

**CHILD OBESITY DETERMINANTS AND MANAGEMENT: AN EMERGING
PANDEMIC IN THE CITY OF GABORONE, BOTSWANA.**

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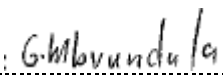
**A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE
REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTERS IN
PUBLIC HEALTH OF
MOUNT KENYA UNIVERSITY**

JULY 2021

DECLARATION AND APPROVAL

Declaration by the Student

I declare that this write up consists of my original work, prepared by me with the guidance of my supervisors.


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Approval by the Supervisors

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DEDICATION

This project was possible because of my wife Ofile Mbvundula and Ethan and Ryan Mbvundula's support understanding and contribution throughout the study. Thus I dedicate it to them.

ACKNOWLEDGEMENT

I wish to acknowledge the assistance from my supervisors Dr Juma Nyamai and Professor Eliab Some, for their guidance in the development of this project. The opportunity to carry out this project granted by Mount Kenya University and all lecturers and colleagues for their input and patience. My heartfelt gratitude goes to my family for the continual support rendered throughout the project.

My sincere gratitude also goes to Mr Petros Gomwe, Mr Cebo Sibutha and Fines Manzira for their assistance in proof reading my work and assistance with data analysis. Their assistance was essential in getting the work done, sleepless nights to meet deadlines and unwavering support throughout the study.

Dr Jackline Nyimbiri who was based at Mount Kenya University faculty at the start of my dissertation and was willing to guide and share all relevant stages required to meet the requirements. Her guidance and support was not taken for granted through her assistance I was able to progress to completion of this dissertation.

Mr Pertson and Dr Mogere of the school of postgraduate studies guidance was essential and key in completion of this dissertation. Standardization of the report in terms of margins and also Dr Mogere my correction supervisor took his time to guide and lead this work to completion. Forever grateful to you both for the assistance rendered.

ABSTRACT

World Health Organization estimated “overweight and obesity to cause 3, 4 million deaths, 3.9% of quality years lost and 3.8% of disability-adjusted life years (DALYs) worldwide”. These alarming figures are a growing concern of adult Obesity emanating from effects of the child Obesity, which has reached pandemic status globally in the developed world and gradually creeping in regionally and nationally at an alarming rate, becoming a major public health issue. The past three years has shown the greatest increase of recorded child obesity cases across Africa and Botswana being in the top three. This alarming increase is worrisome looking at the fact that obese children eventually lead to obese Adults while it is completely avoidable and preventable. This study investigates child obesity based on the following objectives. To identify Socio-economic factors that influences Child Obesity. To determine effects of Child Obesity. To establish Parents role is controlling Obesity Gaborone. To analyze relevant interventions that is already in place. The literature of this study was reviewed to determine the extent of child obesity in Botswana and current implemented health interventions to curb the problem. A descriptive cross sectional study design was initiated to describe current obesity trends, buying behaviours, child obesity perceptions, and to analyse current implemented measures to curb child obesity. The major concerns of child obesity lies in mental disorders such as anxiety, depression and Low self-esteem, affects quality of life and attributed to social problems such as bullying and stigma with high incidences of cardiovascular diseases, mental clinical depression, physical injuries and deterioration in educational performance. Ethical issues were highly considered as obesity is a sensitive issue and a signed consent was sought from all participating parents before commencing the research. The study has established that common cause of obesity amongst under 5 children of Gaborone top being food as 80% of respondents agreed food is the main contributor while 55% selected inactivity. Government has no strategies in place to regulate food entering Botswana and the nutritional value of food given to children. The study established that maternal employment; lifestyle, food, buying and eating habits are the number one contributors of child obesity. Lack of outdoor facilities and lack of governmental food regulations also contribute to high prevalence of child obesity in the city of Gaborone. There’s need to sensitize people about the high prevalence of child obesity and show them the dangerous of obesity from infant stages to adulthood. Physical education should be more of practical than theory. Play time should be included in the curriculum of children to encourage the physical aspect of the children as most of them are not physical at home.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIDS	:	Acquired Immune Deficiency Syndrome
BBC	:	British Broadcasting Corporation
BMI	:	Body Mass Index
CDC	:	Center for Disease Control
CFC	:	Choppies Fried Chicken
GYM	:	Gymnasium
HBM	:	Health Belief Model
HIV	:	Human Immunodeficiency Virus
KFC	:	Kentucky Fried Chicken
NCDs	:	Non Communicable Diseases
NGO	:	Non-Governmental Organization
US	:	United States of America
WHO	:	World Health Organization

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The chapter introduces the Child Obesity trends in the City of Gaborone in Botswana and beyond. Focusing on the increase of prevalence's that have never been recorded before in history. The growing trends have led to a global shift in the health of children and disrupted their quality of life having an impact on their day to day learning.

1.1 Background to the study

Body Mass Index is the common measure for obesity recognized across the world. Which is defined as “a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults” (Dc, 2015).

Obesity has been on the rise over the past years and poses a great challenge to public health and has become a major 21st century problem. This has always been recognized a major problem in the developed countries while the developing countries was spared but of late the developing countries is inheriting problems of developed nations. Obesity is slowly affecting low to middle income countries; problem is highly concentrated in the urban centers or towns. “Global statistics have been on the rise, 41 million under 5 children were recorded to be obese in 2016 in Asia and one quarter lived in Africa as per World Health Organization”.

The danger of child obesity is the high likelihood of obese children becoming obese adults. The shocking child obesity statistics would bread unproductive adults thus affecting the general work force including the GDP hence straining government to provide for its citizens. Increased obesity in adults also leads to dependency on health care for cardiovascular and diabetes diseases.

Obesity and overweight can easily be preventable during childhood rather than at adult stage. Hence child obesity prevention should be a priority at child hood in all communities, strategies and policies should be implemented to fight child obesity.

“Policies and strategies should be implemented to ensure necessary actions are taken against the growing pandemic, to safe guard the health of nation as the children we raise today will become the adults of tomorrow, an obese nation now will be an obese nation in future”.

“A lot of efforts have been put into fighting diabetes and obesity in the developed countries, but few strategies are in place in place in developing nations” (Control, 2013-2016). “Statistics have indicated an influx of obesity cases among under-fives projected over the next three years in developing countries hence the need to introduce measures to curb the condition before it gets out of hand” (Anrig, 2019).

A lot of efforts have been put into fighting diabetes and obesity in the developed countries, but few strategies are in place in place in developing nations. Statistics have indicated an influx of obesity cases among under-fives projected over the next three years in developing countries hence the need to introduce measures to curb the condition before it gets out of hand.

Obesity burden id vast at present across the world, statistics predict figures will worsen over the next years looking at the statistics trends and life style changes show the problem will worsen over the next years. In 2010, 43 million children across the world were obese (35 million were concentrated in developing) were overweight and obese, while 92 million were at risk of being overweight.

The global prevalence of childhood overweight and obesity increased from 4.2% in 1990 to 6.7% in 2010. Such a trend is expected to continue and the prevalence may

reach 9.1% or approximately 60 million children in 2020. In developing countries, the combined prevalence was 6.1% in 2010 and may reach 8.6% in 2020.

Childhood overweight and obesity have increased dramatically since 1990. It is beyond the scope of this review to examine the drivers of the current obesity epidemic in depth; however, a growing body of research identifies the important contributions of globalization and the resultant and many profound changes in society, living environments and individual behavioral patterns. Economic growth, modernization, urbanization and the globalization of food markets are additional forces. The impact of global exchanges of trade, information and culture, made possible by new information technologies, on health-related behaviors such as dietary intakes are likely considerable as well, though are not yet well understood.

“World health Organization reports an increase in child obesity cases in some developing countries”, “the prevalence of child overweight and obesity has increased tremendously over the past two decades, with the combined prevalence within some sub-regions and population groups reaching levels of prevalence on par with some industrialized countries”. “This is especially the case in countries that have are in the midst of rapid social economic transitions (e.g. China, Brazil and Mexico). “China, in particular, is illustrative of dramatic increases in obesity and overweight prevalence that outpace rates observed in industrialized countries”

The current global childhood obesity epidemic is estimated in African countries especially Botswana due to unavailability of data resulting from insufficient researches that have been done around the subject but the few available data shows an increase in cases especially from the local monthly weigh monitoring. “The lack of up-to-date, comparable and representative data from developing countries against the developed. In addition, past studies have included dissimilar study samples (e.g. regarding age and

SES) and used different criteria (e.g. cut-off points) to define obesity. Such makes it difficult to compare findings.

Child obesity prevalence has been on the rise in the past 5 years in the city of Gaborone Botswana and international as indicated in figure 1.

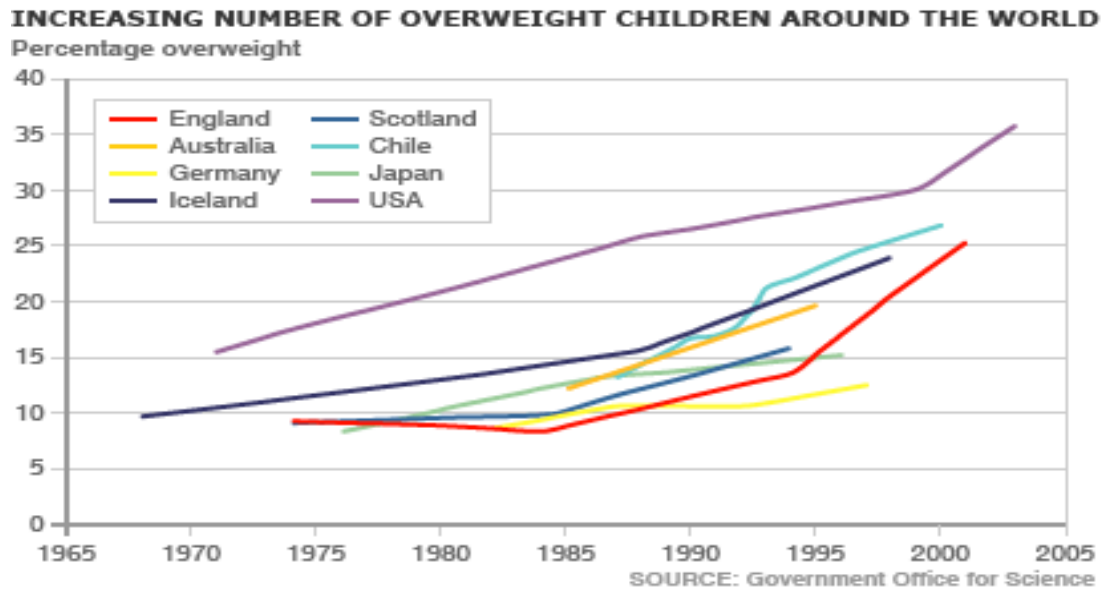


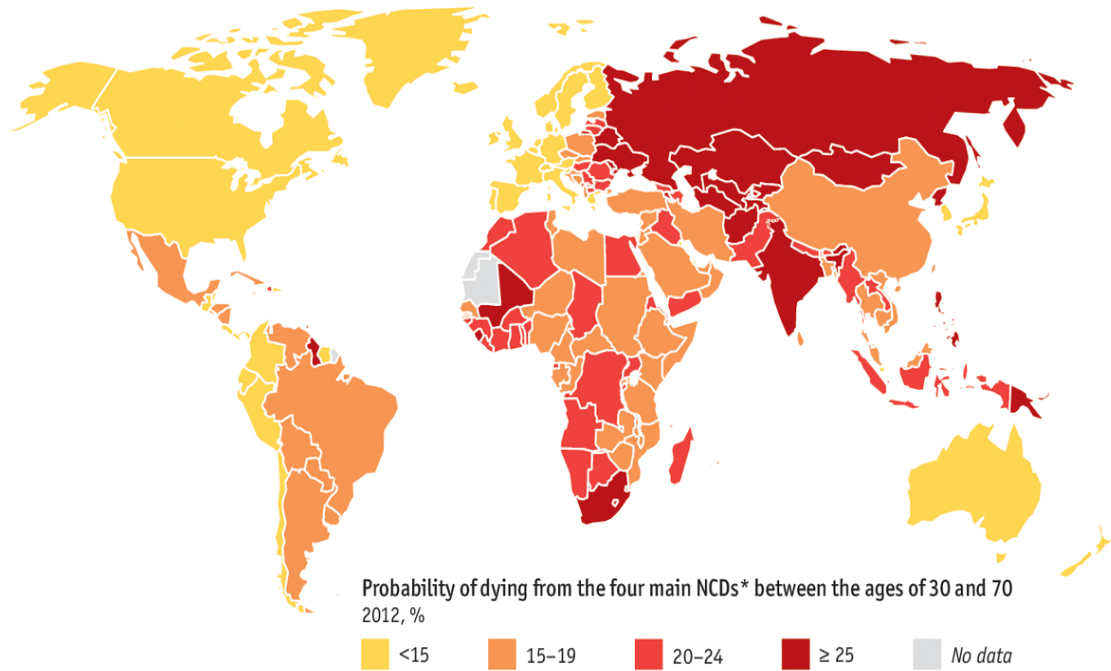
Figure 1: Growing trends of Child obesity around the world

Source: Government Office Science United Kingdom (2003)

The rise in figures has increased children’s risks of compromised physical and mental wellbeing which has led to a drop in academic performance for most learners under the age of 5 and increased number of outpatient visits in hospitals. Child Obesity has always been a challenge in the developed continents but has never gathered the same recognition and attention in developing countries but due to these escalating figures, it’s high time we focus on this phenomenon before it gets out of hand. In a research carried out in 2013 on stunted growth in Botswana, which also documented obesity figures as it was attributed as a contributing factor to stunted growth Under Nutrition. The research stated that 50% of adults and 12% of children were obese in Botswana translating to 26 000 of general children’s population (Nutrilite, 2013).

City of Gaborone has been home to many international food outlets like KFC, Chicken licken, Bimbos, Barceló's, ChisaNyama, Debonairs Pizza, Nandos just to mention a few, some having 4 branches strategically located within the city. Majority of Batswana prefer to eat out due to life style circumstances such as high cost of living, that have led both parents to seek employment to meet daily needs, and contributed to compromised health standards and eating habits for their children, as favorite snacks now range from a packet of chips, ice cream, fizzy drinks, fresh chips that are usually high in fats and sugar opposed to fruits, juices and vegetable sandwiches. Technological advancements have also disadvantaged our children in that they are no longer active; TV and computer games now keep them occupied. Figure 2 shows the probability of premature deaths caused by non-communicable diseases by percentage across the globe. This is relevant information in that obese children become obese adults over time. When adequate measures are not put into place the numbers of deaths will increase over time in the next years.

Probability of dying prematurely from non-communicable diseases



Source: WHO

*Non-communicable diseases: cardiovascular diseases, cancer, chronic respiratory diseases and diabetes

Economist.com

Figure 2: Probability of dying prematurely from NCDs

Source: World Health Organization (2015)

1.2 Statement of the problem

Below 5 Child Obesity pandemic and associated diseases poses serious public health challenges globally and locally. Statistics are escalating daily; greatest concern is the increase and prevalence of Non-Communicable diseases in under 5 children. Overweight and obesity adverse effects significantly affect the physical and psychosocial health aspects either short or long term basis. Obese under 5 children usually become obese youth and eventually obese adults. The more obese children we have now the greater number of Obese adults will have in future thus we breeding a generation of obese adults that will have adverse consequences on the health system and economy. Heart associated diseases; high blood pressure and fat content are associated with obese youth and adults. While obese adolescents and children's are at

risk of physical injuries such as bone and joint fractures, sleep disorders, and castigation therefore affecting negatively the confidence and self-regard of the obese child. Lastly obese teenagers are at risk of using medical services more than their counterparts with normal weight and therefore at risk of obesity associated problems such as Type II diabetes, cancer osteoarthritis and stroke (General, 2013).

“Obese children tend to use medical services such as hospitalizations and clinic visits more often than their healthy weight counterparts (all, 2014) Beyond physical complications, children who are obese tend to have poorer health related quality of life (Wake H, 2017) lower self-esteem (S, 2015), and poor body image and related health risk behaviors e.g., dieting” (Vander Wal & Thelen, 2000). Psychological concerns have been linked to Obesity such as social isolation, low self-esteem, and depression (CDC, 2017).

An informed nation makes the right daily decisions concerning their health. The world health organization in 2010 reports an estimated 42 million of under-fives world over and the number has tripled over the years due to life style changes and food preferences as indicated in figure 3. Under five overweight as a major public health concern of the 21st century, in Botswana, Africa and the World.

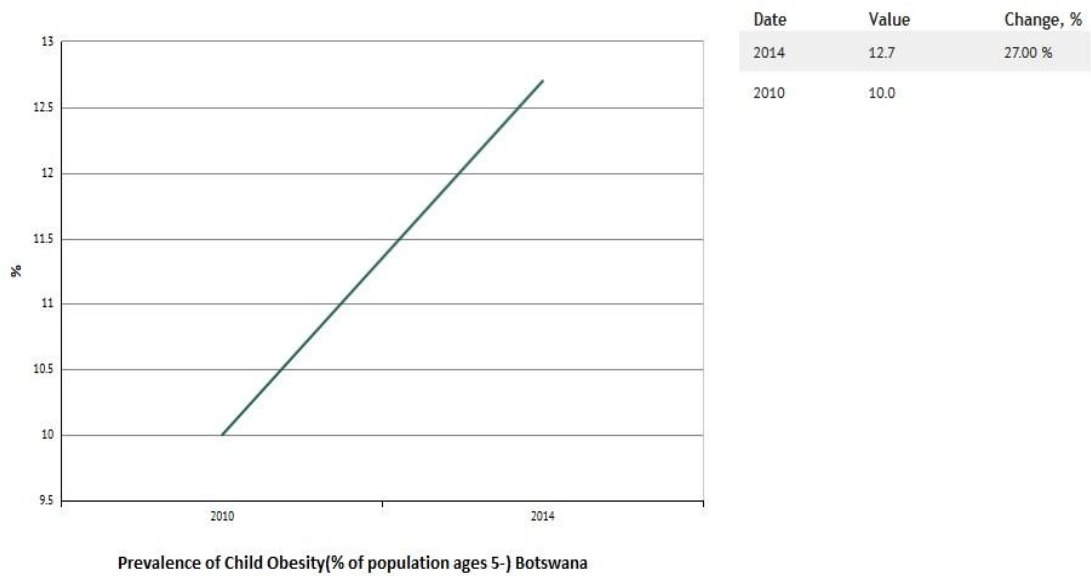


Figure 3: Prevalence of Child Obesity under 5 Gaborone Botswana

Source: World Health Organization (2014)

1.3 Objectives of the study

1.3.1 General Objectives

This write up investigated under 5 obesity determinants, prevalence and management, as an emerging pandemic in the city of Gaborone, Botswana.

1.3.2 Specific objectives

- i. To identify Socio-economic factors that influences Child Obesity.
- ii. To determine effects of Child Obesity
- iii. To establish Parents role is controlling Obesity Gaborone.
- iv. To analyze relevant interventions that is already in place.

1.4 Research Questions

- i. What Socio-economic factors influence child obesity in Gaborone?
- ii. What are effects of child?
- iii. What's the role of parents in controlling child obesity?
- iv. Are obesity management measures adequate in controlling obesity?

1.5 Research Hypothesis

- i. **H₀**: life style choices contribute to child obesity cases in Botswana.
- ii. **H₁**: lifestyle choices do not contribute to child obesity.

1.6 Significance of the Study

Obesity has always been a concern of developed countries and has been classified as a pandemic in many. Developing countries are now facing the same obesity problem which the developing countries been having for many years and yet it hasn't been labeled a pandemic status. Child obesity escalates during the first teen years and is irreversible once it persists into adulthood, thus exposing the adults to cardiovascular diseases. The findings of this research consolidated common causes of obesity that have contributed to the escalating numbers of obese children in Gaborone, adequate measures for managing the pandemic will be established form the research findings and relevant interventions implemented to control and reduce child obesity case. The findings will start conversations with relevant stakeholders to minimize the effects of the obesity scourge thus the following stakeholders will benefit from this research.

1.6.1 Government

Population health impacts can be managed through addressing socioeconomic factors, such as poverty and illiteracy levels. Interventions of this magnitude of reconditioning socio economic levels require broad societal change only initiated at Government level through established policies. The research will assist government officials to initiate policies that will help curb child obesity to reduce the long term effects that continue to adult hood and contributes to burden of Non Communicable diseases. Increasing physical activity, improving nutrition are key factors that can be established by Government at policy level to prevent and control the scourge at national level. Measures can also be put in place to reverse adult obesity as it stands at 50% of the

total adult population to reduce disease burden on the growing economy. Reducing availability and access to daily fast foods in the society can reduce child obesity, Changing food environment, Nutrition education, altering fast food prices reduces obesity chances significantly at community level as organic foods are scarce and highly priced as opposed to fast foods, shifting our exposure of fast foods to healthier alternatives, and improving the image of healthy food through positive marketing which eventually will make unhealthy food less attractive (Frieden, 2015).

1.6.2 Non-Governmental Organizations

Non-governmental organizations will be able to see the extent of child obesity effects on the economy of Botswana and the significance of initiating controls to curb the pandemic as early as possible. Ngos have the power to influence government policies to be acted upon to curb the problem and also work for example In November 2016 Ngos persuaded Chilean authorities to sue Nestle and Kellogg's for using children characters on packaging of unhealthy food, which was a breach of international labeling laws. Ngos can enforce any international laws relating to sugar content and fat that affects children directly those haven't been acted upon by government. Due to influence that Ngos have, financial stand and resources, they can complement government efforts in establishing interventions that curb child obesity through findings from this research. (Control, 2013-2016).

1.6.3 The Community

The greatest beneficiary of this research will be the community. They are directly affected by the effects of child obesity and disease burdens. It's easier when they are in the fore front of initiating, encouraging and promoting healthier living among community members. Community members will be able to recognize and appreciate

child obesity causes and effects including cultural beliefs and affiliations that promote child obesity that have to be done away with (Health, 2018).

1.6.4 Researchers

The research findings will open avenues for further research to fully deal with the phenomena from all aspects of life. Child obesity is a broad topic and my research does not cover specific areas that can be actively endeavored into by other researchers. Findings can be examinable by other researchers, methodologies replicated to further researches, and knowledge applied to real world daily situations for greater good of populations. Thus opening global avenues to initiate effective health programs worldwide (Freedman, 2020).

1.6.5 International Development Partners

The research will help to solicit funds to initiate health programs and interventions. International Development partners have unlimited resources and funds that will be ideal to get certain programs underway to curb the obesity problem. Working closely with governments, donor organizations and the private sector, development solutions that are both effective and sustainable can be established due to findings of this research (Freedman, 2020).

1.6.6 Civil Society

Civil societies in Botswana are usually focused on HIV/AIDS treatment and it's high time they realize other areas of concern that are slowly emerging and crippling the economy with reference to developed countries. Civil societies work in partnership with communities and make it easier for them to influence community members on implemented health programs to promote healthy living life styles for all within the country. Main focus of implemented Civil Society programs are treatment based with the findings of this research focus may shift from treatment to prevention as its

essential to have promotions and education that is timely and relevant to the community to curb the abnormality (Frieden, 2015).

1.7 Scope of the Study

The study focused on underpinning child obesity determinant factors that have led to the escalating statistics of obese children cases in Botswana. I mainly focused on Under 5 Children as they are the study subjects, eating, and food buying preferences, food perceptions will be solicited from parents, guardians and care givers. In that Children have no much control over what they eat. This research took place in the Capital City of Botswana which is Gaborone as it has recorded the largest increase in overweight /Obese Children and the trend is usually the same to all other major cities in Botswana in terms of eating and buying habits.

The study included all children and their parents or guardians who have a BMI of ≥ 30 kg/m², as the child is categorized to be obese. Analyze current obesity interventions implemented in Botswana. Body mass index for age percentiles were also utilized to determine obesity levels.”85th to less than the 95th percentile will be considered overweight while equal to or greater than 95th percentile will be considered obese”. The idea is to understand why the children scored such readings and what has led to the stats. Researcher also included obese parents with children to investigate the probability of their children also being obese due to parents eating habits and buying preferences. Field work took two months while 10 months was devoted to developing the proposal and sought approval.

1.7.1 Time Scope

The project was done within a period of a year from the month of June 2017 to June 2018 to fulfil academic requirements and obligation. This ample time to compile

project proposal, disseminate “data collection tools, collect data, analyze data, interpret collected data and communicate findings” (Post Graduate Students handbook, 2016).

1.7.2 Geographical Location Scope

Gaborone being the capital city of Botswana has a “population of 231,626 according to the last 2011 census which is about 10% of the total population of Botswana. Gaborone is situated at Kgale and Oodi Hills, on the Notwane River in the south-eastern corner of Botswana, and 15 kilometers (9.3 mi) from the South African border”. (Botswana, population census, 2010).

Gaborone accommodates Central Business District of Botswana hence the population highly composed of majority of young business professionals. The older generations of business professionals choose to leave on the outskirts of Gaborone in the Suburbs of Phakalane, Block 10 Kumakwane and Mokolodi. These are low density areas (<http://www.maplandia.com/botswana/gaborone-region/bamaletetlokweg/gaborone/>).

1.7.3 Concept Scope

The project focused on child obesity determinants, prevalence and management as an emerging pandemic in Gaborone, analyze current implemented interventions to curb the situation and establish cost effective measures to manage child obesity as an emerging pandemic in the city of Gaborone. Obesity has reached pandemic status in developed countries and increased Non-Communicable diseases hence this research to manage and understand obesity in our own context and manage before getting out of hand.

1.7.4 Target Scope

The project targeted under five children to develop an understanding of determinants that propel child obesity that have led to the high prevalence of child obesity cases in the city of Gaborone over the years. Parents, guardians and teachers were engaged to

understand their food a preference, buying attitudes and pre-conceived obesity believes, and their role in avoiding obesity cases as they mingle with under 5 toddlers daily.

1.8 Limitations of Study

- i. Validating information given from respondents was difficult as respondents answered from their own point of view there was need for further investigation.
- ii. Food outlets feared to give information in fear of losing business in that their core business is fast foods will have to investigate while undercover or engage customers for accurate information.
- iii. Some parents were reluctant in sharing their eating and food buying habits may be necessary to share with them how the research will benefit for them share correct information.
- iv. It may be difficult to collect relevant precise information from under 5 kids and will need to really on information given by parents, guardians and teachers.

1.9 Delimitations of the Study

- i. Comparison of numerous responds will be ideal to validate consistency of information for interpretation.
- ii. Will explain the importance of the research to them as food outlets as they will be in a better position to make profound decisions that won't deter customers health
- iii. Relevance of the information corrected will be explained including how the collected information will be handled in that the information is not to expose or disrespect their ways of life but improve their standards of living.
- iv. Parents, guardians and teachers will give more information concerning the children's eating habits that are more relevant than from the children themselves.

- v. Researcher may not be able to cover the greater part of Gaborone but will sample from areas that have majority of obese children.

1.10 Assumptions of the Study

- i. All interview respondents answered honestly and not pressured by any means reflecting their own opinions.
- ii. The survey tools are adequately assessed reflecting parents, guardian's food perception of child obesity to enable initiation of relevant prevention strategies.

1.11 Definitions of Key Terms

Child obesity: Excessive fat accumulation in children under the age of 5 that presents health risks. BMI will be used to measure obesity (WHO, 2016).

Prevalence: Child obesity is widespread in Gaborone due to high incidences that have been occurring over time and has reached pandemic status (Dc, 2015).

Management: The process of controlling the Obesity scourge either through establishing preventative measures, initiating educational programs, and promoting current interventions already in place or implementing measures to control the current condition (Borys, 2014).

Emerging: Child obesity was unheard of in Botswana and Africa and recently it's become prominent due to escalating statistics that have been attributed to life style changes and daily life choices resulting from modern ways of living (WHO, 2016).

Pandemic: Child obesity is widespread worldwide and a burden on the economy of Botswana as a developing country and resources and finances are still limited especially that the ministry of health focuses on curative measures as opposed to preventive (WHO, 2016).

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The chapter will explore views of other researchers on child obesity on a global and local level on theoretical literature, conceptual framework. Gaps within the field of study carried out by previous researches will be examined in this section.

2.1 Literature Review

Children have always been recognised as the future leaders of the world and with current obesity trends the future of the world is greatly threatened and soon will be doomed if measures are not put into place while we still can to reduce obesity trends and high prevalence's. Research has proved that obesity rates have been on the rise in the past years in Botswana and the world over. History has proved that obese children continue to obese adults and the effects are irreversible at a later age (Anrig, 2019).

Overweight and obesity have high economic costs considering regular outpatient visits and low quality of life. A 1998 research estimated "related medical costs for overweight and obesity to 9.1 percent of total U.S. medical expenditures, or roughly \$78.5 billion", Meaning obesity does not only affect the quality of life for the individual but also has an impact on the economy in relation to demands for care as opposed to healthier counterparts. Majority of literature suggest culprits of child obesity range from social, economic and environmental factors. Other sectors of the issue have never reached much recognition as family perceptions, buying habits, cultural food beliefs including parent's involvement influencing obesity (Finkelstein, 2016).

2.2 Theoretical literature review

2.2.1 Theory of planned Behavior

“Different methods, approaches and programs are available, but effectively changing obesity related lifestyles’ and behavior choices will require a collective approach joined action from government, private and non-governmental organizations as well as individual and their families” (Philips, F. 2012).

The British Heart Foundation states that “parents play a vital role in encouraging children to be active, what they think about physical activity and how active they become, in a research carried out by the heart foundation, it was established that 79% of primary school learners who live less than 2 miles (3.2km) from school; which is walking distance but only 54% of children walk to school” (British Heart foundation,2016). However Philips put the blame of under-five over weight on parents who fail to recognize when their children are obese and take necessary measures to control the situation (Philips, F. 2018).

Childhood obesity causes may differ amongst researchers; common culprits could be insufficient food education, limited cooking skills, high cost of healthier alternative foods, and both parents working leading to improper feeding in the home especially buying fast foods, junk food marketing campaigns targeting kids (BBC News, Anon, 2014).

Redsell “suggests that childhood obesity is something that can be largely caused by parental ignorance and can be avoided if parents are properly educated about how to healthy feed their children and what constitutes a healthy weight” (Redsell et al, 2013).

2.2.2 Social Ecological Theory

The Social Ecological Model (McLeroy et al., 1988) an understanding of this theory is essential in tailor making intervention programs that suit cultural beliefs of the population in that their beliefs also contribute to the development of child obesity. It's also necessary to understand how best interview questions can be drawn in line with people's aspirations and beliefs to avoiding offending anyone during the research. "The model and theory are unique because the interaction between people, their physical environment, and its relationship to people at an intrapersonal, interpersonal and community levels are being examined" (Davison & Birch, 2019; Glanz, Rimer, & Viswanath, 2020). "Applying the Social Ecological Model and Social Cognitive Theory will allow the researcher to create and implement effective culturally tailored child obesity interventions. The five levels of the Social Ecological Model will be condensed to three for the purposes of intervention development and program planning (McKenzie, Neiger, & Thackeray", 2019).

2.2.3: Social Cognitive theory

The Social Cognitive Theory (Bandura, 1977) enables an understanding of personal, environmental and human behavior factors that influence dietary habits. This is ideal to the research study to develop interventions that are holistic considering all aspects of life that promote behavior change activities. This theory can easily be applied in health interventions targeting dietary change and physical activity habits (Glanz, Rimer, & Viswanath, 2018). Obesity to a certain extent is influenced by habits and individual life choices including the immediate environment.

2.2.4 The Health Belief Model (HBM)

The theory was adopted to demonstrate and anticipate a health behavior which is done by focusing on attitudes and beliefs of individuals. Broader areas can be identified in the theory (Conner & Norman, 2019):

- i. Preventive health behaviors, thus promotion of healthy habits such as organic foods and healthy lifestyles e.g. exercise and marketing of population initiatives such as taking vaccines and contraceptive practices.
- ii. Sick role behaviors, which refer to compliance with recommended medical regimens, usually following professional diagnosis of illness.
- iii. Encourage community members to use health facility regardless of the health problem. “The HBM is based on 4 pillars: the perceived threat and net benefits, perceived *susceptibility*,

Perceived *severity*, perceived *benefits*, and perceived *barriers*”. These principles are essential to monitor people’s readiness to act upon and stimulate behavior.

2.3 Empirical Review

The term Overweight is excessive body weight comprising of muscle, fat, water and bone. While obesity refers excessive amount of adipose or fat tissue (author, 2019).

2.3.1 Global Impact

“In children today, obesity is the most common metabolic and nutritional disease, whereas thirty years ago, obesity was rarely seen in children. In the past twenty years, there has been an exponential increase in the incidence of obesity among children”. A study done by Tremblay et al. (2020) indicated a 17% increase in obese boys and 15% increase among girls since 1981 to 1996. “Child obesity rates been escalating over the years in majority of the westernized countries and specifically in Canada. Rates were

similar in most countries like Scotland, Spain and England early 1980s and by 1990 Canadian rates rose by leaps and bounds. Canadian Press”, (2018).

2.3.2 Obesity Causes

Pediatrician Dr. Peter Nieman, (2020) identified insufficient exercise, genetics and over eating as the main causes of childhood obesity. He concluded that obesity is usually a combination of these three factors and never attributed to a single factor.

- i. Genetics contribute to obesity rarely. Hormonal cause attribute to one percent of obesity causes (Dc, 2015) “that is usually through mutations that lead to altered secretion of hormones or hormonal action. Through guidance from parents and guardians, these children can work hard to maintain a healthy weight”.
- ii. Overeating is one major contributing cause of obesity. Fast food burgers been increasing in size over the years leading to supersized kids with supersized problems (Kempster, 2019).

Cafeterias, food outlets and fast food restaurants serve food stuff with low nutritional value and high fat content, with vending machines strategically placed in all shopping malls serving soda and candy (Kempster, 2019).

A recent study in the Journal of Pediatrics showed that majority of children do not take vegetables in their diet due to fast food establishments around the society (King et al1999) the study was done from 1990 to 1998 showed great decline in the consumption of vegetable and fruits amongst grade six pupils. 30% of kids approximately 200 more calories in each meal through fast foods they consume, adding to 6 pounds of fat yearly. It’s upon government to establish policies that protect children from such damaging eating habits they affect longevity. Food choices and food preferences should be safe guarded (Kuntzman, 2020).

‘One contributing factor is lack of activity due to inability to enforce physical education in schools and home. More specifically development of grass roots sports. Grass roots sports has declined over the years hence reduced amount of play time during and after school that was devoted to physical activity’ (Anrig, 2019).

“Inactivity, video game playing and extensive hours of television watching increases the risk of being overweight by 17% to 44% and becoming obese by 10% to 61%. Physical activity such as bike riding, skating, and jumping rope have been replaced by television and computer games in the 21st century” (Anrig, 2019); (Kempster, 2019).

Children’s TV shows are coupled with fast foods adverts including presweetened cereals and studies have shown that the average child while indoors spends 25 hours weekly watching television and these hours are even higher in Africa more especially Botswana in that Television times are not monitored, parents use television as a way of reliving themselves from monitoring children (Media Awareness Network, 2020). Healthy food commercials make up only 4% of the daily advertising food campaigns, majority are fast foods (Oxford Count Board of Health, 2018).

Child Obesity cut across demographic settings it’s more related to income and family background. A study done by Williams concluded weight gain to be associated with parent’s weights. When parents are overweight, the children are at high risk of becoming obese also in that what the parents eat is what the children will eat too (Willms, 2020).

A 1998 study done by the Medical Journal in England showed that children between the age of 1 and 3 have no risk of obesity when parents are slightly overweight or normal. However children of the same age are endanger once the parents and siblings are overweight, they are at risk of becoming obesity through association as they have no control over what they eat or do (Dc, 2015).

2.3.3: Obesity Consequences

Diabetes, blood pressure, depression, increased levels of low self-esteem are associated with obesity including stroke, heart diseases and asthma for the younger generation. (Dc, 2015)“Low self-esteem and depression do not seem to be a direct effect of obesity, but Dr. Neiman (2016) points out that obese children might have many social and physiological problems. Obese children and teenagers have a greater chance of being teased about their weight leading to low self-esteem and depression and the greatest risk being the teenager becoming an overweight adults and the effects turn to be difficult to deal with at this stage” (Anrig, 2019).

It has been shown that more than 60% of overweight kids have at least one additional risk factor for heart disease and that more than 85% of kids are diagnosed with type II diabetes are obese or overweight (Partridge, 2003). At one point in time, type II diabetes and heart disease were thought to only affect adults. Heart disease and associated risk factors are not only common in adults, but also in teenagers and children. Which is very frightening in that the next generation of adults will have health problems that eminent from their childhood. (Canadian Press, 2017).

Botswana has been labeled as a developing country and yet obesity is on the rise as Africa has the fastest growing obesity rates among preschool going learners as indicated in the chat above. Pienaar in her research carried out in 2015 estimated that thirty million plus obese children live in third world countries, comparable to ten million that live in westernized world (Pienaar, 2015)

A number of health initiatives and programs are available while a lot can still be done, that would require joined up action from government, private sector and non-governmental organizations, and to effectively change obesity related lifestyles and

behavior choices. These strategies have to involve parents and guardians as they also contribute to the rising cases of obesity within the society (Atinson, 2019).

A survey from UK healthcare professionals suggested that children that gained weight faster than normal in the first six months were at greater risk of becoming over weight later in life. (Sarah Redsell, 2014). This theory was supported by an earlier research that concluded parents were not aware of what a healthy weight was in their children which meant when parents were not aware that their children had weight problems, and thus did nothing to control the condition. Educating parents of healthy diets, food preferences, eating habits could avoid ignorance that leads to child obesity in many cases (Sarah Redsell, 2014)

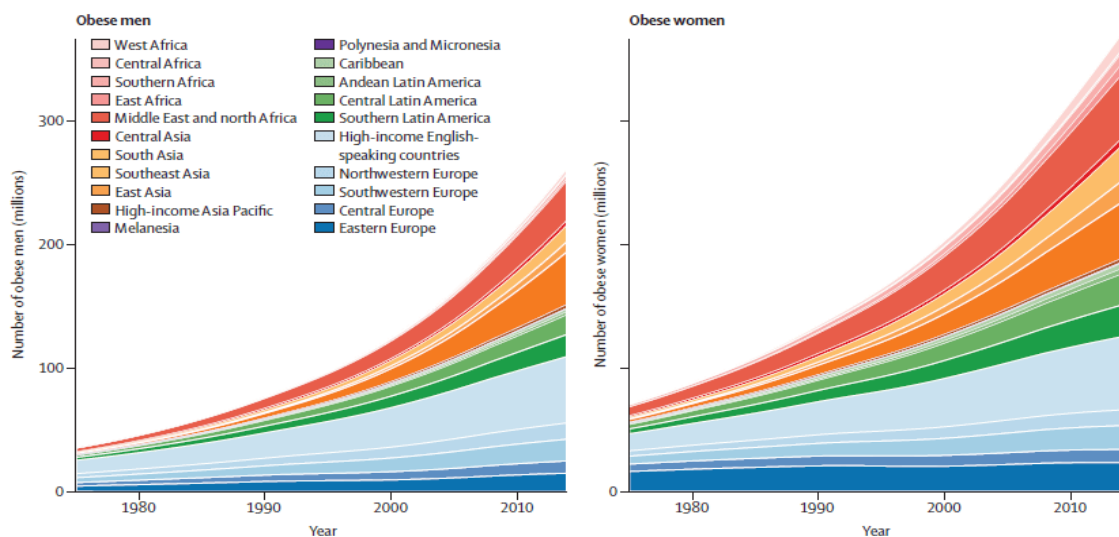


Figure 4: Obesity by Gender

Source: <http://www.ncdrisc.org/> (2013)

Obesity usually affects woman across nations as opposed to fathers and the fact the mothers remain with the children greater part of the day, it becomes very easy for the children to also become obese due to association with the mother. The mother provides for the children and whatever she eats the child eats too. If she eats unhealthy the child

will also eat unhealthy, thus it's essential to ensure that parents and guardians have adequate knowledge about food and diet to avoid such incidences.

2.3.4 Obesity Prevention and interventions

Obesity can be prevented and mitigated before conception, which can be done through education of parents to adopt healthy eating habits and thus avoiding high birthrate risks. Teaching, guiding and monitoring the child's development through routine checks will avoid child overweight and obesity and improve the quality of life of the future child. Some measures that can be initiated include reducing sugar content such as sweetened drinks, French fries and candy content and restrict food intake thus reducing quantity (Medbroadcast, 2015).

These are some of the literature I have reviewed with the aim of identifying areas that appeal to my research area and society and analyzed areas that were not researched by these scholars that would give more room for research.

2.4 Conceptual Framework

After reviewing various literatures on the topic, the conceptual framework for the study will be formulated as shown in figure 5.

The researcher concentrated on the modifiable aspects of the equations that form the direct causes of child obesity. Which include parental determinants, sleep, socio economic factors, life style, physical activity and diet. The modifiable causes can easily be manipulated through health interventions and health education and promotion. At times it's due to lack of knowledge as people are imbedded with their own societal beliefs on obesity and hence foresee the effects there off. Parents play a huge role in perpetuating obesity in that, they chose what the child eats and they are in control of the child's diet, they select what the child should take to school, they dictate the number of

hours the child should spend watching television or playing outside. All these factors contribute enormously to child obesity.

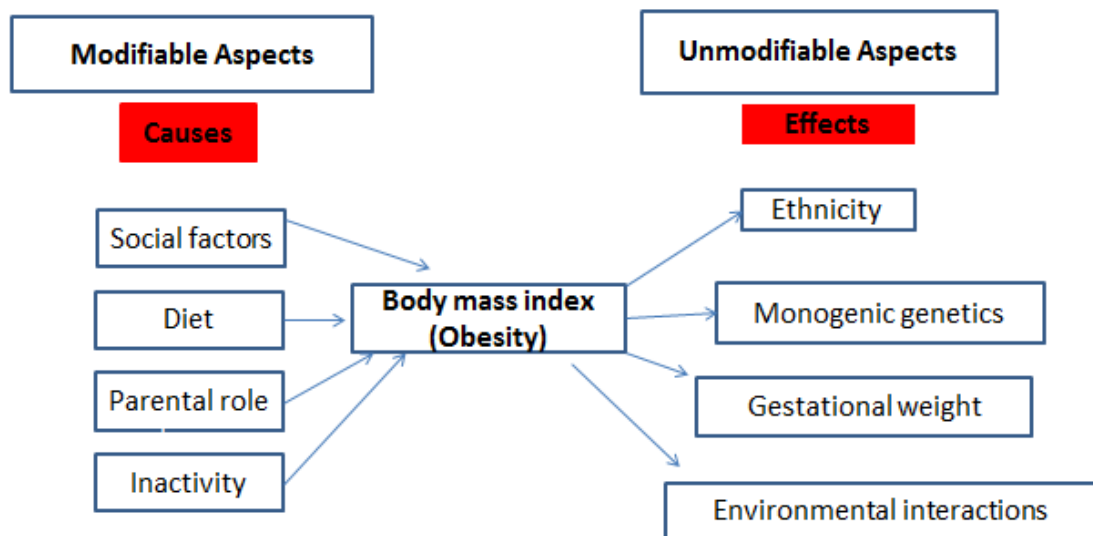


Figure 5: Conceptual Framework

Source: Researcher (2018)

2.5 Summary of conceptual framework

The chapter focused on risk factors that have led to the high prevalence of child obesity in the city of Gaborone Botswana. Figure 5 was developed after reviewing researched literature. I've resolved that other factors are modifiable and those are the factors the research will concentrate on that have emerged due to technological advances, modernization and life style. The modifiable factors include, parent's involvement in the health of their children. Modern parents work full time and have limited contact time with their children. Monitoring what they eat, when they eat and what they do in their free time, like monitoring television times and game play would be difficult.

This usually leads also to most children having taken outs and pre packed foods as opposed to warm cooked meals from home. This includes parent's perceptions on diet and food. Other factors will include life style changes that are mostly due to

socioeconomic status like family income, urbanization and gross national income. Other factors are not modifiable and the researcher will mention them for awareness sake but will not be the main focus for this research.

The unmodifiable effects become difficult to change as the person ages, hence its essential to manage and control obesity from infant stage .Manipulation of the causes from a tender age is key in manipulation of obesity levels in terms of food eaten, being active, including the environmental factors.

A study by Martin (2020) demonstrated how under 5 are affected by screen time which is one of the variables in the conceptual frame work. The children usually have behavioural problems, educational problems, Sleep problems amongst others. Hence it is important to ensure children are protected from all the variables that cause obesity for them to grow healthy with limited complications.

2.4 Summary of Literature Review

Behavior change strategies will be adopted to improve child obesity and interventions will be developed to improve the health of citizens and improve the quality of life. The main strategy being in preventing and rehabilitation for those already affected.

The main contributors of child obesity has predominantly been insufficient physical exercise, fatty food content, high sugar content leading to body fat build up. Policy regulation, legislation, social norms and cultural believes are also significant in improving health at national level.

“A broader understanding of socio-environmental theories can increase understanding of social and environmental trends that maximize opportunities for weight gain and minimize healthy lifestyle options, creating ‘obesogenic’ macro- and micro-environments”.

“This shifts our understanding of the obesity epidemic from a focus on the influence of individual health behaviors and genetic profile to recognition that there are broader influences on health status, including sociocultural influences on health behaviors that are now being reflected in population increases in weight”.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter defined procedures employed in the investigation in Gaborone Botswana. It also focused on how vital research facts were copulated, presented and translated to meet research needs raised in the first chapter. Research justification, design, instruments, finding presentations, techniques will be clearly stipulated in this chapter.

3.1 Research Design

A descriptive cross sectional study design was initiated to describe current obesity trends, buying behaviours, child obesity perceptions, and to analyse current implemented measures to curb child obesity the frequency and distribution. Findings and outcomes from this research will be analyzed to generate new theories concerning obesity in the city of Gaborone in Botswana.

Descriptive cross sectional studies are essential for answering where, when and how phenomena of a specific study population. As a result the researcher cannot manipulate research variables like in an experimental research but only observes and measures them (Mcombes, 2018).

The main reason for selecting descriptive type of research is it allowed the researcher to gather large volumes of data from the study population, describing the prevalence of child obesity in Botswana including soliciting for people's opinions on the causes and effects of child obesity in our society. The collected data was later analyzed and interpreted.

Another reason I settled for descriptive cross sectional study was on the basis that it allows the researcher to study numerous characteristics at a given time in terms of lifestyles, inactivity, parental involvement that might contribute to the rise of obesity

cases in Gaborone. Prevailing characteristics were also studied in terms of growing trends in trying to establish the reasons for the high prevalence.

A snapshot of the extent of problem in the public in terms of child obesity was established from the descriptive cross sectional and trends were concluded from the snapshot unlike in a longitudinal research where characteristics are studied over a longer period of time (Mcombes, 2018).

3.2 Research Approach

The study used a mixed method approach since it will involve the collection of both quantitative and qualitative data to explain child obesity trends in the city of Gaborone. Numerical data will also be collected that will be transformed into statistics to quantify attitudes, opinions and behaviors towards child obesity.

Quantitative methods are ideal for large sample sizes as a standard research instrument can be used to gather standardised responses that can easily be analysed and translated for quick analysis. A semi structured questionnaire is ideal for gathering opinions from the study population in relation to the asked questions and makes it easy for the researcher to probe the research subject to gain more insight from the respondent on the matter.

Advantages of Quantitative Methods

- A semi-structured questionnaire will allow the researcher to collect both quantitative and qualitative data which is equally useful for the study
- A quantitative research method allows the researcher to guide the direction of the research while maintain high objectivity and focus unlike in qualitative research.
- A quantitative method is very critical in testing the research hypothesis because it provides quantitative data that allows such tests to be performed

Disadvantages of Quantitative Methods

- It does not allow for detailed collection of data from the respondents.

- Structured questionnaires restrict the respondents from giving their full opinion only what is required is given as per the researcher's specifications.
- Data collected is so limiting that it may not be used to build and model new theories

Source:(Saunders, Lewis & Thornhill, 2015)

Qualitative Methods

A qualitative method will be used in this study to collect data that will enable the researcher to capture a holistic and contextual view of the study as it will enable the researcher to capture a holistic contextual view the problem at hand. A mixed method study enables the researcher to get answers that might have been missed through a single study method (Cronholm & Hjalmarsson 2017). A qualitative method use customised research instruments such as the interview guide. This allows the research to vary the questions as they collect data from the respondents.

Advantages of Qualitative Methods

The advantages of qualitative research methods include

- It allows collection of rich and detailed data from respondents
- The researcher has autonomy to manipulate the research instrument as they may choose to limit or add questions depending on how much each respondent is willing to share information on the asked question.
- It is ideal for small sample where detailed data has to be collected.

Disadvantages of Qualitative Methods

- The data collection methods are complex and time consuming
- The data collected is usually highly diversified and makes the process of data analysis to be complex
- The methods are highly vulnerable to subjectivity hence the outcomes or research conclusions are highly influenced by the researchers ability to consolidate the data obtained

Source: (Saunders, Lewis and Thornhill, 2015)

3.3 Target Population

“Target population is defined as all the members of a real or hypothetical set of people, Events or objects to which a researcher wishes to generalize the results of the research study” (Borg & Gall, 2013). Gaborone residents which is a total of 2 209 208 people of which 32.4% (364 807 males 350 888 are females) comprises of children between the age of 0-14 years according to Botswana demographics profile 2016 will be the target population. Main focus will be children under the age of 5 in relation to high rate of obesity among them but parents and guardians will also be involved to establish their dietary choices including child obesity perceptions. Three preschools will be selected and interview (Botswana, data portal, 2015).

Inclusion criteria based on guardians of students with obesity in the selected schools around Gaborone including gym instructors in the selected gym as per the sampling procedure. Including teachers and the selected schools to ascertain school menus, eating habits and physical activity allowed to the students as they play outdoors.

The exclusion included parents in the selected schools without obese children, as the main issue is to investigate what parents are feeding their children that can be a contributing factor to the rising obesity in the city of Gaborone. To read through the life of obese children and understand the way they are living and the life choices they make to see if the decision they take could be a contributing factor to the obesity.

Nursery schools were included in the research because teachers of under 5 children are basically in nursery schools, they are with the children at least for 8 hours in a day as parents will be at work. They are familiar with what the children eat, their eating habits and the common foods parents and guardians pack for their children. The fact the children are with teachers for prolonged times, its essential to also consider

interventions they have in place to keep children active and the diet they prescribe for the children as a school center.

Gymnasiums were included in the research to establish measures they have for under 5 children, if they do not have then ways of including such programs for children as they are getting obese just like their parents and need a solution to assist them fight the obesity challenge.

Food outlets are the mainly to gain a deeper understanding of eating habits and patterns of most parents in Gaborone and also what measures they have to combat child obesity. Opinions on whether food is a contributing factor to child obesity was established from food outlet owners as they meet children with their parents daily as they are too busy to have home cooked meals daily. Growing trends and changes in the population can easily be picked by food outlet owners as they are in contact with families every day.

Parents and guardians are the sole care takers of under 5 children. They are in capable of making their own decisions and parents decide for them most of the time. Food choices, when to eat, what to eat is normally decided by this strata. Hence their opinion on child obesity with is valid as they spend a lot of time with children and make most of the decisions for them. Play time, time spent watching television; gadget time is all decided by parents. Guardians and parents will be more knowledgeable and concerns could be taken as any effects of child obesity are felt by them. Taking children to the clinic when they are sick, the daily struggles of child obesity and also the determinant factors that may lead to obesity are perpetuated by this group hence the need to include them in the research.

A study by (Shaibu, 2015), conducted a perception research on adolescent obesity and body size. The study engaged parents to capture their views on the issue and parental involvement in reducing and curbing the situation from a guardian's point of view.

Guardians are an essential component in child obesity, they are influence and make most of the decisions for the child hence they are essential in a child obesity research.

A study by Corbett (2014) engaged food outlet and schools including parents on determining the perceptions of adolescent diet and obesity prevention in Botswana. The research was mainly focused on the body size perception amidst western culture influences of slim body types that put a lot of adolescents under pressure to gain a particular body type to fit in the community some even to fill loved and accepted in society and those with thicker fatter bodies are stigmatized hence leading to body shaming though our culture dictates thicker bodies to be acceptable and symbol of wealth and good living (Brown, 2014).another research done by Letamo an etl (2019) researched on determinants of overweight and obesity in adults in Botswana. The research paper engaged parents and gymnasiums for percepts and establishing control measures for adult obesity as a prevailing problem within Botswana as majority of adult are gaining over weight at alarming rate (Keetile, Navaneetham, & Letamo, 2019).

3.4 Sample Design

3.4.1 Sample Size determination

Sampling means “selecting a given number of subjects from a defined population as representative of that population. Any statements made about the sample should also be true of the population” Orodho, (2014). “It is however agreed that the larger the sample the smaller the sampling error”. Gay (20016) recommends at least of 20% the target population if less than 1000 members for educational research. Random sampling was used to get all members from different strata’s as chosen from parents and guardians, gymnasiums and school teachers. The idea was to establish the extent of the problem from different angles so as to implement a concrete solution to a pandemic at hand.

The sample size for parents, guardians, teachers and food providers will be based on Yamane’s formula (Yamane, 1967).

$$n = \frac{N}{1 + NE^2}$$

Where,

n = Sample Size

N= Total population (231,592)

e= margin of error (5% or 0.05)

Application of the formulae: $n = \frac{231,592}{(1+231,592) \times (0.05)^2} = 400$ participants

3.4.2 Proportionate sample size distribution

Table 1: Proportionate sample size distribution

Participants	Sample total
Parents/guardians/care takers	320
Schools	30
Gymnasiums	20
Food outlets	30
Sub Total	400

Source: Researcher (2018).

3.4.3 Sample Procedure

A stratified random sampling technique was used to select the participants, while purposive sampling technique was used to select the key informants among the stakeholders that perpetuate child obesity, being parents, food providers, guardians and school teachers. “Stratified random sampling technique ensures that different groups of a population are adequately represented in the sample. Stratified sampling divides the population into homogeneous groups such that the elements within each group are more

alike than the elements in the population as a whole” e.g. education of the parents may lead to a perception that obese children are an indication of “good living” while others do to the busyness of daily schedules chose to buy fast foods for their children as they are convenient and they can afford, socio-economic factors have a contributing factor to child obesity. Groups may include educational background, dietary knowledge, and full time house mothers (Pienaar, 2015).

3.5 Data Collection Methods

3.5.1 Data Collection Instruments

Three sets of Data surveys will used to gather data using a 12-question pencil and paper survey, which was distributed randomly. (to parents, food providers and schools) this will give a sample of eating habits, choice of foods, common foods children pack to school, level of physical activity at home and school, parents level of involvement in their children’s food choices, eating habits and being active.

Face to face interviews will also be initiated for the busy workers in the retail business that may not have time to answer the questionnaire form. Key respondents will be managers who are well vest with country regulations to understand if there are any laws governed by any local or any international food laws in terms of sugar and fat content in foods.

Interviews

Interviews are ideal for gathering in-depth data from the study population. This method allows the researcher to ask follow up questions for an in-depth understanding of the asked questions. Respondents can even give more answers than expected to the question thus gaining more insight into the question scope than initially anticipated.

The only major setback of this method of data collection is reliance on respondent's accuracy of given information. Information given was authenticated by comparing consistency of response given by numerous study subjects.

Questionnaires

An opened ended questionnaire will be used for data collection for respondents in the study population. The questionnaire was designed according to Likert scale with an open ended section to gather more insight from the respondent on a given question. A printed form was distributed to all respondents and collected after completion, some respondents opted to give the researcher a specific day when to collect the feedback while some completed and handed over to the researcher immediately after completion. Questionnaires don't have enough depth as interviews but have the following positive properties:

- Have high response rate as forms can easily be distributed to respondents and collected thereafter to as many people as possible in a study population.
- Less time and energy required to administer the data collection instrument as compared to interviews.
- Anonymity is one major factor that questionnaires offer, as respondents don't indicate their names on the respondents.

3.5.2 Administration of Data Collection Instruments

Primary data was collected from respondents through administering a questionnaire by the researcher to all levels of stakeholders. The researcher then collect completed questionnaires for analysis and interpretation.

3.5.3 Validity of instrument

All interviews would require prior setting of appointments with all concerned respondents. Each interview question took approximately 25-30 minutes. Interview guide paper was prepared for each interview question; responds recorded alongside each recorded question. Interviews were used so as to solicit further clarification from the respondents on the subject matter. Teachers in preschools, gym and food outlet managers will be interviewed

Daniel (1985) “a formalized list of questions that are used to solicit information from respondents. Structured and unstructured questions were used for this research”. Some respondents did not have a lot of time to tackle all open ended questions hence some will be closed questions with options to choose from to save the respondent’s time. The open ended questions will allow the respondent to relate their feelings concerning the subject matter. All questionnaires were self-administered, hand delivered and collected immediately when done as opposed to mailing them through post and email there’s no guarantee the questions will be responded to. Anonymity will be adhered to for all administered questionnaires to get honest responds from all interviewees.

Online poll/survey will be used to reach out to many at their convenience and comfort of their homes. Botswana has a rough estimate of 700 000 Facebook users according to Africa 2017 population and internet user’s statistics (group, 2016) the survey will be established in Gaborone based groups, where Gaborone residents can be reached (Sarah Redsell, 2014).

3.5.4 Reliability of instrument

A pilot study was done before the initial dissemination to gather data for the research from the target population, with the idea of establishing reliability of questionnaire and interview questions are understood and are not ambiguous in any way that may lead to different answers to the same question. Reliable data should be collected to establish accuracy of the research. The pilot test engaged 30 nursery learners and their parents at Gaborone University College of law early childhood teaching school. The questions should be consistent over time and should accurately represent the larger population. Consistency of collected responses from numerous stakeholders administered under the same conditions will test reliability (Kimberlin, 2017).

A measure of reliability would be “established by testing for both consistency and stability of a research instrument. Consistency indicates how well the items measuring a concept hang together as a set. Cronbach’s alpha will be initiated as reliability instrument coefficient that shows how well items in a set are positively correlated to one another Cronbach's alpha 0.77”; Bryant et al.(2018).

3.6 Data Analysis Procedure

All collected responses from the questionnaires were checked by the researcher to identify completion to all questions as required.

“Quantitative data was coded manually, organized, and analyzed using percentages and frequencies. The results were presented in tabulated form for easy interpretation. From the interviews, data was sifted through, sorted and coded. Qualitative data generated from questions were organized into themes, categories and patterns pertinent to the study. This helped identify information that will be relevant to the research questions and objectives”. Data from interviews will be sorted and categorized into established

patterns according to the research needs. This helps to sieve out relevant information for the research questions and objectives (Bala, 2019).

3.6.1 Pre Coding

This is a systematic approach assessing completion of data collection tools in terms of grouping ideas from respondents to be analyzed. Pre codes were developed during interviews and administering questionnaires that were later developed in broader themes during the thematic analysis. Only completed questionnaires were processed for analysis and those that answered the given question that will be beneficial in achieving the research objective.

3.6.2 Thematic Analysis

This is a systematic analysis of evaluating and identifying common patterns in qualitative collected data. Main themes were based on variables established from the conceptual framework in the literature review.

A phenomenological approach was used in analysis of the collected data to capture views, beliefs and experiences of respondents in terms of their eating habits, life styles including physical activity.

3.6.3 Think Description

The researcher will apply his thoughts and judgement when dealing with stakeholders to allow the smooth following of ideas throughout the research. Judgement will be given in relation to the study. The researcher applied his own experiences and narratives explaining situations as they happened including the background context of each issue necessary for understanding the relevance and the meaning of the social interaction from the researchers view point.

3.6.4 Statistical Package for Social Science (SPSS)

SPSS software was used to analyze quantitative data for analysis to aid interpretation based on the outcomes from the field. The collected data was presented in graphs, correlation regression and other functionalities. Data from Questionnaires was analyzed using SPSS.

3.6.5 Methodological triangulation

According to Bekhet (2014) “methodological triangulation involves the use of more than one study design to investigate phenomena. Most researchers found this technique to be more beneficial as each study design has its own setback which is complimented by the other design when used concurrently”. It is perfect for confirmation of research data findings as one method can be insufficient, there’s more comprehensiveness of data, increased validity and understanding of research phenomena. The research design is a mixed method hence the use of triangulation to aid in comparison of both quantitative and qualitative collected data from respondents. Validity will be verified after all data has been collected from interviews and other data collection sources.

3.7 Modeling (Hypothesis testing)

Models for Statistical test for hypothesis.

Model one: $Y_t = B_0 + B_1X_1 + B_2X_2 + B_3X_3 + BE$ on the Non- parametric, data.

- i. Where: Y_t is the Dependent Variable.
- ii. While $B_1X_1 \dots B_3X_3 + E$ constitutes the Independent Variables of the study and not limited to error term encountered in the research.

E (error term) that is considered to affect the results significantly of 5% at 95% confidence level will be statistically analyzed to determine the associations.

Model two: The Chi-Square test for Quantitative normal distributed data to test the Hypothesis set in this study:

Where: X^2 is the Chi square test, $X^2 = \text{Square Root of } \frac{\{(X-X_1)^2 + (X-X_2)^2 + (X-X_3)^2 \dots + (X-X_n)^2\}}{n}$

3.8 Ethical Consideration

According to (Gakuu, 2018) “ethical issues are an integral part of the research planning and implementation process”. “Code of conduct and expected social norm of behavior” are essential components as the research is carried out. Obesity, weight gain, eating habits, and weight perceptions are sensitive issues and require utmost respect to the individuals to avoid labeling and name calling as this may affect participant’s self-esteem. Research participant’s confidentiality was safeguarded throughout the research by establishing full consent and confidentiality of the sort information at all times throughout the research process. Purpose of data being collected was explained by the researcher before commencing and only done at the discretion of the respondent. As consent is being sorted that enabled research results to social action, leading to improved quality of life for all. Information gathered will be confidential strictly for research purpose only.

3.9 Summary

The chapter provided methodological details of the study that were followed. A survey descriptive study was adopted in this research and a mixed research design was used. While interviews and questionnaires were the selected methods of data collection for the study for triangulation purposes, for authentication of responds gathered from the study population.

CHAPTER FOUR
RESEARCH FINDINGS AND DISCUSSION

4.0 Introduction

This chapter presents data findings from the field, its analysis and interpretations. The information was gathered through the use of questionnaires that was administered to the different strata's and analyzed using both descriptive and inferential statistical analysis techniques. The discussion of these findings has also been presented under this chapter where the results are compared with the previous research.

4.1 Response Rate

The study failed to get 100% response rate from the different administered questionnaires, somewhere incomplete while others were never returned.

Table 2: Response Rate

Participants	Sample total	Returned	Percentage
Parents/guardians/care takers	320	275	86%
Schools	30	22	73%
Gymnasiums	20	11	55%
Food outlets	30	16	53%
Sub Total	400	324	81%

Source: Field Data (2019)

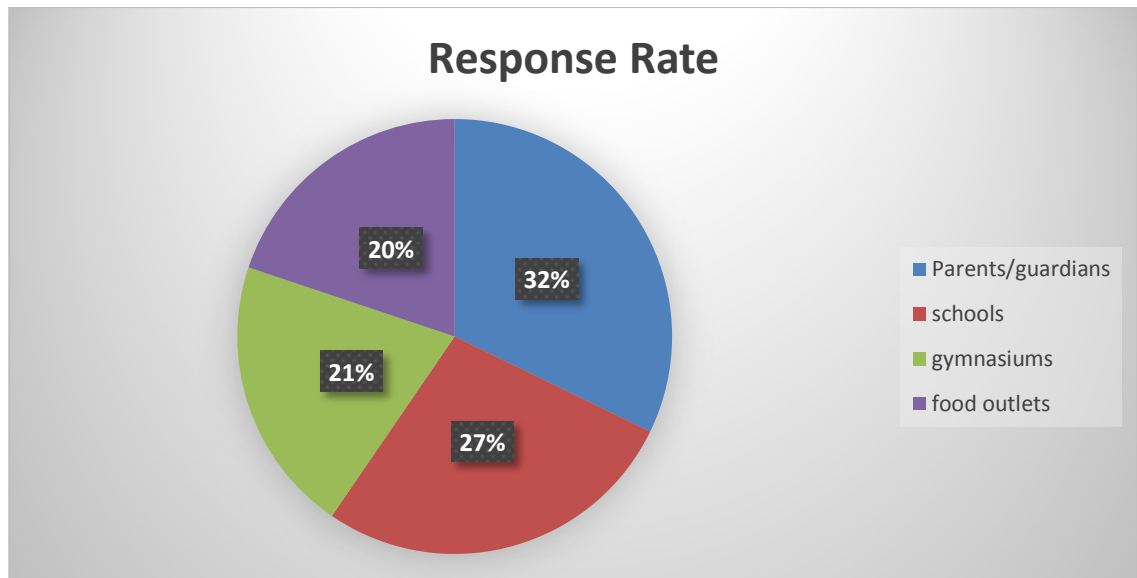


Figure 6: Response Rate

There's a total response rate of 81% for the 320 questionnaires distributed and retained 275 in total. The rest were spoilt and some were not returned.

4.2 Demographic and Social Characteristics of respondents

This section of the research was intended to find the gender of the respondents as buying and eating habits differ by gender and the age of the individual. It also looked at the role of the respondent in the child life, could be the parent, the guardian or the teacher, not forgetting the position of respondents from the gymnasiums and restaurants in relation to managers, supervisors and waiters.

4.2.1 Gender

It was essential to get the gender of the respondents in that our buying habits differ by gender. It is said majority of man spoil their children in getting them whatever they want to eat at any given time as opposed to females who are very careful in what they give their children to eat.

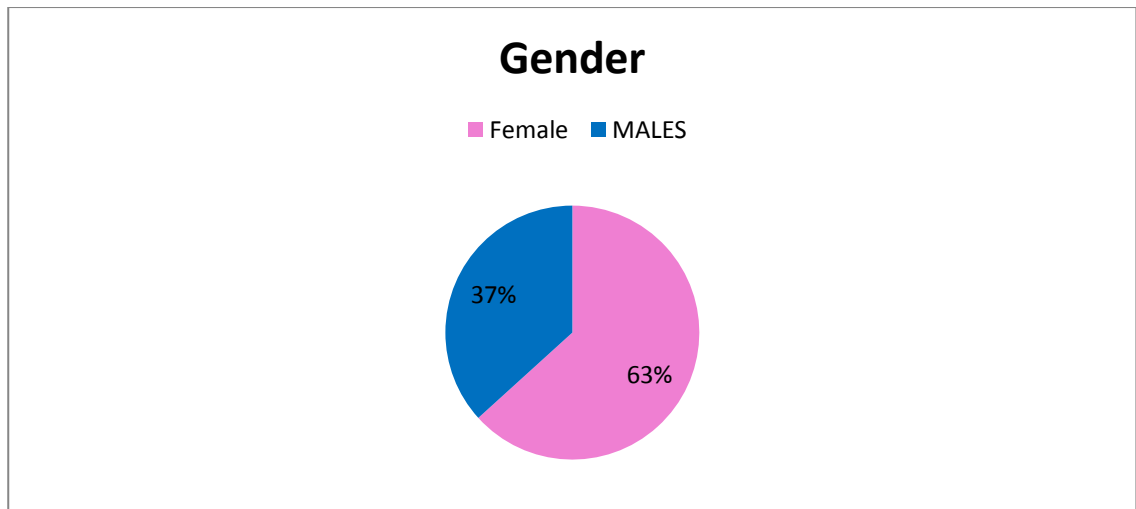


Figure 7: Gender

The study had 63% of females as opposed to 37% of male counterparts. The reason is that more females in Botswana take care of their children than males. Most families are single parent families with the mothers heading the family and taking care of the children and meeting their needs.

The study had more females than males because of the nature of the study population. More females take care of children and they turn to be aware of what the children eat and their life styles as opposed to the male counter parts that leave everything to females for the children's upkeep. Nursery schools are also dominantly females, as majority of the nursery school teachers are females due to female characteristics that favor them to take care of children as opposed to the male counter parts.

Restaurants are also dominated by females due to the nature of the job, a few chefs and waitresses are men while the majority of them are females. As more females are good with the art of cooking as compared to a few men that actually can cook, hence the respondents from restaurants turn to be more of females than men.

4.2.2 Age

Buying and eating habits are also determined by the age group, hence it was essential to include the age group of the respondents to have an idea of which age bracket buys more of junk food than another which is essential in establishing and recommending controls.

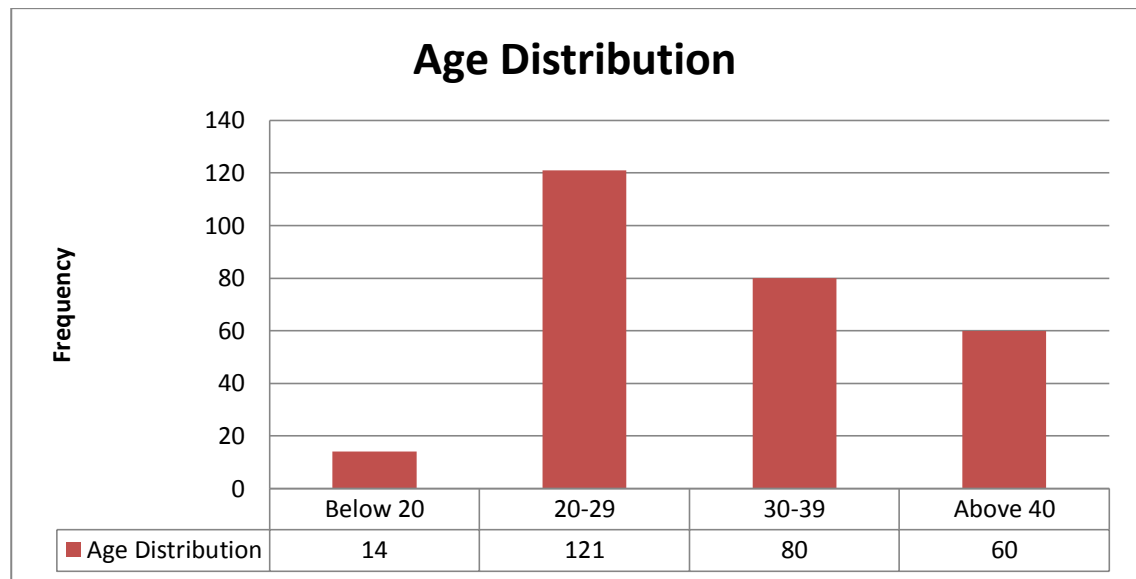


Figure 8: Age

The study got responds from 121 of those between 20-29 14 from below 14, 80 between 30-39 and 60 above 60 of age. Majority of ladies in Botswana have children before the age of 30 hence the largest number of respondents from this age group.

The respondents age is essential as only those directly involved in the guidance, teaching and parents were required to gain their perceptions in daily decisions made for the little ones including lifestyles they leave that are usually compiled and followed by the under 5 as what they see is what they are likely to follow. Majority of the respondents were ladies which is expected as it's the Batswana culture for women to be the cate takers and guardians of children as opposed to men that are responsible for buying necessities but not physically present.

4.2.3 Respondents Category

The study categorized the respondents in terms of parents, guardians and teachers looking at the fact these categories meet with the children daily in different aspects. Parents and guardians are the sole care takers of the children and determined what they buy and give the children to eat, while the teachers are with the children at school and know the usual food they are given to eat daily and may determine the common food stuff given to children to eat in this generation.

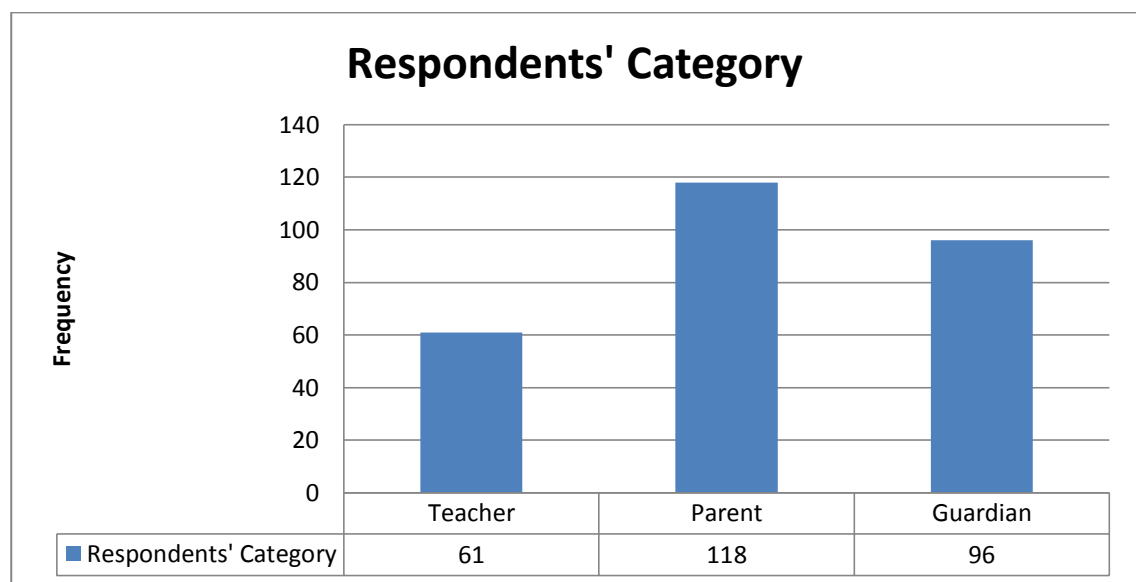


Figure 9: Respondents Category

The study got 118 responds from parents, 96 from guardians and 61 from teachers. This is because Gaborone is an urban setting and children stay with their parents as opposed to rural area where grandparents are left to take care of the children. Teachers were 61 from the selected schools that were included in the study sample. The guardians and parents are key in this study. Understanding their way of life and life choices guided this research in establishing what they do and how it affects the children's weight in terms of level inactivity, food choices including eating patterns that are essentials key factors in contributing to child obesity and could also lead to managing and establishing interventions.

4.2.4 Group Size

Buying and eating habits can also be determined by the number of children under the individuals care. The more children under the care the less junk foods will be eaten and this was also essential for the teachers to know how many children are under their care for a wider perspective in relation to their knowledge in what they see daily in the classroom.

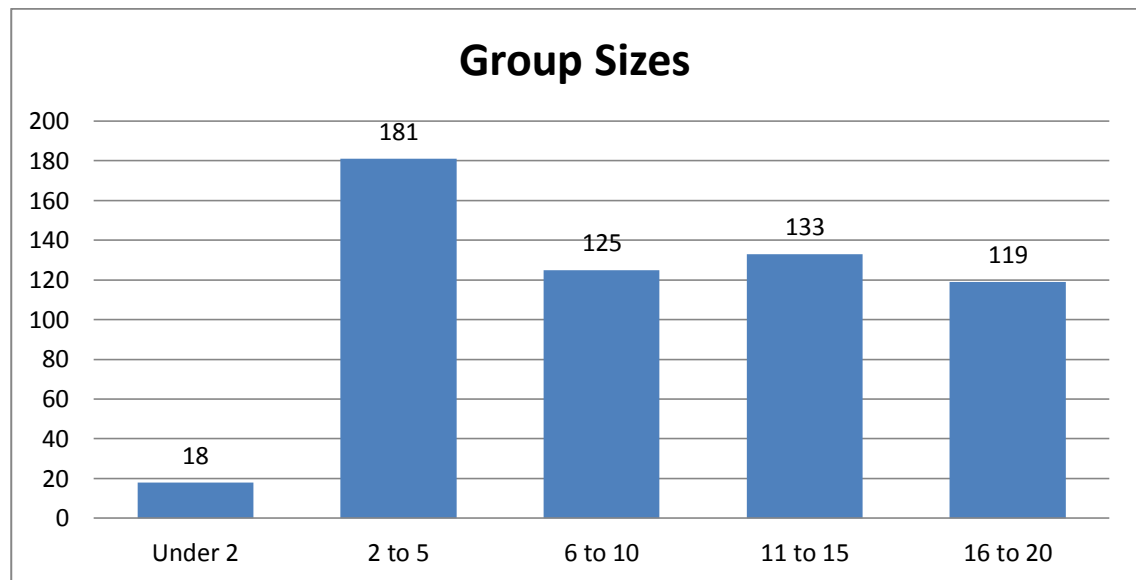


Figure 10: Group Size

The study received more respondents from those parents and guardians who took care of 2 to 5 kids which was 181 children, these were parents and guardians who took care of their children while the rest of the respondents from 6 to 20 children were teachers that had the indicated numbers in their care.

Teachers are guardians contribute to majority of the decisions made for children hence included in the research. Teachers at school monitor play time including food choices and have a responsibility of guiding parents on the right foods the children should eat to ensure they remain healthy and correct food choices are made.

4.3 Causes of Child Obesity

Child obesity is prevalent in today's age and can be linked to numerous reasons from maternal employment to heredity, life style, inactivity, sedentary life style and food. This section presents response from the study on child obesity causes according to the different Status questioned.

Botswana doesn't have enough researches done on child obesity hence not much literature revealed from previous researches on the cause of child obesity in Botswana. There's compelling evidence on the increasing prevalence of obesity around Botswana though there's little evidence on the determinants of obesity. Letamo (2015) a research study done on socio-demographic factors associated with obesity left out behavioral and ;lifestyle factors which have been seen to be the contributing factors to child obesity. Policy development requires a deeper understanding on the causative agents of child obesity so as to target the specific factors that contribute to child obesity. Three spheres as stated by Letamo (2015) need to be investigated to establish the causative agents the socio demographic, the behavioral and life style.

4.3.1 Prevalence of Child Obesity

This was essential to know the communities view on child obesity if indeed they believe we have a problem. Researched has shown that people only take action towards certain phenomena when they believe there is a problem, in the absence of them seeing a problem leaves them to do nothing about that particular phenomena.

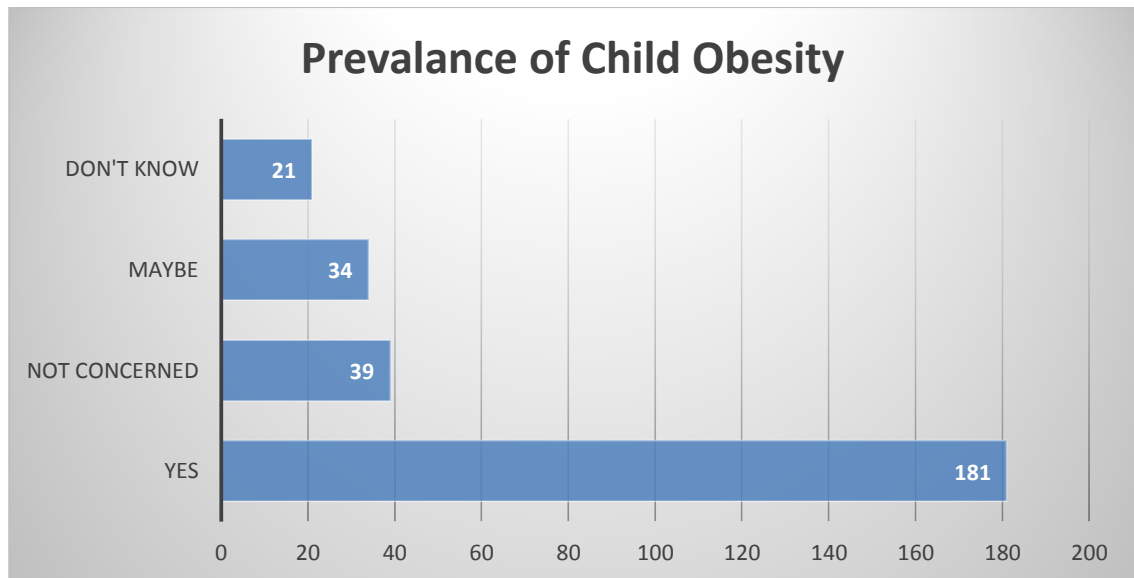


Figure 11: Prevalence of child obesity

181 respondents believe we have a problem of child obesity in Gaborone while 39 people say it's not a concern to them and 34 are not sure whether we have a problem or not. The category that says responded negatively could result from the fact that Batswana associate a fat child with good living and wealth hence they don't see this as a problem.

(National Health Policy 2011) morbidity trends in Botswana have indicated an increase in non-communicable diseases while childhood infectious diseases have declined over the years hence an increase in non-communicable risk factors. The high prevalence in non-communicable diseases has contributed to an increase in hypertension, diabetes, above normal weight, obesity and cancer this was recorded in a study done Ministry of health Botswana (2013). Obese and overweight parent's leads to obese and overweight children in the community. What the parents does will eventually be done by their children as they follow in their footsteps. There's need for parents to be educated on obesity causes and effects then the children will automatically benefit from the life choices made by the parents.

4.3.2 Lack of Physical Activity

Children rarely have time to play outside; they rather play inside with computer, phone or television games. This inability to play has contributed to obesity as children play. On average a child at play loses 23 calories in 30 minutes of being active.

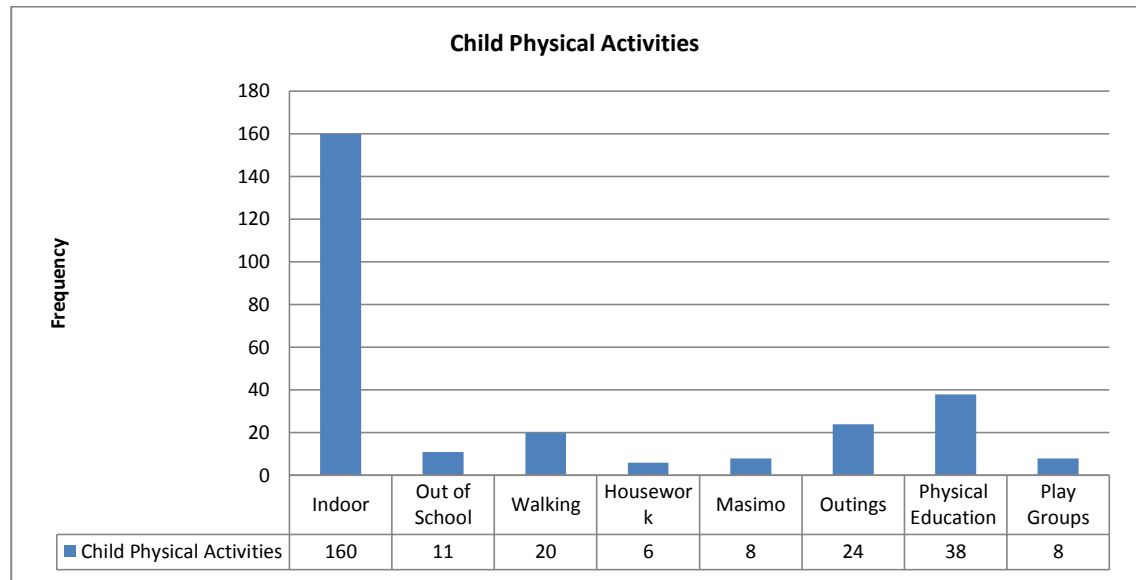


Figure 12: Child Physical Activities

From the collected data 160 parents indicated their children play indoors as compared to other means of being active. 11 parents selected out of school play, only 38 do engage in physical education at school. The rest are divided according to walking, housework, Masimo and play groups. A study by (Tjepkema 2015; Katzmaryk et al, 2015; Kaplan 2016) stated there's significant evidence on the relationship between obesity and physical activity and general health outcomes of community health including child obesity.

Sedentary life styles has been attributed to be the leading cause of child obesity in the modern society due to the lack of high energy expenditure activities such as farming, mining, forestry and current jobs are more inclined to more-sedentary sectors such as service industry, office based (Popkin & Gordon-Larsen 2014). Parents are highly engaged in their work as maternal and paternal parents are working with little time to

play with their children and keep them active so as to release energy. Inactive parent's leads to inactive children as children follow what the parents do (Levine, Hill, & Klesges 2016).

4.3.3 Screen time

Screen time can be attributed to over eating as stated by Lisa Rapaport that a minimum five-hour-a-day habit increased the odds of obesity by 78 percent compared with teens who didn't have TV time. Such heavy use of other screens was tied to a 43 percent greater risk of obesity, researchers report in the Journal of Pediatrics in 2018.

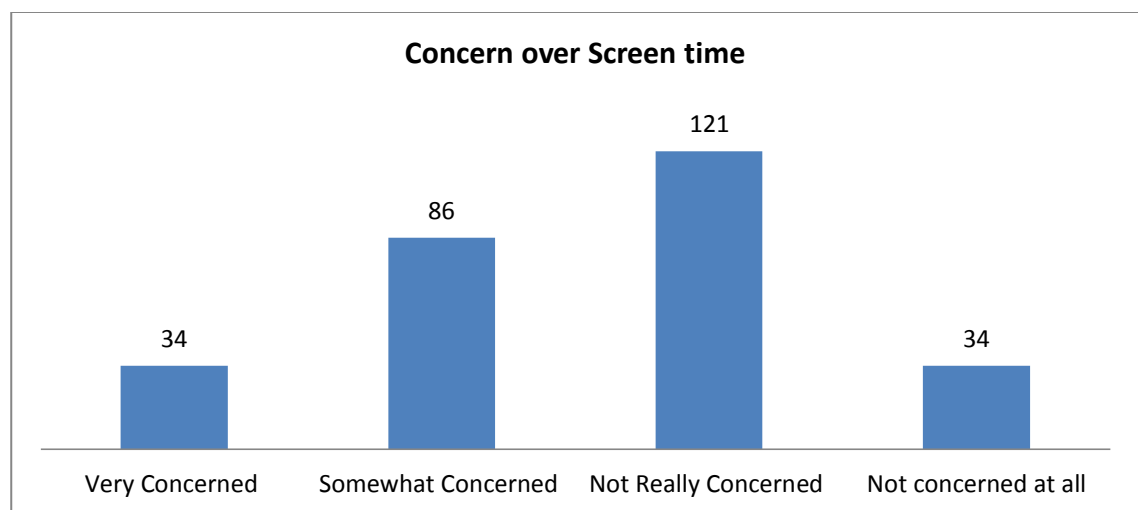


Figure 13: Screen time

Majority of parents and guardians are not concerned about screen time for their children with 86 parents somewhat concerned and 34 very concerned while 34 others are not concerned at all.

Parents not concerned about the amount of screen time is worrying some as the American academy of pediatrics recommends less than an hour of screen per day for children between the ages of 2 and 5 (Reichel, 2019). Parents should encourage physical activity, healthy behaviors and adequate sleep to raise healthy productive children. A research by Tamana (2019) suggested that children who spent more than two hours a day on screen time either television, phones and computer games turned to be more

aggressive, they were more anxious and some of them depressed as compared to children who spent less than an hour on screen time.

4.3.4 Time spent on devices

Time spent on devices ultimately leads to obesity. The more time spent on devices, the more food consumed and usually the commonly taken food would be junk food as its convenient and ready to eat.

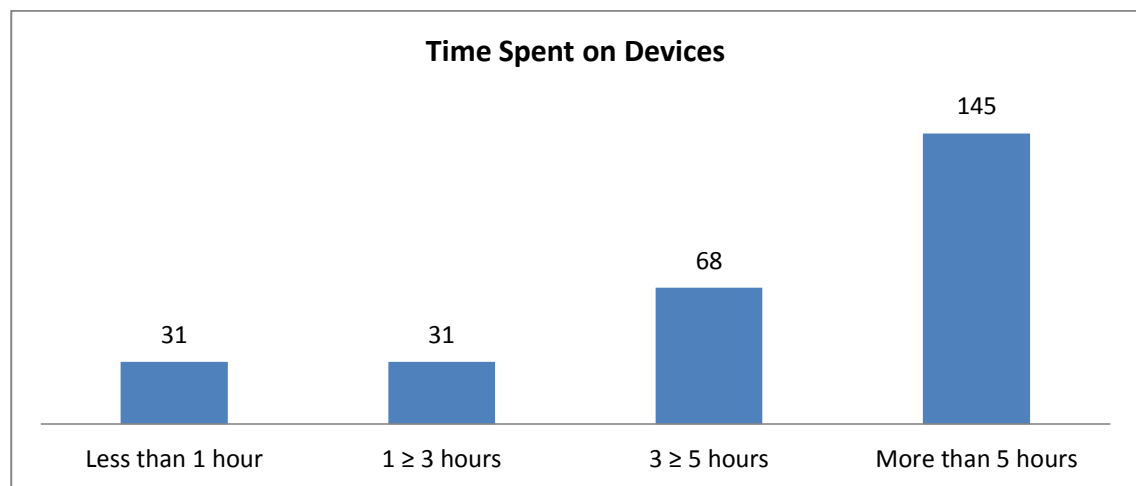


Figure 14: Time spent on devices

Majority of parents have no control over the amount of time the children spent on devices, the study gathered 145 parents who allow their children to spend more than 5 hours on devices followed by parents would allow their children to spend between 3 to 5 hours on devices. Consideration recommendation given by World health Organization in line with the recommended hours spent n gadgets and television this is way over. A child between the age of 2 – 5 is meant to spend less than an hour of screen time to ensure they have a healthy upbringing. A study done by Heuavel (2019) reported toddlers who use gadgets have speech delay, delay in use of gestures and eye gaze. The prevalence of the delays were at 8.8%.The connection between speech delays and devices is linked to insufficient amount of time spent exposed to speech as the devices would not interact with them as speech is learnt from the immediate

environment. Sheri (2019) in her research Association between screen time and children performance on developmental screening test suggests children who have more screen time have developmental delays including speech as they are disconnect from their immediate environment. While Mireia (2019) suggests increased screen time leads to academic performance due to sedentary effects though numerous studies previously stated screen time improved academic performance and computers and laptops were introduced in most of the schools.

Screen time has greatly been associated with eating habits, the more children watch an play as they interact with the screen the demand for food is high, hence the increase in obesity by children who spend a lot of time in front of a screen. Children's television programs have heavy commercials on unhealthy snacks, sweet sodas, fast foods that have high sugar content and salts that are unhealthy. The commercials entice the children's taste buds in craving advertised foods (Tremblay, 2020).

4.3.5 Eating Out Frequency

Due to parental employment both paternal and maternal children. The house dining room has been abandoned and parents. Children are left to eat fast foods and out in restaurants as it's cheaper and more convenient. Fat, sugar and salt content in food restaurants and fast food places in Gaborone are not regulated and as a result the food may have any of the elements in high quantity that may put the child at high risk of obesity and heart conditions.

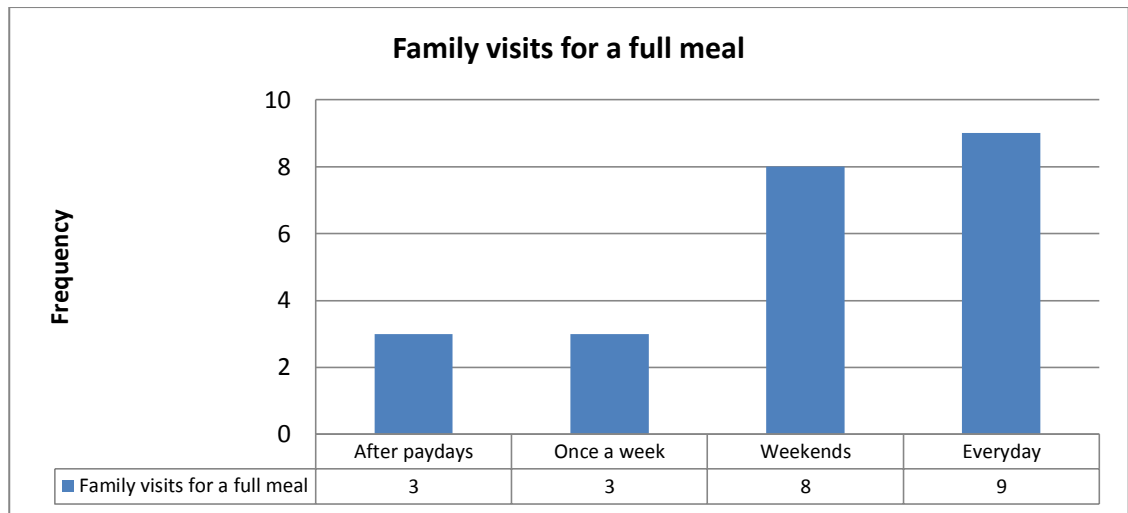


Figure 15: Eating out frequency

Most parents opt to eat out to life demands of work and hardly have time to cook and seat around the dining table in the home. Those that ate out every day topped the charts followed by these that eat only on weekends and those that eat once a week and after pay days only.

Figure 15 shows 60% of the respondents opted for eating out daily, while 35% were eating out on weekends and the rest were divided by once a week and after pay day. The frequency of eating out shows how much children are exposed to fast foods that is major contributor to child obesity.

4.4 Child Obesity Perceptions

4.4.1 Child weighting

Different nations and cultures may view obesity in various forms. The African culture believes a woman needs to be big and round and thus considered a woman, while whites may believe in the lady to be portable and slim. All these different views have a bearing on the perceptions of child obesity as others view it as good living while others may view it as a condition that needs an urgent wake up call.

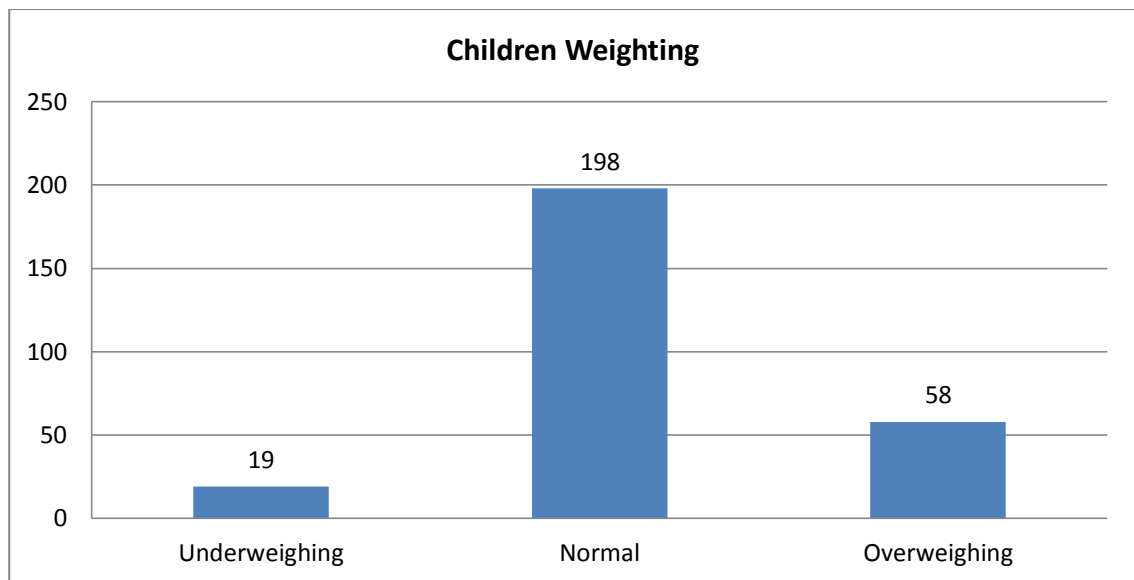


Figure 16: Child weighting

Most parents believe their children are normal and not overweight and 198 parents fall in this category while 58 parents have confirmed their children to be overweight while 19 say their children are underweight.

Child weigh including weight perceptions are a key indicator for stigma and also acceptance of child obesity above normal weight. The main challenge with perceptions without actual weighing is the exacts weight of the child might not be known and yet the parents might believe the child weight is normal when it's above normal. The African culture believes obesity is a sign of good living meaning the perceptions might be vary depending on the believes of the individual. Those that value obesity and view it as a sign of wealth might not see their obese child to have any problem. Parents may be fine with the child weight but with time the child might be teased for the weight at school causing body shaming and eventually leading to low self-esteem. "Harriger (2014) defines body image as construct that arouses a great deal of interest and no little concern. Numerous researchers are studying body image with young participants aimed at ascertain the exact point when a person begin to have negative thoughts or are concerned about their body image (Harriger, 2014).

4.4.2 Child Weight Importance

Due to different beliefs on child obesity most parents may not realize obesity as a problem as it is praised and encouraged amongst community members but ultimately obese children have difficulties in breathing and most of them develop asthma, sleep complications, are at risk of coronary heart diseases and they grow to be obese adults. The question was designed to check perceptions of respondents in line with child obesity. Obesity can easily be managed when the community members see it as a problem.

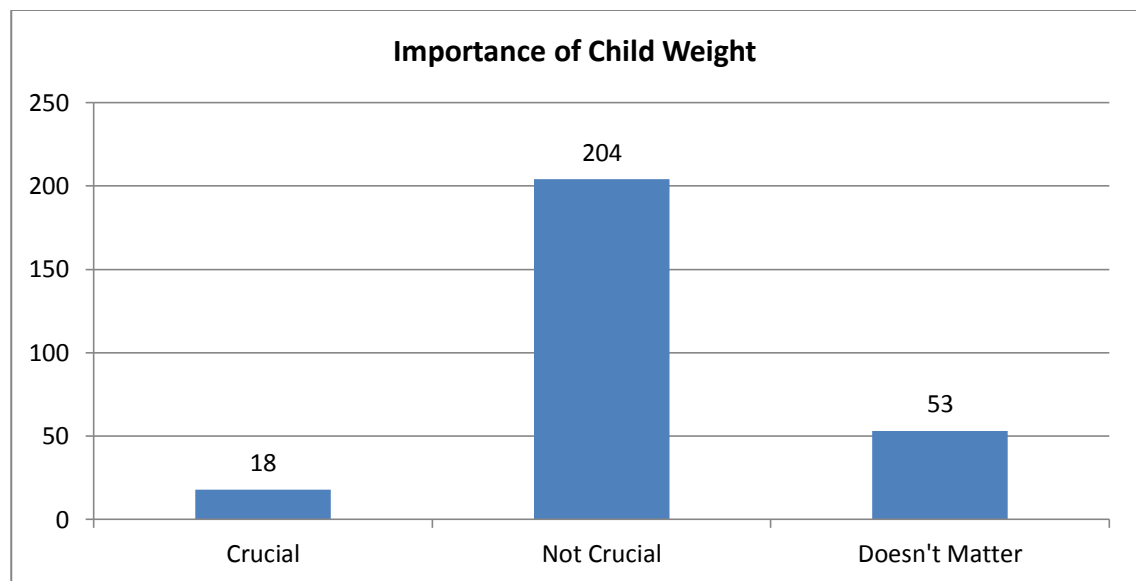


Figure 17: Importance of child weight

204 parents and guardians don't view obesity as being crucial to their health while 53 don't care about obesity and only 18 out of 275 parents and guardians see child's weight as a crucial thing.

Most parents don't care about child weight because of cultural perception, ignorance and lack of knowledge on the effects of obesity on the child. Adolescents are the ways concerned about their body image, and most body shaming and low self-esteem begins when the child in a teenager.

Awareness campaigns need to be established and parents taught on the effects of child obesity and the struggles they go through in school as teenagers. With the right tools and information shared in the public then obesity perceptions will be changed over time and parents and guardians will be more aware of the challenges of body imaging.

Obesity problems that may arise from weight perceptions could be Body Dysmorphic Disorder (BDD), which is “preoccupation with body defects or flaws that may not appear as flaws to others, while in actual fact the defect may appear not to be a problem” (Association, 2014).

4.4.3 Communities view of causes of obesity

People and family members may hold different views on the causes of child obesity. The question was designed to evaluate what they think is the cause of child obesity at community level considering how life has changed over the years.

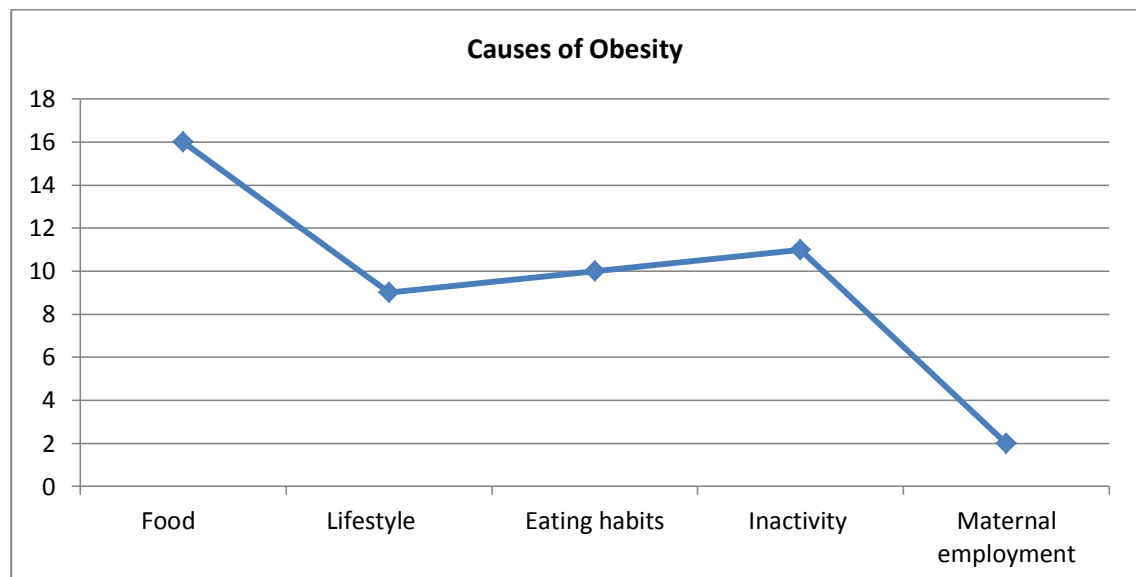


Figure 18: Obesity causes

Food, inactivity and eating habits were the main culprits of child obesity within Gaborone city. While lifestyle and maternal employment were the least selected options. 80% of the respondents agreed that food is the major contributor of child obesity in Botswana while 55% of the parents and guardians alluded to inactivity being

a contributor to child obesity considering the lifestyle people tend to live nowadays which is very different from form the traditional way of life.

Interventions and controls are of child obesity are based on the causes, understanding and manipulation of the causes would reduce the prevalence of obesity among children even adults. The lifestyle choices, the food and inactive levels all lead to the increase in obesity cases. Parents have insufficient understanding of obesity as their judgement is clouded by cultural believes that view obesity in different light.

4.4.5 Fast Foods Booming Business

Fast foods are conveniently located in all city areas some even deliver at the conform of the individuals home, and due to life pressure of work and life commitments people have neglected family home cooked meals and been pushed to eat out almost daily. Fast food restaurants are lucrative business and most outlets have branches all over the city some even having 3 – 4 outlets in the same area but different locations for convenience sake. The question seeks to find reasons for fast food restaurants booming within the city of Gaborone and this was asked managers and waiters of the food restaurants.

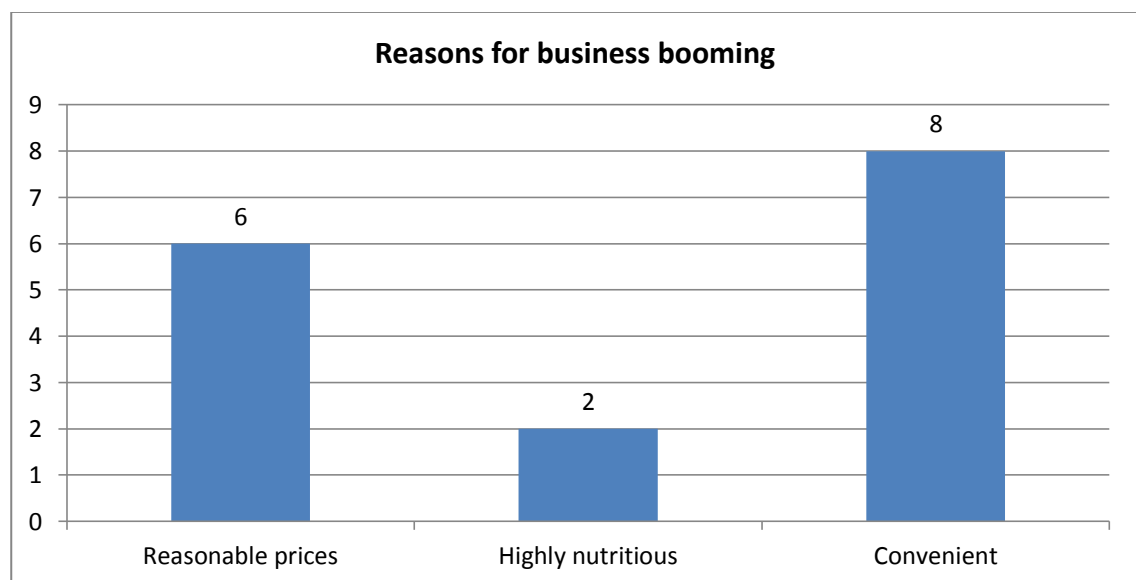


Figure 19: Fast food booming business reasons

8 respondents believe fast foods are booming to their convenience to the customers and has nothing to do with nutritional content of the food served. The second most picked option was reasonably priced as customers will chose a place that's convenient and right price disregarding the nutritional value of the food served.

4.4.6 Reaction To Childs Play

Child play is important and we cannot separate play and dirt. Parents want their children to play and not get dirty to unextend where they buy indoor games to avoid the children playing and getting dirty from outside. The question seeks to find individuals reactions to a child returning home dirty either from school or play.

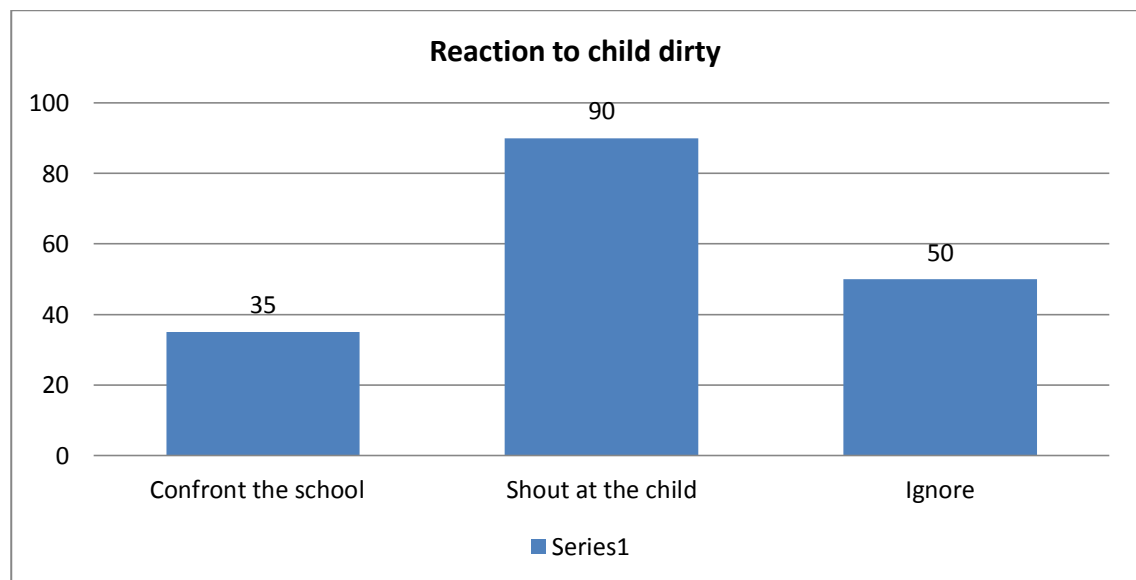


Figure 20: Parents reaction towards child being dirty

Modern parents would react by shouting at the child when they return home dirty from school, 50 would ignore while 35 will confront the school on reasons why the child is dirty.

4.5 Child Obesity Management

4.5.1 Importance of what a child eats

It is said we are what we eat and this is true in that what we eat either makes us healthy or unhealthy depending on the intake, frequency and the quantity. Due to time pressure and also marketing pressure children usually eat ready packed, chips, polony, cheese food that's socially accepted and enjoyed by children may be due to heavy marketing but having no nutritional value. The question sought to find parents and guardians perceptions on the importance of what the child's eat and its effect thereof.

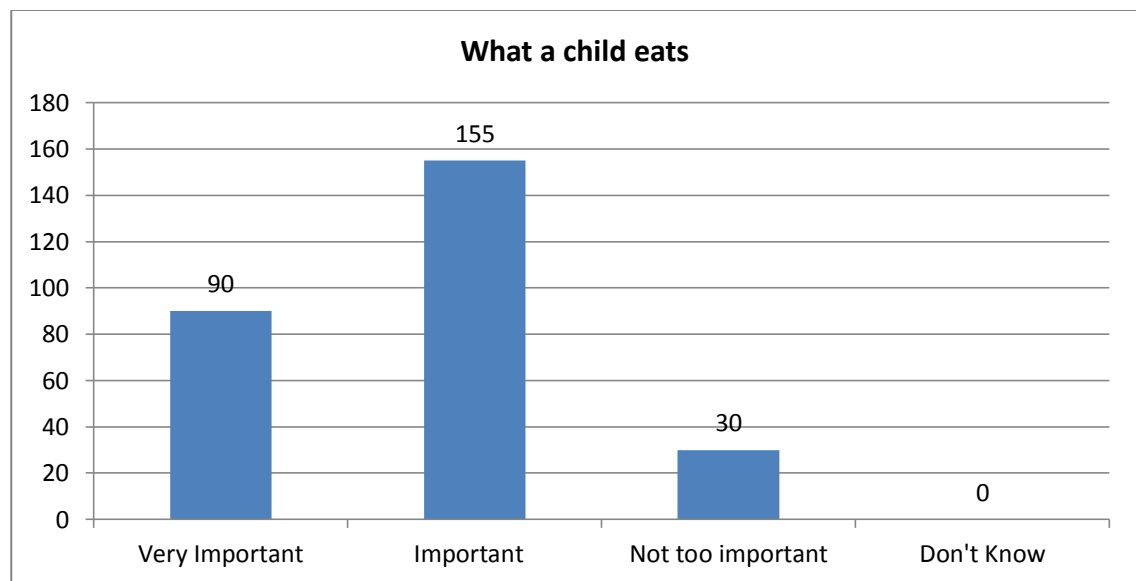


Figure 21: importance of what a child eats

The findings are that majority of guardians and parents believe what a child eats is an important element, while it's followed by 90 parents who say it's very important and the least being 30 parents. The fact that children become what they eat and it's difficult to reverse what they have become, it's essential to watch what they are eating daily. In order to manage child obesity we ought to be careful what we feed the children, it's not only about what they enjoying eating but the nutritional value in what they are eating.

4.5.2 Food Choices

There's a battle between becoming our children's friends and parents. This is realized when parents decide to feed children what the child desires and not necessarily what is good for the child. Children copy from friends, see from the television and also what the majority are eating and desire to eat such and the fact that we can't control them we offer them what they fancy.

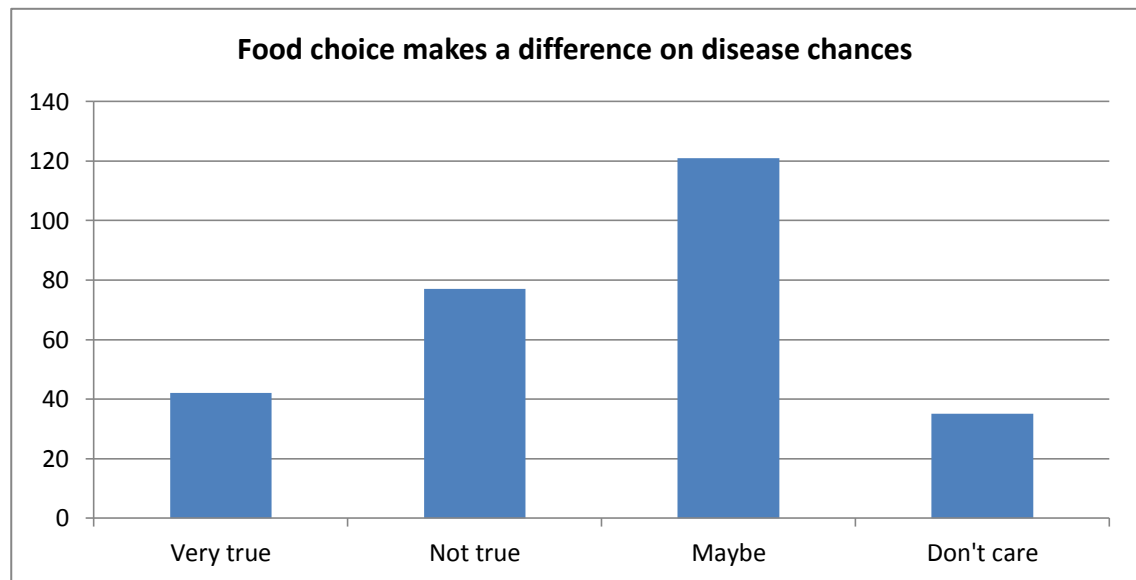


Figure 22: Importance of food choices in obesity

Food choices have an underlining determinant in modeling the child's weight. Most parents and guardians are not sure if food choices have any effect on the child's weight, followed by those that indicated not true and insignificantly those that selected very true and those that don't care. The fact that majority of parents are not sure shows we do have a problem and measures have to be implemented to control obesity from a tender age.

4.5.3 The food amount

The question sought to find if parents understand and appreciate quantity the effects of quantity of food on the growing child.

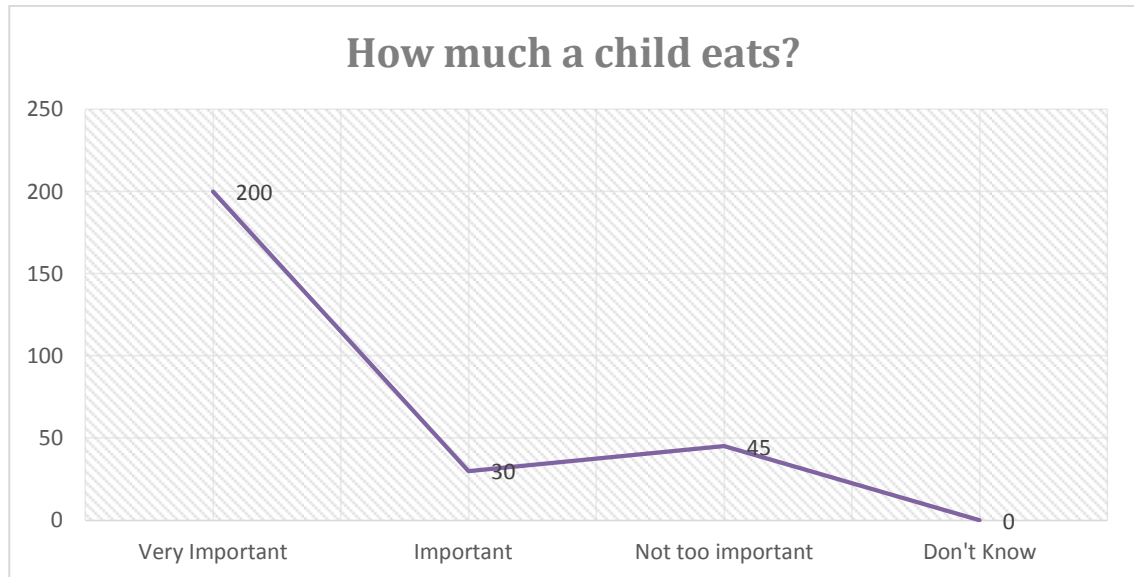


Figure 23: Importance of food quantity in meals

Most parents and guardians agree that food quantity is an important element and should be watched to avoid health complications. The more food a child's eats or the lesser the food has health effects on the growing child's health. 45 parents indicated it's not important while 30 it's important and no one on don't know.

4.5.4 Frequency of eating fruits

Eating fruits and vegetables is an important measure in managing child obesity, they are both nutritious though majority of children don't like eating them. These should be served regularly if not with every meal to combat obesity. The question sought to find the frequency of eating fruits and vegetables in a day.

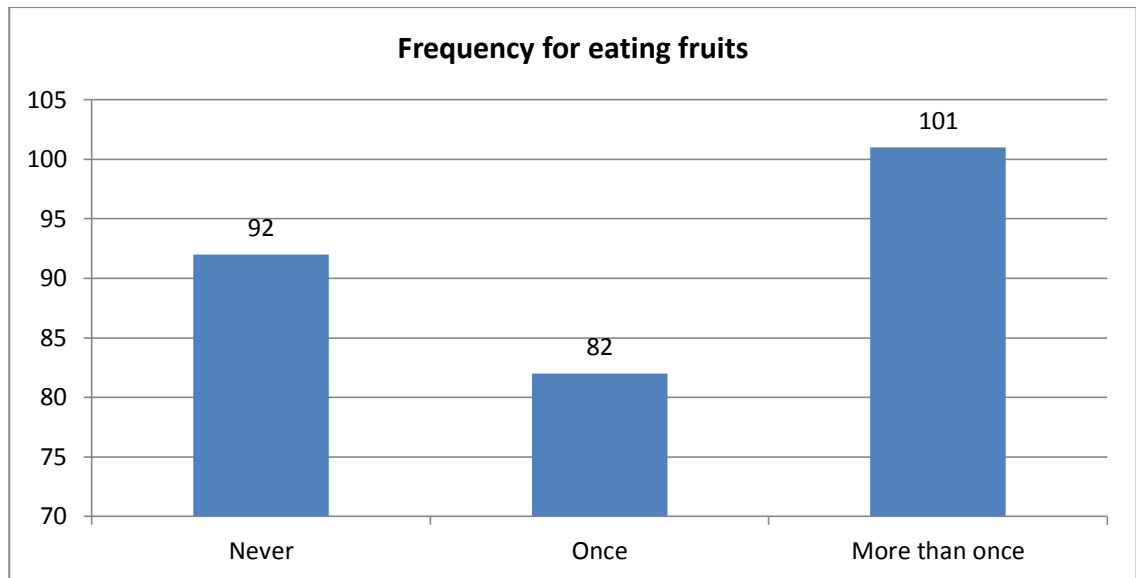


Figure 24: Importance of frequency of eating fruits

101 parents and guardians indicated their children eat fruits more than once daily, while 82 indicated once a day and 92 never eat fruits at all. Creative persuasive ways should be introduced to allow the child to eat fruits and vegetables with zeal every meal as the saying goes and apple a day keeps a doctor away.

4.5.5 Governments role

Government has an important role on managing obesity at national level. When the government is involved it's easy for all to follow as regulations will be in place and enforced with counter measures for law breakers. The question sought find respondents understanding on the role of government in managing obesity at national level.

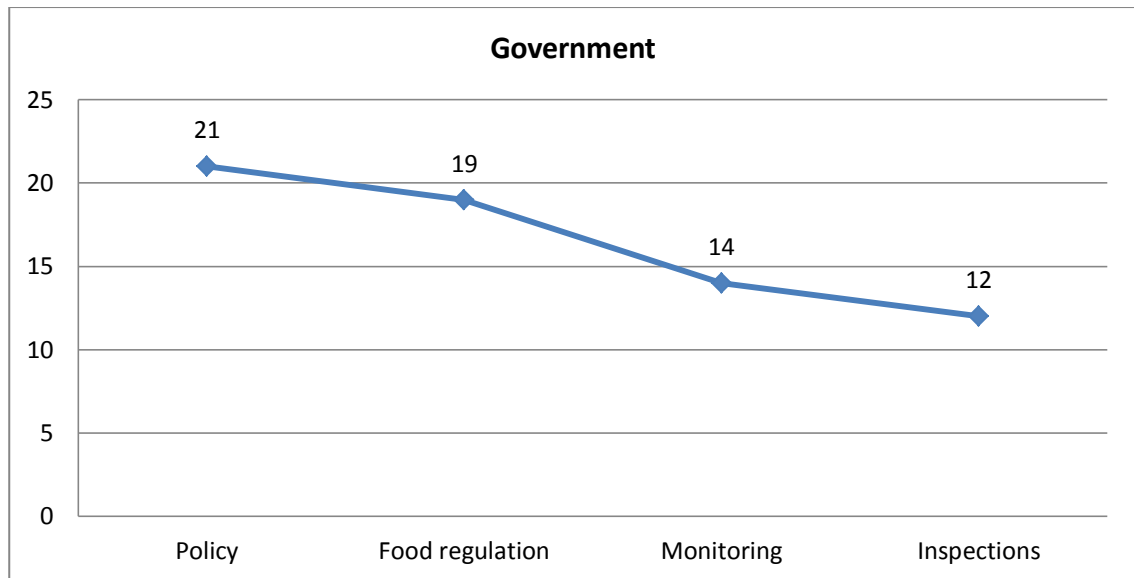


Figure 25: Governments role in managing obesity

The greatest role government can play is to introduce policies that are to be followed by schools, parents, restaurants, fast food shops including importation of food from outside, the second selected was food regulation as we have seen in the developed countries where salt, sugar and fat content are regulated at national level then government can also monitor all regulations that have been implemented and eventually facilities inspected to ensure their compliance at all levels.

4.5.6 Parents role

Guardians and parents have an important role to play as they decide what to buy for the child, quantity and the quality of food given and the frequency of eating. The question sought to understand the role the parents and guardians can play in managing child obesity at the family level.

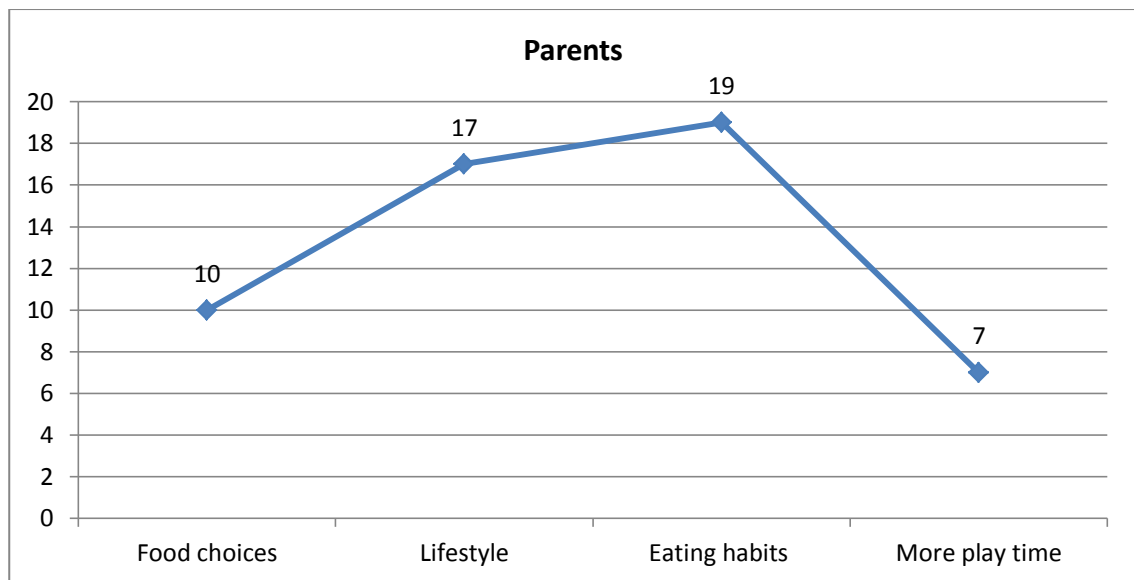


Figure 26: Parents role in combating obesity

19 parents selected their role could be in managing eating habits, while 17 choice they can manage lifestyle of the children to ensure they are active and physical active while 10 chose they can also manage food choices and the least selected more play time for the children. The greatest role lays on the parents as it's their responsibility to ensure children in their care are healthy and free from any health complications including obesity.

Parents have the greatest role on combating child obesity as they are the sole custodians and decision makers for their children. What they decide to do is what eventually the children will do hence life choices decide by parents will have consequences on their own children. Parents need to understand what leads their children to be obese and what measures they can take to ensure the children are protected in the light of screen time, food choices including the level of physical activity.

There's also need for a cultural shift in terms of our understanding of what is associated with being rich and being wealthy. Batswana cannot be rejoicing when their children are obese and calling them to "fresh" meaning they would have accepted the child to be

as they are, and don't see anything wrong with them hence no need of finding an intervention or solution to the problem.

4.6 Discussion of findings

Majority of parents have little understanding of child obesity and the causes. This is due to the fact that Batswana have mixed feelings on child obesity others believe it's prestigious to have a fat child as it's a sign of good living which goes in line with Setswana sayings: "*ngwana o fresh*" which means a fat child is associated with freshness as opposed to a normal sized child.

With such in mind it's difficult for parents and the community to take stand against child obesity as every parent and guardian would want to have a child that's "*fresh*" a complete mindset overhaul is essential that will go beyond cultural beliefs on obesity.

Physical activity has revolved over the years. During my time Physical education at school was done outside the classroom while nowadays it's done indoors and most of the time students would be learning as opposed to being active and playing. Parents would want student's home immediately after school with no opportunity for the children to play and when at home they are instructed to play indoors to avoid any levels of dirt.

Indoor games may range from watching television, to playing games and children are not monitored on the amount of time spent in front of the television set or what they are watching and yet this leads to high intake of food. Which is usually junk food as its more convenient compared to adequate meals. The more television programs they watch the more they get to see adverts for fast foods and the more they demand and appetites for these fast foods grow. Most children would have their own desired food they would want to eat and pack for school which is the same with their children and with little nutritional value.

4.7 Summary

The chapter contained analysis and presentation of the collected data for the respondents from the interview and the questionnaires that were distributed to the study population. Data cleansing was done and all incomplete questionnaires were discarded and only the completed collected data was processed and analyzed.

CHAPTER FIVE

SUMMARY CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

The chapter presents a summary of the study results as discussed in chapter four, conclusions that were done in line with the results as well as the recommendations that the researcher made with regard to the study results. The chapter also presents the recommendations that were made.

5.1 Summary of Findings

Research Findings were based on the research objectives of the study and summarized as outlined below:

- i. To identify Socio-economic factors that influences Child Obesity.
- ii. To determine effects of Child Obesity
- iii. To establish Parents role is controlling Obesity Gaborone.
- iv. To analyze relevant interventions that is already in place.

5.1.1 Objective one: To identify socio economic factors that influence child obesity

The study has established that common cause of obesity amongst under 5 children of Gaborone is food. This is in view that both parents are fully engaged in work and have little time to cook from home hence opt for fast foods either eating out or ordering in. A study by (Larson N, 2019) reported that parents need to be aware of the food they keep around the house, the food they eat and the eating patterns. The food shared by the family and food available in the house for example the availability of fruits and vegetables is strongly associated with whether children and adolescence will eat fruits and vegetables.

Government has no strategies in place to regulate food entering Botswana and the nutritional value of food given to children. Taxes on unhealthy foods need to be revised, salt and sugar content in foods monitored and have policies to guard against these. There's need for government to establish task forces and committee geared at combating child obesity from a national level.

Funding needs to be prioritized to ensure all programs and initiatives are implemented (Baker and Poter,2015), (Frank et al,2018) suggested local governments should adopt the a physical activity policy, that would encourage parks and recreational facilities to be established by councils, and run by them for the benefit of children.Erecting child friendly infrastructure that will encourage children to be physically active like sidewalks on roads and child friendly gyms.

Children are given lots of fast foods resulting from work pressure from parents and guardians and not having sufficient time to have home cooked meals. Heavy marketing on junk foods usually aired during cartoon time, and when children see such they envy and desire such foods and the new generation parents have no much control over food taken by children. Policies on zoning farmers markets, location of super markets, limitation on advertising unhealthy foods menu labeling by food restaurants would assist buyers to know how much calories they are consuming in the food they buy daily (Flournoy and Treuhaft,2019).

Physical inactivity is another element that's overlooked nowadays. Parents want children to always be clean and remain indoors and not to get dirty by any means. Life circumstances have forced children to play indoors and not out door, and games and television have gained commonality in many homes. The more kids run around outside, they more they mingle, the more they are losing calories. A research done by (Stettler, 2016) stated school personnel believed that physical activity was provided in schools

insufficiently as children spend more time in door being taught as opposed to being physically active. Similar sentiments were shared by (Angelo, 2020) who unearthed the relationship between screen time leading to less physical activity and hence leading to child obesity.

5.1.2 Objective two: To determine effects of Child Obesity.

Child obesity has numerous effects the major one being the obese child becomes an obese adult. Obesity also puts the child at risk of heart diseases, development of asthma and sleep difficulties. This doesn't not only affect the child physically but also emotionally due to being teased by other students. This kills the child's esteem which eventually affects the educational capabilities if the child and their general outlook. Similar sentiments were shared by (Frank, 2017) who claimed body image was not a problem at childhood stage but once they reach adolescent stage, Body shaming and "preoccupancy" leading to low self-esteem in teenagers as they feel their body is inadequate and not beautiful enough.

Increased screen time had been associated with delayed developed in children in terms of speech, language including educational delays in grasping concepts (Anrig, 2019). Screen time was also linked to behavioral problems by (Kuntzman, 2020) as he argued that more than two hours of screen time a day leads to emotional and attention problems. While (Finkelstein, 2016) associated screen time with sleeping problems, as parents watch television to wide down after a long day at work and the light emitted from the screen interferes with sleeping cycle in the brain hence leading to insomnia. A study (Adler, 2014) linked screen time with violence especially resulting from movies, cartoons and video games that may have violence scenes. Children become desensitized to violence and eventually use violence to solve problems imitating what they see on the screen.

The research established that child obesity eventually leads to body shaming or negative self-body. The society has a perceived ideal body size and everyone who does not conform to the perceived size is seen as an outcast and the individual may feel out of place too (Control, 2013-2016).

5.1.3 Objective three: To analyze relevant interventions that are already in place in Gaborone Botswana.

Botswana currently doesn't have any interventions in place to combat child obesity. Gymnasiums are not equipped to accommodate under 5, physical education at school and play time at school has also been reduced and most of the time taken up with theory than practical.

When parents enroll in gyms, join fitness clubs, jog and do morning walks children are left with nothing to manage their weight. Children are left at home watching television and hugging on a large bag of potato chips while eating polony on the side as they drink fizzy drinks. Current life style has led children to obesity. Children's food quantities have been getting large over the years and the so has been the size of our children.

5.2 Conclusions

Child obesity is a current problem and the residents being parents, guardians, shop owners, restaurant operators and gym instructors haven't accepted the magnitude of the problem. It's ideal to sensitize people of the problem and establish adequate controls through engaging the relevant stakeholders before the situation gets out of hand.

i. What Socio-economic factors influence child obesity in Gaborone?

The study established that maternal employment; lifestyle, food, buying and eating habits are the number one contributors of child obesity. Lack of outdoor facilities and

lack of governmental food regulations also contribute to high prevalence of child obesity in the city of Gaborone.

ii. What are effects of child obesity?

The effects of child obesity has ranged from negative body image, developmental delays, educational difficulties and other complications such as breathing complications, high blood pressure and asthma. The worst effect of child obesity would be obese adults and hence it will be difficult to reverse the obesity effects.

iii. What's the role of parents in controlling child obesity?

Parents have the greatest responsibility in managing and controlling child obesity as they decide almost every aspect of under 5 from what they should eat, how long they should play, how often they should eat and also what they should pack for lunch hence parents and guardians have a mammoth task of deciding what work for their children. Most importantly parents and guardians should know there are effects to child obesity and also need to know the BMI scale and when their child's weight is becoming above normal.

Fast food restaurants are a major contributor of child obesity in that most families have no time for family meals and rather chose to eat outside in restaurants and the restaurants are not regulated as the food offered is oily, has high sugar and salt.

iv. Are obesity management measures adequate in controlling obesity?

Obesity is not recognized as a serious problem in Gaborone and Botswana, with this research the recommendation will assist in sensitizing residents on the high prevalence of obesity and how it affects the nation at large. Since majority of people do not view child obesity as a problem, there are insufficient interventions implemented to combat the pandemic. The research will create awareness and advocate for

5.3 Recommendations

There's need to sensitize people about the high prevalence of child obesity and show them the dangerous of obesity from infant stages to adulthood. Living examples can be used either from around or from the developed world and try relate to where we are going as a country and the ultimate negative effects if we do not initiative immediate strategies. Pictures, advertisements can be used to discourage acceptance of obesity as a positive thing.

Government should develop outdoor play area that haven't been utilized for a very long time and are now home grounds of predators and negative activities such as drug sale and misuse. If these parks can be developed and taken care of or even privatized. They would be suitable for use to all toddlers, give an opportunity to the under 5 to have an outdoor play center.

Parents and guardians should not use the television as a getaway from parental responsibility and looking after the little ones. Television and device time should be monitored and managed to avoid children spending too much time watching television and playing television games. Unmonitored tv time does not only lead to obesity due to the constant eating but also the common culprit of violence among under 5 as they watch and play violent games that eventual molds their behaviors. This has also affected classroom participation levels as such children don't participate in class but opt to hear answers from other students as the television doesn't not give an opportunity to reciprocate only watch what it has to offer.

Schools should encourage parents to pack nutritional foods for their children. Most schools have nutritionists some are monitored by nutritionist from the government. Monitoring meals would eventually to all parents packing healthy meals for their children and all children eat healthy.

Physical education should be more of practical than theory. Play time should be included in the curriculum of children to encourage the physical aspect of the children as most of them are not physical at home. Outdoor play should be a must and included in the school time table.

Its high time government regulates foods imported into the country and also served in fast food restaurants. The fast food we eat has high fat content, sugar and salt and majority of food we buying even in the supermarkets is preserved with sugar and salt which increases the sugar and salt content. When government can set limits of sugar, salt and fat content and monitor such, would lead people eating healthy.

Family time should be revitalized. Over the years due to work pressure and maternal employment, families are no longer eating together home cooked meals and I fear for the generations to come as parents are not teaching their children to cook which could only mean families will rely on eating out which is not only costly but unhealthy. Family time also allows parents to know what's going on in the child's school life, give them life nuggets to face life's challenges and also assist them with school work.

5.4 Suggestions for further study

The study has opened avenues into various researches that may be done:

- I. Psychological effects of maternal employment on children as the study unearthed that maternal employment has also been a leading cause of child obesity over the years.
- II. Cognitive Effects of unmonitored television and device time on children: due to work pressure parents have pushed children to indoor games being television and device games. They are left alone to play these games, watch movies, cartoons unsupervised.

III. Evaluation of government food regulation: This is essential to establish measures taken to control food elements that may have negative effects on the growing economy.

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APPENDICES

Appendix I. Questionnaire for parents/guardians/care givers

INTRODUCTION

Dear Responder, this questionnaire is designed to gather buying and eating habits among Gaborone residents that may influence high prevalence of Child Obesity. Kindly indicate your favorable responses in the spaces provided. Provided information will be treated with utmost confidentiality and used for research purposes only. Don't include names on any questionnaire.

Please respond as indicated before each question to reflect your appropriate option

(Tick appropriate)

Gender: Male Female
Age : 10-20 20-30 30-40 above 40
Teacher parent guardian

Please indicate the number of children under your care:

Under 1
2 to 5
6 to 10
11 to 15
16 to 20

Are you concerned of your children's weight?

- Very Concerned
- Concerned
- Not Really Concerned

- Not at all Concerned

Is child obesity a current community issue?

- Yes
- Not Concerned
- Maybe
- Don't know

Indicate reasons for answer



How do your children keep physical active (Tick all that apply)

- indoor/outdoor play
- lands/Masimo
- Outings
- None
- Out-of-School Sports
- Physical Education
- Walking/Riding
- Housework
- Gyms
- play groups

Does screen time hours concern you (pc games, TV, phone and internet)

- Very Concerned
- Somewhat Concerned
- Not Really Concerned
- Not concerned at all

How many hours a day does your child watch T.V or play computer games/T.V?

1 hour less 1 -3 hours 3-5 hours more than 5 hours

Which category does your child fall?

- Underweight
- normal weight
- overweight

What the child weighs

- Crucial Not crucial Doesn't matter

Does the amount of physical exercise activity

- Matters Not sure Doesn't matter

WHAT ARE YOUR VIEWS ON THE FOLLOWING?

There's nothing we can do about our weight, its either you born thin or fat

- True Not True Maybe Don't care

Food choices makes a difference in your chance of getting diseases, like heart disease or cancer.

- True Not True Maybe Don't care

FOOD BUYING HABITS

How important is the following when buying food?

Safety of the food

- Important care Not Important Maybe Don't

Nutrition (how healthy the food is)

- Important care Not Important Maybe Don't

Price

- Important care Not Important Maybe Don't

How easy the food is to prepare

- Important care Not Important Maybe Don't

Taste (whether child likes the food)

- Important care Not Important Maybe Don't

CHILD HEALTH MANAGEMENT

Is the following essential to a child's present and future health?

What a child eats

- Very Important Important Not too important Don't know

How much a child eats?

- Very Important Important Not too important Don't know

Please answer the following questions for each of your children:

Child 1: Male Female Age _____ years old Height _____ meters
weight _____ kgs

Child 2 Male Female Age_____ years old Height_____meters
weight_____kgs

Child 3 Male Female Age_____ years old Height_____meters
weight_____kgs

Child 4 Male Female Age_____ years old Height_____meters
weight_____kgs

Child 5 Male Female Age_____ years old Height_____meters
weight_____kgs

Child 6 Male Female Age_____ years old Height_____meters
weight_____kgs

EATING HABITS

Not counting juice, how often do your children below age 5 eat fruits or vegetables in a day?

Never once a day more than once whenever available

How many times a week does your child eat fast food (Pizza, kfc, Hungry lion, Wimpy?)

Never once a week twice a week everyday

How many fizzy drinks per week does your child take(coke,fanta,sprit,twizza etc)

Never once a week twice a week everyday

How many hours a week does your child play outside the house?

1 hour 2 hours 3 hours more than 4 hours

How would you react when child returns home dirty due to outdoor play at school?

Confront the school shout at the child ignore

THANK YOU FOR YOUR COOPERATION

Appendix II: Questionnaire for Food Restaurants

INTRODUCTION

Dear Responder, this questionnaire is designed to gather buying and eating habits among Gaborone residents that may influence high prevalence of Child Obesity. Kindly indicate your favorable responses in the spaces provided. Provided information will be treated with utmost confidentiality and used for research purposes only. Don't include names on any questionnaire.

Please respond as indicated before each question to reflect your appropriate option

1. **Gender :** male female
2. **Position:**.....
3. **Experience in the post:** less than 5 years more than 5 years
4. **Are fast food restaurants a lucrative business in Gaborone**
 Strongly agree somewhat agree somewhat disagree strongly disagree
5. **Why is the Business booming and having numerous branches around**
 Reasonably priced highly nutritious Convenient easily accessible
6. **How often do families visit for a complete meal?**
After paydays once a week weekends everyday
7. **Is Child Obesity a concern in the city of Gaborone?**
 Concerned Not Really Concerned Not Concerned at All very Concerned
8. **In your own option do fast foods contribute to Child Obesity?**
 Strongly agree somewhat agree somewhat disagree strongly disagree

9. What has led to the increase in Child Obesity cases over the years?

(tick all relevant options)

Food Lifestyle Eating habits Inactivity Maternal employment

10. What role can the following play in Child Obesity Management?

Parents : food choices lifestyle eating habits more play time

Restaurants: monitor fat content gymnastic for kids monitor eating cut calories

Government : policy food regulation monitoring inspections

THANK YOU FOR THE PARTICIPATION

Appendix II: Questionnaires for gym centers

INTRODUCTION

Dear Responder, this questionnaire is designed to gather buying, eating habits and exercise attitude among Gaborone residents that may influence high prevalence of Child Obesity. Kindly indicate your favorable responses in the spaces provided. Provided information will be treated with utmost confidentiality and used for research purposes only. Don't include names on any questionnaire.

Please respond as indicated before each question to reflect your appropriate option

1. **Gender :** male female

2. **Position:**.....

3. **Experience in the post:** less than 5 years more than 5 years

4. **Is obesity a concern in Gaborone**

Concerned Not Really Concerned Not Concerned at All very Concerned

5. **What is the major contributing factor for child obesity**

(Tick all appropriate options)

Food lifestyle eating habits inactivity maternal employment
Other reasons:



6. **Are people doing enough to combat the phenomena(obesity)**

Yes No Maybe Don't care

7. **What can be done to combat**

8. Are your facilities user friendly for under 5

- Yes No Maybe Don't care

9. Do parents enroll their children for gym in your facilities

- yes no

- Reasons for the answer above

THANK YOU FOR THE PARTICIPATION

Appendix IV: MKU Ethics Committee Review



FEBRUARY 1, 2018

Ref. No. MKU/ERC/0625

CERTIFICATE OF ETHICAL CLEARANCE

This is to certify that the proposal titled “CHILD OBESITY DETERMINANTS, PREVALENCE AND MANAGEMENT: AS AN EMERGING PANDEMIC IN THE CITY OF GABORONE, BOTSWANA”, whose Principal Investigator is Mr Gerson Mbvundula (MPH/50423/2016) has been reviewed by Mount Kenya University Ethics Review Committee (ERC), and found to adequately address all ethical concerns.

Mr Francis W. Makokha
Secretary, Mount Kenya University ERC

Sign:  Date: 01.02.2018

Prof. Francis W. Muregi
Chairman, Mount Kenya University ERC

Sign:  Date: 01.02.2018

The Chairman
Mount Kenya University
Ethics Review Committee
P.O. Box 342 0100, Thika

Main Campus, General Kago Road, P.O. Box 342-01000 Thika. Tel +254 067 2820 000, Cell: +254 720 790 796
Email: info@mku.ac.ke, Web: www.mku.ac.ke

Chartered and ISO 9001 : 2008 Certified institution.

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Appendix V: MKU Postgraduate Committee



SCHOOL OF POSTGRADUATE STUDIES

MPH/50423/2016

23rd May, 2018

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

RE: GERSON MBVUNDULA - REGISTRATION NO. MPH/50423/2016

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health (International Health and Development)** in the Department of **Epidemiology and Bio-Statistics** in the School of **Public Health**.

The title of his research is *"Child Obesity Determinants, Prevalence and Management: as an Emerging Pandemic in the City of Gaborone, Botswana."*

He has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data for his research between **May and July 2018**.

Any assistance accorded to him will be highly appreciated.

Thank you.

A handwritten signature in blue ink, appearing to read "S. Karenga".

Mount Kenya University
Dean, School of Postgraduate Studies
P. O. Box 342 - 01000
Thika

Dr. Samuel Karenga, PhD
Dean, School of Postgraduate Studies

Enc.

Appendix VI: Ministry of health Botswana Ethics Committee

PRIVATE BAG 0038
GABORONE
BOTSWANA
REFERENCE:



REPUBLIC OF BOTSWANA

MINISTRY OF HEALTH AND WELLNESS

TEL: (+267) 363 2500
FAX: (+267) 391 0647
TELEGRAMS: RABONGAKA
TELEX: 2818 CARE BD

REFERENCE NO: HPDME 13/18/1

1st June 2018

Health Research and Development Division

Notification of IRB Review: **New application**

Gerson Mbvundula
Gaborone University College of Law
Gaborone

Dear Gerson Mbvundula

Protocol Title: **CHILD OBESITY DETERMINANTS, PREVALENCE AND
MANAGEMENT: AS AN EMERGING PANDEMIC IN THE
CITY OF GABORONE BOTSWANA**

HRU Approval Date:	01 June 2018
HRU Expiration Date:	31 May 2019
HRU Review Type:	Expedited Review
HRU Review Determination:	Approved
Risk Determination:	Minimal risk

Thank you for submitting new application for the above referenced protocol. The permission is granted to conduct the study.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health and Wellness within 3 months of completion of the study. Approval is for academic fulfillment only. Copies should also be submitted to all other relevant authorities.

Continuing Review

Vision: *A Healthy Nation by 2036.*

Values: *Botho, Equity, Timeliness, Customer Focus, Teamwork, Accountability*



In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 7A.7 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomoiso Motlhanka, e-mail address: kgmmotlhanka@gov.bw As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form

Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 7A 7 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomoiso Motlhanka, e-mail address: kgmotlhanka@gov.bw . In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting

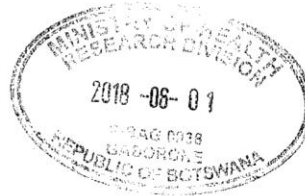
Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Ms Seeletso Mosweunyane at smosweunyane@gov.bw Tel: 3632018 and Mr Kgomoiso Motlhanka at kgmotlhanka@gov.bw at 3632751. Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours faithfully


Ms S. Mosweunyane
for/PERMANENT SECRETARY

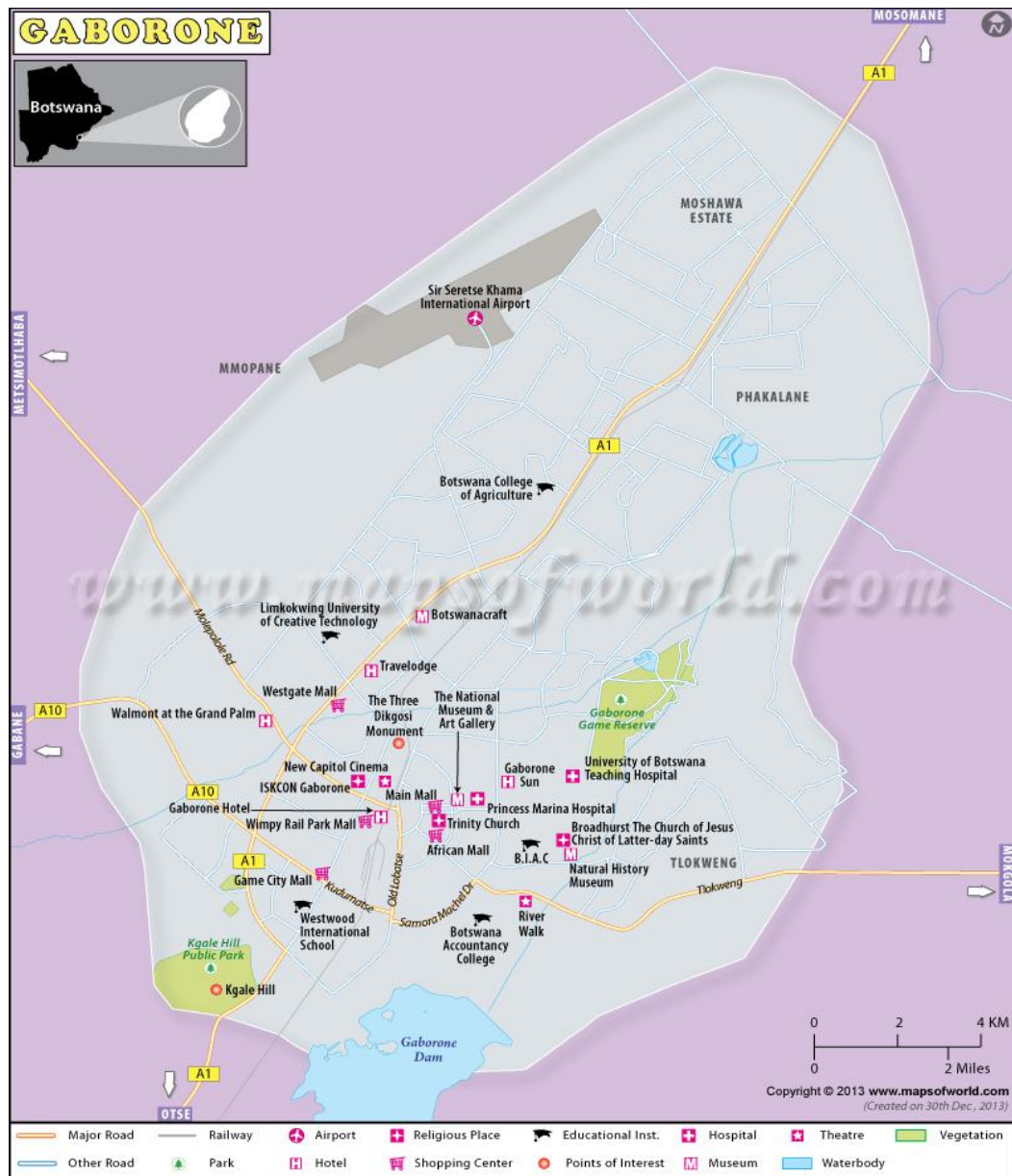


Vision: *A Healthy Nation by 2036.*

Values: *Botho, Equity, Timeliness, Customer Focus, Teamwork, Accountability*



Appendix VII: Study area map



Source: MapsWorld.com (2011)

Appendix VIII: Similarity Index

research complete

ORIGINALITY REPORT

8%	6%	1%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Mount Kenya University Student Paper	1%
2	www.jyi.org Internet Source	1%
3	Submitted to Western Governors University Student Paper	<1%
4	Submitted to Kenyatta University Student Paper	<1%
5	fhop.ucsf.edu Internet Source	<1%
6	www.jamestownsun.com Internet Source	<1%
7	phatkid1.wordpress.com Internet Source	<1%
8	Submitted to University of Southampton Student Paper	<1%
9	Submitted to Africa Nazarene University Student Paper	<1%
