Obesity and Factors that Contribute to Obesity among Pre- Adolescents Attending Day Private Primary Schools in Nairobi, Kenya

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Abstract

Obesity is a diet-related condition and it refers to an abnormally high proportion of body fat. Various studies carried out in the United States reveal that obesity stems right from childhood. Childhood obesity is the most prevalent and common nutritional condition among the urban population and it is becoming an area of public concern. Cited literature suggests that feeding habits, especially during infancy and childhood predisposes the child to obesity in adulthood. This was a descriptive study aimed at investigating obesity and factors that contribute to obesity among Pre-adolescents. The respondents were randomly selected from two day private primary schools in Nairobi. Systematic random sampling was used to select pupils from each school making a sample of 120 pupils. School head-teachers were also included in the sample. Data were collected by use of questionnaires, an interview schedule and an observation checklist. Both qualitative and quantitative data were collected. Qualitative data were analyzed by coding raw data into common themes to form patterns. Quantitative data were analyzed by computer through the use of Statistical Package for Social Sciences (SPSS). Linear regression analysis was used to test the hypothesis. Results were reported using frequencies and percentages. The study showed that there was a significant relationship between eating habits of the pre-adolescents and obesity. Eating food three times a day and eating any time were positively correlated with obesity. In the schools studied, 40% of the respondents ate food three times in a day while (50%) consumed food at any time of the day. The reasons given for these trends of food consumption were: availability of money, peer pressure, boredom and influence by media. Skipping meals had a very significant relationship with obesity. The t-statistic of –2.88 was significant at 5% significant level. This implied that an obese person could reduce their BMI by 2.0 points by skipping meals. On the other hand, eating between meals was positively correlated with obesity and the result was significant at 10% significant level. Data collected indicated that 55.8% of the respondents ate between meals. A third of the respondents were found to have a BMI of over 26, which indicates evidence of overweight.

Keywords: Obesity, Eating habits, Overweight, Body Mass Index (BMI), Activity Patterns

1. Introduction

Obesity refers to an abnormally high proportion of body fat resulting in a significant impairment of health (Dietz, 1988). The word "obesity" according to Williams (1989) is a clinical term for excess body weight used in the traditional medical model. It is generally applied to a person who is 20% or more above the so-called ideal weight. Obesity, especially amongst children, is mainly prevalent and serious nutritional disease in Western industrialized world. Studies carried out in the United States indicate that one third or more infants and 20-30 per cent adolescents are obese (Dietz, 1983).

According to Gail and Marie (1996), both hereditary and environmental factors influence obesity in human beings. The tendency to obesity is probably inherited, but environment is probably influential in the sense that it can prevent or permit the development of obesity when the potential is there. Evidence suggests that overfeeding of infants and young children may lead to the production of increased number of fat cells in the body and predispose the individual to obesity in adulthood (Robinson, 1986). Obesity increases with age up to sixty years and thereafter begins to decrease. However, the decrease appears more likely to occur in men. In the developing countries, men, women and children are likely to be obese in the higher socioeconomic status (Latham, 1997). Nevertheless, it should be emphasized that obesity occurs in all groups; it is simply more common in some groups than others (Fielding et.al., 1991).

Obesity is a diet-related disease. Diet related diseases are emerging as a new phenomenon threatening the life of a sizeable proportion of the population in both developed and developing parts of the world (Helsing, 1990). In Africa, it is sometimes considered that obesity adds prestige to an individual. Latham (1997) further states that obesity is often considered a condition of affluence. Certainly in affluent nations such as United States, obesity is highly prevalent. However, the condition is common even among the poor non-industrialized countries.

Modern lifestyles with excessive food intake and reduced physical activity are the main contributive factors to the increasing incidences of obesity. Obesity is a growing health problem throughout the world; even

in developing countries where under nutrition has traditionally been seen as endemic, obesity is beginning to emerge as a problem (Twahir, 2000). There is a growing concern among nutritionists that we may be "snacking our way to malnutrition". There is an ever greater and greater consumption of the so-called snack foods especially among children (Barasi, 1997).

Childhood obesity has become an area of public concern because children are at increased risk of carbohydrate intolerance, increased insulin secretion, hypercholesterolemia, coronary heart diseases and hypertension (Dietz, 1988). Obese children experience adverse physical and psychological disturbances and they are not likely to grow out of obesity during adulthood. In fact, studies show that 80% of the obese children become obese adults (Eleanor, 1988). The social, health and psychological effects of obesity can be devastating to the child. The obese child is teased about his/her fatness, is excluded from many peer activities and made to feel unwanted (Brownell, 1984).

In Kenya, not much research has been done on obesity. It was therefore deemed important to investigate the prevalence and causes of obesity amongst pre-adolescents, because this is the age when strange eating habits intensify and peer pressure is high.

2. Materials and Methods

A descriptive study was used whereby obesity was determined by calculating the Body mass Index (BMI). Weights and heights of children were taken. Questionnaires were used as the key method of data collection hence able to reach a large number of respondents within a short period of time. The sample consisted of two private primary schools in Nairobi, with each providing a sample of sixty students (n=60). In total, the sample consisted of one hundred and twenty (N=120) respondents. The target Population comprised of children aged between 11years and 12 years of age.

Systematic Random Sampling was used to select respondents. Random sampling ensures that each unit in the defined population has an equal chance of being included (Snedecar and Cochran, 1989 and Sproul, 1988).The sample comprised of 60 male and 60 female pupils attending day private primary schools in Nairobi,Kenya. A total of 16 respondents both male and female were purposively selected to form a subset for observation. Overweight respondents were the ones to be included in the observation schedule hence they were purposively selected after obtaining their weight and height. A questionnaire and an observation check-list were used to gather information on demographic characteristics, eating habits and activity patterns of the respondents. Data were analyzed using SPSSS Computer package. Descriptive measures were used to organize and describe characteristics of the sample. These were mainly frequencies and percentages. The body mass index was also calculated to determine nutritional status.

3. Results

3.1 Demographic Characteristics of Respondents

3.1.1 Weight of Respondents

It was necessary to find out the weight of the respondents because it is one of the indicators of obesity.

The highest category of weight was 51-65Kg, where (55 %) of the respondents fell. There were more males (41) than females (25) in this category and this could be due to the fact that men have a higher basal metabolic rate than women so they tend to eat a lot at this age. The least represented was 66-80 kg with 20% respondents.

Table 1: Weight of respondents

Weight (Kg)	Male	Female	Total	%
36-50	7	23	30	25.0
51-65kg	42	25	67	55.8
66-80	10	11	21	17.5
80 and over	1	1	2	1.7
TOTAL	**60**	**60**	**120**	**100.00**

3.1.2 Height of respondents

Two measurements, height and weight were used to calculate the Body Mass Index (BMI) of the respondents. The height of respondents ranged between 125cm-169cm. The highest category reported was 140-154cm with a frequency of 69.2%. Twenty per cent (20%) had a height range of 155-169cm and a small percentage (10.8%) had a height range of 125-139 cm. The mean height was 147 cm. This means that most respondents were average in height in regards to their age.

Table 2: Height of respondents

Height (Cm)	Male	Female	Total	%
125-139	8	5	13	10.8
140-154	36	47	83	69.2
155-169	16	8	24	20.0
TOTAL	**60**	**60**	**120**	**100.0**

3.2 Eating Habits of the Respondents

The respondents were asked to describe some of the factors that influenced their eating habits in terms of peer pressure, boredom, media influence, and availability of money and price of food. Data showed that all the above factors apart from the price of food had a large influence on the respondents eating habits with a majority being influenced by availability of money (62.5%). A half (50%) of the respondents were influenced by peer pressure, (60.8%) being influenced by boredom while media influenced 59.2 % of the respondents. Only 33.3% were influenced by the price of food (Table 3).

Table 3: Factors Influencing Eating Habits of Respondents.

	RESPONSE					
FACTOR*	*Number*		*YES*		SOMETIMES	
	N	%	N	%	N	%
Peer Pressure						
	42	35.0	60	50.0	18	15.0
Boredom	29	24.2	73	60.8	18	15.0
Media influence	32	26.7	71	59.2	17	14.1
Availability of money	35	29.2	75	62.5	13	10.8
Food being cheap	51	42.5	40	33.3	29	24.2

*Multiple responses allowed.

3.2.1 Number of Times respondents ate in a day

Table 10 shows that fifty percent (50%) of the respondents consumed food at any time of the day while 40% ate three times in a day, 6.6% ate twice a day and 1.7% ate once a day. This clearly shows that availability of money has an influence on the eating habits as the respondents were able to buy food at any time hence ate whenever they felt like.

Table 4: Number of Times the Respondents Ate in a Day

No. of eating times	**Male**	**Female**	**Total**	<u>%</u>
Once	1	1	2	1.7
Twice	3	5	8	6.6
Thrice	16	32	48	40.0
Any time of the day	39	21	60	50.0
No response	1	1	2	1.7
Total	**60**	**60**	**120**	**100.0**

3.2.2 Type of Foods Consumed By Respondents

The researcher sought to find out the type of foods consumed by the respondents the previous day. This acted as a guideline to assess food varieties hence ensure pupils ate a balanced diet. As shown in Table 5, a diverse range of food items were mentioned by the respondents

Table 5: Type of Foods Consumed by respondents the Previous Day

Type of food*	Break-fast		Mid-break		Lunch		4 O'clock		Supper	
	N	%	N	%	N	%	N	%	N	%
Tea	21	17.5	-	-	-	-	-	-	-	-
Tea/Bread	25	20.8	-	-	-	-	-	-	-	-
Milo/Milk	34	28.3	-	-	-	-	24	20.0	-	-
Cereal	40	33.4	-	-	-	-	-	-	-	-
Chips	-	-	32	26.7	-	-	-	-	40	33.4
Sandwich	-	-	38	31.6	-	16.7	-	-	-	-
Juice/Fruit	-	-	23	19.2	-	-	15	12.5	-	-
Peanuts	-	-	12	10.0	-	-	-	-	-	-
Sweets/Chocolates	-	-	6	5.0	-	-	-	-	-	-
Milk	-	-	9	7.5	-	-	-	-	-	-
Rice/Stew	-	-	-	-	16	13.3	-	-	26	21.7
Chips/Sausages	-	-	-	-	62	51.7	-	-	-	-
Chapati/Stew	-	-	-	-	22	18.3	-	-	21	17.5
Tea/Cake	-	-	-	-	-	-	30	25.0	-	-
Soda	-	-	-	-	-	-	26	21.7	-	-
Ice Cream	-	-	-	-	-	-	25	20.8	-	-
Pasta/Stew	-	-	-	-	-	-	-	-	8	6.6
Burger	-	-	-	-	-	-	-	-	25	20.8

***Multiple responses allowed**.

3.2.3 Consumption of food in between meals.

It was necessary to find out whether the respondents consumed any foods in between meals as this would largely affect their consumption of regular meals and quantity consumed hence their weight.

Table 6: Consumption of Food in Between Meal (Snacks)

Response	**N**	**%**
Yes	67	55.8
No	53	44.2
Total	**120.0**	**100.0**

3.2.4 Amount of Pocket money given to a respondent and how it was spent

It was necessary to find out if the respondents are given pocket money and the amount because this would determine their consumption of snacks. A majority of the respondents were given some amount of pocket money to spend at school on a daily. The amount given ranged from Kshs.50.00 to over Kshs.300.00, with 80% of the respondents receiving between Ksh.100.00 – Kshs.250.00 per day.

There were two extreme groups where ten percent (10%) received over Kshs.250.00 and the other (2.5%) below Kshs.100.00 See table 15. This disparity could be due to the fact that parents/guardian have different occupation hence different levels of education therefore treat children differently. Most of the parents were employed or self-employed, hence had a regular source of income and therefore they could afford to give their children pocket money on a daily basis.

Table 7: The amount of pocket money offered to respondents by parents/guardian

Amount (Kshs)	N	%
Below 100	3	2.5
100 – 250	96	80.0
Over 250	12	10.0
No response	9	7.5
TOTAL	**120**	**100.0**

This money was spent on either buying break snacks (23.3%) or lunch (23.3%) both (19.3%) as shown in Table 7. A very small number of respondents (3.3%) saved it or used it for other purposes. The snacks sold in the canteen included popcorns, crisps, biscuits, soda, ice cream, sweets and cakes. Lunch items provided by the schools outside catering included chips, chapati, rice, spaghetti, sausages and beef stew. There was no specific meal for the day and therefore all these food items were brought to school on a daily basis.

Table 8: How money offered was spent by the respondents

Use	N	%
To buy break only	28	23.3
To buy lunch only	52	43.3
To buy break & lunch	23	19.3
Saving	4	3.3
Other	4	3.3
No response	9	7.5
TOTAL	**120**	**100.0**

3.3 Activity pattern of respondents

Activity pattern refers to the regularity of participation or performance of activities. The level of participation in various activities may affect food consumption and basal metabolic rate of an individual which are some of the indicators of obesity. The activity pattern was obtained by use of a scale. The results are presented in table 9. A few of the respondents were active in various activities with swimming having (50.0%) of the respondents participating actively. In all the other activities apart from swimming respondents recorded over fifty percent inactive participation. The active participation in swimming can be attributed to the fact that training is started early and most respondents have an interest in it.

Table 9: Respondents Level of Participation in Various Activities at School

Activity*	RESPONSES					
	ACTIVE		FAIRLY ACTIVE		NOT ACTIVE	
	N	%	N	%	N	%
Swimming	60	50.0	24	20.0	36	30.0
Rugby	15	12.5	8	6.7	97	80.8
Basket ball	36	30.0	15	12.5	69	57.5
Football	42	35.0	17	14.2	61	50.8
P.E	18	15.0	9	7.5	93	77.5
Tennis	15	12.5	6	5.0	99	82.5
Hockey	10	8.3	6	5.0	104	86.7
Running	13	10.8	5	4.2	102	85.0

*Multiple responses allowed

3.3.1 Activities performed at home

It was necessary to find out what kind of activities the respondents performed at home as this could also affect their food consumption and consequently the basal metabolic rate.

On further questioning it was revealed that most of the respondents did not participate in other physical activities at home. Over two thirds of the respondents indicated having never participated in cooking (87.5%) or cleaning of cars (82.5%), while nearly one third of the respondents indicated participating in cleaning of dishes (39.2%) and cleaning their own rooms (32.5%). The results are presented on Table 9.

Table 10: Respondents Participation in Various Activities At Home

Activity*	RESPONSES							
	Daily		Once a week		Twice a week		Other/Never	
	N	%	N	%	N	%	N	%
Cooking	4	3.3	9	7.5	2	1.7	105	87.5
Cleaning dishes	11	9.2	47	39.2	4	3.3	58	48.3
Cleaning room	20	16.7	39	32.5	7	5.8	54	45.0
Cleaning cars	1	0.8	14	11.7	6	5.0	99	82.5

*Multiple responses allowed

The low participation in household tasks can be attributed to the time available to carry out these activities e.g. cooking and cleaning cars are quite involving and consume a lot of time. These activities also require certain techniques and interest in order to perform them. Most of the respondents also have house helps who carry out these duties. Dishes and rooms are quite easy to clean and will not require a lot of skill and time.

3.3.2 Mode of Transport to School

It was necessary to find out how the respondents commuted to and from school to measure their level of physical activity. It was revealed that 97.5% of the respondents were driven to school by either using private means of transport (80.0%), school transport (15.8%) or public transport (1.7%). Only a small percentage (2.5%) of the respondents walked to school and this is because they lived next to the schools they attended.

3.4   Body Mass Index (BMI) of the Respondents

BMI is an indicator of obesity and it was determined using the following formula below.

   BMI   = weight (in kg)
                    Height (in meters squared)

According to Gibson (1990) anthropometry as an indicator for nutritional status of the young children approaching adolescence is not appropriate due to the snacking involved and the rapid growth experienced. The table below shows the body mass index of the respondents.

Table 11: The Body mass index (BMI) of respondents

BMI	Gender		Total	
	Male Count	Female Count	Total	%
16 – 20	2	8	10	8.3
21 – 35	22	21	43	35.8
26 – 30	29	22	51	42.5
30 & over	7	9	16	13.3
Total	60	60	120	100.0

A BMI between 16-20 indicates that the person is under nourished, while 21-25 indicates that the person is well nourished. Between 26-30 indicates that the person is overweight and over 30 indicates that the person is obese. The table above indicates that 47.5% of the respondents are well nourished, 35.0% are overweight and 4.1% are obese. Therefore this shows that over one third of the respondents (39.1%) were above a BMI of 26 hence showing evidence of overweight and this could be attributed to their eating habits as most of the respondents consumed a lot of snacks in between meals and they did not involve themselves in activities that would ensure energy output. Nearly half (47.5%) of the respondents were between a BMI of 21-25, indicating that they were well nourished. These were just on the border line and were prone to becoming overweight and eventually obese if their eating habits did not change from the one discussed previously.

4. Discussion

The findings of the study showed that in the schools studied, 40% of the respondents ate food three times in a day while (50%) consumed food at any time of the day. The reasons given for this trend of food consumption were; availability of money, peer pressure, boredom, and influence by media. The amount of pocket money offered to the pre –adolescents, on a daily basis ranged between Kshs.50/= to 300/= with majority (80%) receiving between Kshs. 100/= to 250/=. This money was spent to buy snacks or lunch at school. Half (50%) of the respondents admitted consuming what their peers consumed; while 59.2% responded to the advertisements in the media. They would try all new foods or snacks advertised in the media.

According to Latham (1997), obesity is more common among the affluent population. The economic status influences the dietary pattern of an individual .The higher the economic status the more money one has available for spending and therefore this explains why availability of money has an influence on the eating habits of the respondents. From the above data it shows also that media had a great influence on the eating habits of the respondents. According to Twahir (2002), television not only influenced what children ate but also how much they ate. This is in agreement with Tansey and Worsely (1995) who pointed out that television plays a major role in informing and influencing children, as it does influence their eating habits and selection of food because it provides information on new and existing foods.

The foods that were highly consumed included chips/ sausages (51.7%) for lunch, cereal (33.4%) for breakfast, chips (33.4%) for supper. The least consumed items were pasta and stew. The high consumption of chips can be attributed to the little preparation and cooking time required and it is more appealing to children than rice and stew. Also dietary fat contributes to over eating. This finding is in accordance with Astrup (1996), who pointed out that the satiating effect of carbohydrates is greater than that of fats. This therefore makes it easier for individuals to over consume fat containing diets without reaching satiety.

Having consumed excess fats, subsequent food intake is not reduced, so continued over consumption can occur without someone being aware of it. Today fast foods and snacks tend to be universal in nature and are high in fat; therefore it is widely perceived that obesity has increased due to utilization of fast foods. Further questioning was undertaken to find out whether the respondents consumed any foods in between the given meal times. Those who responded positively were 55.8% (table 6). This could be due to availability of money, peer pressure or boredom as most of them indicated earlier as reasons influencing eating habits.

As shown also in table 6, more than half (55.8%) of the respondents indicated consuming food in between meals. According to Williams (1989), continued nibbling of food between meals is associated with obesity.   This is also in agreement with Robinson (1986) who stated that sometimes overeating becomes a habit and this pattern is often set in infancy when a mother overfeeds the baby in the erroneous belief that 'a fat baby is healthy'.

The findings also revealed that respondents were involved in various physical activities both in school

and at home. The activities performed in school were swimming, hockey, rugby, running, P.E, Tennis, Basketball and football. Swimming had more participants (50%) compared to other activities. Amongst the activities carried out at home, most respondents indicated participating more in cleaning their own rooms (16.7%) and cleaning dishes 9.2% on a daily basis than cooking or cleaning of cars.

5. Conclusions and Recommendations

5.1 Conclusions

On the basis of the outlined findings, the following conclusions were drawn.

❖ Factors that influenced eating habits of pre-adolescents were:

Availability of money, peer pressure, boredom and media .This finding, according to Taras (1995) shows that media plays a major role in informing and influencing the eating habits and selection of food in children.

❖ A variety of foods were consumed by pre-adolescents with the carbohydrates, fat and proteins having the highest percentage contributing to overeating and hence overweight.

❖ The pre-adolescents indicated low participation in physical activities eg games at school or cooking at home and only a small percentage (2.5%) walked to school hence also contributing to overweight.

❖ Over one third of the respondents indicated a BMI of above 26 (39.1%) hence showing evidence of overweight.

5.2 Recommendations

The following recommendations have been made based on the findings of this study.

Nutrition- education should be given to pre-adolescents so that they can make wise choices in selection of snacks and meals. Extra – curricular activities should be made compulsory in schools. The pre-adolescents should not be given any pocket money if they are dropped to school and carry an adequate packed lunch. Schools should establish a compulsory Lunch programme where a balanced meal is provided and all children enroll for it. They can opt for outside catering services where the latter are provided with a standard menu for the week by the schools and should be followed closely.

5.3 Suggestions For Further Research

There are numerous openings for further research in this area. A comparative study of the upper, middle and low-income day schools in Nairobi area could be done so as to map out the weaknesses and strengths that each one could borrow from the other in planning for intervention programmes.

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