

Prevalence and Contributing Factors for Overweight and Obesity in Children 0-18 Years in Sub Saharan Africa for 20-Year Period: Systematic Review

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Abstract

Overweight and obesity among children in the sub Saharan Africa is emerging to be a public health concern in recent decades. The global occurrence of childhood overweight and obesity has increased remarkably during the past 20 years. The objective of this paper is to establish the trend of overweight and obesity for children under 18 years of age in the sub Saharan Africa. The study adopted systematic literature review over 20-year period from 1999 to October 2019. Results showed that childhood overweight and obesity has been increasing for the past 20-year period especially in the urban settings. It has been found that between the year 2010 and 2014 about 10.7 million children from 26 Sub Saharan African countries under the age of five are overweight or obese. The study also identified that obesity was more prevalent in urban than rural areas, particularly in women. If this situation is not remedied, sooner or later a large percentage of the African children could grow to be obese and this could be at a greater risk of mortality and morbidity among children due to these extreme body weight categories. It is therefore critical to address the factors that are associated with the higher prevalence of overweight and obesity among children in sub Saharan Africa to reduce the overall burden of overweight and obesity in the region.

Keywords: Overweight; Obesity; Prevalence; Contributing Factors; Children

Introduction

Childhood obesity has increased to an wide-ranging proportion in both developed and developing countries. The prevalence of childhood obesity has doubled in the past thirty years in most developed countries and in some low-income countries, most especially in the urban settings [1]. Conversely, the rate of increase in childhood obesity has slowed down, specifically in the developed countries [2]. Accordingly, the World Health Organization (WHO), has stated that 41 million children below the age of 5 were overweight or obese in 2014 [3]. Again, it has been estimated that in 2016 alone over 50 million female child and 74 male child globally were obese [4]. Overweight and obesity have been described by the WHO as abnormal or excessive fat buildup that may be harmful to health. Body mass index (BMI) is a simple way of determining overweight and obesity in adults. It is described as a person's

weight in kilograms divided by the square of his height in meter square (kg/m^2). For adults, overweight is a BMI greater than or equal to 25; and obesity it is a BMI greater than or equal to 30. The measure gives a valuable large based measure for overweight and obesity. For children, age is crucial when describing overweight and obesity. For children less than 5 years of age, overweight described by WHO is weight-for-height greater than 2 standard deviations above WHO Child Growth Standards median and obesity is weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median. For children between the age of 5-19 years overweight is defined as BMI-for-age greater than 1 standard deviation above the WHO Growth Reference median and obesity is more than 2 standard deviations above the WHO Growth Reference median [3]. But in sub Saharan Africa, childhood overweight and obesity has been debated as a result of lack of a standard definition [5].

Method of locating articles

This is a secondary research paper, which reviewed the findings of literature that has already been published on this topic. A methodical review of articles published on overweight and obesity in Sub Saharan Africa from 1999-September 2019 on children below 18 years of age. The data search was limited to studies published between 1999-2019. The following combined keywords search terms were used in the search: “overweight in children”, “obesity in children,” “prevalence of overweight and obesity in children”; “Risk factors of overweight and obesity in children in sub Saharan Africa.” The search was done utilizing mostly Medline and Embase bibliographic database. The Cochrane collaboration database and other sources such as EBSCO, JSTOR, and Emerald were also used. Grey literatures, from sources including the websites of International Diabetes Federation, World Diabetes Foundation, Center for Disease Control, the World Bank, and the World Health Organization were also reviewed. Sub-Saharan Africa is defined as all mainland African countries south of the Sahara including Madagascar.

Inclusion criteria

The search was limited to published articles between 1999 and 2019 and the age of the children was also limited to 0-18 years. The data obtained were from prevalence and incidence studies,

hospital-based studies, registry reports, hospital statistics, government estimates, and the likes. An eligibility criteria was established before commencing the review. Data were included in the systematic review if they meet the following criteria:

1. Cross-sectional study, case control, hospital-based clinical studies, and randomized control trials.
2. Reported incidence and prevalence of overweight and obesity in children 0-18 years of age.
3. Studies published between 1999 and October 2019.
4. Only fully published articles were reviewed.
5. Reports, letters, editorials, commentaries, case studies, etc. were excluded from the study.

Preliminary review was performed by title and abstract to remove articles that were clearly not relevant to the study or did not meet eligibility criteria. Two other reviewers independently reviewed the remaining articles in full text, and they each noted whether the article should be included or excluded, and if so, the reason for exclusion. If an article had multiple reasons for exclusion, the primary reason was chosen for exclusion in the order in which they were listed in the inclusion and exclusion criteria (Figure 1).

Exclusion and exclusion criteria

| Author | Title | Location | Age | Sample size | Year | Study Design | Significant Findings |
|---------------------------------------|---|----------|-------|-------------|------|-----------------|--|
| Furahini, Germana, Mmbaga [6] | Magnitude and factors associated with overweight and obesity among adolescents in semi-rural area of Babati District, Tanzania | Tanzania | 10-16 | 619 | 2018 | Cross sectional | Prevalence: 9.2% overweight and obese with more girls overweight and obese than boys (P<0.0001) |
| Muhihi., et al. [7] | Prevalence and determinants of obesity among primary school children in Dar es Salaam, Tanzania | Tanzania | 0-18 | 446 | 2013 | Cross sectional | Prevalence Overall obesity 5.2% Obesity in girls 6.3% Obesity in boys 3.8% |
| Mosha and Fungo [8] | Prevalence of overweight and obesity among children aged 6-12 years in Dodoma and Kinondoni Municipalities, Tanzania | Tanzania | 6-12 | 428 | 2010 | Cross sectional | Prevalence Aged 6-9 was 6.4% Aged 10-112 was 5.4% |
| Oluwafunmilayo, Fagbenro, Olatona [9] | Overweight and Obesity Among School-aged Children and Maternal Preventive Practices against Childhood Obesity in Select Local Government Areas of Lagos, Southwest, Nigeria | Nigeria | 6-13 | 440 | 2019 | Cross sectional | Prevalence: 6.6% overweight 8.9% obese |

| | | | | | | | |
|------------------------------------|---|--------------|-------|---------|------|-----------------|--|
| Gebremedhin [10] | Prevalence and differentials of overweight and obesity in pre-school children in Sub-Saharan Africa. | South Africa | 0-4 | 155,726 | 2010 | Cross sectional | Prevalence: Overweight/obesity 6.8% in Sierra Leone 16.9% in Comoros 15.9% in Malawi 14.5% in Ethiopia 3.0% in Togo and 2.0% in Senegal |
| Gewa [11] | Childhood overweight and obesity among Kenyan pre-school children: association with maternal and early child nutritional factors | Kenya | 3-5 | 1,443 | 2010 | Cross sectional | Prevalence: 18% overweight, 4% obese, 8% overweight and obese. |
| Wandia, Etyang Mbagaya [12] | Prevalence of and factors associated with overweight and obesity among nursery school children aged 3-6 years in Eldoret municipality | Kenya | 3-6 | 320 | 2014 | Cross sectional | Prevalence Overweight 13.4% Obesity 6.9%. |
| Choukem., et al. [13] | Overweight and obesity in children aged 3-13 years in urban Cameroon: a cross-sectional study of prevalence and association with socio-economic status | Cameroon | 3-13 | 1,343 | 2017 | Cross sectional | Prevalence: 12.5% overweight and obesity. 13.2% in girls, 11.8% in boys) |
| Mukuddem-Peterson and Kkruger [14] | Association between stunting and overweight among 10-15-year-old children in the North West Province of South Africa: the THUSA BANA Study. | South Africa | 10-15 | 1,257 | 2004 | Cross sectional | Odds ratio and the 95% CI for the association between stunting and overweight in boys and girls were 0.45 (CI 0.16, 1.30) and 0.50 (CI 0.21, 1.19) respectively. |
| Kamau., et al. [15] | Prevalence of overweight and obesity among primary school children in Nairobi province, Kenya | Kenya | 10-15 | 5325 | 2011 | Cross sectional | Prevalence Obese 8.5% |
| Chirwa, Musuku Pandey [16] | Prevalence of Obesity and Associated Risk Factors Among School Children in Primary Schools in Lusaka, Zambia | Zambia | 7-12 | 556 | 2019 | Cross sectional | Prevalence 8.8% |
| Amidu., et al. [17] | Determinants of childhood obesity among basic school children aged 6 - 12 years in Tamale Metropolis | Ghana | 6-12 | 400 | 2013 | Cross sectional | Prevalence 9.8% |
| Huda [18] | Prevalence of Overweight and Obesity and its Associated Risk Factors among Primary Public School Children (10-14) Years Old in Arkaweet Block 50-Khartoum | Sudan | 10-13 | 161 | 2019 | Cross Sectional | Prevalence 4.97% |
| Muthuri., et al. [19] | Correlates of objectively measured overweight/obesity and physical activity in Kenyan school children: results from ISCOLE-Kenya | Kenya | 9-11 | 563 | 2014 | Cross Sectional | Prevalence 14.4% overweight 6.4% Obese |

Table 1: Data Extraction and Management.

Results

Figure 1 shows the diagrammatic flow chart with numbers of included and excluded articles at each step of the review process. The search strategies in the database identified 1,200 related articles and additional records identified 750 through grey literature search. The combined search yielded 1,950 articles all together. Following the inclusion and exclusion criterial 1,937 articles were not eligible for inclusion leaving only 13 articles that were qualified for eligibility (Figure 1). Reasons for exclusion include ineligible sample (e.g., articles do not qualify for cross-sectional study, case control, hospital-based clinical studies, and randomized control trials; articles did not report on incidence and prevalence of overweight and obesity in children 0-18 years of age; studies were not published between 1999 and 2019; and articles were not fully published). The qualified articles describe interventions from for eight different African countries as follows: Tanzania, Nigeria, South Africa, Kenya, Cameroon, Zambia, Ghana, and Sudan (Table 1). Overweight and obese children have the tendency to develop higher risk for co-morbidities such as hyperlipidemia, hypertension, Type two diabetes, psychological problems, and many other negative health effects [20].

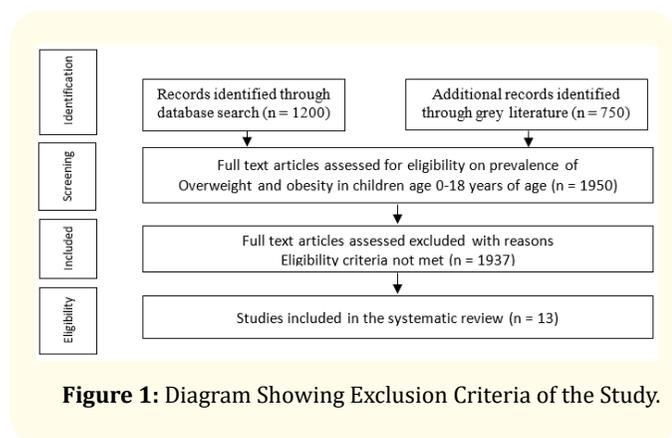


Figure 1: Diagram Showing Exclusion Criteria of the Study.

Prevalence of overweight and obesity in children in sub Saharan Africa

Data from the Demographic and Health Surveys conducted between 2010 and 2014 from 26 Sub Saharan African countries suggest that 10.7 million children under the age of five are overweight or obese. Significant in the result was that 16.9% were overweight in Comoros Island, 15.9% in Malawi, and 14.5% were overweight in Ethiopia [10]. Moreover, in 2013, studies conducted in several

Sub Saharan African countries found that the prevalence of overweight and obesity in children between 5 and 17 years old was 10.6% and 2.5% respectively [5]; overall obesity in children 0-18 years in Tanzania in 2013 was 5.2% with more girls overweight 6.3% compared to boys 3.8% [7]. It was also found by Furahini, et al. [6] in Tanzania that 9.2% children between the age of 10-16 were overweight and obese with more girls overweight and obese than boys.

Gebremedhim [10] carried out health survey and sampled out 26 countries in sub Saharan Africa with the total sample size of 15,5726 found that overweight and obesity was 6.9% in Sierra Leone, 16.9% in Comoros Island, 15.9% in Malawi, 14.5% in Ethiopia, 3% in Togo, and 2% in Senegal. It was evident in his study that 11 out of the countries studied, overweight and obesity were more prevalent than wasting. It is estimated that in the whole subcontinent, 10.7 million children were affected by the problem of overweight and obesity. The prevalence of overweight and obesity was slightly higher in boys than in girls. Equally, Gewa [11] documented in a cross sectional study in Kenya that the prevalence of children aged 3-5 years was 18% overweight, 4% obese, and 8% are both overweight and obese. The situation is not different in sub Saharan African countries such as Zambia, Ghana, and Sudan. Obesity and overweight just like any sub Saharan African country is increasing in Zambia. Chirwa, Musuku, and Pandey [16] found that the prevalence rate of obesity among the 7-12 years old in Zambia was 8.8%. Likewise in Ghana the obesity rate among the 6-12 years old is 9.8% [17].

Risk factors of childhood overweight and obesity in sub Saharan Africa

The primary cause of obesity and overweight is an energy imbalance between calories eaten and calories used. An increased consumption of high fat diet, less or lack of physical activity, sedentary lifestyle, mode of transportation, and urbanization has led to the increase in the overweight and obesity in children under 18 years of age in the sub Saharan African region. More so, there is a general perception which is endemic in most African countries that being overweight or obese is an admired trait for girls. It has been documented that childhood obesity is a pressing public health concern which has consequences for physical and emotional well-being of the child. It also possess to a larger extent risks for the child's health later in life [3,4]. The disease was previously thought to be a problem of the affluent society, however, they are currently

increasing in the low- and middle-income countries, especially in urban areas. In sub Saharan Africa, children who are overweight or obese has nearly doubled from 5.4 million in 1990 to 10.6 million in 2014 [3]. The primary cause of obesity and overweight is primarily attributed to energy disparity between calories ingested and calories used. There has been an increased consumption of energy-dense foods that are high in fat as well as decrease in physical activity due to the sedentary nature of many forms of work. Also there has been a change in modes of transportation, and the recent urbanization [3]. The United Nation International Cultural and Education Fund (UNICEF) stated that 87% of children less than five years with overweight or obesity live in least to Middle Income Countries [21].

Complications of childhood overweight and obesity

Establishing risk factors for overweight and obesity in children is critical since childhood is an important period for the development of obesity in adulthood. Childhood obesity can negatively affect many organ systems and can cause severe consequences, which includes high blood pressure, dyslipidemia, insulin resistance, dysglycemia, fatty liver disease and psychosocial complications. The condition is also a key contributor to healthcare expenses [22]. Obesity in Children can also lead to premature death and disability in adulthood. But in addition to increased future risks, obese children experience breathing difficulties, increased risk of fractures, hypertension, early markers of cardiovascular disease, insulin resistance and psychological effects.

Discussion

The available literature on childhood overweight and obesity were reviewed as much as possible to assess the prevalence of the condition in children under 18 year of age for 20 year period for sub Saharan Africa. This study has shed light on the understanding of the epidemiology of obesity and overweight in children aged 0-18 years in the sub-Saharan Africa. It has been highlighted in the study that overweight and obesity is increasing since 1999 in the sub Saharan Africa especially in the urban populations compared with their rural population. Childhood obesity is related to early death and disability in adulthood. Many low- and middle-income countries are currently fighting with a "double burden" of disease. These countries are still dealing with the problems of communicable diseases and undernutrition, at the same time they are also experiencing a rapid increase in non-communicable diseases such as obesity and overweight, particularly in urban settings. It is not

rare to find undernutrition and obesity in the same country, community, and household.

Children in low- and middle-income countries become susceptible to the condition who are exposed to high-fat, high-sugar, high-salt, energy-dense, and micronutrient-poor foods. These type of foods tend to be lower in cost but also lower in nutrient quality. These type of dietary lifestyle in addition to poorer physical activity usually result in increased childhood obesity while undernutrition issues remain unsolved [23].

Limitations

Relating to other systematic reviews, this study also had some short falls and as a result, caution should be exercised when interpretation or applying findings from the study. Notwithstanding the fact that this paper wanted to include studies from all sub-Sahara African countries, most of the studies retrieved were articles conducted and published in English-speaking countries, hence language bias cannot be avoided. It is important to note that most of the studies from African countries are likely to be published in non-indexed. Furthermore, the multilingual, with its diverse culture, diverse ethnic and racial divisions that characterize the African continent make it difficult to generalize the findings of this study. An additional limitation was the inadequate number of studies that fitted the inclusion criteria. Almost all the articles reviewed utilized mainly cross sectional study design.

Conclusion

Overweight and obesity can easily be prevented with the supportive environments and communities in place. Families need to make smart dietary choices, and also making regular physical activity the easiest choice. The key findings of this review are: (1) obesity was more prevalent in urban than rural areas, particularly in women; (2) obesity was increasing in many sub Saharan countries in Africa since 1999. These findings have important public health implications and call for immediate action to combat the increasing prevalence of obesity in children under 18 years of age. This may require a policy shift towards organized and coordinated strategies directed at both prevention and treatment of existing obesity.

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