INFLUENCE OF CHILDHOOD OBESITY ON PUPILS' SCHOOL ATTENDANCE AND PARTICIPATION IN PHYSICAL ACTIVITIES IN LOWER PRIMARY SCHOOLS, NAIROBI CITY COUNTY, KENYA

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DECLARATION

I declare that this research project is my original work and has not been presented to any other university for consideration. Similarly, this research project has been complemented by referenced sources duly acknowledged. Where text, data graphics or tables have been borrowed from other sources, including the internet, these are specifically accredited and references cited by anti-plagiarism regulations.

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This is to confirm that the work reported in this project was carried out by the candidate under my supervision.

Signature _____ Date _____

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DEDICATION

To my dear and loving mother; Jacinta Waka, spouse; Festus Stanley Mulakoli, daughter; Victoria, brother; Athanasius Maero and sister; Braxcides Maero for their the support that made this effort worthwhile and for being a source of joy, both material and psychological support and encouragement; only God can reward you for your prayers, love, support and patience.

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

AHA **:** American Health Association

BMI **:** Body Mass Index

CDC **:** Centre's for Diseases Control

ECD **:** Early Childhood Development

IASO **:** International Association for Study of Obesity

IOTF **:** International Obesity Task Force

KDHS **:** Kenya Demographic and Health Survey

NHNE **:** National Health and Nutrition Examination

PE **:** Physical Education

SMBs **:** School Management Boards

WHO **:** World Health Organization

ABSTRACT

Obesity is a condition of abnormal or excessive fat accumulation in the adipose tissue to the extent that health may be impaired. Globally it is estimated that about 155 million children are obese. Studies further reveal that childhood obesity has become a serious health epidemic, where more than a third of children aged between two to nineteen years are obese. The purpose of this study was to investigate the influence of obesity on pupil's school attendance and participation in physical activities. The study objectives were to establish the prevalence of childhood obesity among pupils in lower primary schools; find out whether obesity influences pupils' level of participation in physical activities; explore the influence of childhood obesity on pupils' school attendance; find out the available physical facilities in schools for use during physical activities; and to establish strategies that schools have put in place to prevent childhood obesity among grade three pupils in Kasarani Sub County, Nairobi County. The study was guided by the Looking Glass Self Theory that was developed by Charles Horton Cooley (1902). Mixed method study design was employed in the study. The target population were headteachers, teachers, and grade three pupils in Kasarani sub-county. Simple random sampling and purposive sampling techniques were employed to select the sample schools and pupils respectively. From the 25 schools, 30% were selected giving a total sample of 8 schools in both Kahawa and Ruaraka educational zones. Interview schedules, anthropometric datasheets and questionnaires were used to collect data. Data were analyzed by both qualitative and quantitative procedures. Pearson Product Moment Correlation was employed to test the study variables. The significance level of 0.05 was used and the probability value was then established. Regression analysis was done using SPSS giving means, percentages and frequencies. Data was presented in tables and figures. The findings showed that the prevalence rate of childhood obesity was at 11.6 % (BMI). The findings indicated that childhood obesity did not influence pupils' frequency on school attendance. There was also no statistical significance between childhood obesity and level of participation in physical activities and lastly, most schools were also keen on ensuring schools have at least four physical facilities or equipment. As for strategies employed by schools to mitigate childhood obesity; school feeding programs (considering nutritional value), timetabling of physical education lessons and mandatory school participation in games and sports by every pupil was reported in all the selected schools. The study recommends that a similar study can be done in other schools especially in rural areas and as well as establish intervention measures put in place to mitigate the problem.

CHAPTER ONE

INTRODUCTION AND CONTEXT OF THE STUDY

1.1 Introduction

This chapter presents an overview of the background to the study, statement of the problem, the purpose of the study, research objectives and research questions. It also presents the significance of the study, its delimitations and limitations, study assumptions, theoretical and conceptual frameworks. The key terms that were used in the study were also operationally defined.

1.2 Background to the Study

Good nutrition can contribute to healthy children who are generally productive in different aspects of life. Good nutrition is also very important for any country's general development, this is because children with good health tend to perform well in school learning activities, this would result into adults who are brilliant, dependable and productive socially, economically, and in other aspects of life. Obesity being one of the nutritional childhood illnesses may hinder such a child from achieving this. Studies have reported that the environment in which the child lives generally determines its food patterns and quality of nutrition consumed. Each household thus plays a key responsibility to feed a child, therefore the kind of food offered to the child influences the nutritional health nutrition of a child objectively. Tasher (1996) reported that a high intake of energy foods and refined foods may predispose an individual to obesity. Similarly, the provision of too much snacking has been largely associated with increased rates of obesity (Bagully, 2006). Therefore, there is a need

to ensure that children are free from childhood obesity by ensuring that proper nutrition and an active lifestyle is observed both at school and home.

Obesity is a health condition where an individual has abnormal or excessive fat accumulation in the adipose tissue which may impair a person's health (World Health Organization, 1997). Childhood obesity is also defined as a Body Mass Index at or above the 95th percentile for children of the same sex and age according to the Centres for Disease Control, CDC (2009). To assess a child's body weight, the BMI of the child has to be measured. BMI is calculated using a child's weight and height. A child's classification of body weight is then established based on age and sex percentiles. Hence, the BMI for children was measured to establish the prevalence rate of obesity among the sampled population and, and to bring the attention of the teachers and parents on the ways to help these children.

Globally, childhood obesity has recorded increasing rates by years. It is becoming a global epidemic (World Health Organization, 2002); childhood obesity has further continued to be an epidemic according to Fairclough & Stratton, (2006). Similarly, as stated by the Committee on Nutrition (2003), the likelihood of childhood obesity continuing into adulthood is estimated to have increased from 20% at 4 years of age to 80% by adolescence. The increased rate of obesity among children in recent years involves both its prevalence and development at earlier ages, this has led to increased occurrence of other lifestyle illnesses such as cardiovascular diseases, diabetes mellitus type2, and hypertension (Bauer and Maffeis, 2002). Further, studies have reported that obesity is also associated with diseases such as insulin resistance, hyperlipidaemia, respiratory problems, hypertension and orthopaedic complications

(Trost, Sirard, Dowda, Pfeiffer, & Pate, 2003). The current study, however, focused on the trends in obesity among young children and not related illnesses.

Research studies have reported that obesity not only affects the health of a child but also school learning processes. Naticchioni (2013) complemented this observation by stating that both young children and adolescents that are obese score generally low in test scores than those of average weight. They also tend to portray shorter attention spans, reduced mental flexibility, and low cognitive functioning than their counterparts of average weight and, that obesity does affect school-going children in multiple aspects of their academic learning and achievement. Obese children due to issues with weight may participate less in physical activities and frequent absenteeism that may affect their learning achievement.

Children should generally be encouraged to be physically active at all times, both at home and at school since if they are inactive, childhood obesity increases as well, proper nutrition is also advised. Within the past 20 years, rates of obesity in children have doubled, and currently, according to research, one in three children is either overweight or obese (American Heart Association, 2006). Research further indicates that childhood obesity may also affect cognition and therefore academic achievement and other school learning activities' performance including participation in physical activities (Yau, 2012).

Regionally, trends of childhood obesity have also been observed as an indication that Africa has similar issues. For instance, studies conducted among the pre-school children from several African countries reported that South Africa had a prevalence

rate of 31.9%, Algeria 21.6%, Seychelles 25%, Malawi 8.4%, Mauritius 5.6% and Kenya 4.6% (Aballa, 2010). Desoite these revelations, there are limited representative data available in African countries for studying these trends on childhood obesity (IOTF, 2002). Therefore, the need to establish prevalence rates of childhood obesity objectively to the study area necessitated the current study.

Studies that have been done locally have reported that just like the other States, Kenya has been reporting increased rates of obesity among children. Generally, in Kenya, there has been an increase in levels of overweight and obesity as established by previous studies like the Kenya Demographic and Health Survey, (KDHS, 2008); 18% of preschoolers were overweight while 4% were obese. The current study also explored the prevalence level and also established strategies that schools have put in place to prevent childhood obesity.

One key focus area of Kenya Vision 2030 is the health sector, and most importantly to improve the overall livelihood of each Kenyan by providing an efficient, high quality and affordable health care services with priority being preventive care at the community and family level. As such, addressing prevention measures on childhood obesity falls well within this vision, Kenya'sReport Card on the Physical Activity and Body Weight of Children and Youth (2011).

1.3 Statement of the Problem

Good nutrition is fundamental for survival, health and development for all human beings and children who are well nourished perform better in school, later grow into healthy adults and in turn, give their children a better start in life. Nutritional status is

a major environmental factor which can affect the learning achievement of school children (Beimnet 2015). Similarly, according to Pollitt (1984), nutritional status in school going children has always had significant adverse effects on school progress. Obesity is a nutritional disease among children may, therefore, affect children's learning achievement in the school including their participation in physical activities as well as attendance.

Childhood obesity is a serious health issue lately which also affects children's learning achievement. Studies have similarly revealed that obesity in childhood has become a serious health epidemic with more than one-third of children aged two to nineteen being overweight or obese (CDC, 2013). Further research has indicated that overweight and obese children tend to score lower in their academic as compared to those ranging within the normal weight. As far as the weight of children is concerned, improvements in learning have been linked to greater physical activity (PA; CDC, 2010a) and a lower Body Mass Index (BMI; Datar & Sturm, 2004; 2006; Datar, Sturm, & Magnabosco, 2004). However, an obvious relationship stating how the BMI of a child influences school attendance and participation in physical activities has not been broadly covered by many studies, therefore the need to establish this relationship.

Obesity has equally become a public health concern in Kenya especially among children living in urban. This could be attributed to the changes in lifestyle, for instance, many children seem to have shifted from being physically active to a sedentary lifestyle, with many changes in their diet. Foods seem to be mostly eaten are carbohydrates and fats which provide more calories than what is needed in the

body (Malla, 2004). The current study was however not exploring causes of childhood obesity, but rather its influence on children's attendance and general level of participation in physical activities at school.

Studies further report that in Kenya, there is a lack of an obvious national representative data on the prevalence rates of childhood obesity and levels of participation of physical activity among school-going children. Few studies done are not nationally representative and have further revealed that prevalence rates of childhood obesity are on the increase due to the inadequate physical activity levels especially among children living in urban areas (Muthuri, 2014). For that reason, the current study was done in an urban area.

1.4 Purpose of the Study

The purpose of this study was to establish the prevalence rates of childhood obesity and explore its influence on pupils' school attendance as well as pupil's level of participation in physical activities among lower primary grades pupils in Nairobi County, Kasarani Sub County.

1.5 Objectives of the Study

The study sought to:

i. Establish the prevalence rate of childhood obesity among pupils in lower primary schools in Kasarani Sub County.
ii. Find out the influence of childhood obesity on pupils' participation in physical activities among pupils in lower primary schools in Kasarani Sub County.

iii. Explore the influence of childhood obesity on pupils' school attendance among pupils in lower primary schools in Kasarani Sub County.

iv. Find out available physical facilities in the school for use during physical activities in lower primary schools in Kasarani Sub County.

v. Establish strategies schools have put in place to prevent childhood obesity in lower primary schools in Kasarani Sub County.

1.6 Research Questions

The study was guided by the following research questions:

i. What is the prevalence level of obesity among pupils in lower primary schools in Kasarani Sub County?

ii. How does childhood obesity influence pupils' participation in physical activities among pupils in lower primary schools in Kasarani Sub County?

iii. What is the influence of childhood obesity on pupils' school attendance among pupils in lower primary schools in Kasarani Sub County?

iv. What physical facilities are available in schools for children's use during physical activities among pupils in lower primary schools in Kasarani Sub County?

v. What strategies have schools put in place to prevent childhood obesity among pupils in lower primary schools in Kasarani Sub County?

1.7 Significance of the Study

The study was meant to measure children's BMI to identify those with obesity, thereafter obtain the prevalence levels of obese children. The study then, investigated if obesity in the identified children influenced their school attendance and levels of

participation in physical activities. It also investigated the strategies schools have put in place to mitigate childhood obesity.

The findings of this study could be useful to different stakeholders such as the Ministry of Health, Ministry of Education, Science and Technology, the County Education Board and School Management Boards (SMBs) as can offer insights on the level of childhood obesity prevalence. It will also help them explore mitigating strategies that can be employed by schools to prevent childhood obesity. Quality Assurance and Standards Officers and health officers may use the findings of the study to create awareness to schools in general on how the schools can be involved in assessing and monitoring children's weight, contributing factors and how to reduce obesity among children with the School Management Boards (SMBs) through involving parents in the awareness creation on childhood obesity.

1.8 Delimitations and Limitations of the Study

The delimitations and limitations of the study were described in the following sub-sections:

1.8.1 Delimitations of the Study

The study was conducted in Kasarani Sub-County. There are many childhood nutritional related illnesses but the current study was confined to childhood obesity. Childhood obesity may influence a child's performance in several ways but the current study only explored the influence of childhood obesity on pupil's school attendance and levels of participation in physical activities. The study also established

measures that the school can put in place to prevent childhood obesity among lower primary pupils' in Kasarani Sub-County.

1.8.2 Limitations of the Study

Due to time, financial and other resources involved, this study did not cover the larger Nairobi County but was limited to Kasarani Sub-County, however for the location selected, simple random sampling was employed in selecting the schools. This study was also limited to a small population of participating schools only. Study findings may not, therefore, be generalizable to other areas especially the rural areas because of disparities in feeding habits, different engagements of physical activities and food type related to income levels between urban and rural settings among other factors.

1.9 Assumptions of the Study

The study was guided by several assumptions. First, some children are obese. Second, childhood obesity does influence children's school attendance. Third, that obesity can also influence children's participation in physical activities. Fourth, it is assumed that schools have initiated some strategies to minimize childhood obesity among pupils.

1.10 Theoretical and Conceptual Frameworks

This study was guided by the Looking Glass Self Theory (1902) as described in the following sub-section.

1.10.1 The Looking Glass Self Theory (1902)

This theory was developed by Charles Horton Cooley (1902). The concept of the looking glass self demonstrates that a child's self-relation, and how the child views oneself is dependent on others' perception on them too, thus many studies state that a

child who is obese will view self-based on how he/she is perceived by others, either positively or negatively. Cooley further states that people have an inborn way to interact with other people within their environment.

The theorist suggested that this self-feeling and social feeling should be harmonized as it may have effects on how such a child socializes and play freely with other children; An obese child who believes that others view him unfavourably tends to either withdraw from activities such as outdoor physical and general play activities or may portray aggressive behaviour towards others (Latner,2003 & Jansses,2004).

The theorist further stated that a person's main thought is made up of perceived social observation by that particular person which may or may not be factual, but this may affect the person's behaviour either positively or negatively. The theory further expresses that, the perception one has of his or her social relations may sometimes be unrealistic, therefore, one needs to distinguish between what is true, right and fair. For instance, an obese child may have a very wrong judgement of how his social environment views him. Similarly, an obese child that feels that the social environment is not being judgemental of his or her weight will have no problem with his or her body image, thus, will also be present and willing to participate in all physical/play activities and his interaction with others will be a healthy one just like a looking glass, perceptions tend to reflect reality. Further, obesity will rarely be found among children that lead active physical lives through the use of physical materials as physical involvement is mandatory but will be common in those whose lives are sedentary. This is basically because their energy expenditure is low (Eleavior, 1998).

For a child having a negative perception of his or her social environment, self-stigmatization would crop in which may lead to such a child unwillingness to participate in physical activities and deliberate absenteeism from school to evade such stigmatization (Puhl & Moher, 2009). This unwillingness to participate in such activities may lead to increased rates in obesity due to lack of or less involvement. These mental perceptions have three principle elements, these are; i) The mental image we have of our appearance to the other people ii) The thought of one's judgment of what is seen iii)Self-feeling such as pride or shame.

In a nutshell, an obese child who is psychologically unstable of his or her social system may be affected in his/ her general learning and academic performance either negatively by having low self-esteem in everything done, or by withdrawing from the social domain such as absenteeism at school or participation of physical activities. This is why this study was focused on the influence of childhood obesity on children's attendance and participation on physical activities in school and try to establish strategies that schools can use to mitigate the problem.

1.10.2 Conceptual Framework

Schools should come up with strategies to mitigate or/and prevent childhood obesity through strategies such as ensuring that there are a uniform and proper nutritional planned meals in their school feeding programs, proper utilization of physical education lessons and to complement this, availability of physical facilities is necessary, collaboration with parents on all prevention measures, encouraging early screening of pupils weight by parents, and monitoring food eating habits among

pupils. If all this are put in place, then reduced obesity rates will be achieved considerably.

Childhood obesity may affect a pupil's frequency of school attendance and level of involvement in physical activities if it's high. This is because the affected children may be frequently absent due to frequent illnesses or stigmatization by other classmates such as teasing them owing to their inability to perform well in physical activities due to their weight. To this regard, there is a need to reduce the prevalence level of childhood obesity among pupils to prevent such occurrences.

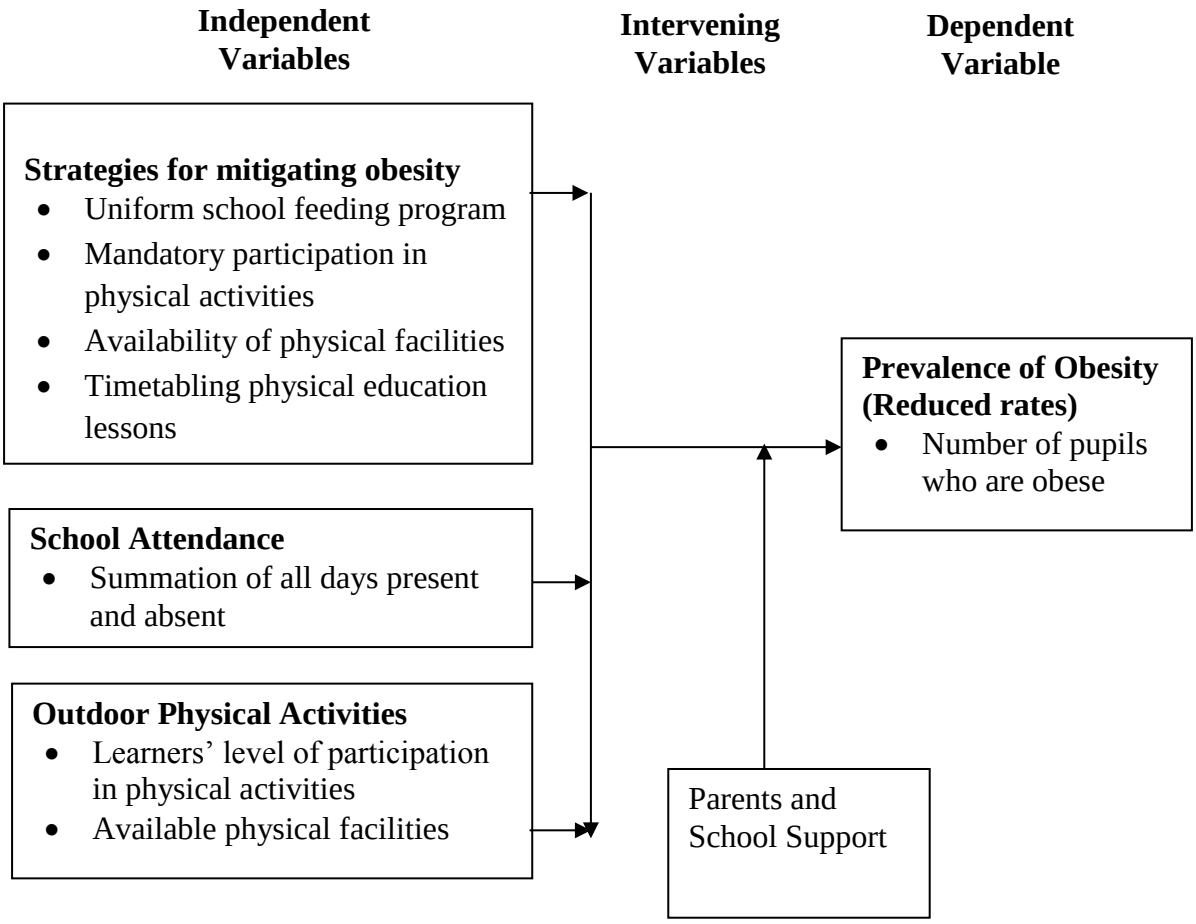

Figure 1.1: Conceptual framework showing the influence of childhood obesity on pupil's school attendance and participation in physical activities

1.11 Operational Definition of Terms

Anthropometric data: Refers to information gathered after measuring a child's Body Mass Index (BMI). It was obtained by measuring weight in Kilograms and divided by height in meters squared.

Attendance: Refers to how frequently pupils' come to school regularly. In this study, it refers to the frequency of pupils' coming to school daily; it included a summation of all days present and absent in a term.

Childhood obesity: Excessive accumulation of body fat in young pupils in grade three in public schools.

Lower primary: Refers to the first 3 grades of primary school in Kenya that is (grades 1-3). For this study, grade three class level was sampled.

Participation in physical activities: Refers to the level of engagement and involvement of children in outdoor, indoor or games activities of a grade three pupil.

Physical activities: Refers to all activities engaged in during free choice play, sports or games by pupils that entails relatively vigorous movement of the body; this included running, jumping, skipping, rolling, and hopping among other activities among grade three children.

Physical facilities: Refers to outdoor play materials and equipment used by pupils when playing or during physical education lessons among grade three pupils.

Strategies: Approaches and measures put in schools to mitigate childhood obesity among grade three pupils.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of related literature and studies concerning the influence of childhood obesity on pupils' attendance and participation in physical activities. In particular, the literature explored the prevalence of obesity among children, the influence of obesity on pupils' participation in physical activities, influence of obesity on pupils' school attendance and strategies used to prevent childhood obesity.

2.2 Prevalence of Obesity among Children

Prevalence of childhood obesity has been increasing annually and steadily; the current rate is ten times higher as compared to the 1970s (WHO, 2003). The International Association for the Study of Obesity (IASO, 2012) similarly reported that in Iceland, Spain, Estonia, Austria, Ireland, Czech Republic, Canada, Lithuania, Australia, Luxembourg, and Hungary the percentages for obesity are equally increasing. Portugal, Slovakia, Germany, UK, Mexico, Cyprus, and Malta have obesity rates of over 20%. The current study, therefore, explored the estimates of obesity among children in Nairobi County, Kasarani Sub County.

Globally, it has been observed that more children seem to be struggling with their weight. The Centres for Disease Control and Prevention (CDC, 2010) showed that childhood obesity has more than tripled in the past 30 years, making it one of the most critical health problems in the United States. According to the North Carolina Child

Health Assessment and Monitoring Program (2009), more than one-third of the children were underweight, overweight, or obese. Studies consistently reveal that obesity estimates and prevalence of overweight is 15.3% in 6- to 11-year-old children and 10.4% among two to five-year-old children, as compared with 11.3% and 7.2%, respectively, in 1988 to 1994 (Ogden, Flegal, Carroll, Johnson, 2010). Further, children aged between the ages of six to eleven, 15.8% are overweight and obese and, while another 31.2% are at risk for being overweight (Pate, Davis, Robinson, Stone, McKenzie, & Young, 2006).

It has also been reported that 31.8% of children and adolescents aged two to nineteen are overweight or obese according to the National Health and Nutrition Examination Survey (2005). This prevalence estimates has increased from 30% in 2005-2006, 28.1% in 1999-2000, and 23.0% in1988-1994. It is further estimated globally that, 155 million children are obese, the prevalence rates worldwide stands at 25%, whereas in America stands at 37%, Europe 35%, the Middle East 25%, and Asia 15% and in Africa, it is estimated to range at 8.4% (IOTF, 2002). The current study specifically focused on the prevalence of obesity among lower primary pupils excluding adolescents to come up with statistics and find out its relationship on school attendance and participation in physical activities to the specified children.

Regional studies indicate that childhood obesity is a concern in Africa too. Similarly, studies conducted among the pre-school children from several African countries reported that South Africa had a prevalence rate of 31.9%, Algeria 21.6%, Seychelles 25%, Malawi 8.4%, Mauritius 5.6% and Kenya 4.6% (Aballa, 2010). However, there are limited representative data available in African countries for studying these trends

on childhood obesity (IOTF, 2003). The studies further report that there are limited data and evidence of childhood obesity not only in Africa but also in Kenya. The current study sought to establish prevalence levels and avail information on childhood obesity among lower primary school children in Nairobi County, Kasarani Sub County.

In Kenya, according to Aballa (2010), the prevalence of childhood obesity among school-aged children was found to be 25.6% with more boys (27%) being obese than girls (26%). The study further concluded that the prevalence of obesity among school-aged children in the city of Nairobi is very compared to most developed countries. In a study that was done in Nairobi by International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE, 2013), out of the 563 who participated in the study, it was reported that 14.4% of the population were overweight, and 6.4% of them turned out to be obese, this was obese based on WHO cut-points. Further, studies have revealed that Kenya has an increasing incidence of obesity amongst its citizens (Muriuki, 2004). The current study sought to establish the current prevalence rates of childhood obesity among grade three children in Nairobi County, Kasarani Sub County.

Generally, in Kenya, there has been an increase in levels of obesity rates according to studies done by the KDHS (2008); which reported that 18% of preschoolers are overweight while 4% are obese. However, studies done within Nairobi have concentrated on adolescents and teenagers from 8-18yrs and adults particularly women and not young children, thus the need for the current study to establish the

current trends of childhood obesity specifically among lower primary school pupils in Nairobi County, Kasarani Sub County.

2.3 Influence of Childhood Obesity on Pupils' Participation in Physical Activities

Physical activity can be defined as the movement of the body produced by skeletal muscles which utilize energy beyond the levels of resting, according to (Ward, Saunders & Pate, 2007). Studies further done by the US Department of Health and Human Services (2008) reported that there are many benefits of one being physically active. According to the study, active physical activity reduces the risk of many adverse health outcomes including improved muscular fitness and cardiorespiratory. Physical activity has also been found to reduce the risk of obesity, cancer, cardiovascular disease, and diabetes (Stein, Fisher, Berkey, & Colditz, 2007). Frequent physical activity promotes a healthy body weight (U.S. Department of Health and Human Services, 2008). The current study, however, did not put focus on the relationship between obesity and related illnesses, but rather on the influence childhood obesity has in a child's level of participation in physical activities.

Physical activity as a key factor acts as a preventive strategy in youth to reduce the risk of obesity along with other chronic diseases and not only does active bodily physical activity have positive physical outcomes, but also contributes to stable emotional health in an individual (Panfil, 2015). Physical activity decreases symptoms of anxiety and depression, also promotes self-esteem and confidence of someone (Stein, Fisher, Berkey, &Colditz, 2007), such a child will, therefore, feel confident and comfortable and be actively engaged in physical activities. The current study,

however, sought to establish how childhood obesity influences pupils' participation in physical activities.

Further studies indicate that obese children as young as five through nine years old increasingly experience negative emotions from their peers, thus more likely to be emotional (Gable, Krull, & Chang, 2009). Further studies state that how self-esteem is measured varies and includes school academic performance, body appearance, athletic ability, level of participation in physical activities social networking behaviour and conduct. These attributes increase suicidal ideas and suicidal attempts among overweight adolescents who reported being teased by peers and family members (Eisenberg, 2003). Emotionally disturbed children are more likely to score lower on measures of learning achievement (Schwartz, Gorman, Nakamoto, & Toblin, 2005). Investigating how obese children view themselves as social beings and how this affects their school attendance level of participation in physical activities at school is necessary; however, the current study was inclined to childhood obesity on level of participation in physical activities.

Despite the benefits associated with active physical involvement, obese children still score low in their level of participation in physical activities. Similarly, in a case study done by Epstein (2000) participation of children in physical exercises during obesity treatment has been noted to be very poor, however, those that cooperated were better able to maintain long-term weight control unlike those that did not. The type of physical exercise involved included: dancing, swimming, sports, games and cycling. The current study, therefore, sought to establish if childhood obesity also influences how children participate in physical activities. Other studies have consistently

reported that childhood obesity has a negative influence on children's participation in physical activities. Obese and overweight children are seemingly less involved in sports and games than in children with normal range weight (John & Hill, 2003). The current study thus sought to establish this vrelationship as well as the strategies that schools have employeed to reduce or prevent childhood obesity to make such children comfortable enough to participate in physical activities.

The American Academy of Paediatrics (2013) encouraged schools to schedule leisure time/breaks as this helps in social, emotional, physical, and cognitive development. This also helps young children release pent-up emotions, and burn excess fats. The current study, therefore, tried to establish the level of participation among obese children during play, games and leisure time.

Studies by Latner (2003) and Jansses (2004) were in agreement and reported that children with obesity are more likely to experience social difficulties and behavioural problems. They may, therefore, fear being ostracized, embarrassed or teased by other children; thus will deliberately absentee themselves from schools especially on days they do have physical education lessons, as it is difficult for them to perform better in physical tasks such as jumping. The current study, however, sought to establish the relationship between obese children's, physical participation and not the treatment they get from other children.

Children with obesity may view themselves negatively; this lowers their self-esteem and confidence especially if they have to involve their bodies physically because of difficulties experienced in such motions. Concurrently, in a study done by Zabinski,

Saelens, Stein & Wilfley (2003) it was pointed out that obese children especially girls are very concerned about their body images, this may make them reluctant to participate in physical activities as compared to those in the normal weight ranges. Deforche, Tanghe, Debode & Bouckaert (2005) further stated that youth and adolescents tend to feel very insecure about how they appear to others; this in itself becomes a self-barrier to their participation in sports. The current study, however, did not focus on adolescents but lower primary school pupils and similarly established the influence of childhood obesity on children's level of participation on physical activities.

Most studies done in Kenya have reported that children prone to childhood obesity are those staying in urban areas. Further, research studies have shown that a greater percentage of children living in rural are not obese, this has been partly because they relatively accumulate less time in sedentary behaviours (67 minutes per day) than their counterparts living in urban areas (95 minutes per day), Kenya's Report Card on the Physical Activity and Body Weight of Children and Youth (2011). The report further stated that a large proportion (50%) of children in urban Kenya tend to spend over 2 hours weekly on-screen time activities compared to 30% of children in rural Kenya, Kenya's Report Card on the Physical Activity and Body Weight of Children and Youth (2011). It is for this reason that the current study was done in urban schools and not in rural schools, however, this study did not focus on causal factors of childhood obesity.

2.4 Availability of Physical Facilities

Outdoor facilities in children's play are important, this is because, through them, children are able to exercise, thus improving and maintaining their physical fitness (Frankel, 1999); similarly, obesity will rarely be found among those children who lead such active physical lives through the use of physical materials as physical involvement is mandatory, it can only be common in those whose lives are sedentary. This is basically because their energy expenditure is low (Eleavior, 1998). The current study, therefore, sought to establish the relationship between the availability of materials,level of participation in physical activities and prevalence rates of obesity in sampled schools among grade three-level children.

Elis (2000) examined the effect play materials have on certain aspects of children's development. He used 36 children ranging in age from 2 – 3 years. Each child was engaged in different play materials. The result revealed that children who had used a variety of playthings had developed better than those who were not exposed to a variety of materials. This current study, however, was inclined towards the effect and relationship of play materials concerning prevalence rates in obesity among children above the age bracket of two-three: children's general growth and development were also not researched on, but rather the influence availability of physical materials at school have to childhood obesity among grade three pupils' class level.

2.5 Influence of Childhood Obesity on Pupils School Attendance

Frequent school attendance is important in determining children's performance and achievement in both cognitive and physical well-being. However, studies indicate that obese children are mostly teased and bullied by fellow peers making them suffer from

stigmatization, depression, withdrawal and low self-esteem; which may negatively affect their motivation for regular school attendance leading to frequent absenteeism (Puhl & Moher, 2009). Such children may, therefore, miss a lot when away from school thus lag in most learning activities. The current study however sought to establish whether childhood obesity influenced children's school attendance and its influence on their level of participation in physical activities and not on their socio-emotional well being.

Studies have further reported that there's a relationship between childhood obesity and school attendance as a result of frequent absenteeism. In a case study carried out by (Jeannine, 2012) through the International Journal of Obesity; it was reported that obese children generally missed at least two or more days every week, because of fear being bullied or teased, and being embarrassed about their participation in physical activities. Studies have further state that children with obesity are usually teased compared to those ranging in normal weights; this generally demotivates them from attending school frequently, leading to habitual and chronic absenteeism (Bacchini, 2015). The current study, however, did not focus on the treatment obese children were subjected to by their classmates, but rather sought to establish the influence of childhood obesity on children's school attendance in Nairobi County, Kasarani Sub County.

Childhood obesity may not only have an impact on school attendance but also academic performance. Similarly, it was revealed that childhood obesity may affect school attendance and learning performance, as it impacts negatively on children's physical and mental health (Henderson, 2014). Obese children further suffer from

illnesses which lead to frequent absenteeism and negative participation in-class activities, which may be due to them being absent frequently while sick, their chance of being at the same pace with other children is usually compromised (Griffiths, 2006). Whereas the study sought to find out the relationship between childhood obesity and academic performance, the current study sought to find out the influence childhood obesity has on a pupils' school attendance and level of physical participation and not academic performance.

Regular school attendance among school-going children yields better acquisition of skills and academic performance, however, obese children seem to be negatively affected due to frequent sicknesses, making them rate low in such learning skills and academic performance. Similarly, (Liping, Sherry, Park, Blanck, 2012) reported that irregular school attendance negatively affects learning and academic achievement. The findings further linked the frequent absenteeism among obese children as a result of psychosocial and physical consequences from others, thus leading to irregular school attendance. The study finally concluded that most adolescents who were obese missed schools more frequently than those who were not obese because of falling sick more often. The current study, however, sought to find out how childhood obesity influence children's school attendance among grade three class level pupils and not among adolescents. The study also explored the influence of childhood obesity on school attendance.

School attendance is by and large believed to contribute to success and good performance at school. However, this is not always the case in children who are obese because of health issues related to their weight. Bagully (2006) complemented this by

reporting that, overweight children tend to miss four times as many days at school as compared to those in the normal weight range children due to frequent medical appointments related to issues with their weight that negatively affects their health. The study further stated that such absenteeism from school, while others are learning, affects their achievements in learning activities as well as academic performance. This necessitated the need to undertake the current study to explore the attendance level of obese children among lower primary pupils in Nairobi County, Kasarani Sub County.

2.6 Strategies to Prevent Childhood Obesity in Schools

The school should help reduce the increasing levels of obesity among children in collaboration with parents. For instance, Singhal (2010) did a case study which was carried out in India from May 2008 to January 2009 in eleventh-grade adolescents among obese students in a co-educational school. The study came up with recommendations that suggested some mitigating intervention measures, these included consumption of healthier food choices in the school canteen, counselling by a trained nutritionist, and teachers and parents were also to be engaged in a broad range of other activities inclined to promote healthy lifestyles. The current study therefore also sought to find out specific strategies employed by schools in preventing childhood obesity in Nairobi County, Kasarani Sub County.

A school that put focus on healthy eating habits and encourages physical activities at school reduces obesity rates significantly. This is in line with Hip-Hop Health Journal(2002), where a case study of twelve Chicago Head Start preschool programs serving minority children was done, where half of the preschools around participated in a fourteen-week (forty minutes three times a week) program of healthy eating

habits and were then involved in physical activities. Further, their parents were sent weekly newsletters with information on obesity-related issues. Children in the other six preschools served as a control group. Findings of the study revealed that children involved in the program had reduced BMIs than children in the control group for the one-year and two-year follow-ups. The current study also sought to establish if such a strategy as healthy nutritional patterns and physical activities and any other workable strategies are being practised by schools and the influence they have on prevalence rate on childhood obesity comparatively.

For schools to effectively reduce and prevent childhood obesity, they need to partner with parents. Consequently in Beijing, Jiang (2007) did a 3-year, nutrition education and awareness in a school including physical activities; this involved parents and their children and achieved positive results. In the study, two primary schools in urban Beijing were involved for 3 years, and intervention measures put in place included providing parents with educational materials, children were also taught lessons related to obesity and were actively involved in various physical activities. The schools also organized educational meetings with parents once per term on the health implications of overweight and obesity, both parents and teachers were also taught about all components of the food pyramid and what a healthy lifestyle is all about, this included aspects such as (frequent physical activities where overweight and obese children ran for 20 minutes after class, balanced diet, reduction of the television watching and computer usage). Parents of overweight and obese children also had an exceptional meeting once per term where they were provided with a light food list to guide and adhere to. Findings revealed that overweight and obesity prevalence compared after

the 3-year period was lower in those schools as compared to the control schools respectively, (overweight 9.8% compared with 14.4%; obese 7.9% compared with 13.3%. The current study also sought to establish if schools have come up with strategies that have helped mitigate childhood obesity problem positively.

Exposing children to opportunities to observe healthy eating habits and having an active life may be a very effective measure to reduce cases of childhood obesity which has become a global issue. Pekruhn (2006) argued that schools have a responsibility to enhance healthy eating habits to children by providing them with several opportunities to observe healthy eating and encouraging them to stay active. The study further proposed that schools can, therefore, offer healthy foods in school canteens and discourage any sale of unhealthy foods at school. To promote an active lifestyle, children should also be encouraged to be walking more often or use bikes than being driven, and this will promote their physical activity. Consistently, schools should incorporate physical activity programs, this is because they offer children with not only specific and necessary skills and knowledge, but also acts as a way of sustaining active lifestyle in children, thereby reducing chances of childhood obesity National Council of State Legislatures (2007). The current study similarly sought to establish whether there are measures in place at school to curb childhood obesity.

Provision of a common school feeding program in schools can also play a role in reducing and preventing childhood obesity. According to Karen, May & Simone (2006), schools that have a defined healthy school feeding program can reduce or prevent obesity among children through reducing the fat content of foods in sold, and make more fruits and vegetables available. The schools should further encourage

physical activities among children as a complementary measure as well. The current study also explored if related strategies exist in schools to curb childhood obesity among lower primary pupils.

2.7 Summary of the specific Gaps that the Study Intended to Fill

Review of related literature has revealed and identified the following gap of knowledge that the study will fill:

First, studies that have been reviewed have proved that despite the several empirical pieces of evidence indicating the health implications of obesity, prevalence rates of obesity are still on the increase rendering the situation a global issue of concern. This is one of the reasons for undertaking this study was to also find out the current prevalence rates of childhood obesity in the study location.

Secondly, regular school attendance has also been associated with better academic performance as well as the physical well-being of children. However, this is somehow compromised among obese children due to frequent absenteeism from school according to studies reviewed. Schools, therefore, need to put workable strategies to reduce and prevent childhood obesity at school such as provision of outdoor physical play materials, proper school feeding habits and especially if a school feeding program exists among other measures.

Third, most studies reviewed on childhood obesity seem to put a focus on prevalence rates and causes, but few studies have been done in Kenya on the influences of childhood obesity on attendance and level of participation among school-going children. This is why the researcher did the current study.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter presents the methodology that was used to achieve the study's research objectives. The chapter outlines; research design, variables, study area, target population, sampling techniques, sample size, research tools, pilot study, validity, reliability, data collection techniques, data analysis and logistical and ethical considerations.

3.2 Research Design

The researcher employed a descriptive survey research design because it helps to draw valid general conclusions from the findings discovered. Ader, (2008) also describes a descriptive survey as a collection of data to test hypotheses or to answer questions concerning the subject of the study. Descriptive survey design has been chosen because it is appropriate for finding out facts and also yields a great deal of information that is accurate. The research design also enables a researcher to gather data at a particular point in time and use it to describe the nature of the existing conditions (Cohen, 2000). The current study aimed to gather accurate information about the level of participation in school physical activities, school attendance and strategies put in place when dealing with childhood obesity among lower primary school pupils.

3.2.1 Variables

The study investigated two types of variables, namely, dependent and independent. The independent variables were available physical facilities, frequency of school

attendance level of involvement in physical activities at school, and strategies used to prevent children from childhood obesity.

The independent variables were measured as follows:

i. Availability of physical facilities for use during outdoor was established by observing their presence.
ii. Strategies used to prevent children from childhood obesity was established by observing the presence of the school feeding program and food served to pupils, and by also interviewing headteachers and teachers.
iii. Frequency of school attendance was measured by inspecting attendance from grade three class register based on the days present or absent.
iv. Level of involvement in physical activities was determined by observing children's participation in physical activities in school.

The dependent variable was the prevalence of obesity. This was established by measuring the BMI of children in grade three in the sampled schools. It entailed gender,age, weight and height measurements.

3.3 Study Area

Nairobi is the smallest County in Kenya and covers an approximate area of 693 square kilometres. Nairobi is cosmopolitan and has purposively been chosen because obesity seems to be rampant in urban areas and the presence of a variety of people with varied social, cultural, economic and religious backgrounds. The study was conducted in public schools within Nairobi County, but specifically in Kasarani Sub-County which is also in an urban setup.

3.4 Target Population

The target population comprised of 25 public primary schools in Kasarani Sub County and entailed grade three pupils inclusive of both genders. Grade three was selected for this study because children at this level are in a position to explain themselves more accurately on how they view their body images; whether favourably or unfavourably, willingness to participate in physical activities and frequency of attending. The grade teachers of selected schools were also included in the sample as key respondents.

3.5 Sampling Techniques and Sample Size

The study was concerned with establishing the influence of childhood obesity on pupil's school attendance and participation in physical activities in lower primary in Nairobi County, Kasarani Sub County. To this end, a multi-stage sampling method was used, this allowed the use of combined methods of sampling. Trochim (2002) argued that the use of a combined sampling approach is necessary where there is no general sampling framework and the need to reduce the sampling error.

3.5.1 Sampling Techniques

Purposive sampling was used to select Nairobi County and Kasarani Sub County. This is because this method allowed the researcher to select the sample with the required information to serve the purpose of the study. As for the schools in respective educational zones, multistage sampling was employed to select the schools and participants. The multi-stage sampling technique also allowed purposive selection of the study schools and the participants. For a relatively large population, Sutter (2011) suggests that the use of a 30% to 60% sample of the total population is

appropriate in education-related studies. Therefore, purposive sampling was used to select 30% of the total number of schools and children to be involved in the study. The schools were numbered and then simple random sampling was used to select 30% of schools expected to be sampled. One grade three teacher per school was included in the study. Besides, all headteachers from the sampled schools were included in the study.

3.5.2 Sample Size

The sample size of this study were four schools in Kahawa educational zone, and four schools in Ruaraka educational zone. Eight teachers for grade three from each sampled school.

Table 3.1: Sample Size for Schools.

Sub County	**Educational zone**	**No. of schools**	**Sampling 30% of schools**	**Sample size teachers**
Kasarani	Kahawa	14 (56%)	4	4
	Ruaraka	11 (44%)	4	4
Total		**25(100)**	**8**	**8**

Table 3.2: Sample Frame/ Matrix Size for Headteachers and Pupils

School Code	Educational Zone	Sample Size of Headteachers	Total Number of Target Population	Sampling 30% of Pupils
A	Kahawa	1	121	40
B	Ruaraka	1	120	40
C	Ruaraka	1	61	20
D	Kahawa	1	188	59
E	Ruaraka	1	87	29
F	Kahawa	1	122	41
G	Ruaraka	1	86	29
H	Kahawa	1	109	36
Total		8	**994**	**294**

3.6 Research Instruments

The researcher used multiple data collection tools, this helped minimize the weaknesses and limitations of both qualitative and quantitative research studies. Similarly, according to Bamberger (2012), the use of mixed methods produces more justifiable and convincing findings. The following data collection tools were therefore used.

The research instruments that were used for the collection of data were interview schedules for headteachers (Appendix III) to determine strategies used by the school to prevent childhood obesity, and grade three pupils to determine their level of participation in physical activities (Appendix IV). Questionnaires were administered to grade three teachers on the frequency of school attendance among obese children

through checking attendance from the school register and provide information on the level of involvement in physical activities (Appendix II).

3.6.1 Interview Schedule for Headteachers

An interview schedule was used to collect information from the headteachers on strategies that school have put in place to prevent childhood obesity. Interview schedules were used because headteachers were a few in number making it easier to generate adequate information from them. It consisted of two sections. Section (A) was used to collect background information on headteachers such as gender, and level of education. Section (B) was used to collect information on strategies that school have put in place to prevent childhood obesity.

3.6.2 Questionnaires for Teachers

Teachers were in a better position to explain the level of involvement in physical activities, and frequency of school attendance thus the use of questionnaires. These questionnaires were administered to grade three teachers. They were used to collect this information descriptively. Section (A) was used to collect background information of sampled teachers such as gender and level of education. Section (B) was used to gather information on the frequency of school attendance and level of involvement in physical activities concerning sampled children. Section (C) was used to gather information on the level of participation of physical activities of the pupils. Section (D) was used to gather information on strategies used at school to prevent and enhance children from childhood obesity.

3.6.3 Interview Schedule for Children and Anthropometric Data Sheet

Data was also collected by the use of an interview schedule with pupils. This contained both structured and unstructured questions to get detailed responses with clarity to meet the study's objectives. Information covered here included: level of involvement in physical activities and information on whether they have physical education lessons at school.

The weight and height of children were taken and recorded on the anthropometric datasheet to get pupil's BMI, where pupil's height was taken using a height board. The child was expected to remove excessive clothing such as heavy cardigans then stand on the weighing bathroom scale, the measurements of weight and height were read concurrently. These measurements were recorded twice to cater for any arising errors and also ensure accuracy.

3.6.4 Observation Checklist

An observation checklist was also administered to establish available outdoor physical facilities, the level of involvement in physical activities and the existence of school feeding program if any and establishment of foods being prepared.

3.7 Pilot Study

The study conducted a pilot study in two schools in each educational zone; one in Ruaraka and the other in Kahawa, they were selected at random. Two grade three teachers (one from each selected school). Two pupils in grade three in each school were selected at random for the interviews. Schools selected were from Kasarani Sub County since they provided a population that was similar to the study. Pilot testing

helped inform the time required to administer the tools and detected any biased item or ambiguity in the instruments before the collection of actual data. The participants were also informed on the process of revision of any questions. Piloting also helped in establishing the validity and reliability of the instruments. Schools that were selected for the pilot study were not included in the main study to avoid influencing the findings of the study.

3.7.1 Validity

Validity is the degree to which results obtained after analyzing data to represent the phenomenon that is being studied, and therefore has to do with how accurately the data obtained represents the variables being studied (Mugenda, 2003). In this context, content validity was used to test the validity of the instruments to be administered. Analysis of content and construction of related data and information through pre-testing of instruments to be studied validates the tools Wiersma (2004). This was achieved by ensuring that items to be tested covered all the stated objectives and variables of the study.

The instruments were validated through a pilot study and reviewed by a panel of experts in the field of early childhood and triangulation by use of multiple data collection methods (Trochim, 2002). The panel of experts comprised of the study supervisor from the University at the Department of Early Childhood Studies. Items that were found to be ambiguous were rephrased, modified and fine-tuned where necessary. The modification involved dropping and adding some research items, and editing of grammar to make it easily understandable where necessary and recommendations from these experts were incorporated to enhance the validity.

3.7.2 Reliability

Goodwin and Goodwin (1996) describes reliability as the extent to which researchers working independently discover the same phenomena, similarly describe the findings and agree with participants about their meanings. The internal consistency of the study's research instruments was achieved by using the test-retest method to establish the reliability of research instruments. Research instruments were administered to the same group within the pilot study after two weeks. Their responses were recorded and the same instruments repeated after two weeks. Responses from the two tests were compared to establish the extent to which the instruments were consistent, any inconsistency made the researcher do adjustment of the items where necessary.

3.8 Data Collection Techniques and Procedures

The researcher used interview schedules, questionnaires, anthropometric measures datasheet and observation checklist to collect data as data collection techniques. Data collection procedures included getting an introductory letter from the University to authorize the data collection process. This was presented to the Kasarani Sub County Education headquarters' office. The county director then helped by providing information about the list of all public schools around, this thereafter informed the researcher on the selection of specific schools to be included in data collection before the collection of data. This was also helped in planning ahead of time by visiting the schools in advance and plan accordingly.

3.8.1 Data Collection Techniques

Mixed method approach was used. The data was collected through an interactive process between the respondents and the researcher using prepared interview

schedules, and questionnaires, both had structured and unstructured questions and observation checklist were also used. Data was also collected through the anthropometric data-sheet in calculating and determining children's BMI.

3.8.2 Data Collection Procedures

The researcher visited the respective Education Sub County headquarters and reported to the Education Officer to inform on the data collection exercise. This was followed by planning for an awareness visit to the sampled schools. The Education Officer assisted in sampling the schools from the list of registered public school primary in the respective Sub County. An introductory letter and participant's informed consent forms were produced to the schools sampled in the study. In each of the sampled school, the researcher was accompanied by the Headteacher in–charge, held a meeting with the schools` management including School Management Committee (SMC) chairperson, grade three teacher and parents.

During the meetings, the researcher explained the importance and objectives of the research study and the expected role of the participants. After the discussion, the school management was requested to consent to having the research done in the respective school. Parents were then requested to give consent to their children's involvement and participation

Interview schedules were administered to pupils on appointment by the researcher to various schools. During this period weights and heights of the pupils were taken. Questionnaires for grade three teachers were conducted during eleven o'clock and lunch breaks. One school was interviewed per day.

3.9 Data Analysis

Data analysis was done using Statistical Package for Social Sciences (SPSS) version 20 to analyze the anthropometric data to determine the BMI, which was graded according to (WHO, 2000) age-specific cut-off points for age and gender to analyze the relationship between variables under study. Relationships between the variables were tested using chi-square and Pearson's Product Moment Correlation. Qualitative data were summarized according to similarities and common themes and was used to complement the quantitative information. Analysis of the qualitative interview data involved was also analyzed into various defined themes according to the interview schedules and questionnaires in line with the study objectives into a written format, coding and then entry of the data into a computer database. Inferential statistical analysis was involved in testing all relationships at 0.05 level of confidence and probability value was established using SPSS. The analysis also involved discussion summary, presentation (chart, pie chart and tables) as well as appropriate content analysis.

The Statistical Package for Social Sciences (SPSS) version 20 was utilized to prepare and organize data quantitatively for analysis. Descriptive statistics were used, and involved calculations of various measures that included frequency distributions, as well as measures of central tendency, which includes mean, frequency, percentages and standard deviation.

3.10 Logistical and Ethical Considerations

A letter from the University authorizing the collection of data was obtained and a permit was issued by the National Council for Science and Technology (NACOSTI)

as a requirement by the Ministry of Higher Education Science and Technology. Permission to collect data was sought from Kenyatta University Graduate School, Nairobi City Council and Ministry of Education by obtaining an introduction letter from the County Education Director, Kasarani Sub-County.

Ethical approval for this study from the Kenyatta University Ethics Review Committee (KU-ERC) was also obtained. Participation was voluntary through informed consent from sampled respondents. The researcher explained the purpose of the study and gave assurance to respondents that the study had no ill motives and confidentiality of their responses was assured.

3.10.1 Care and Protection of Research Participants

Research participants were assured that they had the right to pull out from the study research at will if they felt like they wanted to withdraw at any point in the research process. In the event of withdrawal, the researcher would replace the participant from the sampled school through a simple random sampling technique. However, the researcher could seek the probable reason for withdrawal of the participant and address any discomforts and uncertainties which might have occasioned such withdrawal from the participant.

Safeguarding participants' protection was in full disclosure of the intention of the study to them beside the approval by the County Director of Education, the Parents, Headteachers and the Teachers.

3.10.2 Protection of Research Participant Confidentiality

The identity of all respondents was not to be revealed as only codes were assigned to each respondent. The information gathered was confidential.

3.10.3 Informed Consent Process

The researcher also sought informed consent from all research participants, namely; the parents, the headteachers, grade three teachers and the Sub-County Director officer. The researcher informed the participants that it was their right to raise any information or queries and complaints regarding their participation in the research either personally or through their teachers for pupils. The participants were also informed accordingly on any information that came up in the course of the research and which was pertinent to their participation in the research.

CHAPTER FOUR

RESULTS AND DATA ANALYSIS

4.1 Introduction

This chapter presents the results from data analysis and discussions. First, the demographic results are presented, then followed by descriptive results which have been thematically organized according to the objectives of the study. The study sought to achieve the following objectives:

i) To establish the prevalence of childhood obesity among pupils in lower primary in Kasarani Sub County.

ii) To find out the influence of childhood obesity on pupils' participation in physical activities among lower primary pupils in Kasarani Sub County.

iii) To explore the influence of childhood obesity on pupils' school attendance among lower primary pupils in Kasarani Sub County.

iv) To find out available physical facilities in the school for use during physical activities among lower primary pupils in lower primary schools in Kasarani Sub County.

v) To establish strategies schools have put in place to prevent childhood obesity in among lower primary pupils Kasarani Sub County.

4.2 Demographic Information

The demographic information of headteachers, teachers and grade three pupils who were sampled was established.

4.2.1. Demographic Information for Headteachers and Teachers

The gender and educational levels of the headteachers and teachers in the study was established. The results have been presented in Table 4.1 and 4.2 below.

Table 4.1: Gender of Teachers

Gender	Headteachers	Percentage %	Teachers	Percentage %
Male	5	62.5	0	0
Female	3	37.5	8	100
Total	**8**	**100**	**8**	**100**

Tables 4.1 reports that out of the eight schools sampled, five of them had males as headteachers (62.5 %), while the remaining three were females (37.5%). These statistics are in line with the study done by Maranga (1993) who reported that in Kenya, majority of women in public schools hold fewer positions in administration due to gender-related factors such as challenges of family responsibilities, gender socialization beliefs among others that deter women from such roles compared to men. That could then be the reason why most headteachers were male in the sampled schools. It was also noted that all grade three teachers were females.

Table 4.2: Educational Level of Headteachers and Teachers

Level of Education	Number of Teachers	Percentage %
1. Form Four	0	**0**
2. Certificate Course	2	**12.5**
3. Diploma	2	**12.5**
4. Degree	11	**68.75**
5. Masters	1	**6.25**
Total	**16**	**100**

It was also reported in Table 4.2 that all the sampled schools had Degree Graduates as headteachers, one school had a Master's Degree headteacher. It was further noted that for grade three class teachers, half of them were Degree holders, two were Diploma holders and the other two were certificate holders. This implies that all the teachers were trained and qualified. The findings imply that all teachers were competent and well informed in terms of teaching delivery as far as healthy eating habits is concerned, and could have enhanced participation in the advocacy and creation of awareness on how to prevent childhood obesity to the community if need be as compared to teachers with less or no teaching qualifications. This concurs with Pekruhn (2006) who reported that exposing children in observing healthy eating habits and providing them with opportunities to eating healthy and living an active life can mitigate childhood obesity, and in this line, such qualified teachers are in a better position to enhance the above measures.

4.2.2. Demographic Information of Grade Three Pupils

The demographic features of Grade three pupils were also established. This was done based on the age, weight, height and gender of the pupil. The total sample was 294 as presented in Table 4.3 below.

Table 4.3: Children's Weight, Height and Age (N=294)

	Weight (Kgs)	**Height 9cms)**	**Age**
Mean	30.3	132.3	9.0
Mode	28	129	9
Median	30	133	9
Range	30	37	6
Standard Dev	6.6	7.3	1.0

The total sample was 294 as presented in Table 4.3 above. The sample saw an almost equal selection in gender. The age and gender of the respondents were very important in categorizing pupils in their respective BMI cut- off points.

Table 4.4: Distribution of Grade Three Pupils

		Number of Pupils Interviewed (294)	**Percent (%)**
Gender	**Male**	150	51.0
	Female	144	49.0
Age (both male and female)	6- 7 yrs	10	3.4
	8- 9 yrs	211	71.8
	10-11 yrs	65	22.1
	12-13 yrs	8	2.7

Table 4.4 shows that there were 150 males at 51% and 144 females at 49%. There was almost an equal distribution of both male and female, although the boys had a slightly higher percentage compared to girls by 2%. The sampled schools were generally representative in all sampled schools and so were the selected participants.

Weight Frequency of the Study Population

Distribution of weight of the pupils was also established as presented in figure 4.1 below.

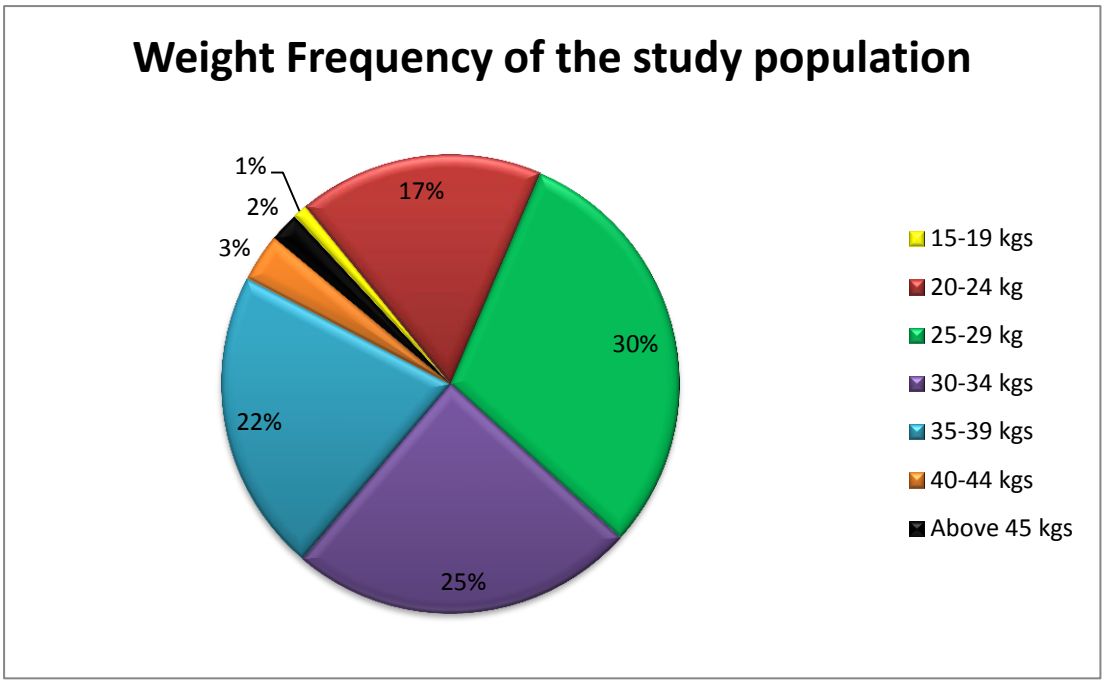

Figure 4.1: Distribution of Grade Three Pupils Based on Weight

According to the findings in Figure 4.1 above, the frequency of weight in percentages among grade three pupils were as follows; children under the category of between 25-29 kgs (30%),30-34 kgs (25%), 35-39 kgs (22%), 20-24kgs (17%),40-44kgs (3%), above 45kgs (2%) and 15-19 kgs (1%).

4.3. Prevalence of Obesity of the Study Population

BMI of the respondents was also established for accurately categorizing the participants. This therefore involved establishment in the following categories; obese, overweight, normal, moderate underweight and underweight. As presented in Table 4.5.

Table 4.5: Prevalence of Obesity in the Study Population

BMI		
	Frequency (n)	**Percentage (%)**
Obese	34	11.6
Overweight	51	17.3
Normal	185	62.9
Moderate underweight	20	6.8
Underweight	4	1.4
Total	**294**	**100.0**

Data collected were categorized according to the accepted age-specific cut-off points for children (WHO, 2000). For BMI to be done accurately, the age, gender and the weight of the respondents were taken and computed accordingly and objectively, thus the frequency levels of the 294 participants were analysed in different BMI categories of weight and their respective percentages computed. Table 4.5 therefore revealed that 34 (11.6%) of the population was obese, 51 (17.3%) overweight, 185 (62.9%) normal, 20 (6.8%) moderate underweight and 4 (1.4%) were underweight. In a research study done in Kenya by Aballa (2010), the prevalence rate of obesity among school-aged children was found to be 25.6%. These findings had a higher prevalence rate compared to the current study which was at 11.6. Despite the current study rating lower than the findings of Aballa (2010), obesity prevalence is still high.

In another study research done in Nairobi by International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE, 2013), it was reported that 14.4% of the population were overweight, and 6.4% of them turned out to be obese. These findings recorded a low rate compared to the current study, a further indication that obesity prevalence in Kenya is still on the rise.

4.3.1 Prevalence Level of Obesity Based on Gender.

Obesity-related to the gender of the respondents who participated in the study was established. The results have been presented in Table 4.6 below.

Table 4.6: Prevalence Level of Obesity Based on Gender.

Gender			BMI					Total
			Obese	Overweight	Normal	Moderate underweight	under weight	
	Male	n	20	27	92	10	1	150
		%	13.3%	18.0%	61.3%	6.7%	0.7%	100.0 %
		n	14	24	93	10	3	144
	Female	%	9.7%	16.7%	64.6%	6.9%	2.1%	100.0 %

The findings in Table that 4.6 show that 20 out of 150 boys were obese at 13.3% (with BMI of 58.8%), while 14 out of 144 girls were obese at 9.7% (with BMI of 41.2%). A study done by Malla (2004) among pre-adolescent in private schools in one division in Nairobi Province Kenya contradicted these results since the prevalence of obesity in the study was 38.1% with more girls being obese than boys; a sample of 120 was used. The current study, therefore, differed since boys had a greater percentage comparatively on obesity values and the prevalence rate was also less by 16.5%.

In another study, the prevalence rate of obesity among school-aged children was also found to be 25.6% with more boys (27%) being obese than girls (26%) Aballa (2010). The findings thus concurred with the current study because boys' prevalence rate was

higher at 13.3% compared to girls' at 9.7% although the prevalence rate was lower by 14% comparatively.

4.3.2 Prevalence Level of Obesity Based on Age

Obesity-related to the age of the respondents who participated in the study was also established. The results are presented in Figure 4.2 below.

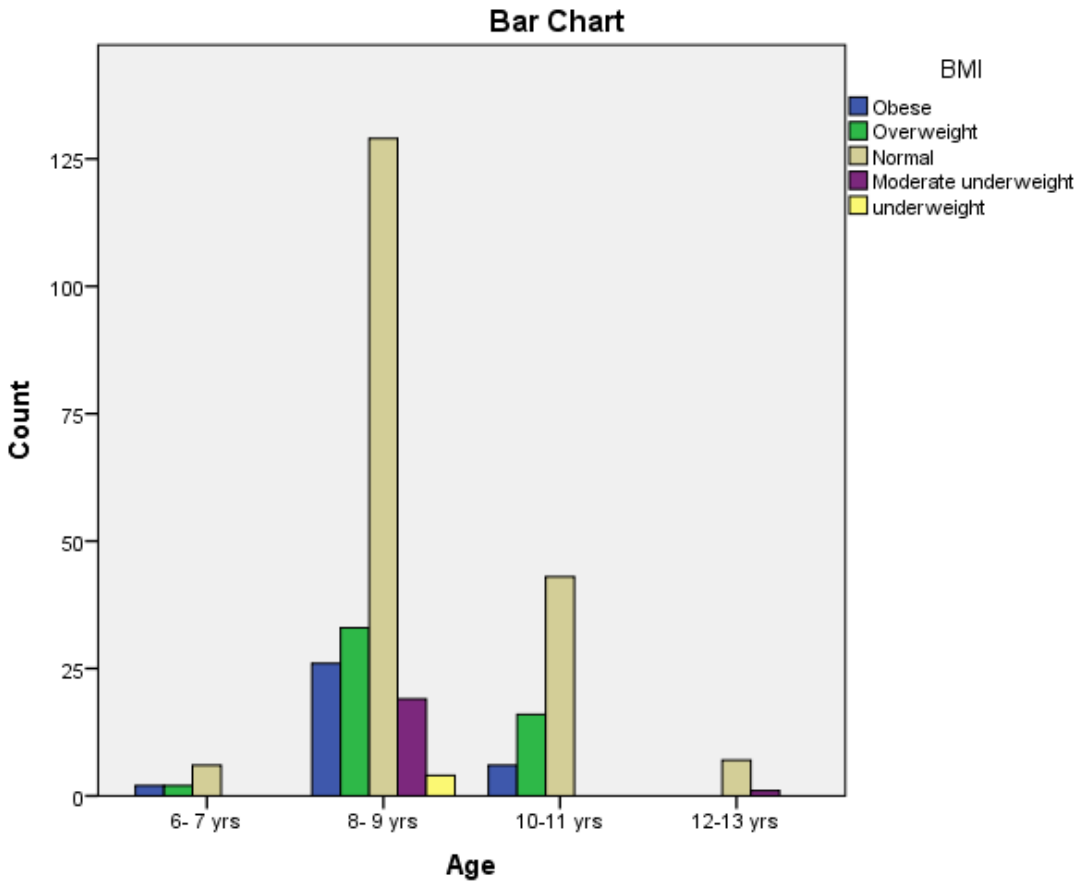

Figure 4.2: Prevalence Level of Obesity Based on Age.

The study findings show that the age category of the respondents ranged between 7-13 years. According to the findings, the mean age of respondents was 9 ± 1years. Findings further reported that the age category of between 6-7 years was obese at 20.0%, between 8-9 years category 12.3% were obese, between 10-11 years category

9.2% were obese, and between 12-13 years category none of the respondents was obese. Subsequently, respondents in the age category of between 6-7years had a greater percentage, while those between 12-13 years had none of the pupils falling into the category of obesity.

According to Ogden, Carrol, Curtin, McDowell, Tabak and Hegan (2006), it was reported that as children grow older so is the likelihood of them falling under the obesity category. These findings, however, differ with the current study because of the younger the pupil the more likelihood of falling under the obese category and not the older child as implied by the study. This could be attributed to the fact that young children are less active in terms of their inability to be vigorously engaged in most physical related activities compared to older children whose growth and development gives them an upper hand in their advancement in engagement in most physical activities, hence reduction rates in childhood obesity.

4.3.3 Prevalence Level of Obesity Based on Height

Obesity prevalence related to the height of the respondents was established to be able to categorize individuals in their respective BMI cut- off points accurately as presented in Table 4.7 below.

Table 4.7: Prevalence Level of Obesity Based on Height

Height		BMI					Total
		Obese	Overweight	Normal	Moderate underweight	underweight	
111-120 cm	Count	5	1	17	2	0	25
	% within Height	20.0%	4.0%	68.0%	8.0%	0.0%	100.0%
	% within BMI	14.7%	2.0%	9.2%	10.0%	0.0%	8.5%
Above 121 cm	Count	29	50	168	18	4	269
	% within Height	10.8%	18.6%	62.5%	6.7%	1.5%	100.0%
	% within BMI	85.3%	98.0%	90.8%	90.0%	100.0%	91.5%
Total	% within BMI	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The height of the respondents ranged between 113 (being the least height in centimetres) to 150 centimetres (being the highest measurement in height). According to findings, the mean height of respondents was 132.3 ± 7.3 centimetres. Respondents under the category of 111-120 cm that were obese had 20% (with a BMI of 14.7%), while the category of 121cm and above of respondents who were obese had a 10.8% (with a BMI of 85.3%).

The findings implies that the taller the child was the less likelihood being obese and the opposite was true. Contrary to the current study findings, it was reported by Freedman, Khan, Serdula, Dietz, Srinivasan & Berenson (1939) that the height of an

individual is somewhat dependent on the person's current body fatness and weight. The study further stated that the height of an individual has a consistent positive association with obesity status.

4.3.4 Prevalence Level of Obesity Based on Weight

Obesity prevalence related to the weight of the respondents was also established. This has been presented in Table 4.8 below.

Table 4.8: Prevalence of Obesity Based on Weight

	BMI						
Weight		**Obese**	Over-weight	Normal	Moderate Underweight	Underweight	**Total**
15-19 kgs	Count	0	0	2	1	0	3
	% within weight	0.0	0.0	66.7	33.3	0.0	100
20-24kgs	Count	0	1	30	16	4	51
	% within weight	0.0	2.0	58.8	31.4	7.3	100
25-29kgs	Count	3	8	75	3	0	89
	% within weight	3.4	9.0	84.3	3.4	0.0	100
30-34kgs	Count	5	8	59	0	0	72
	% within weight	6.9	11.1	81.9	0.0	0.0	100
35-39kgs	Count	16	30	17	0	0	63
	% within weight	25.4	47.6	27.0	0.0	0.0	100
40-44kgs	Count	5	4	1	0	0	10
	% within weight	50.0	40.0	10.0	.0	0.0	100
45 and Above kgs	Count	5	0	1	0	0	6
	% within weight	83.3	0.0	16.7	0.0	0.0	100
Total	Count	34	51	185	20	4	294
	% weight	100	100	100	100	100	100

The weight of the respondents ranged between 19-49 kgs. According to Table 4.9, the mean weight of respondents was 30.3± 6.6 kgs. The findings further show that the respondents in the category of 15-19kg, 20-24 kg, 25-29kg, 30-34kg, 40-44kg and above 45kg had 0%, 0%, 3.4%, 6.9%, 25.4%, 50% and 83.3% respectively.

The results imply that the heavier a pupil was, the more likely to fall under the obesity category. This was because pupils that were categorized to be weighing above 45 kgs had 83.3%, while those that were in the category of between 15-19 kgs had none of the respondent falling under the obesity category.

4.4 Association of Childhood Obesity to Attendance in School

The correlation between obesity and frequency of school attendance was also established as shown in Table 4.10 below.

Table 4.9: Association of Childhood Obesity to Attendance in School

BMI	Correlation	95% CI	p-value
Attendance	-0.2840	-0.1170 to -0.4450 -	<0.0001

There was a significant negative association between BMI and school attendance among grade three pupils (r=-0.2840, 95%CI: -0.1170 – 0.4450, p<0.0001). For every additional attendance of school for a grade three pupil, BMI reduced by -0.2840 units (95%CI: -0.1170 – 0.4450, p<0.0001). This study concurred with the study done by Jeannine (2012), which reported that there is a negative relationship between childhood obesity and school attendance through frequent absenteeism. This could be because factors that contribute to a child being absent in school frequently are not

limited to childhood obesity only, this could be because of other factors such as social, physical and health-related concerns among others.

4.5 Association of Childhood Obesity to Level of Participation in Physical Facilities

Correlation between childhood obesity and the level of participation in physical facilities was also established as presented in Table 4.11 below.

Table 4.10: Association of Obesity to Level of Participation in Physical Activities

BMI	Correlation	95% CI	p-value
Activity	-0.0790	0.0420 to -0.2040	0.1750

There was a significant negative correlation between BMI and level of participation in physical activities among grade three pupils (r=0.0790-, 95%CI 0.0420 to -0.2040: p 0.1750). This study contradicts with the study done by John & Hill (2003) who reported that obese and overweight children are usually less active in sports and games than children with normal range weight because of their BMI as there is no association between obesity and level of participation in physical activities.

4.6. Availability of Physical Facilities at School

The study also sought to find out the available physical facilities in sampled schools for use during physical activities in lower primary schools in Kasarani Sub County as presented in Table 4.12 below.

Table 4.11: Distribution of Outdoor Physical Facilities at school

	School A	School B	School C	School D	School E	School F	School G	School H
Playground	✓	✓	✓	✓	✓	✓	✓	✓
Swings	**X**	✓	**X**	✓	✓	✓	**X**	✓
Slides	**X**	✓	**X**	✓	✓	**X**	**X**	✓
Seesaws	**X**	**X**	**X**	**X**	**X**	**X**	**X**	✓
Sandpit	✓	✓	✓	✓	✓	✓	✓	✓
Climbing Frames	**X**	✓	✓	✓	✓	**X**	✓	**X**
Balls	✓	✓	✓	✓	✓	✓	✓	✓
Tyres	✓	✓	✓	✓	**X**	**X**	✓	**X**
Sacks	**X**	✓	**X**	**X**	✓	**X**	✓	**X**
		✓			✓		✓	

✓ Available **X** Not Available (Key)

From the findings from Table 4.11, it was established that all the eight schools provide the pupils with outdoor physical facilities. However, most respondents reported that playing with the facilities had restriction especially the likes of swings, slides and climbing frames in the sense that they were preserved for the preschool children and grade one pupils The fact that the facilities were available was however evident that those pupils were allowed to get involved in physical activities. This observation is concurrent with Frankel (1999) who stated that the availability of outdoor materials and facilities in children's play is important; this is because through

exercising they do improve and maintain their physical fitness. Availability of these facilities, therefore, explains the reason why most fell under the normal category.

4.7 Strategies to Prevent and Mitigate Childhood Obesity

The researcher was also interested to find out the strategies used to prevent and mitigate childhood obesity at school. Findings through responses from headteachers indicated that physical education lessons and school's participation in games or sports were mandatory. Consistently, schools should incorporate physical activity programs, this is because they offer children with not only specific and necessary skills and knowledge, but also acts as a way of sustaining active lifestyle in children, thereby reducing chances of childhood obesity according to National Council of State Legislatures, (2007).

From the study findings it was also established that, out of the eight schools, six of them had an organized school feeding programme which provided a variety of food, the foods included beans, rice, cabbage, carrots, githeri, ugali and sukuma wiki. These foods promote preventive strategies for curbing childhood obesity. Similarly, these findings concurred with study report by Pekruhn (2006), who argued that schools have a responsibility to enhance healthy eating habits to children by providing them with several opportunities to observe healthy eating and encourage them to stay active. The study further proposed that schools can, therefore, offer healthy foods in school canteens and discourage any sell of unhealthy foods at school.

According to the researcher's observation, school E had none of the pupils under obesity category; one major contributing factor could have been that right at the

entrance of the administration offices, there was a nutritional guide-chart indicating objectively proper meals to be taken during breakfast, lunch and dinner, and foods that should be avoided for that matter. The teacher also reported that health education at classroom level was also emphasized including the first two strategies mentioned earlier.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of the study findings and the implications that can be drawn from these findings. The chapter also presents recommendations for different stakeholders to mitigate childhood obesity among lower primary pupils. Lastly, the chapter suggests areas for further research that other scholars can undertake to prevent or reduce cases of childhood obesity among lower primary pupils.

5.2 Summary of objectives Study Findings

The study aimed to explore and establish the influence of childhood obesity on pupils' school attendance and participation in physical activities in lower primary schools in Nairobi County, Kenya. The respondents were aged between 7-13 years of age: a sample of two hundred and ninety-four grade three pupils was used. The prevalence of obesity was at 11.6 %. The factors to be investigated included; the prevalence of childhood obesity, the influence of childhood obesity on pupils' participation in physical activities, explore the influence of childhood obesity on pupils' school attendance, find out available physical facilities in the school for use during physical activities among lower primary pupils and the strategies used to mitigate childhood obesity challenges in schools.

The major findings of the study were as follows:

5.2.1 Prevalence of Childhood Obesity among Pupils in Lower Primary

The findings in the current study differed with IOTF study in Africa, America, Europe, and Asia which indicated that the prevalence rates of overweight and obesity were the same. Additionally, in this study, boys were found to be more obese compare to girls. This could be attributed to the fact that at this stage boys are very active compared to girls, hence take in more food to replenish them which may sometimes be high in fat and carbohydrates.

An examination of the prevalence of obesity among school-aged children from Nairobi in Kenya revealed that a 6.4% of the children were obese, based on WHO BMI cut-points for this age group (Stella, 2014.) These conclusions are equally supported by a study which reported that the prevalence of overweight/obesity among school-aged children in the urban city of Nairobi was 20.8%, an implication that childhood obesity prevalence is on the increase. These results did concur well with IOTF, (2002) results, which revealed that obesity is rising significantly in developing nations more so among the urban populations. It was also noted in the current study that most respondents who were obese had preferences of foods such as meat, chicken, chips, rice, eggs and chapati.

5.2.2 Influence of Childhood Obesity on Pupils' Participation in Physical Activities in Lower Primary

Energy expenditure is a critical and important factor in the development and protection against obesity in people. Physical activity not only uses up stored energy but also helps to stimulate muscle development. However, the findings showed no correlation between childhood obesity and level participation in physical activities.

This could be true because, based on the interview most of the pupils including those who were obese cited feeling good participating in games, sport and physical activities. Findings also indicated that vigorous sports and games such as football, running and dancing competition were cited to be their activities and so was their involvement in the activities.

5.2.3 Available Physical Facilities in Schools for use during Physical Activities in Lower Primary

Presence of at least four different outdoor physical facilities in all the eight schools is the reason behind a lower percentage in the prevalence rate of childhood obesity among the pupils in comparison to other countries whose trends are seemingly high. This was a clear indication that the schools valued the pupils' engagement in physical activities.

5.2.4 Influence of Childhood Obesity on Pupils' School Attendance in Lower Primary

According to the findings, there was a statistically significant negative relationship between childhood obesity and the frequency of school attendance. The reason could be qttributed to the fact that there may be other intervening factors such as physical,social, emotional among others that may lead to school bsenteeism among pupils.

5.2.5 Strategies Schools have put in place to Prevent Childhood Obesity in Lower Primary

This objective explored the strategies put in place by schools to prevent and mitigate childhood obesity among lower primary school pupils. When respondents (headteachers and teachers) were asked approaches that they have in place, they all agreed that they do have strategies. The strategies employed were as follows;

The two schools which did not have a feeding programme, respondents indicated that negotiation plans with the parents were ongoing and hoped parents would finally buy into their idea. This was to be done convincingly by creating awareness to parents on the importance of such a programme. The current study also came in handy as the issue of provision of a proper meal to mitigate childhood obesity was highly recommended.

Schools that had an existing feeding programme that did not provide proper meals promised to review their menu accordingly. This was to be done by having a meeting with parents and creating awareness of the same. They all agreed that such meetings may have an impact on the feeding programme where the issues discussed would be looked into to improve the programme performance in delivering service and the quality of meals.

Further, the researcher noted that the teachers occasionally met with their headteacher and discussed how to make the feeding programme better, where they discussed issues to deal with meal times, food serving, how the meals were prepared, need for additional facilities and to give any feedback on the programme as conveyed by the pupils.

5.3 Conclusion

First, obesity prevalence was at 11.6%; more boys were obese compared to girls at 20% and 14% respectively. It was also ascertained that all respondents that were obese had no issue relating with others and enjoyed being engaged in physical activities contrary to many studies which state otherwise. It was further noted that when asked to state their best food, majority of obease children preferred intake of proteins (meat -both white and red and beans), carbohydrates (ugali, rice and chapati) and chips. This could be the reason why they were obese because too much of the above-mentioned food is not healthy.

Secondly, all the pupils were involved in physical activities in all selected schools. It was also noted that a majority of the obese children interviewed listed athletics, football and dancing as their favourite sport and games, only a handful preferred indoor games such as play station related activities. The findings also reported that the heavier the child weighed the greater the chances of being obese, seemingly, respondents who weighed 45kgs and above rated at 83.3%, while none was registered obese in the category of between 15-19 kgs and 20-24 kgs respectively being the lowest category in the study. Physical Education lessons in all the sampled schools were allocated in school timetable and all pupils were required to be actively involved in all activities scheduled for that particular lesson. It was also established that there was no association between the engagement of a child's physical activities and their weight, therefore other factors could be contributing towards a child being obese other than being physically active.

Third, all the schools sampled had at least four outdoor physical facilities and being public schools,they had an adequate playground to cater for all pupils. However, it was also noted that despite most schools having play facilities such as slides, climbing frames/ ladders among others the facilities were majorly reserved for preschool and grade one pupils.

Fourth, the study findings indicated that there was no correlation between school attendance and childhood obesity. This could be attributed to the fact that absenteeism among pupils may be contributed to other factors and not being obese such as sickness, family problems among others. This is the reason why some children who were not obese still registered a low attendance rate, while some that were obese were regular school attenders.

Fifth, each sampled school had strategies to mitigate childhood obesity among the pupils. The most common strategy employed by most schools was a common feeding program that tried to provide healthy meals, and for those whose meals were compromised as far as obesity is concerned stated that they would review their meals after consultation with parents. Other strategies were the likes of making physical education lessons compulsory and ensuring that every child participated in at least one game o sport. Out of the eight sampled school, only two stated of having occasional health education awareness at the classroom level.

5.4 Recommendations

It is the responsibility of all stakeholders who take care of children to work as a team to reduce the prevalence rates of childhood obesity, improve school attendance and

increase the level of participation in physical activities and also in other areas of development, especially the health of a child. Good nutrition is therefore important for the growth and development of all citizens of any country. Similarly, good nutrition in children leads to good health, leading to good performance in school activities (Roday, 2007). Mitigating strategies will yield to such if all the stakeholders cooperate.

Therefore, based on the findings of this study, the following recommendations were drawn for different key stakeholders to take part in in order to achieve the goals mentioned above high hello if:

(i) Teachers

Teachers should take the lead in advocacy programs on childhood obesity. The school could therefore be doing BMI checks possibly termly and where need be communicated to parents of children with obesity or those falling under the overweight category to prevent thir weight from transiting to obesity.

Schools should also promote physical activity by incorporating a variety of recreational activities and allocate more time and make it compulsory for every child to participate in any game or sport. During P.E lessons, children should be allowed to go out and be guided through the lesson by a teacher. School feeding program should also be encouraged in all schools, and meals provided be balanced if possible. Fatty foods and those very rich in carbohydrate should be minimized.

(ii) Parents

Nutritional health education should be provided to both parents to create awareness of good nutrition and wise choices when selecting meals and snacks. For those parents that pack snacks and meals for their children, healthy snacks such as fresh vegetables, whole fruits, milk and its products, fresh fruit juices, sandwiches and sugar-free biscuits should be encouraged. Parents should also encourage their children on the consumption of water all through the day.

Parents should also be educated on being advocates of a common school feeding program concerning the provision of healthy food to their children at school, for that reason, total support on their part is paramount.

(iii) School Management Boards (SMBs)

The SMBs should be tasked to organize education awareness meetings and workshops for other community members and parents. This will help them understand the importance of preventing childhood obesity based on its negative implication on children's growth and development.

(iv) Ministry of Education, Science and Technology

The Ministry of Education should facilitate the integration of health education in the curriculum as one of the major subjects in schools, for example, re-introduction of home science where proper nutrition as a topic will be taught at length. This will also be for equipping teachers and parents with knowledge on good nutrition and the importance of a balanced diet which is vital for mitigating childhood obesity if well adhered to.

The Ministry should also partner with other development bodies, NGOs and GOK ministries to identify obese and overweight children and put them on special programs so as to mitigate the issue.

(v) National and County Government

The county government of Nairobi should also spearhead mobilization and awareness for its community to empower them and enlighten them on the importance of good nutrition and how failure to observe that can lead to childhood obesity and its adverse implication.

5.5 Areas for Further Research

Concerning the findings and the conclusion in this study, the researcher recommends that further studies should be done on the influence of obesity on other school factors such as academic performance. This should also include other grade levels other than grade three.

A similar study should be conducted in rural settings too so as to offer a basis for comparison to get the prevalence rate and come up with appropriate intervention measures.

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APPENDICES

APPENDIX 1: INTERVIEW CONSENT FORM

This consent form should be signed by the clients to show a willingness to participate in this study. I am a student at Kenyatta University from the school of Education. I am carrying out research on the **influence of childhood obesity on pupils' school attendance and participation in physical activities in lower primary schools in Nairobi City County, Kenya.** You have been chosen as one of the respondent and participant in this study. Kindly, assist the researcher by answering the questions as accurately as possible. Confidentiality in the information given is assured. The information will be used for academic purposes only.

Thank You for your cooperation

I agree to be a participant in the study.

Signature…….

Date……

Serial Number of the respondent…….

APPENDIX II: QUESTIONNAIRE FOR TEACHERS

Instructions

The interviewer was fill in or tick the appropriate answer

Section A: Background information

Code of the school …….

Code of the teacher ……..

Gender: Male [ ] Female [ ]

Highest level of academic qualification: Primary [ ] Secondary [ ]

College [ ] University [ ]

Code of the pupil …… Age …… Years

Gender: Male [ ] Female [ ]

Section B: Frequency of pupil's school attendance

1 How many days was the child present or absent?

Present …… days out of …… days

Absent …… days out of …… days

Section C: Level of involvement in physical activities

2 a) Does the school offer time for physical activities?

Yes [ ] No [ ]

b) How would you rate the level of involvement and participation in physical activities?

Low [ ] Average [ ] Above Average [ ]

3. How can you rate the level of social interaction with other classmates?

Low [ ] Average [ ] Above Average [ ]

APPENDIX III: INTERVIEW SCHEDULES FOR HEADTEACHERS

Section A: Background Information

Code of the school …….

Code of the headteacher ……..

Gender: Male [ ] Female [ ]

Highest level of academic qualification: Primary [ ] Secondary [ ]

Section B: Physical activities.

1. Does the school offer time for physical activities?

Yes [ ] No [ ]

2 a) Does your school have strategies to improve childhood obesity?

Yes [ ] No [ ]

b) If Yes (to the above question), kindly state the approaches that have been put in place?

i) .....

ii) ……..

iii) ……..

iv) ……..

v) …….....

APPENDIX IV: INTERVIEW SCHEDULE FOR GRADE THREE PUPILS.

Section A: Background information

Code of the school …….

Code of the pupil ……

Gender: Male [ ] Female [ ]

Age: ……Years

Anthropometric Data Sheet

MEASUREMENTS	**IST READING**	**2ND READING**	**AVERAGE**
HEIGHT (CM)			
WEIGHT (KG)			

Section B: Level of involvement in physical activities.

1. a) Does the school offer time for physical activities?

Yes [ ] No [ ]

b) Do you like being engaged in the school's physical activities?

Yes [ ] No [ ]

c) What is your favorite sport/ game (if any)?.....

d) Rate the child's ability when being engaged in the activities listed below.

1. Skipping/ frog jumping	Above Average	Average	Below Average
2.Sack racing			
3.Dancing competition			
4. Running races			
5.Walking races			
6. Climbing slides/ frames/			

ladders			
7. Kicking/ rolling a ball			
8. Crawling through tunnels			
9. Throwing and dodging games			
10. Any other			

2. How do you view yourself in terms of your body image?

Favorably [ ] Unfavorably [ ]

3. a) Do you enjoy playing and interacting freely with your classmates?

Yes [ ] No [ ]

b) If No, why don't you like playing and interacting freely with them?

i. …….

ii. …….

iii. …….

iv. …….

APPENDIX V: OBSERVATION CHECKLIST

Section A: Background Information

Code of the school ……..

Educational zone …….

Section B: Observe Available Outdoor Physical Facilities.

1a) Tick where applicable (√)

FACILITY	
1. Playground	
2. Swings	
3. Slides	
4. Seesaws	
5. Sandpit	
6. Climbing frames	
7. Balls	
8. Tyres	
9. Sacks	
Any other:	

b) Observe various activities indulged by children during physical activity sessions.

i. ……..

ii. ……..

iii. ……..

iv. ……..

v. ……..

2a) Observe the presence of the school feeding programme.

Yes [ ] No [ ]

b) If present, indicate types of meals prepared.

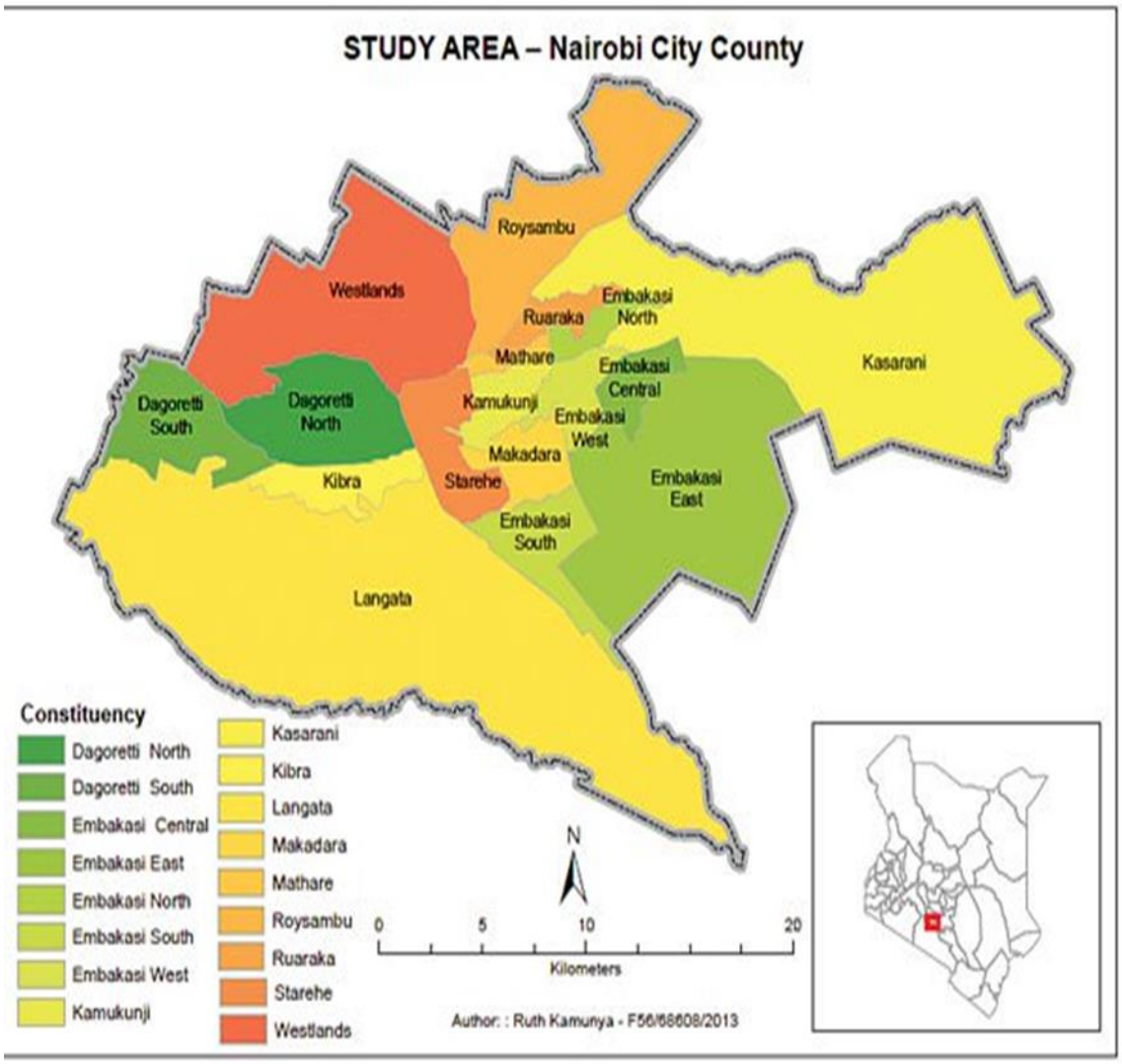
……

……

……

……

APPENDIX VI: MAP OF NAIROBI CITY COUNTY



APPENDIX VII: RESEARCH AUTHORIZATION LETTER

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 810901 Ext. 4150

Internal Memo

FROM: Dean, Graduate School

DATE: 15th March, 2019

TO: **Maero Rose Nelima**
C/o Early Childhood & Special Needs Education Dept.

REF: E55/CE/26387/2011

SUBJECT: APPROVAL OF RESEARCH PROJECT PROPOSAL

This is to inform you that Graduate School Board at its meeting 6th March, 2019 approved your Research Project Proposal for the M.Ed Degree Entitled, **"Influence of Childhood Obesity on Pupils' School Attendance and Participation in Physical Activities in Lower Primary Schools in Nairobi County, Kenya".**

You may now proceed with your Data Collection, Subject to Clearance with Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University's Website under Graduate School webpage downloads.

Thank you.

ANNBELL MWANIKI
FOR: DEAN, GRADUATE SCHOOL

c.c. Chairman, Early Childhood Studies Department.

Supervisors:

1. Dr. Yattani Buna
   C/o Department of Early Childhood Studies
   Kenyatta University

AM/lnn

MINISTRY OF EDUCATION

STATE DEPARTMENT OF EARLY LEARNING AND BASIC EDUCATION

Telegrams: "Schooling" Nairobi
Email:deokasarani@gmail.com
Fax No: N/A
When replying please quote

SUB- COUNTY EDUCATION OFFICE,
KASARANI SUB COUNTY,
P.O Box 1274-00618,
RUARAKA.

REPUBLIC OF KENYA

REF: SCDE/KAS/GF/VOL. 2/34

DATE: 19TH MARCH 2019

ALL HEADTEACHERS
KASARANI SUB-COUNTY

RE: MAERO ROSE NELIMA: E55/CE/26387/2011

The above subject refers:

The above named person is a bonafide student at Kenyatta University undertaking MEd Degree.

Currently she is conducting and collecting data on "*Influence of childhood obesity of pupils' school attendance and participation in Physical Activities in Lower Primary School in Nairobi County*".

Any assistance accorded to her will be highly appreciated.

Thank you.

SIGNED:.....
FOR SUB-COUNTY DIRECTOR OF EDUCATION
KASARANI SUB-COUNTY
P. O. Box 1274 - 00618, RUARAKA

RICHARD ONG'AYO
FOR: SUB COUNTY DIRECTOR OF EDUCATION
KASARANI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone:+254-20-2213471,
2241349,3310571,2219420
Fax:+254-20-318245,318249
Email: dg@nacosti.go.ke
Website : www.nacosti.go.ke
When replying please quote

NACOSTI, Upper Kabete
Off Waiyaki Way
P.O. Box 30623-00100
NAIROBI-KENYA

Ref: No. **NACOSTI/P/19/38928/30880**

Date: **7th June, 2019.**

Rose Nelima Maero
Kenyatta University
P.O. Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Influence of childhood obesity on pupils' school attendance and participation in physical activities in lower primary schools in Nairobi County, Kenya."*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **6th June, 2020.**

You are advised to report to **the County Commissioner, and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

BONFACE WANYAMA
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.

APPENDIX VIII: RESEARCH PERMIT

THIS IS TO CERTIFY THAT:
MS. ROSE NELIMA MAERO
of KENYATTA UNIVERSITY, 800-50102
MUMIAS,has been permitted to conduct
research in *Nairobi County*

on the topic: *INFLUENCE OF CHILDHOOD OBESITY ON PUPILS' SCHOOL ATTENDANCE AND PARTICIPATION IN PHYSICAL ACTIVITIES IN LOWER PRIMARY SCHOOLS IN NAIROBI COUNTY, KENYA*

for the period ending:
6th June,2020

.....
Applicant's Signature

Permit No : NACOSTI/P/19/38928/30880
Date Of Issue : 7th June,2019
Fee Recieved :Ksh 1000

.....
Director General
National Commission for Science, Technology & Innovation

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013

The Grant of Research Licenses is guided by the Science, Technology and Innovation (Research Licensing) Regulations, 2014.

CONDITIONS

1. The License is valid for the proposed research, location and specified period.
2. The License and any rights thereunder are non-transferable.
3. The Licensee shall inform the County Governor before commencement of the research.
4. Excavation, filming and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
5. The License does not give authority to transfer research materials.
6. NACOSTI may monitor and evaluate the licensed research project.
7. The Licensee shall submit one hard copy and upload a soft copy of their final report within one year of completion of the research.
8. NACOSTI reserves the right to modify the conditions of the License including cancellation without prior notice.

National Commission for Science, Technology and innovation
P.O. Box 30623 - 00100, Nairobi, Kenya
TEL: 020 400 7000, 0713 788787, 0735 404245
Email: dg@nacosti.go.ke, registry@nacosti.go.ke
Website: www.nacosti.go.ke

REPUBLIC OF KENYA

NACOSTI

National Commission for Science, Technology and Innovation

RESEARCH LICENSE

Serial No.A 25203

CONDITIONS: see back page