Research Article

Effectiveness of Healthy Eating and Active Lifestyle Intervention Program (HEALIP) on Body Mass Index among Children with Obesity

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ABSTRACT

The objective of the study is to determine the effectiveness of Healthy Eating and Active Lifestyle Intervention Program (HEALIP) on body mass index among obese Children. True Experimental research design was adopted with 200 samples who met the inclusion criteria. Healthy Eating and Active Lifestyle Intervention Program was administered for the samples in the experimental group and their Height, weight and body mass index (BMI) was measured. Data were analysed by descriptive and inferential statistics. The school children were screened for overweight and obesity from the selected schools and the prevalence rate was calculated and it was estimated that the prevalence of overweight and obesity was 6.4%. The height, weight and body mass index were assessed before and after the intervention .The base line BMI score of the control group pre-test was 32.8 which was reduced to 31.72 in the post-test and in experimental group pre-test 32.71 and had marginally reduced to 30.26 during the post-test . The calculated "t" value for the post test reveals that there was a significant difference between the control and experimental group at p < 0.001 level. There was a significant reduction in the body mass index in the experimental group post-test (p < 0.001). The study findings emphasized that there was significant reduction in weight control. However; further studies with larger samples to investigate the effect of HEALIP intervention with other parameters in obese children.

Keywords: Healthy Eating and Active Lifestyle Intervention Program, Weight, obese children.

INTRODUCTION

Overweight and obesity are emerging public health problem among school children. Today's children are tomorrow's citizens. Childhood obesity has reached epidemic portions and one of the common metabolic and nutritional disorders. The increased incidence of both overweight and obesity among children has resulted in an escalation in the prevalence of multi-system co -morbidities.[1] To enjoy good health is the right of every child. School age is an important period where the children grow physically, mentally, and socially to healthy adult. Several factors are responsible in unhealthy weight gain among children. These include genetic, lack of physical activity, and unhealthy eating habits or combination of both[2].

The overall magnitude and pattern of obesity in India has been studied sporadically. A decade ago very few children were overweight as well as obese. In India, where there is a wide variation in the geographical, social and cultural norms, there is lack of national representative data on obese children. The prevalence of obesity was five to eighteen percentage in under-five children and two times higher in northern India than in southern India[3].

Today's environment promotes the lifestyle modifications and less physical activity[4]. Dietary factors like fast food consumption, sugary beverages, and carbonated drinks , soda, juice and other sweetened beverages are the leading cause of un healthy weight gain.[5] The consumption of unhealthy foods like chips, baked goods, and candies also cause the obesity.[6,7] Further change in the eating habits, eating large portions in addition to frequent eating of snacks contributes to unhealthy weight gain. Low levels of physical activities are the contributing cause for excessive weight gain.[8]

Management of obesity consists of dietary interventions, physical activity, and behavioral modification. Dietary changes and exercise are the important measures to manage and control obesity among children. The weight control is the only management rather than any other treatment. Drug therapy is less frequently advised in children[9]. Many intervention programs have been implemented to control the obesity .Prevention is the only key strategy to control the current epidemic of obesity which includes both primary and secondary prevention. Weight regains after weight loss and preventing further weight gain in people with well-defined obesity.[10]

Most of the children were unaware to recognize the healthy foods which cause the excessive weight gain. The children fails to do regular physical activities that enhance the storage of fat in the body resulting obesity related complications like dyslipidaemia, fatty liver and atherosclerosis.[11] Severe obesity in children resulting diabetes, hypertension and metabolic syndrome.[12] Early assessment and identification is essential to control the obesity.

The investigator felt that the number of obese children is increasing and prevalent in all age groups in India. Obesity

is one of the important public health issues and challenging the world in the 21st century. The prevalence of obesity has reached epidemic proportions in most populations. According to the England Journal of obesity reported that India has the second highest number of obese children in the world. 14.4 million children in the country have excess weight. China with 15.3 million and India with 14.1 million children were estimated as overweight and obesity[13]. A comparative study was conducted on overweight and obesity among private and government school children and the results revealed that the prevalence rate was high in private schools[14]. Similar study conducted from Karimnagar, Hyderabad, reported that the prevalence of overweight and obesity was 11.9 and 2.7 percent among children. Epidemiological evidence suggests that unless effective preventive measures are implemented, the global prevalence will continue to raise.[15] The healthy eating, active and lifestyle intervention program is simple intervention to reduce the body weight. The intervention focus on healthy eating habits , balanced diet, classification of foods, diet plan, and dietary pyramid and healthy food habits, avoidance of unhealthy foods, processing and ready-made foods and low glycaemic index foods. Planned physical activity program which helps to burn out the excessive calories and education on complication prevention along with the involvement of the parents in their child measurement program. The benefits of the intervention are enormous that helps to reduce weight with this background, the investigators felt it necessary to conduct a study to assess the effectiveness of Healthy Eating and Active Lifestyle Intervention Program on body mass index among children with obesity.

METHODS

A quantitative approach was used to conduct the study. True experimental pre- and post-test research design was adopted. The study was conducted with 200 samples in selected schools after obtaining approval from ethical clearance with reference number 002/05/2015/IEC/SU and formal permission from the school authority. The schools were selected by convenient sampling technique and allocated randomly into experimental and control group by lottery method. In order to obtain the samples from selected schools the baseline survey was done as a first phase. In the second phase the children who fulfill the inclusion criteria were identified and randomly selected as sample for the study. The children were explained about the importance of the study and obtained informed consent from the parents and assent from the children. The weight was measured by using standardized weighing scale. The calibration of the scale was done before using the scale. Height was measured with audiometer. The BMI interpretation was calculated based on the World Health Organization guideline.[16] The Experimental group received Healthy Eating and Active Lifestyle Intervention Program for four months. The body weight was assessed before the intervention and after four months for the experimental control group children. They were assured about their confidentiality and anonymity throughout the study Data was analysed using both descriptive and inferential statistics.

Table 1: Prevalence of obesity among school children:

Table 1: Prevalence of Obesity among Control and Experimental group children			
Classification of obesity	Control Group (N= 100)	Experimental Group(N=100)	X^2(P value)
	Number (%)	Number (%)	
Over weight	50	52	0.251 P = 0.882
Obesity	46	43.4	
Obesity – Class I	4	4.6	

RESULTS

Table 1 shows the prevalence of obesity among school children in both experimental and the control group. The school children were screened for overweight and obesity from the selected schools and the prevalence rate was calculated. It was estimated that the prevalence of overweight and obesity was 6.4%. Over all 200 students were assessed and they were divided in to two groups based on the homogeneity of the samples. In the experimental group 100 and control group 100. The prevalence was 6.4% in experimental group and 6.2% in control group. There was no significant difference observed in both group and equal distribution was observed. In experimental group 52(52%) had overweight and 43(43.4%) had obesity and 5(4.6) had obesity Class I. In control group 50 (50%) had over weight and 46 (46%) had obesity and 4(4%) had obesity class I. Both experimental group and control children were in par with the prevalence of obesity. No significant difference was observed in both groups.

The frequency distribution of children in the control and experimental group was expressed in the Table 2.During the pre-test, in the control group majority of the children were in the category of 60 – 80 Kg and above 80Kg were 16 but in the experimental group majority of them were in the category of 60– 80 Kg.

Table 2: Frequency Distribution of weight, Body mass index among experimental and control group during pre-test and post-test

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S. No	**Parameters**	**Pre test**		**x^2** **(P value)**	**Post –test**		**x^2** **(P value)**
		Control Group **No**	**Experimental Group** **No**		**Control Group** **No**	**Experimental Group** **No**	
1	Weight < 60 kg 60 – 80 Kg >80 Kg	30 54 16	23 58 19	1.325 P=0.516	32 52 16	32 48 16	0.78 P=0.962
2	BMI Over weight Obesity Obesity class -I	50 46 04	52 43 05	0.251 P=0.882	54 42 04	56 40 04	0.085 P=0.958

The calculated X^2 showed that there was no significant difference in the weight of children in the control and experimental group in the pre-test and post-test (p = 0.962).The body mass index of children was classified into three categories. They were overweight, obesity and obesity class I. In control group pre-test majority of the children were in the category of overweight and the second majority of the participants were in the category of obese but in experimental group majority of children were in the category of overweight and obese. The similar pattern of distribution was noticed in the experimental group during the post-test. The calculated value (p = 0.882) revealed that there was a significant difference between control and experimental group during the pre-test and post-test.

Table 3: Effectiveness of healthy eating and active lifestyle intervention program on reducing weight among control and experimental group children

| Para meters	Group	Mean ±SE	Significance unpaired t test		Significance paired t test	
			Con-Exp **Pre -test**	**Con-Exp** **Post - test**	**Control** **Pre-Post test**	**Experimental** **Pre –Post test**
Body Mass Index	Control group Pre- test	32.8±0.18	t =0.386 P<0.05	t =5.623 P<0.001	t =1.495 P<0.05	t =28.093 P<0.001
	Control group Post- test	31.72 ±0.18				
	Experimental group Pre -test	32.71.6±0.19				
	Experimental group post-tests	30.26. ±0.13				
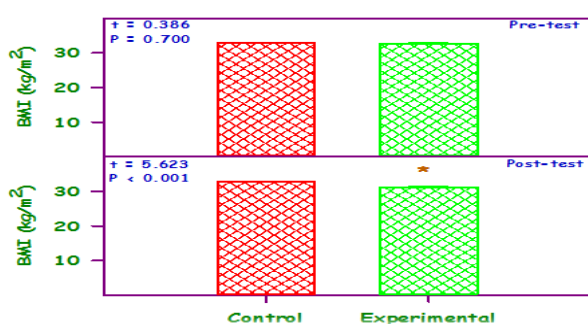
Figure 1: The body mass index (BMI) of obese children in control and experimental groups, in the pre-test and post-test following HEALIP (mean ± SE n = 100 each).The 't' and 'P' values (unpaired 't' test).The pre-test and post-test of control and experimental groups were tested by paired 't' test. The 't' and 'P' values of control group are 1.495 and 0.138 respectively, The 't' and 'P' values of experimental group are 28.093 and < 0.001.Significantly different from the respective pre-test.

The calculated mean body mass index score of the control group during the pre-test was 32.8 which had marginally reduced to 31.72 in the post-test. In the experimental group the mean body mass index during the pre-test was 32.71 and had reduced to 30.26 during the post-test. There was a considerable reduction noticed in the experimental group. The calculated "t" value for the difference in body mass index between control and experimental group in pre-test and post-test shows that there was no significant difference (p=0.700). The calculated "t" value for the post test reveals that there

was a significant difference between the control and experimental group at p < 0.001 level. There was a significant reduction in the body mass index in both the groups in the post-test (p < 0.001).

DISCUSSION

Globalization brings vast lifestyle modifications among children and they were exposed to multiple risk behaviours. Early identification of obesity is an important measure to manage, control and prevent the complications. Overweight and obesity are the leading public health issues and challenges that increase the morbidity and mortality.[17] The management of overweight and obesity among children requires a multi-phase approach that includes dietary management, physical activity and restriction of sedentary behaviour modification. Many programs like school-based interventions, home based interventions, community based interventions, family focused interventions, and educational interventions, dietary interventions, and physical activity based interventions provide unique opportunities to enhance the health status of children. Many studies have reported that the effectiveness of school based intervention program is effective in obesity control. Healthy Eating and Active Lifestyle Intervention Program focuses on multi-component school-based prevention program. Promotion of healthy eating habits, physical activity, education on complication prevention and parental involvement are effective in maintaining weight management and control the complications. With this background, the present study was carried out with 200 samples to assess the effectiveness of healthy eating and active lifestyle intervention program in reducing the body weight among children with obesity. The findings showed that the prevalence was 6.4% in experimental group and 6.2% in control group. There was no significant difference observed in both group and equal distribution was observed. In experimental group 52(52%) had overweight and 43(43.4%) had obesity and 5(4.6) had obesity Class I. In control group 50 (50%) had over weight and 46 (46%) had obesity and 4(4%) had obesity class I.

The present study findings revealed that the prevalence of overweight and obesity among school children in both experimental and the control group are similar. The prevalence was 6.4% in the experimental and 6.2% control group. The findings are consistent with the study conducted by Ezzati et al on worldwide trends in body mass index, underweight, overweight, and obesity among children and the results revealed that there was a regional change was observed in the mean body mass index. Global age-standardized prevalence was 0.7% to 5.6% in girls and 0.9 to 7.8% in boys and it was reported that 75 million girls and 117 million boys were moderately underweight, where as 50 million girls and 74 million boys were overweight and obese worldwide.[18, 19] Similar study was conducted by Ramachandran on prevalence of overweight in urban Indian adolescent school children between 13- 18 age group and reported that that age-adjusted prevalence was 17.8% in boys and 15.8% in girls. Obesity increases with age, physical activity and high socio- economic group and concluded that life style factors influence more on BMI[20, 21].

The present study demonstrated the effectiveness of Healthy Eating and Active Lifestyle Intervention Program on body mass index and the relevant data was collected from both groups. The study findings revealed that the experimental group demonstrated overall reduction in the weight when compared to the control group children. The base line BMI score of the control group pre-test was 32.8 which had marginally reduced to 31.72 in the post-test and in experimental group pre-test score was 32.71 and had reduced to 30.26 during the post-test score. The calculated "t" value for the post test reveals that there was a significant difference between the control and experimental group at p < 0.001 level. There was a significant reduction in the body mass index in both the groups in the post-test (p < 0.001).

These study findings are consistent with other interventional studies. Zohar et al conducted a lifestyle intervention program benefits on overweight and obesity children and the results reported that baseline, 55/165 (33.3%) had BMI z-score 1.5—2 and 98 (59.4%) had BMI z-score >2. At follow-up (mean 5.4 1.4 years), 80 (48.5%) had a clinically significant reduction in BMI z-scor.[22]Similarly many studies have reported that regular physical activity, diet control and long term interventions are effective in weight management. The present study has several limitations. The baseline measurements of height, weight, and body mass index was measured further more extension of the parameters like waist hip measurements, hip measurements and their ratio was not measured. The other limitations include the duration of the interventions limited only for four months[23].

CONCLUSION

Healthy Eating and Active lifestyle Intervention Program was effective for children with obesity .The study results contributed to sustained improvement in weight status which in turn to reduce body mass index. School children are more vulnerable to consume lot of unhealthy foods, the parents and teachers need to focus on the eating habits of the children However, furthermore research studies need to be investigated regarding the effects of intervention in reducing the different parameters among obese children.

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