial fulfillment of the
requirements for the degree of Bachelor of Arts.**

By

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Declaration

I hereby declare that the work presented in this project entitled “impact of diabetes on infant mortality in Lesotho” for the award of “BA Sociology and Demography” is my original work and has not been written for me by any other person. Also no part has been plagiarized without citations, this project has not formed a basis for any award, degree or any scholarship applications.

Abstract

Lesotho has witnessed high maternal and infant mortality. The 2009 DHS reported 91 deaths per 1000 live births of infant mortality; it also stipulates that 1 in every 9 child born in Lesotho dies before age 5. Diabetes is a very dangerous disease and if not treated can lead to sickness or ultimately death; this paper concentrates on how GDM affects women through its impact during pregnancy and how it poses a threat to the health of both mother and child. With evidence from previous research, it can be seen that diabetes does affect infant mortality in a large spectrum and may even harm the health of the mother. Even though results did not show as much a difference as to how diabetes affect the infant mortality of Lesotho, a conclusion was reached that a more detailed study should be undertaken in the near future.

1.0 CHAPTER ONE

INTRODUCTION

1.1 Background

Diabetes mellitus is a chronic life-long disease that affects people of all ages, gender and socio-economic background. Its rapidly increasing prevalence is a significant cause for concern at clinical and public health level. According to Virjee et al (2001), diabetes has two types; type1 which refers to the absolute lack of insulin due to breakdown of islet cells (cells producing insulin) in the pancreas and type2 which is the metabolic disorder that is characterized by high blood sugar in the context of insulin resistance and relative lack of insulin.

Type2 diabetes makes up 90 percent of cases of diabetes with 10 percent due to primarily type 1; obesity is thought to be a primary cause of type 2 diabetes in people who are genetically predisposed to the disease. Moreover there is also a type of diabetes called the Gestational Diabetes Mellitus (GDM) which is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy (Virjee at al 2001). Furthermore, GDM is hyperglycemia (high blood glucose) that might have started before or during pregnancy, but is discovered during the pregnancy and may persist after delivery. All these types of diabetes have high chances of causing deaths among pregnant women and women who have just given birth together with their children.

In 2000, diabetes mellitus together with other endocrine disorders ranked amongst the top ten of hospital admissions in Lesotho (Bureau of Statistics, 2001) and also ranked amongst the top ten causes of institutional deaths with a total of 1.7 percent (Lesotho Government, 2001). In addition diabetes mellitus continued to be the leading non-infectious cause of admissions to public hospitals in Lesotho in 2009. Non-communicable diseases are gradually becoming important public health issues as they hamper the health and life expectancy of the population.

Shaw 2010 further explains that diabetes mellitus is emerging as one of the most common chronic illnesses with an estimated global prevalence of 220million people in 2010, of these, approximately 12.1million were situated in Africa. In support of this explanations, the World

Health Organization (WHO) has estimated that 11,000 people in Lesotho were diagnosed with diabetes in 2010 and that given the prevailing circumstances it is expected to increase to 42,000 by 2030 (WHO, 2010).

Further research by Pekka J et al (2001) found that the chances of an early miscarriage or having a baby with malformations are enhanced for women with type1 diabetes and that the incidence of maternal mortality among pregnant women with type1 diabetes in some countries is 5 to 20 times higher than of women without diabetes, other research also points out that gestational diabetes mellitus often results in obstructed labor, death of the mother and baby even birth injury for the infants (Counsen, 2011). He further states that pregnancies complicated by GDM have an increased risk of perinatal mortality.

Maternal chronic medical conditions have an established impact on fetal and neonatal health. In his paper about diabetes in preexisting diabetes, Serap (1986) stipulates that the complications that arise from the effects of maternal diabetes on early fetal development include spontaneous abortions and major congenital malformations. The most prominent fetal complications that arise during the second and third trimesters are still birth and microsomia (Serap, 1986).

GDM has long-term public significance contributing to the escalating type2 diabetes. Although GDM is a temporary phenomenon for the pregnant woman, more than 50 percent of women with GDM develop type2 diabetes within 5 to 10 years after delivery (Kin C et al, 2002). Moreover, the International Diabetes Federation (IDF) reported that infants of women with GDM have a higher prevalence of overweight or obesity as young children and adolescents and develop an also higher risk of developing type2 diabetes later in life (IDF, 2009).

1.2 Statement of the problem

Diabetes is a major cause of deaths in Lesotho; this can be attributed to the fact that it cannot be cured. As stipulated by the IDF, 2009 most infants` mortality and morbidity has been a result of pregnancy complications aggravated by diabetes. The 2009 Demographic and Health survey of Lesotho (DHS) recorded 91 deaths per 1000 live births of infant mortalities and the under 5 mortality was 117 deaths per 1000 live births. It also stipulated that 1 in every 9 children born in Lesotho dies before reaching their 5th birthday

Furthermore, Lesotho is reported to be off track in achieving the targets of the goal four of the Millennium Development Goals four which concentrated on child mortality and goal five that focused on maternal health. The under-5 mortality rate increased from 90 per 1000 live births in 1996 to 117 per 1000 live births in 2009 (DHS 2009). The World Health Organization showed that the maternal mortality ratio of Lesotho increased from 762 per 100000 live births in 2004 to 1155 in 2009 (WHO, 2008).

These statistics show that the mortality rate among children under the age of 5 are very high, and among these deaths there are those caused by pregnancy related diabetes. Under 5 mortality deaths caused by diabetes are highly underestimated because most deaths are not recorded by causation as there are many causes of under 5 mortality, however diabetes has been proved to be very risky as it a silent killer. Women of low socio-economic status are said to be at risk of being diagnosed with the disease if they experience barriers to care, such as lack of health care coverage, inability to purchase maintenance medications, access to transportation and related issues (Thinyane and Theketsa, 2013); which reflects the characteristics of most of the Basotho women, therefore they find themselves being in utmost risks of contacting diabetes.

The researcher therefore investigated if the cause of maternal mortality and infant mortality are a result of diabetic related illness in Lesotho.

1.3 Study objectives

The overall objective of the study is to find out the impact of diabetes on infant mortality.

1.3.1 Specific objectives

The specific objectives of the study are to:

- a) Investigate how Gestational Diabetes Mellitus affects children through its impact during the mother`s pregnancy;
- b) How it poses a threat to the survival of the child;
- c) Discover the proportion of infants who die or get disabled because of pregnancy related complications aggravated by diabetes;
- d) To consider what healthcare systems are doing in order to reduce infant mortality.

1.4 Significance of the study

Lesotho is off track for achieving the targets of the Millennium Development Goal 4 (on child mortality) and 5 (on maternal health), (DHS. 2009). Given the high rising infant and children deaths in Lesotho, clarifying the relationship between diabetes and pregnancy outcomes will be highly valuable for health program planning and policy developments in order to cater for all different causes of deaths and make the necessary evaluations to its policies and adjustments in the budgets so that Lesotho can in turn achieve the targets which were set up for them of the Millennium Development Goals regarding both the child and maternal health.

1.5 Hypothesis

1.5.1 Null Hypothesis

There is a difference between infant mortality of women diagnosed with diabetes and those without the disease.

1.5.2 Alternative hypothesis

There is no difference in the prevalence of infant mortality between women with diabetes and those without diabetes.

1.6 Conceptualization

This section provides definition of concepts as they are going to be used in the study.

1.6.1 Diabetes mellitus

A group of metabolic diseases in which there is high blood sugar levels over a prolonged period. Diabetes is due to either the pancreas not producing enough insulin or the cells of the body not responding properly to the insulin produced.

1.6.2 Type 1 diabetes

Refers to the absolute lack of insulin due to breakdown of islet cells (cells producing insulin) in the pancreas.

1.6.3 Type 2 diabetes

Type 2 diabetes refers to the metabolic disorder that is characterized by high blood sugar in the context of insulin resistance and relative lack of insulin.

1.6.4 Gestational Diabetes Mellitus

GDM is a condition in which women without previously diagnosed diabetes exhibit high blood glucose levels during pregnancy (Virjee et al 2001).

1.6.5 Non-communicable diseases

A medical condition or disease which by definition is non-infectious and non-transmissible among people. Non-communicable diseases may be chronic diseases of long duration and slow progression or they may result in more rapid death such as some types of sudden stroke.

1.6.6 Neonatal mortality

Neonatal mortality is defined as the number of babies who die during the first 28 days of life per 1,000 live births based on the birth cohort.

1.6.7 Infant mortality

Deaths of children less than one year of age.

1.7 Organization of the study

The study is organized into five chapters. Chapter one introduces the study by presenting background information about the topic, general aims of the study, and some challenges or limitations which might come across when conducting the study. Chapter two presents a review of literature relevant to the topic; what other researchers say about the problem, it looks at general literature and empirical literature. Chapter three presents the study's design and

methodology while Chapter four looks at the analysis of data. Lastly Chapter five presents the study`s conclusions and recommendations.

2.0 CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section discusses literature related to diabetes and infant mortality. It explains how gestational Diabetes Mellitus affects children and how it poses a threat on the survival status of the child. Furthermore the literature discusses the effectiveness of the health care service delivery.

2.2 Diabetes as a concept

Diabetes is said to be a condition in which the body does not properly process food for use as energy (CDCP, 1999). Most of the food we eat is turned into glucose, or sugar, for our bodies to use for energy. When a person has diabetes their body either does not make enough insulin or cannot use its own insulin as well as it should, this causes sugars to build up in their blood. It is also asserted that diabetes can cause serious health complications including heart disease, blindness, kidney failure and lower extremity amputations; in fact diabetes is the seventh leading cause of death in the United States (CDCP, 1999).

The global burden of disease study of the World Health Organization (WHO) estimated that about 177 million people in the world had diabetes (WHO 2003). In addition, it is estimated that 194 million people had diabetes in the year 2003 which makes up 90 percent of the world population and about two thirds of these people lived in developing countries (IDF, 2003).

There are three main types of diabetes; first type 1 diabetes has its onset mainly in people who are younger than 40 years and is caused by lack of insulin secondary to an autoimmune destruction of pancreatic hangerhan cells; Second, type 2 diabetes occurs in subjects who are 40 years or older who are obese and insulin resistant; and third gestational diabetes is defined as any degree of glucose intolerance with onset or first recognition during pregnancy.

According to the Center for Disease and Prevention report symptoms of diabetes include urination, excessive thirst, unexplained weight loss, extreme hunger, nausea and vomiting (CDCP, 1999). Stomach pains may accompany some of these symptoms in the abrupt on-set of Type 1 diabetes. Epidemiological studies provide evidence that over-eating, particularly when combined with obesity, is associated with the development of type 2 diabetes. Types 2 diabetes is often associated with other risk factors for cardiovascular diseases such as dyslipidemia and hypertension.

Although diabetes cannot be cured, it can be managed, controlled and treated; treatment typically involves diet control, exercise, home blood glucose testing and in some cases oral medication or insulin injection (CDCP 1999). Approximately 40 percent of people with type 2 diabetes require insulin injection. A number of studies have shown that regular physical activity can significantly reduce the risk of developing type 2 diabetes (CDCP 1999); type 2 diabetes is also associated with obesity.

2.3 Infant mortality as a concept

Infant mortality is defined as deaths of children, who are less than a year old. Globally, 10 million infants and children are reported to die each year before they reach their fifth birthday, 99 percent of those deaths occur in developing nations (WHO 2008). Some causes of infant mortality are malformations, maternal complications during pregnancy and unintentional injuries (Shelby, 2001). It is also stipulated that 99 percent of infant deaths occur in developing countries and 86 percent of those deaths are due to infections, premature births and complications during delivery (Andrews et al, 2008).

A child's size at birth has been shown to be strongly associated with the risk of dying during infancy, particularly during the first months of life (LDHS, 2009). In the United States, a primary determinant of infant mortality risk is infant birth weight with lower birth weights increasing the risk of infant mortality. A study conducted in Mississippi asserts that the perinatal mortality rate is a useful indicator of the state of delivering services, both in terms of the use of these services and their ability to ensure delivery of healthy babies (Piper, 2002). Mississippi has a long history of high morbidity and negative birth outcomes, traditionally ranking among the states with the highest prevalence of obesity and diabetes (Piper, 2002).

Infant mortality rate is a reflection of the socio-economic development and effectively represents the presence of medical services in the countries. It is also shown from the LDHS report that infant mortality rate is an effective resource for the health department to make decision on medical resources reallocation. The IMR also formulates the global health strategies and help evaluate the program success, the existence of IMR helps to solve the inadequacies of the other vital statistics system for global health as most of the vital statistics usually neglect the infant mortality statistic number from the poor (Bishai et al, 2007).

2.4 Differences in relationship between diabetes and infant mortality among different societies.

Winfrey (2007) asserts that racial and ethnic minorities experience disparities across a significant number of health status measures and health outcomes. He also adds that problems accessing services and lower quality of care for minority populations clearly affect the health of those populations. The institute of medicine (IOM) report, unequal treatment: confronting racial and ethnic disparities in health care (Brian et al, 2003) defines a disparity as a difference in treatment provided to members of different racial ethnic groups that is not justified by the underlying health conditions or treatment preferences of patients.

Moreover, recent research by Paradies et al has shown that while there is a genetic component to diabetes that affects people throughout society, genes are no more important for indigenous people than for anyone else. This research stipulates that it is the social disadvantage and aspects of the social environment such as poor diet, reduced physical activity, stress, low birth weight and other factors linked to poverty that are responsible for the high rates of diabetes among these populations (Paradies et al, 2007).

2.4.1 Global relationship

Diabetes is a major risk factor for heart and kidney diseases and other conditions causing severe disability. American Indians and Alaska Natives are the greatest risk for diabetes; nearly 18 percent of this population suffers from diabetes and the prevalence is 2.8 times the overall rate. Nearly 15 percent of African Americans and 14 percent of Hispanics have been diagnosed with diabetes compared with 8 percent of whites (Mead and Cartwright, 2008).

Asian or Pacific islanders had the lowest rates of infant mortality where they experienced 4.9 per 1000 live births infant mortality rate while Hispanic experienced 5.6, whites 5.7 and African Americans 12.3 (CDCP, 2011). Sometimes it is very interesting to look at the infant mortality rates in comparable countries that have indigenous populations, for instance, in Australia, the national infant mortality rate in 2006-08 was 4.4 per live births and the Aboriginal and Torres strait Islanders rate was 10 percent- the rate varied from 13.6 in the Northern territory to 6.4 in south Australia (CDCP, 2011).

The International Diabetes Federation explains that diabetes uniquely affects women through its impacts during pregnancy and it poses a threat to the health of both mother and child; Gestational Diabetes Mellitus (GDM) affects only pregnant women and causes maternal and infant deaths and serious complications during labor. Moreover, maternal chronic diseases such as diabetes can contribute to the risk of poor birth outcomes (Rosenberg, Garbers, Lipkind, and Chiasson, 2005). Sibai et al asserts that maternal chronic diabetes is associated with pre-edampsia, an association that increases with severity of diabetes and ultimately can lead to infant mortality. Maternal diabetes may be associated with abnormal fetal development and excess fetal morbidity and mortality compared with non-diabetic pregnancies (Ratner RE, 2007).

Also research undertaken in Ireland also showed that there was a significant association found between stillbirths and perinatal mortality (Dunne 2009), this supported the multivariate analyses found by Reddy (2010) on his research that pre-existing diabetes was independently associated with increased risks of still births, moreover according to Person (2009). Still births and perinatal mortality were significantly more common in diabetic pregnancies than most normal pregnancies this discovery therefore highlights the high risks that maternal diabetes has on the wellbeing of the child as it reduces its chances of survival.

Doctors in the UK University Hospital adhere that fetal complications of maternal diabetes can arise from the effect of maternal diabetes on early fetal development, this may include spontaneous abortions and major congenital malformations (Casson, 1997). These doctors also add on to say that diabetes can cause a baby to be born heavy weight which will increase the risk of birth trauma and most often is associated with long term risks of obesity in offspring. Further research by the doctors found out that overt diabetes nephropathy in mothers increases the

prevalence of intrauterine growth retardation and prematurity in infants, fetal morbidity and mortality has also been seen to increase as well (Casson, 1997).

In addition, Gabbe et al (1977) elucidates that maternal diabetes may be associated with abnormal fetal development and excess fetal morbidity and mortality compared with non-diabetic pregnancies. The frequency of fetal abnormality vary according to the type and timing of medical care delivered to women with diabetes. Gabbe attains that “as a result frequency of fetal morbidity and mortality in diabetic pregnancies have been changing over the past six decades” (Gabbe et al, 1977).

The impact of diabetes in pregnancy can be seen in the short-term and long-term for babies. The short-term impact includes those characteristics, outcomes, conditions and interventions that can be seen shortly after birth while the longer-term impact may be seen as the ongoing impact of a short-term effect or may not be evident for many years. For babies short-term effects include congenital malformations, stillbirths and birth injuries to mention but a few (Hall et al 2001, de Valk et al 2006). While the long term effects also impact babies by increasing their risk to obesity, impaired glucose tolerance and may lead to type2 diabetes in their early adulthood (Fetita et al, 2007).

2.4.2 African relationship

Infant mortality rates for babies of all birth weights are said to be twice as high for African infants as the national average. Diabetes is of public health importance for all ethnic groups in the United States. However, there is a need to address this problem specifically in the black population. Over the past 30 years, the prevalence of diabetes in African Americans has more than tripled.

A report by Eugene et al (1999) shows that blacks are 1.7 times as likely to develop diabetes as whites, the prevalence of diabetes among blacks has quadrupled during the past 30 years. It also shows that among blacks aged 20 and older, about 2.3 million have diabetes, blacks with diabetes are more likely than non-Hispanic whites to develop diabetes and to experience greater disability from diabetes related complications such as increased risk of heart disease and kidney failure (Eugene et al, 1999). Death rates for blacks with diabetes are 27 percent higher than for whites.

Furthermore, the National Health Interview survey of America conducted in 1993 showed the prevalence of known, physician-diagnosed diabetes among African Americans to be 3.7 percent from 1.3 percent; it also revealed that the rate of diabetes in blacks has tripled during the past 30 years (NHISA, 1993). Epidemiological studies conducted to assess the impact of diabetes in black populations have examined a number of syndromes of glucose intolerance, some of which appear to be more common in black than in white Americans (WHO, 1985).

The explosion in the prevalence of diabetes undoubtedly represents a serious public health burden, but with regards to GDM in Africa, the situation appears relatively unknown as only 6 countries, equating to 11 percent of the African continent has conducted studies concerning the impact of diabetes mellitus on infant mortality and this indicates how little is known about GDM in Africa and highlights the need for further research (Jiwani et al, 2012).

It is therefore evident that the extent of GDM in Africa as a whole is not well investigated. Africa has been plagued with under nutrition and GDM may not be considered a public health concern, however, as African countries shift economically a double burden of under nutrition and over nutrition emerges, with this increase particularly in females GDM may be naively overlooked which will in the near future cause tragic consequences on the African communities.

2.4.3 Diabetes and Infant Mortality in Sub-Sahara

Pregnancy with diabetes is said to be an unhealthy combination. Prior to the discovery of insulin, pregnancy in the diabetic woman was uncommon and was accompanied by maternal and fetal mortality rate (Landon and Gabbe, 1992). In a study conducted in Nigeria, 200 pregnant diabetic women were reviewed and 12030 mothers delivered during a 10 year period analyzed, the results of the study showed a prevalence of 1.7 percent of diabetes mellitus which is similar to that of other studies in Africa (Daponte et al, 1999). The results from the Nigerian study also showed that babies with birth weight excess of 4kg constituted 49 percent of deliveries from diabetic women, this led analysts to conclude that the overlarge infant is a consequence of poorly controlled diabetics of the mother (Fraser, 1995) and that fetal macrosomia in pre-gestational diabetes is determined largely by first trimester diabetic control, which in the case of Nigerian women was recorded as poorly controlled (Rey et al, 1999). The study also goes on to show that the Nigerian cesarean section rate was 36 percent.

Pregnancies affected by GDM pose a risk for adversities such as the need for caesarean section due to fetal macrosomia. Infants born to diabetic women have certain distinctive characteristics including large size and high morbidity risks. The neonatal mortality rate is over five times that of infants of non-diabetic mothers and is higher at all gestational ages and birth weight for gestational age, diabetes has long been associated with maternal and perinatal morbidity and mortality (Butle, 2000).

Another study aimed to determine morbidity and mortality pattern amongst infants of diabetic mothers in Nigeria was conducted; whereby 60 percent of low birth weight babies were born to mothers with gestational diabetes while 40 percent were born to mothers with pre-gestational diabetes and 74.3 percent were born by caesarian section. This study focused on determining also the prevalence of GDM amongst women with risk factors such as history of fetal macrosomia, previous intrauterine death, first degree relative with diabetes and history of GDM in a previous pregnancy (Kuti et al, 2011). The study was case controlled whereby women with risk factors for GDM or women who had delivered macrosomic babies were classified as cases and women without risk factors or those who had delivered normal babies served as the controls; prevalence of GDM was higher amongst the cases than controls (Adegbola and Ajayi, 2008).

Furthermore, other studies around the sub-Saharan region were conducted in order to discover how diabetes affects the survival status of infants; such studies include the study conducted in rural Ethiopia a decade ago. The study was well reported as it showed a low risk of bias; they reported GDM prevalence to be 3.7 percent (Seyoum et al, 1999). Another study was published in 2009 by the Moroccan researchers which reported a relatively high prevalence of GDM constituting to 7.7 percent (Bouhsain et al, 2009). Lastly, in Mozambique a study was also conducted which reported a GDM prevalence of 11 percent amongst women who had late fetal deaths and 7.3 percent amongst women who had delivered live-new borns (Challis et al, 2002).

Many lessons have been learnt from the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study which showed that there is a continuous association between maternal blood glucose levels below those diagnostic of diabetes and adverse outcomes such as increased neonatal birth weight (Stats SA, 2013).

2.4.4 Diabetes and Infant Mortality in Lesotho

There has been no sign of any studies conducted in Lesotho about diabetes and infant mortality hence this research has been established.

3.0 CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter presents the methodology of the study. The chapter first considers the type of study that the project undertaken, this therefore explains the route taken to analyze the data obtained and as it is noticed the study undertook an explanatory research. It also considers the study population which are the women with and without diabetes as well as how they were sampled. Moreover, in this chapter how data was collected is explained together with the methods used to analyze it.

3.2 Study type

The study is an explanatory research, which implies that there is a causal relationship between diabetes and infant mortality. This means that for the study to hold true, diabetes must have occurred before infant mortality and infant mortality should never occur without the absence of diabetes, also all other explanations of diabetes and infant mortality will be ruled out. The study used quantitative research to gather data. Quantitative data relates to the observations that are described in numbers indicating amounts or counts (quantity). The method was useful in quantifying data for the purpose of variations, predict causal relationships and describe the characteristics of the population employing its statistics techniques.

3.3 Study population and sampling

The study population is defined as the group of individuals in a study; the study populations therefore in this research are pregnant women who are diagnosed with diabetes and those who are not. The 2009 LDHS covered the women`s population and a sample of 872 women were studied.

3.4 Data collection

The study was carried out using secondary data from the Lesotho Demographic and Health Survey (LDHS).

3.5 Data analysis

The statistical package for social sciences (SPSS) was used to analyze the data, where the independent variables (diabetes) and the dependent variable (infant mortality) were analyzed to examine their relationship. Furthermore, the study used inferential statistics to analyze data, in order to infer conclusions about the population from the sample population. The study also used both univariate and multivariate analysis to examine how single independent variable can influence the dependent variable. This was done by computing cross tabulations, the frequency tables and the bar graphs of the variables under study. Also it explored the relationship between other explanatory variables, how they have influenced the response variable when they worked together.

4.0 CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

This chapter introduces the data analysis from the data collected from the DHS files of 2009 to determine the relationship between infant mortality and diabetes. This chapter has been in such a way that the demographic profile of the respondent has been discussed.

4.2 Prevalence of Diabetes in Women

A total of 872 women were studied in order to consider their diabetic status, so that its relationship with infant mortality can be assessed. Table 1 shows that of the 872 women studied, only 2 percent were found to have been diagnosed with diabetes while 87 percent did not record any diagnosis of diabetes. Table 1 further show that the majority of women diagnosed with diabetes were in the middle ages of 20-29 which are the ages most prevalent to child bearing as well as older women in the age groups 40-44.

Table 1: Diabetes Diagnosis by Age

Age	<u>ever diagnosed</u> <u>with diabetes</u>		Total
	No	Yes	
15-19	52	0	52
20-24	169	3	172
25-29	165	4	169
30-34	138	2	140
35-39	88	0	88

40-44	82	8	90
45-49	82	2	84
Total	776	19	795

For women diagnosed with diabetes, Table 2 shows that only 52.6 percent were taking medication for treating Diabetics. Out of the women who were not taking any medication to treat their condition, Table 2 shows that the majority falls under the middle aged group 20-34 which are at a higher likelihood of child bearing. As indicated in the literature, failure to take any medication for diabetes can result in many complications most of which most could lead to death and for pregnant women it can be very dangerous for both mother and child (CDCP, 1999).

Table 2: Medication

Taking medication	Age	Diabetic (percentage)
No	20-24	22.2
	25-29	33.3
	30-34	22.2
	40-44	11.1
	45-49	11.1
Yes	20-24	10
	25-29	10
	40-44	70
	45-49	10

Furthermore, women who were found to have been diagnosed with diabetes offered how they take their medication so that the severance of their disease can be determined; for diabetic medication taken orally this articulates type1 diabetes and for medication taken by injection it presumes type2 diabetes. These two types have different effects on infant mortality rate; Table 3

shows that 60 percent of the women diagnosed took their medication orally while the 40 percent used injections. Table 3 shows that 33 percent of women between the age groups 20-24 and 25-29 were taking medication by injection and this meant that they had type1 diabetes and that between the older ages 40-44 and 45-49; 50 percent were taking medication orally while the other 50 took it by injection.

Table 3: Type of Diabetic Treatment Taken

How takes medication	Age	Diabetic (percentage)
Injection	20-24	16.7
	25-29	16.7
	40-44	66.6
Total		100
Orally	40-44	75
	45-49	25
Total		100

4.3 Socio-demographic comparisons of diabetic women

The need to compare diabetic women by their socio-demographic characteristics was to consider how the distribution of diabetes was like in different age groups and different parts of the country in order to consider if diagnosis differs from women with different backgrounds.

Table 4 shows that the prevalence of diabetes in women was higher in the urban areas than in rural areas, this may be due to the lifestyles experienced in urban areas where people are exposed to unhealthy eating habits. Because of the pressures of work experienced in urban areas, most individuals do not take good care of themselves; some may drink more alcohol or exercise less. They may forget or have no time to plan good healthy meals, therefore making them prone to heart diseases and high blood pressures which in turn may cause them to have diabetes (American Diabetes Association, 1995). It can also be seen from the age structure that most women diagnosed with diabetes in the urban areas are those under the economically active age

group which gives testimony to what is being said. Table 4 also shows that there were no women diagnosed with diabetes in the age group 15-19.

Table4: Socio-demographic variables of women diagnosed with diabetes

Characteristics	Age	Frequency (percentage)
Urban	20-24	8.3
	25-29	16.7
	30-34	8.3
	35-39	0
	40-44	50
	45-49	16.7
rural	20-24	28.6
	25-29	28.6
	30-34	14.3
	35-39	0
	40-44	28.6
	45-49	0
Highest education: Primary	20-24	20
	25-29	20
	30-34	0
	35-39	0
	40-44	60
	45-49	0
Secondary	20-24	10
	25-29	30

higher	30-34	20
	35-39	0
	40-44	30
	45-49	10
	20-24	25
	25-29	0
	30-34	0
	35-39	0
	40-44	50
	45-49	25

4.4 Prevalence of Infant Mortality among the Diabetic Women

Infant mortality is a problematic issue in most societies and analyzing the prevalence of infant mortality ensures and gives a better picture as to how a country's health care services are developing, also considering how diabetes affects infant mortality would help in discovering the severity and danger of diabetes in pregnant women and therefore would give way to offer solutions on ways to reduce diabetes which will in turn lead to the reduction of infant mortality.

The impact of diabetes on infant mortality is found by analyzing the prevalence of infant mortality to women who are diagnosed with diabetes and to match them against women without diabetes in order to see if there is a difference between the two. From Table 5 it can be seen that diabetes supposedly has no great effect on the level of mortality as was expected, this is seen by the low percentages of infant mortality exhibited in women with diabetes whereas in contrast high percentages of infant mortality were the ones experienced to women without diabetes.

Table 5: differences in infant mortality of women with diabetes and those without.

	Mother`s diabetic status (percentages)	
	Positive	Negative
Survival status of child: alive	2.2	95.5
dead	0.11	2.0
Age at death: 1 week	6.7	6.7
1 month	0	20
1 year	0	33.3
Sons who have died: 0	2.1	84.9
1	0.4	10.7
2	0	1.5
3	0	0.5
Daughters who have died: 0	2.3	89.2
1	0	7.2
2	0.1	0.9
3	0	0.4

4.5 Multivariate Analysis for Diabetics and Infant Mortality and the Socio Demographic Variables.

Table 6 below shows the multivariable of the diabetic prevalence, infant mortality together with some of its socio-demographic variables. Table 6 summarizes what has been discussed in this chapter, from the table it can be seen that the women who were interviewed showed low levels of infant mortality regardless of their status and also the majority of the interviewed women depicted a negative diagnosis towards diabetics. Table 6 also shows that the majority of women who were interviewed come from the rural areas.

Table6: Multivariate Analysis of the Variables

Characteristics	Frequency (percentages)
Child is alive	
No	2.1
Yes	97.8
Diabetic status	
Positive	2.4
negative	97.6
Residence	
Urban	26.8
rural	73.2
Sons who died	
0	86.0
1	11.8
2	1.7
3	0.6
Daughters who died	
0	90.6
1	8.0
2	1.0
3	0.4
Age	
15-19	4.6
20-24	19.7
25-29	21.8
30-34	18.3
35-39	11.8
40-44	12.5
45-49	11.4

5.0 CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.1 Introduction

This chapter presents the summary and conclusions of the key findings of the research project and will also offer recommendations in the end of how problems facing the research questions might be best addressed in the future. The summary will try to align the literature in chapter two and the data analysis.

5.2 Summary of key findings

5.2.1 Prevalence of Diabetes

From the literature, it was reported by Eugene et al (1999) that blacks were 1.7 times likely to develop diabetes than whites and that the prevalence of diabetes among blacks had quadrupled during the past 30 years. Also the NHISA (1993) showed the prevalence of known physician-diagnosed diabetes among African Americans to be 3.7 percent, taking this into consideration and comparing it with the data analysis we find that 2 percent of women were diagnosed with diabetes which supports the literature. The analysis also showed that the majority of women diagnosed with diabetes are in the ages 20 and above which is supported by the report given by Eugene et al (1999) stating that among blacks aged 20 and older about 2.3 million have diabetes.

5.2.2 Medication and Treatment Taken

Literature says that although diabetes cannot be cured, it can be managed, controlled and treated; and that treatment includes oral medication or insulin injection (CDCP, 1999). In support of this statement, Table 2 of the data analysis shows that 52.6 percent of women diagnosed with diabetes were taking medication and that 60 percent took their medication orally while 40 percent used injection which is also in support of the report given by the CDCP (1999) that approximately 40 percent of people with type 2 diabetes require insulin injection.

5.2.3 Socio-Demographic Comparisons of Diabetic Women

The prevalence of diabetes in women was shown to be higher in urban areas than rural areas which can be attributed to the poor lifestyles experienced in urban areas, this gives a true reflection of what was reported by Paradies et al (2007) stating that social disadvantage and aspects of the social environment linked to poverty are responsible for the high rates of diabetes among populations. Moreover, the economically active age group seemed to have a higher degree of diabetes diagnosis which supports the statement given by the American Diabetes Association (1995) that individuals because of work habits do not take good care of themselves.

5.2.4 Prevalence of Mortality among Diabetic Women

Although the Hyperglycemia and Adverse Pregnancy Outcomes (HAPO) study showed that there is a continuous association between maternal blood glucose levels below those diagnostic of diabetes and adverse outcomes (Stats SA, 2013) and research by Butle (2000) attaining that diabetes has long been associated with maternal and perinatal morbidity and mortality the data analysis shows otherwise. This is shown from Table 6 where prevalence of diabetes in women seems to have no greater effect in infant mortality but in fact a higher prevalence of infant mortality can be seen in women with no diabetes.

5.3 Conclusion

To conclude, it can be seen that the data analyzed in chapter four corresponds with the literature which was expressed in chapter two and this gives a clear indication that this paper holds truth in it and that in fact there is correlation between diabetes and infant mortality.

5.4 Recommendations

The following recommendations are made with the intention that it may improve the livelihood of the Basotho people, improve their health status and ensure that decreased infant mortality rates are experienced as from the research it is apparent that Lesotho is facing major problems regarding its infant mortality levels.

As noted in chapter two of this research; there is no proof that Lesotho has conducted any study regarding how diabetes may play an impacting role in the rise of infant mortality. Therefore my first recommendation would be that the government takes measures in ensuring that research is conducted about this matter as they have the necessary time and manpower to conduct it. Because even though this study may be small it has proved through literature that diabetes is a problem that highly affects infant mortality.

Secondly, I think that it would be wise for the Ministry of Health to take initiatives in ensuring that news and information about diabetes are spread throughout the country in order for people to have knowledge that would help them in improving their health. This suggestions comes through because of the prevalence of women who were not taking their medication to treat their diabetes, it is apparent that they do not know how deadly diabetes is otherwise they would take their medication.

Finally it would be of great importance if during antenatal services pregnant women are also made aware of the dangers of diabetes to both their health and the survival of the baby.

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