

## Promoting A Healthy Lifestyle And Proper Nutrition Education To Control Childhood Obesity: An Intervention Study on School-Going Children Aged 5 To 9

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### Abstract

**Introduction:** Childhood obesity is a severe medical condition that arises while a child is above standard weight for his age and height. The leading reason for early life obesity consists of the unbalanced pattern of ingesting, physical activity and food addiction. Consistent with the world survey, early-life weight problems have notably expanded in youngsters and quadrupled in teenagers within the previous 30 years. This trouble can be avoided with the assistance of parents and other own family participants, through applying the proper course of action inside the everyday food conduct and physical exercise.

**Objectives:** The goal of this research is to reduce childhood obesity by intervention through counseling on nutrition education.

**Study Design:** An experimental intervention study.

**Methods:** A research-administrated questionnaire was used to assemble the information from randomly selected 78 overweight children from 3 schools in the Dhaka city. The selected age group of the children for the study was 5-9. The children & their parents answered a structural questionnaire about their food selection knowledge and their condition of physical activities. Then we counseled the intervention group and showed them a booklet to understand. The data collection of this study was completed from September to December 2018 and analyzed the data using (SPSS V.20).

**Results:** We performed this interventional process between the intervention & control group, which achieved positive results involving the baseline and end-line measurement within a 16-week duration. In the intervention group, the baseline weight is  $40.95 \pm 3.83$  kg and in the end-line, the weight reduced to  $39.02 \pm 3.32$  kg. Their P-value is 0.001, which is significant. In the control group, the baseline weight is  $43.92 \pm 4.42$  kg, and in the end-line, the weight increased to  $43.98 \pm 4.37$  kg. Their P-value is 0.135 which is not significant. The baseline BMI of the intervention group is  $23.75 \pm 1.42$ , and in end-line BMI reduced to  $22.57 \pm 1.13$ . Their P-value is 0.001 which is also substantial. The baseline BMI of the control group is  $24.13 \pm 0.47$ , and in end-line, BMI increased to  $24.19 \pm 0.52$ . Their P-value is 0.279. So, there is no significant difference in BMI within the baseline and end-line data. In the intervention group, the knowledge about overweight and obesity, overweight related health problems and adverse effect of consuming excess junk food increased the judgment against the control group. Physical activity and sedentary behaviour of the children of the intervention group also improved compared to the children of the control group.

**Conclusion:** Despite the inescapable limitations, hopeful and positive results have been demonstrated via in-depth study and analysis. Overall, it appears that obesity prevention interventions can be both protected and efficient for children when multi-component strategies paid attention to both diet and physical action are used.

**Keywords:** Childhood obesity; Physical activity; Intervention; Lifestyle assessment.

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### I. Introduction:

The formative year's childhood obesity epidemic has come to be intense public fitness trouble in many countries globally, and it is a substantial public fitness challenge of the 21st century [1, 2]. Globally, in 2016 the variety of obese kids below the age of five is expected to be over 41 million [3], with massive unfavorable consequences on physical and psychosocial health in recent years as well as in adulthood [4]. Once human beings expand obesity, it's miles complicated and expensive to therapy, and there are amazing demanding

situations for patients to hold a standard body weight[5]. It's far estimated that 155million or one in 10 school-age (five–17 years vintage) kids are overweight or obese[6]. In a nationwide examine through ICDDR'B on obesity prevalence and physical activity amongst children and teenagers in city regions of Bangladesh, it was seen that of children aged 5-18 years, 10% are overweight while 4% are obese[7]. In Bangladesh, almost 40% of kids < 5 years old children are laid with malnutrition[8]. The country is now experiencing the double burden of nutrition, with the lifestyles of each undernutrition and overnutrition.

In this study, we had appeared an intervention study in Bangladesh with the expectancy of reducing childhood obesity as childhood weight problems are escalating at a shocking rate. The school team of workers has admittance to sizable numbers of kids in surroundings that can aid healthful behavior and is favorable for the transport of fitness merchandising programs[9]. Schools are in particular appropriate for such applications as youngsters in this age institution are attentive to health messages, and behavioral adjustments can be maintained into adolescence and adulthood[10]. We aimed at counseling on nutrition education to the school going overweight children (age 5 to 9) will significantly reduce 15% body weight. The current trend of inflation of obesity posed a severe threat if necessary steps and proper intervention studies were not carried out.

### **Purpose of the Study:**

The ranks of childhood obesity are mounting at frightening rates in many countries. Obesity can have a significant impact on children's consideration of themselves and how they intermingle with others. Obese adolescents can have low sense of worth, which may have implications for the other portions of their lives. For example, the expansion of friendships and proficiency at school. Childhood obesity amplifies the risk of a series of diseases and disorders in later life. It is essential to categorize and start to reverse the form before children become adults while overweight and obesity should be prevented. The principle of this study is to establish and see the reduction of extra body weight of children by implementing nutritional education & counseling to the children with the association of their parents.

### **Methods and Participants:**

An experimental intervention study over obese children aged from 5-9 years was carried out in 4 selected schools of Dhaka city, Bangladesh and the duration of the study was 16 weeks. There were 78 participants in this study; we divided them into two groups as control and intervention. We addressed the intervention group as cluster-1 and control group as cluster-2. Overweight and obese children separated from standard weight children by eye estimation. Then we met them individually with the permission of their parents, measurement of height, weight and the calculation of BMI was done. After the measures, we selected obese children and indiscriminately divided them into cluster-1 and cluster-2. Then the investigators collected information about the participants (both the cluster-1 and cluster-2) through a questionnaire. Then we gave them nutrition education. We observed them for 16 weeks and tried to reduce their extra body weight by appropriate nutrition education.

### **Inclusion Criteria**

The sample was selected randomly following the inclusion and exclusion criteria.

1. Children of 5 to 11 years who were overweight.
2. Children who were interested in participating.
3. Students of the chosen school.
4. Children who had no physical complications.
5. The students and the parents who were promised to follow our instruction.

### **Exclusion Criteria**

1. Children who were not in the following age group.
2. Children who were not interested.
3. Children who were not overweight.
4. Children who had a hormonal problem.

This research would not risk the child at all in any way. Instead, the child and her parents have the opportunity to know about the relevant information through their active participation in this research. Ethical clearance and research permit obtained from BMRC. Both oral and written approval was sought from the participants before recruiting them into the study.

**Core outcome measures**

We assessed the consequence of the intervention on personage behaviour by using assembling statistics on the growth, knowledge about obese and overweight problems, physical activity, regular water consumption at the baseline for 12 weeks. These procedures could not be acquired blind to the schools' intervention condition.

**Growth measurement**

The group members assessed the selected children in school. Weights had been measured without shoes, sweaters and recorded to within 0.1 kg with portable digital scales. Height measured via a popular technique and registered to the exactness of 1 mm with a free-standing stadiometer. Then we calculated the body mass index (weight in kilograms divided by the square of height in meters).

**Knowledge assessment**

We asked about the knowledge of overweight and obesity, overweight connected health problem and adverse effect of having excess fast food to the children through the questionnaire.

**Physical activity**

We questioned about the regularity of physical activity and sedentary behavior with the aid of the questionnaire and categorized through the frequency of recreation and physical activity for the duration of the last week (outdoor games, swimming, walking, attending any club or activity in which they had been active, playing outdoor games) and frequency of sedentary conduct in past 24 hours (watching TV and playing game on the computer).

**Water consumption**

We also asked about the frequency of drinking water by the questionnaire.

**Data Analysis Plan**

Raw information cleaned, coded and analyzed using Statistical Package for Social Sciences (SPSS) software. WHO Anthro-software computed nutritional status to review changes in body mass index, knowledge, physical activity, the sedentary lifestyle and water consumption. Table and statistical analysis was analyzed by the frequent table and pair t-test

**II. Result:**

After complete the research on the selected 4 schools, the table shows the improvement of the students through the experiment. In all 78 children measured at the baseline and the end of the intervention period.

**Table 1:** Comparing nutritional assessment of the children between the baseline and end-line data of Cluster 1 & 2.

| Variables     | Cluster-1 (n=38) |               |         | Cluster-2 (n=38) |               |         |
|---------------|------------------|---------------|---------|------------------|---------------|---------|
|               | Baseline data    | End-line data | P-value | Baseline data    | End line data | P-value |
| 1.Height (cm) | 131.17±3.66      | 131.37±3.62   | 0.001   | 131.61±4.87      | 131.69±4.78   | 0.083   |
| 2.Weight (kg) | 40.95±3.83       | 39.02 ±3.32   | 0.001   | 43.92±4.42       | 43.98±4.37    | 0.135   |
| 3.BMI         | 23.75±1.42       | 22.57±1.13    | 0.001   | 25.42±2.90       | 25.42±2.84    | 0.279   |

**Growth measurement:**

Table 1 shows the baseline and end-line data of height, weight and BMI of cluster-1 & 2 where significant difference in weight and BMI within the baseline and end-line data. However, in cluster-2, there is no significant difference in weight and BMI within the baseline and end-line data.

**Knowledge assessment:**

Table 2 shows the noteworthy difference in the knowledge assessment among the children about obesity and overweight; it is a related health problem, adverse effects of having excess fast food, benefits of physical activity. Their knowledge on those topics increased to 100% after the intervention, where the knowledge rate of cluster 2 was still low.

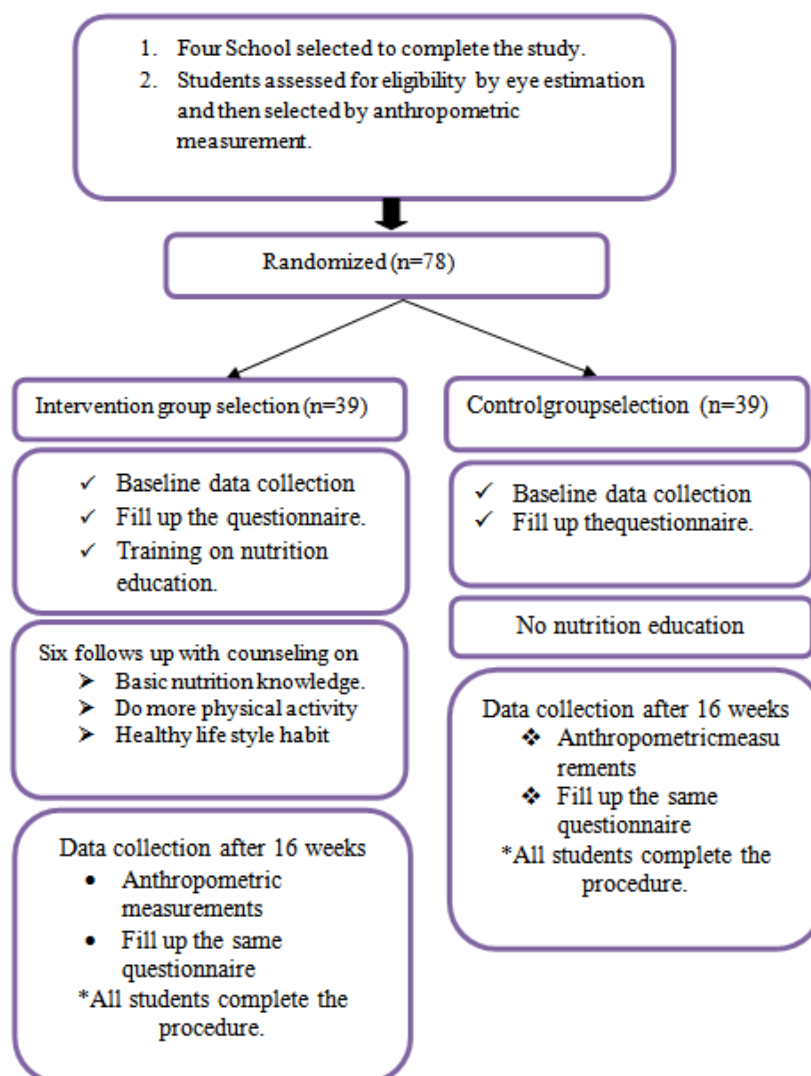


Figure 1: The framework of participant flow and follow-up.

**Physical activity and sedentary lifestyle:**

We found a significant difference in physical activity and sedentary behavior for the cluster-1 showed in (Table 2). Both increased in the overweight children of the registered 1 judged against obese children ofcluster-2.After meal activities such as resting, lying down, brisk walking and others also significant in thecluster-1 shown in table 3 which is not substantial in the cluster-2.

**Table 2:** Comparing the intervention and control groups baseline and end-line data of knowledge assessment and regular activity of the children.

| Variables  | Cluster-1 (n=38) |               |         | Cluster-2 (n=38) |               |         |
|--|------------------|---------------|---------|------------------|---------------|---------|
|  | Baseline data    | End-line data | P-Value | Baseline data    | End-line data | P-Value |
| 1. Knowledge about overweight                                    | 2.6%             | 100%          | 0.001   | 4.9%             | 19.5%         | 0.057   |
| 2. Knowledge about the overweight related health problem         | 2.6%             | 100%          | 0.001   | 4.9%             | 7.3%          | 0.974   |
| 3. Knowledge about the adverse effect of having excess fast food | 15.4%            | 100%          | 0.001   | 9.8%             | 17.1%         | 0.083   |
| 4. Knowledge about the benefit of physical activity              | 2.6%             | 100%          | 0.001   | 4.9%             | 14.6%         | 0.103   |
| 5. Playing outdoor games   |                  |               |         |                  |               |         |

|                              |       |       |       |       |       |       |
|------------------------------|-------|-------|-------|-------|-------|-------|
|                              | 97.4% | 100%  | 0.324 | 76.9% | 64.1% | 0.23  |
| 6.Using laptop               | 87.2% | 86.8% | 1.00  | 74.4% | 73.8% | 0.66  |
| 7.Sleep in daytime           | 25.6% | 35.9% | 0.044 | 41.0% | 51.3% | 0.44  |
| 8. Watch TV during eating    | 87.2% | 82.1% | 0.16  | 53.7% | 55.2% | 0.32  |
| 9. Take exercise regularly   | 10.3% | 35.9% | 0.23  | 9.8%  | 10.5% | 0.37  |
| 10.Watching TV (<3o minute)  | 35.9% | 59.0% | 0.225 | 14.6% | 12.2% | 0.372 |
| 11. Watching TV (>3o minute) | 51.3% | 20.5% | 0.225 | 36.6% | 34.1% | 0.372 |

### Water consumption:

Table 4 shows the daily water consumption of the selected children. The children who were not willing to drink sufficient water; after the intervention, the end line data of cluster-1 of drinking water has been increased compared to the baseline data which is significant. However, in cluster-2, there is no significant difference.

**Table 3:** Comparing the intervention and control groups' baseline and end-line data of 'after-meal activity' of the children

| Variables     | Cluster-1 (n=38) |               |         | Cluster-2 (n=38) |               |         |
|---------------|------------------|---------------|---------|------------------|---------------|---------|
|               | Baseline data    | End-line data | P-value | Baseline data    | End-line data | P-value |
| Rest          | 41%              | 20.5%         |         | 35.9%            | 41%           |         |
| Lay down      | 33.3%            | 43.6%         |         | 38.5%            | 33.33%        |         |
| Brisk walking | 0.01%            | 87.2%         | 0.017   | 17.9%            | 12.8%         | 0.378   |
| Others        | 25.6%            | 0%            |         | 7.7%             | 12.8%         |         |

### Focus group:

Comparing with the children in cluster-2, children in the cluster-1 had higher point of self stated behavior changes, greater understanding of the health benefits of physical activity, after meal activities, knowledge about the long-lasting adverse effects of overweight and obesity, increased amount of drinking water, eagerness and self-reliance to share their ideas, and basic knowledge. They were more able to think of topics learnt and activities undertaken in school connected to maintain a good and healthy lifestyle.

### III. Discussion:

Overweight and obesity problems in childhood have a considerable effect on each physical and psychosomatic health. Primary or secondary prevention may be the answer to controlling the current outbreak of obesity, and the techniques appear to be more efficient in children than adults.

The objective of the study was to reduce childhood obesity by nutrition intervention. On this research, we gave nutritional education to the overweight children of some selected school of the Dhaka city. We found some significant changes in their regular lifestyle after 16 weeks of intervention.

Weight of the selected children reduces in the cluster-1 than the cluster-2. BMI also reduces the cluster-1 with the compare of the cluster-2. Their knowledge about overweight and obesity and health problem related to it has increased in the cluster-1. Now they are fully aware of the adverse effects of having excess fast food. They also know about the benefits of physical activity. However, in the cluster-2, students are not so much aware of this knowledge. Their participation in playing outside games has increased in the cluster-1. The selected children for intervention try to do exercise regularly. The proportion of using the laptop, sleeping in the daytime, watching TV during eating has dropped off in the cluster-1. The percentage of watching TV more than

30 minutes has also lessened in the cluster-1. The selected children of intervention watch TV less than 30 minutes and do more physical activities. In the cluster-2, there is no considerable difference in their regular lifestyle and physical activities. In the cluster-1, the ratio of after-meal actions such as brisk walking after eating has boosted after the intervention. They also increase their regular water consumption after the intervention. However, selected students for the cluster-2 remain same as before. They do not have much difference in the ratio of the baseline data and end-line data of after-meal activities or their regular water consumption.

**Table 4:** Comparing the baseline and end-line data of intervention and control group on water consumption of the children

| Variables    | Cluster-1 (n=38) |               |         | Cluster-2 (n=38) |               |         |
|--------------|------------------|---------------|---------|------------------|---------------|---------|
|              | Baseline data    | End line data | P-value | Baseline data    | End line data | P-value |
| <4 glasses   | 7.7%             | 0%            |         | 23.1%            | 23.1%         |         |
| 4 to 5 glass | 53.8%            | 23.1%         |         | 43.6%            | 43.6%         |         |
| 6 to 7 glass | 30.8%            | 66.7%         | 0.003   | 23.1%            | 28.2 %        | 0.483   |
| >7 glass     | 7.7%             | 10.2%         |         | 10.3%            | 5.1%          |         |

#### Research Limitations

It's true that one research may have a few boundaries, and it's normal. However, it's very crucial to be striving to minimize the range of scope of barriers at some stage in the studies technique. The intervention becomes designed for 16 weeks handiest, recognizing funding boundaries. The response may have reinforced if the families had been centered more immediately[11], even as still keeping the focus on the school community.

#### IV. Conclusion

Childhood obesity has emerged as one of the most pressing clinical and public health problems of our day. Overweight and obesity, as well as different ways of life-associated persistent sickness, are in large part preventable[12]. Proper nutrients education and keeping a healthy way of life can be the solution to the overweight problem for the children. Other research of this kind recommends that behavior exchange is feasible over time[13, 14]. Schooling, interventions, and critiques of the effectiveness and effects of the latest tasks aiming to reduce adolescence overweight and obesity problems are needed to suggest future programs with the best likelihood of success[15]. In reality, the commission on ending childhood obesity (ECHO) recently supplied its very last document to the WHO and covered tips to put into effect comprehensive programs that offer steerage on and guide for a healthy diet, physical activity, proper lifestyle in early formative years to ensure proper increase and improvement of a healthy habit. In addition to comprehensive applications that promote healthy school environments, fitness, and nutrition literacy in school-age children and adolescents, and offer a family-based, multi-factor, weight control lifestyle services for children who're obese[16].

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