

**CHILDHOOD OBESITY IN KIGALI: EXTENDED THREE-LEVEL APPROACH
FOR COST-EFFECTIVE REDUCTION INTERVENTIONS**

Olukemi Olufunmilola ASEMOTA

Mount Kenya University, School of Business and Economics

Avenue-De-la-Paix Near Belgium School, P.O. BOX 5826,

Kigali - Rwanda

ooasemota@gmail.com, ooasemota@mku.ac.ke

(+250) 785 273 442

ABSTRACT

Globally, childhood obesity is becoming a public health concern in developed, developing and medium income countries. Although there are little statistical data on childhood obesity in Rwanda, available evidence indicates that childhood obesity is growing among children and adolescents in Kigali city, due to rapid urbanization and city culture of eating less nutritious energy dense snacks, sedentary lifestyles and little or no physical exercises.

Extensive literature search and review coupled with the three-level approach, which entails: screening all children, intervene early for children with body mass index (BMI) greater than 25 but less than 30, and provide intensive intervention for children with BMI greater than 30, were used for this study. The results show some ten-year old children weighed 60kg because of diet and sedentary lifestyles, predisposing them to higher morbidity and mortality. Conclusively, the proposed three-level approach for childhood obesity would drastically reduce multiple risk factors and psycho-social disorders.

KEYWORDS

Body mass index, city culture, diet and lifestyle modification, educational performance, food fortification, policy alignment, psycho-social disorders, urbanisation

1.0 INTRODUCTION

The aetiology of childhood obesity, a largely poorly understood non-communicable health problem, constitutes a multifactorial epidemic of grave proportions, which negatively affects the health of individuals across the globe. Ohlhorst (2011) reports that obesity rates worldwide have doubled in the last three decades. Globally, an estimated 170 million children under 18 years are overweight or obese. This includes more than 25% of all children in some countries. In the US, about 17% (12.5 million) children and adolescents aged 2-19 years are obese. Overweight or obese children increase the risk of developing heart disease, hypertension, type-2 diabetes and increases the risk or chances of becoming overweight or obese adults. Ohlhorst (2011) continued by saying that hospital costs connected with childhood obesity alone were estimated at close to US\$ 237 million in 2005.

Furthermore, the Center for Disease Control and Prevention (CDCP) established that childhood obesity has more than doubled in children and tripled in adolescents in the past 30 years (CDCP, Childhood Obesity Facts, 2013, Berkowitz and Borchard, 2009) from 7% in 1980 to nearly 18% in 2010. Childhood Obesity Facts (2013) also estimate that adolescent obesity among children aged 12-19 years increased from 5% to 18% in 2010. Moran (1999) reports that the prevalence of childhood obesity in the United States and globally has increased significantly in the past several decades, with an estimate of 25 to 30 percent of children affected. In addition, this condition is under-diagnosed and undertreated. Childhood obesity has been identified as a risk factor for multiple chronic conditions and premature mortality in adult life (Moran 1999),

and they are more likely to develop risk factors for cardiovascular diseases, such as high cholesterol or high blood pressure (Barthel, 2001;

CDCP-Childhood Obesity Facts, 2013).

1.1 PROBLEM STATEMENT

Obesity in children is currently a major health problem in many countries of the world (Berkowitz, and Borchard, 2009; Mosha and Fungo, 2010). Evidences from statistics show that, 16% of children 6-11 years old are overweight and that an additional 14.3% are at high risk of becoming overweight (Mosha and Fungo, 2010). Statistical records also show that, prevalence of overweight continues to increase during the school age and adolescent stages (Mosha and Fungo, 2010) with serious health implications such as cardiomyopathy, pancreatitis, orthopaedic disorders, respiratory disorders and other psycho-social disorders (De Onis and Blössner, 2000); coupled with low self-esteem, depression, anxiety disorders and subsequent decline in academic performance. In Tanzania, prevalence of obesity among men and women in urban areas is estimated to be 30% and 28.6%, respectively (Mosha and Fungo, 2010), while in rural communities, prevalence of obesity among men and women is significantly lower.

Although there is little statistical data in Rwanda, available evidence shows that childhood obesity is significantly increasing, becoming worrisome in proportion and incidence

(Kabalira, 2013), which could lead to psychological and psychiatric repercussions (Barthel, 2001). This paper therefore attempts to evaluate childhood obesity in Kigali City, using the sparse data on prevalence and risk factors to make useful recommendations on cost effective intervention programmes to the Ministry of Health for necessary remedial action.

1.2 . RESEARCH OBJECTIVE

The main objective of this study was to examine the three-level cost effective approach to managing childhood obesity in Kigali City, in Rwanda.

1.3 RESEARCH QUESTION

How can childhood obesity be cost effectively managed in Kigali City and in Rwanda?

2.0 METHODOLOGY

The research design was purely qualitative and descriptive. This investigation was carried out using extensive literature search and critical review of empirical, exploratory and other studies from journal articles, newspapers, conference proceedings and reports. Although various methods, strategies and even surgical procedures (bariatric) have been proposed, a three level approach (screen all children, intervene early for children with body mass index (BMI)>25 but <30, and provide intensive intervention for children with BMI>30) was adopted in this study, as it has proved effective in the pilot study conducted by Fletcher, et al (2009).

3.0 RESULTS

From the review of relevant literature, available evidences show that childhood obesity is on the increase globally, in East Africa and in Kigali-Rwanda, in particular (CDCP, Childhood Obesity Facts, 2013, Moshaand Fungo, 2010, Kabalira, 2013). Furthermore, Wise (2011) suggests that there is a continuous increase in worldwide levels of obesity with countries in the Pacific Islands having the highest levels. She also indicates the presence of obesity, high blood

pressure and high cholesterol in low and medium income countries including parts of East Africa and South Asia.

Although childhood obesity research is sparse and far between for children in Kigali,

Rwanda, a few of the opinions differ on what the realities, actually are. For instance,

Berkowitz and Borchard (2009) say there is “near absence of obesity in the adult or children population” in Rwanda. They attributed this to malnutrition and poor health status, which should lead ultimately to either underweight or overweight in the population. Their observation was based on children having fewer sweets, moderate-to-strenuous physical activity and exercise among the women and children groups.

On the other hand, Tabaro (2013) says obesity is gaining prominence in Rwanda, as it mostly affects the rich, who associate over-eating with wealth; but unaware of the health implications.

In addition, obesity and overweight issues constitute very serious health threats for Rwanda.

This is so because a growing number of young urban men and women are putting on weight, leading to the current rise in cardiovascular diseases in Rwanda. Tabaro

(2013) continued by adducing one strange reason for obesity in Kigali, which derive from an “eating frenzy and need to binge on food they were deprived of when growing up”.

Another angle to obesity in Kigali, as related by Tabaro (2013) concerned a 30 year old woman who weighed 103 kg (227 lbs) at 14 years of age. A Psychologist told her “that she was mourning”. This twist in obesity in Kigali derive from that fact that more than 70% of physical diseases are due to negative feelings, while anger produces hormones that contribute to obesity coupled with the Rwandan historical past as accentuated by the 1994 genocide (Tabaro, 2013).

Again, the upper-class in Rwanda is mostly beset with obesity. This is so because a Nutritionist related how more than 800 patients, who visited her offices in a space of: “eight months, the

larger majority came from Kigali's most expensive schools, where children under 10 years of age sometimes weigh up to 60 kg (132 lbs)". Therefore, a closer study of childhood obesity research done in neighbouring, Tanzania, should bear much relevance, semblance and could help us relate it to childhood obesity problems in Kigali,

Rwanda.

A cross sectional comparison study conducted in Tanzania, for Dodoma and Kinondoni municipalities (urban communities) show that the prevalence of childhood obesity among school children aged 6-9 years is on the increase (5.6%) in Dodoma and 6.3% in Kinondoni, while for children aged 10-12 years the prevalence ranged between 3.9% in Dodoma compared to 5.8% of their peers in Kinondoni (Mosha and Fungo, 2010). The body fat mass percentage of children aged 6-9 years in Dodoma ranged from 21.42-21.81% while their peers in Kinondoni ranged from 21.66-21.98%, respectively (Mosha and Fungo, 2010). In addition, the average body fat mass percentage of children between ages 10 and 12, was estimated to range from 23.95-24.10% in Dodoma and 23.65-24.95% in Kinondoni (Mosha and Fungo, 2010). Furthermore, Mosha and Fungo (2010) reported that girls and older children have higher significant body fat mass ($P < 0.05$).

In a similar study conducted by Boutayeb and Boutayeb (2005), globally overweight affects 1.2 billion of which 300 million are clinically obese. In some developed countries like USA, the prevalence reaches 60% but developing countries like Kuwait have also a very high prevalence, with increasing number of children suffering from overweight and obesity (Boutayeb and Boutayeb 2005). However, the most striking and contrasting phenomenon is to find overweight, obesity and malnutrition side by side in low- and middle-income countries and hence contributing to the growing burden afflicting these countries (Boutayeb and

Boutayeb, 2005). Accordingly, it was also reported by Boutayeb and Boutayeb (2005) that about 60% of diabetes globally can be attributable to overweight and obesity. Priorities in Health (2013) estimated that globally, 2.6 million deaths are attributable to excessive weight, which has become a growing problem in almost every country, even the poorest. The trend of excessive body weight is increasing so rapidly that in middle-income countries the disease burden associated with having a body mass index greater than 25 is now equal to or greater than the disease burden resulting from under-nutrition (Priorities in Health, 2013).

4.0 ACTIONS AND INTERVENTIONS

Since obese children may likely suffer life-long physical and emotional consequences, it is undoubtedly necessary to examine preventive measures and interventions for children who are already obese and for the community at large.

4.1 DIET AND LIFESTYLE MODIFICATION

A practical model is the example from Finland, which had the highest rates of cardiovascular diseases (CVD) in the world, and where a comprehensive program focused on diet and lifestyle modification reduced the mortality rate by approximately 75 percent between 1972 and 1992 (Priorities in Health, 2013).

4.2 THREE-LEVEL APPROACH

A three level approach (screen all children, intervene early for children with BMI >25 but <30, and provide intensive intervention for children with BMI >30) was adopted and proved effective in the pilot study conducted by Fletcher, et al. (2009). The project tagged, the “Kids for Healthy Eating and Exercising (KHEE)” club was a model developed in the North Midtown area of

Jackson, Mississippi. The aim of the project was to develop the first weight control programme and the model was specifically designed for African American children in the North Midtown (urban) area of the city of Jackson (Fletcher, et al., 2009). Results of the pilot project revealed positive changes among all participants, such as: (a) a decrease in body mass index (BMI), (b) a decrease in waist girth of greater than 4 inches, and (c) positive behavioural changes as documented in the daily entries of the participants' food journal

(Fletcher, et al., 2009).

It is recommended that, children should be informed on good nutrition practices and trained to develop healthy eating behaviours. Parents should encourage lifestyle behaviours that promote high levels of physical activities. Physical education and organised sports at schools should be revived and incorporated into school curriculum (Mosha and Fungo, 2010).

4.3 POLICY ALIGNMENT

WHO (2009) asserts that interventions will only be effective when national policies are aligned, coherent and supportive to the local context and covers the various categories, namely: (a) policy and environment, mass media, school settings; (b) the workplace; (c) the community; and (d) primary health care and religious settings. Different policies and interventions on diet and physical activity, such as: “What works” as published by WHO (2009), had been found to work where these policies had been implemented. A few cases of these intervention programmes are, subsequently stated below.

4.3.1 COMPOSITION OF COOKING OILS AND STAPLE FOODS

One of the interventions that worked at this level was the policy introduced by the Ministry of Health (MoH) in Mauritius to regulate the composition of general cooking oil and policies that change the composition of staple foods, which had a direct influence on the nutrients intake of

the population (WHO, 2009). It was established that the consumption of saturated fatty acids had decreased by an estimated 3.5% of energy intake (WHO, 2009).

4.3.2 HEALTHY COMMUTING FOR NON-MOTORISED TRANSPORT

Another intervention example cited from Bogota in 1995, in Colombia is the in-built environmental changes that support and encourage healthier commuting and also support non-motorised modes of transportation, sports for all, increased public places for recreation, and support for the use of stair case, rather than elevator (WHO, 2009).

4.3.3 HEALTHY FOODS IN SCHOOLS

At the school setting which is more related to this study, different schools adopted strategies that suit their needs. For example, intervention programmes such as: (a) Know Your Body for grades 1-6, (b) CATCH (a 3 year-programme from grade 3 through grade 5), where vending machines have been used to sell healthier snacks and beverages, restaurants have used point-of-purchase prompts and messaging to encourage shoppers to select healthier food and offered physical activity programmes (walking club), (WHO, 2009).

4.3.4 PRIMARY HEALTH

At the primary Health care level, cholesterol screening programme, weight loss programme and self-health monitoring programmes have been found effective (WHO, 2009).

4.3.5 FOOD PROCESSING CHANGES AND FORTIFICATION

Priorities in Health (2013) also recommend targeted changes in food processing include reducing salt and fortifying foods with micronutrients such as vitamin A, vitamin B12, iodine, iron, and folic acid. Priorities in Health (2013) report that Finland, which had the highest rates of CVD in the world, and where a comprehensive programme focused on diet and lifestyle modification had remarkably reduced the mortality rates by approximately 75 percent between

1972 and 1992 (restrict the consumption of sugars-sweetened soft drinks, and micro-nutrient-poor foods, promote the intake of fruits and vegetables, etc).

4.3.6 EDUCATION AND TRAINING FOR CHILDREN AND PARENTS

In the light of the above, therefore, we posit that, children and parents should be educated on good nutrition practices and should also, be trained to develop healthy eating behaviours (Mosha and Fungo, 2010). Parents should encourage their children to imbibe lifestyles and behaviours that promote higher levels of physical activities (Mosha and Fungo, 2010). The

National Cholesterol Education Programme Expert Panel on Blood Cholesterol Levels in

Children and Adolescents therefore, also, recommends that physicians consider screening all obese children over two years of age for elevated cholesterol levels (Moran, 1999). This would enhance close monitoring and follow-up procedures and programmes for intervention.

5.0 CONCLUSION

Since obesity in childhood tends to lead to obesity in adulthood as corroborated by Mosha and Fungo, (2010) there is an impending danger as the prevalence of the phenomenon is rising with urbanisation and requires drastic preventive measures to stem the tide of the epidemic (Mosha and Fungo, 2010). Consequently, Kigali, which is currently a fast growing city where children are exposed to city culture of eating in restaurants, characterised by sedentary lifestyles, high intake of less nutritious, energy dense snacks/soft drinks and many fast food outlets, is in dire need of child and adolescent obesity study for policy actions. It is therefore, important to prevent the rising prevalence of obesity and overweight among children in Rwanda, since the cost of managing this epidemic is very high considering the low incomes and the large number

of competing diseases such as malaria and HIV that must also be addressed (Mosha and Fungo, 2010).

Western lifestyles and socio-economic improvements have contributed significantly to the increasing problems of overweight and obesity among children in developing countries (Boutayeb and Boutayeb, 2005; Mosha and Fungo, 2010), including Rwanda. Such socioeconomic factors and demographic variables like parental education level, age and income have been associated with the increasing prevalence of overweight and obesity among children in low-income countries (Boutayeb and Boutayeb, 2005; Mosha and Fungo, 2010). Mosha and Fungo (2010) report that executive families such as businessmen/women may have high incomes and could afford to purchase nutritious foods. However, due to low education levels in nutrition, they may decide to purchase foods that are high in energy and low in essential nutrients. In addition, since all members of the family share the foods purchased, children are more likely to be affected by the high fat, high calorie foods than other members of the family (Mosha and Fungo, 2010).

Furthermore, the evidences surveyed and presented in this paper show that childhood obesity is becoming an increasing health problem (De Onis and Blössner, 2000) not only in developed and industrialised nations but it is a growing trend in the developing, low income and middle income nations. Therefore, early multi-sectoral intervention programmes through national policies that consider the culture and the needs of the beneficiaries in Rwanda through community mobilisation (Berkowitz and Borchard, 2009), should be implemented for the interventions to work.

It is strongly recommended, and especially to the Rwanda Ministry of Health and other policy making organs that, childhood and adolescent obesity can be strategically and significantly reduced using the Extended Three-Level Approach, which incorporate: (a) Education and training of parents and children, (b) Food processing changes and food fortification, (c) Primary health care principles and practices, (d) Provision of healthy foods in schools, (e) Healthy commuting using non-motorised transport, (f) Composition changes of cooking oils and staple foods, (g) Aligned national policies, which cohere and supportive to local contexts, and (h) Diet and lifestyle modifications.

6.0 REFERENCES

Barthel, B. (2001). Prevalence of obesity in children: a study in primary schools in Paris.

Public Health, 1 (13). SFSP. DOI 10.3917 /spib. 011.0007

Berkowitz, B. and Borchard, M. (2009). Advocating for the Prevention of Childhood Obesity: A Call to Action for Nursing. *The Online Journal of Issues in Nursing* Vol.

14, No. 1. Manuscript 2. Available:

www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/

[N/TableofContents/Vol142009/No1Jan09/Prevention-of-Childhood-Obesity.](http://www.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/TablesOfContents/Vol142009/No1Jan09/Prevention-of-Childhood-Obesity)

Boutayeb, A and Boutayeb, S (2005).The burden of non communicable diseases in developing countries. *International Journal for Equity in Health* 2005, 4:2
doi:10.1186/1475-9276-4-2 . January.

Centre for Disease Control and Prevention (2013). Adolescent and School Health, Childhood

Obesity Facts. From <http://www.cdc.gov/healthyyouth/obesity/facts.htm>

Fletcher, A.; Cooper, J. R.; Helms, P.; Northington, L-D and Winters,K. (2009). Stemming the Tide of Childhood Obesity in an Underserved Urban African American Population: A Pilot Study. *The ABNF Journal*.

Moran, R.(1999). Evaluation and Treatment of Childhood Obesity. *American Family Physician*. February, 15:59 (4):861-868 . From <http://www.aafp.org/afp/1999/0215/p861.html>

Mosha, T.C.E.; and Fungo, S. (2010). Prevalence of overweight and obesity among children aged 6-12 years in Dodoma and Kinondoni Municipalities, Tanzania. *Tanzania Journal of Health Research* 12, 1, January.

National Heart, Lung and Blood Institute (2007).Working Group Report on Future Research Directions in Childhood Obesity Prevention and Treatment, *Journal of American Medical Association*, August 21-22. From: www.nhlbi.nih.gov/meetings/workshops/child-obesity/index.htm.

Ohlhorst, S. (2011).ASN Partners to Bring Attention to Childhood Obesity, American Association for Nutrition. From: <http://www.nutrition.org/asn-blog/2011/09/asn-partners-to-bringattention-to-childhood-obesity/>

Priorities in Health (2013).Cost-Effective Strategies for Non-communicable Diseases, Risk Factors, and Behaviors. From

Tabaro J.C. (2013) When Africa Grows: Obesity Now A Public Health Issue in Rwanda. SYFIA International/Worldcrunch. From: <http://www.worldcrunch.com/culture->

[society/whenafrica-grows-obesity-now-a-public-health-issue-in-rwanda/fat-obesity-health-kigalirwanda/c3s10013/](http://www.ijrd.com/society/whenafrica-grows-obesity-now-a-public-health-issue-in-rwanda/fat-obesity-health-kigalirwanda/c3s10013/)

Wise, J. (2011). "Tsunami of obesity" threatens all regions of world, data show'. *British Medical Journal (Overseas & Retired Doctors Edition)*, 342, 7794, p. 354, Feb. 12.

