Effectiveness of Teaching and Text Message Based Intervention on Dietary Habits among Overweight Adolescents in Selected Schools of Ambala, Haryana

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Abstract

Background: Overweight and obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy.

Objectives: The objectives of the study was to assess and compare the dietary habits among overweight adolescents before and after teaching and text message based intervention in experimental and comparison group, to determine the association of dietary habits among overweight adolescents with their selected variables in experimental and comparison group.

Methodology: A quasi experimental non equivalent control group pretest-posttest design was used for the study. Fifty nine (59) overweight adolescents were selected by using purposive sampling technique. The data was collected by rating scale to assess the dietary habits for overweight.

Results and Conclusion: The findings revealed that mean post test score of dietary habits (29.5 ± 2.55) was significantly higher in experimental group than mean post test score of dietary habits. There was a significant association found between post test of dietary habits of experimental group with BMI ($p=0.02$) and with age ($p=0.05$) in comparison group. It was concluded from the study that teaching and text message based intervention was effective in improving the dietary habits among overweight adolescents.

Keywords: *Dietary habits, overweight adolescents, teaching and text message based intervention.*

Introduction

Obesity is an independent risk factor for CVD. Obesity is associated with an increased risk of morbidity and mortality as well as reduced life expectancy. The last two decades of the previous century have witnessed dramatic increase in health care costs due to obesity and related issues among children and adolescents.[1]

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The number of overweight or obese infants and young children (aged 0 to 5 years) increased from 32 million globally in 1990 to 42 million in 2013. In the WHO African Region alone, the number of overweight or obese children increased from 4 to 9 million over the same period. The vast majority of overweight or obese children live in developing countries, where the rate of increase has been more than 30% higher than that of developed countries. If current trends continue, the number of overweight or obese infants and young children globally will increase to 70 million by 2025. Without intervention, obese infants and young children will likely continue to be obese during childhood, adolescence and adulthood. Obesity in childhood is associated with a wide range of serious health

complications and an increased risk of premature onset of illnesses, including diabetes and heart disease.[2]

With a rapid demographic and socioeconomic transition, India is becoming the epicenter of epidemics of both adult and childhood obesity, especially in urban populations. Although the age-standardized rates are low, but in absolute terms, India is the country with the third-highest level of obesity in the world. Over the years, epidemiological studies have reported a consistent increase in the prevalence of childhood overweight and obesity in the subcontinent.[3]

This rising trend in developing countries is largely due to rapid urbanization and mechanization which led to reduction in energy expenditure along with increase in energy intake in the form of high calorie snack and junk food.[4]

Overweight and obesity result from an energy imbalance. The body needs a certain amount of energy (calories) from food to keep up basic life functions. Body weight tends to remain the same when the number of calories eaten equals the number of calories the body uses or "burns." Over time, when people eat and drink more calories than they burn, the energy balance tips toward weight gain, overweight, and obesity. Children need to balance their energy too, but they are also growing and that should be considered as well. Energy balance in children take place when the amount of energy taken in the form of food or drink and used by the body in natural growth without promoting excess weight gain. Many factors can lead to energy imbalance and weight gain. They include genes, eating habits, how and where people live, attitudes and emotions, life habits, and income.[5]

More and more children and teenagers nowadays are becoming a prey to bad eating habits and tend to consume fast foods instead of eat a healthy diet. These junk foods which are rich in fast carbohydrates and fat are considered as the major reason for childhood obesity. Nowadays, children spend much of their time in front of the TV or on their gaming consoles instead of taking part in exercise, which causes them to gain extra pounds.[6]

Recent research finds that adolescents are following poor dietary habits and on a routine basis which is a contributing factor for them becoming overweight.

Fast foods affect children and youth often worse than adults. This is because most of the fast foods are targeted towards children and there is a sustained pattern of eating fast foods and eating out. Children with a sustained excess energy imbalance, intake of approximately 2% result in the development of obesity over time. A 2% imbalance could mean an excess of only about 30 kilocalories per day. This corresponds to two-thirds of a chocolate cookie, fewer than two French fries or one-fourth of a can of soda. Eating out is another major contributor to childhood obesity. Studies show that calorie content of out-of-home meals that children consumed was 55% higher than that of in-home meals.[7]

By 2025, India will have over 17 million obese children and stand second among 184 countries where the number of obese children are concerned, says a study published in Pediatric Obesity, an international journal. According to Global Burden of Disease collaborative for 2000 and 2013, estimated that by 2025, some 268 million children, aged between five and 17 years, may be overweight, assuming that no policy interventions have proven effective at changing the current trend. China has the largest number of children who are obese. The estimation of the likely numbers of children in 2025 with obesity-related comorbidities: impaired glucose tolerance (12 million), type 2 diabetes (4 million), hypertension (27 million) and hepatic steatosis (38 million). The global overweight prevalence for children aged 5–17 years rising from 13.9% in 2010 to 15.8% in 2025. On the assumptions of continued population growth given by the World Bank, this translates to a rise from some 219 million children in this age group in 2010 to 268 million children in 2025. Obesity alone rises from 76 million children (4.8%) in 2010 to 91 million (5.4%) by 2025.[8]

A cross - sectional study was conducted on Fast Food Consumption, Quality of Diet, and Obesity among Isfahanian Adolescent Girls. Results showed that individuals in the highest quartile of fast food intake had significantly lower NARs for vitamin B_1 ($P = 0.008$), phosphorus ($P = 0.0250$), selenium ($P < 0.001$) and vitamin B_2 ($P = 0.012$) compared with those in the lowest quartile. Those in top quartile of fast food intake consumed more energy-dense diets than those in the bottom quartile ($P = 0.022$). High intakes of fast foods were significantly associated with overweight (top quartile: 40% versus bottom quartile: 0%, $P = 0.0001$) and obesity (11.4% versus 2.9%, $P = 0.0001$).[9]

Material and Method

The study was conducted in January 2017 in the state Haryana, India. A sample of 60 (analyzed 59 due to attrition of one adolescent) overweight adolescents (13-16 years of age) participated in the study with the prior permission from the Principals of participating schools. The ***ethical clearance*** was obtained from university research ethics committee of Maharishi Markandeshwar University Mullana, Ambala (MMU/IEC/775) and the study was carried out in accordance with the guidelines laid by Indian Council for Medical Research ICMR (2006). The assent was taken from the overweight adolescents and telephonic consent was taken from the parents prior to the study. A quasi experimental Non Equivalent Control Group Pretest-Posttest Research Design was used in this study. The overweight adolescents who were in the age group of 13-15 years and were studying in selected schools of Mullana/Ambala and were available to be accessed as study subjects. The overweight adolescents who were not regular to school were excluded from the study. Fifty nine (59) overweight adolescents were enrolled in the study. Out of which 30 were enrolled in experimental group and 29 were enrolled in comparison group on convenient basis. Data was collected by using **rating scale** to assess dietary habits for overweight. Reliability of the tool was established by Cronbach's alpha and was found to be 0.74 (acceptable range is 0.07-1.00).

Statistical Analysis: According to the objectives, hypothesis of the study and opinion of the expert, it was planned to organize, analyze and interpret the data by using both descriptive and inferential statistics i.e. frequency, mean, median, standard deviation, chi-square, ANOVA and 't' test.

Results and Discussions

Homogeneity between the experimental and comparison group was checked by x^2 test in terms of selected variables that is age, gender, religion, total family income per month (in rupees), number of siblings, birth order, type of family, dietary habits, kind of medication taken, other health risk habits, mother's educational status, father educational status, mother's occupation, father's occupation, place of living, height, weight, Body Mass Index. There was no significant difference between experimental and comparison group in terms of selected variables at 0.05 level of significance which infer that both the groups were homogenous in terms of selected variables except number of siblings (p=0.01), mother's educational status (p=0.004) and place of living (p=0.00).

There was no significant difference between experimental and comparison group in terms of selected variables at 0.05 level of significance which infer that both the groups were homogenous in terms of selected variables except number of siblings (p=0.01), mother's educational status (p=0.004) and place of living (p=0.00).

Percentage distribution of experimental and comparison group in terms of level of dietary habits is shown in figure 1. Majority of overweight adolescents in both experimental and comparison group were following unhealthy dietary habits i.e. 90% and 89.65% respectively.

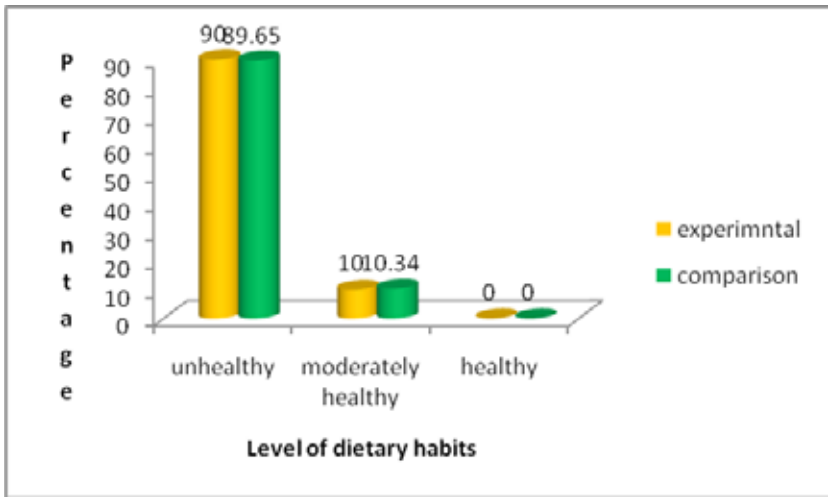

Figure 1: Pre test score of level of Dietary Habits before Administration of Teaching and Text Message Based Intervention

Majority of overweight adolescents in experimental group were following healthy dietary habits i.e. 26(86.66%) whereas in comparison group majority of adolescents were following unhealthy dietary habits i.e. 27(93.1%) after administration of teaching and text message based intervention. [Figure 2].

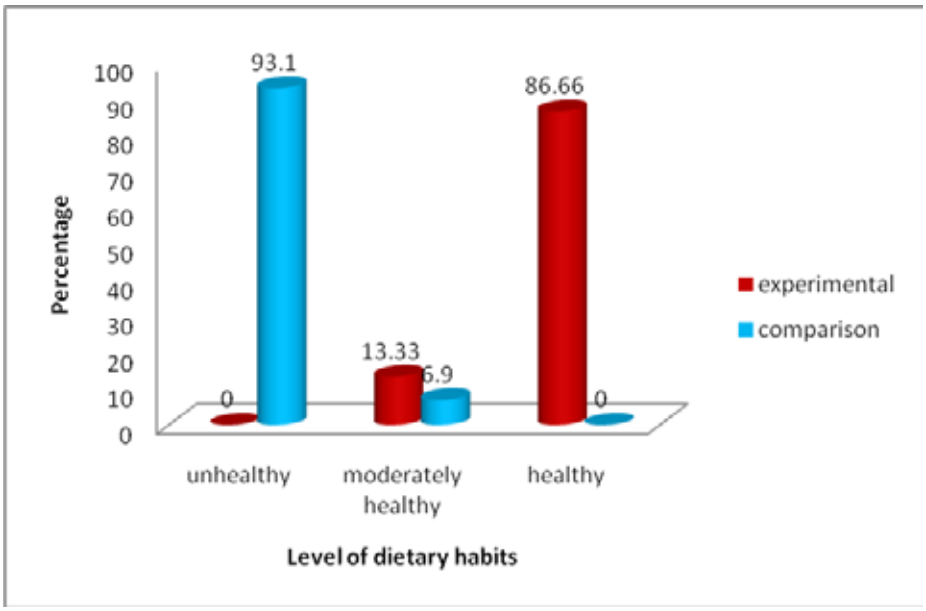

Figure 2: Post test score of level of Dietary Habits after Administration of Teaching and Text Message Based Intervention

In order to find out the significant difference between experimental and comparison group in dietary habits after teaching and text message based intervention independent 't' test was applied which is shown in table 1.

Table 1: Mean score of dietary habits after teaching and text message based intervention among overweight adolescents in experimental and comparison group N=59

Variable	Group	Mean	M_D	SD_D	SE_{MD}	't' value	p value
Dietary Habits	Experimental (n=30) Comparison (n=29)	29.53 13.10	16.43	5.97	2.34	19.44	0.001*

't'(57)= 2.00 *- significant ($p \leq 0.05$)

The table shows that there was a significant difference between experimental and comparison group in dietary habits after teaching and text message based intervention as computed 't' value **19.44** was higher than the tabulated 't' value **(2.00)** at 0.05 level of significance.

Further, paired 't' test was applied to find out the significant difference within the experimental group which is shown in table 2.

Table 2: Mean pre test and post test scores of dietary habits among overweight adolescents in experimental group n=30

Variable	Assessment	Mean	M_D	SD_D	SE_{MD}	't' value	P value
Dietary habits	Pre Test Post Test	13.60 29.53	15.93	4.46	0.81	19.58	0.001*

't'(57)= 2.05*- significant ($p \leq 0.05$)

The table shows that there was a significant difference between pre test and post test in dietary habits in experimental group as calculated 't' values was 19.58, p=0.001 which was higher than the tabulated values (2.05) at 0.05 level of significance.

In order to find out the association of dietary habits among overweight adolescents with their selected variables one way ANOVA and 't' test were applied as shown in table 3.

Table 3: ANOVA and 't' test value showing association of dietary habits among overweight adolescents with selected variables N=59

S.No.	Variable	Mean	F/t	p value
Experimental group (n=30)				
1.	**Body mass index (BMI)**			
1.1	Overweight	30.00	2.40	0.02*
1.2	Obese	27.20		
Comparison group (n=29)				
2.	**Age**			
2.1	13	13.33		
2.2	14	11.93	3.27	0.05*
2.3	15	17.67		

t (28)= 2.00, t(27)=2.05 *- significant (p≤0.05)

There was no significant association of dietary habits with selected variables was found except body mass index i.e. p=0.02 which was found to be significant at 0.05 level of significance. Similarly, in comparison group all variables found to be non- significant except age i.e. p=0.05 which was found to be significant at 0.05 level of significance. Hence, dietary habits of overweight adolescents were dependent on BMI and age.

Additionally, Post Hoc test was applied to reveal the mean difference of significant association in comparison group (age group) which is shown in table 4.

Table 4: Post hoc test showing significant mean difference in association of Dietary Habits for Overweight with selected Variables (age in comparison group) n=29

S.No.	Selected variable	Category	MD	SE	p value
1.	Age	13 Vs 14	1.40	1.39	0.58NS
		13 Vs 15	-4.33	2.29	0.16 NS
		14 Vs 15	-5.73	2.26	0.04*

NS- non significant (p>0.05), *- significant (p≤0.05)

It concluded that age group of 15 had healthy dietary habits than the age group of 14.

Discussion

The present study aims to evaluate the effectiveness of teaching and text message based intervention on dietary habits among overweight adolescents in selected schools of Ambala, Haryana.

In the present study, morethan half of the overweight adolescents in experimental and less than half of overweight adolescents in comparison group were in the age group of 14 i.e. 16(53.3%) and 14(48.3%) respectively. More than half of the overweight adolescents in experimental group were males 19(63.3%) whereas in comparison group most of the overweight adolescents were females 17(58.6%).These findings are contradictory to a cross-sectional study conducted by Natalija Smetanina, Edita Albaviciute, Veslava Babinska et al (2010) on Prevalence of overweight/ obesity in relation to dietary habits and lifestyle among 7–17 years old children and adolescents in Lithuania. The study results showed that overweight, and obesity among boys and girls was 12.6 and 12.6 % *(*p> *0.*05), and 4.9 and 3.4 % (p < 0.05), respectively. Obesity was significantly more prevalent in the 7–9 years old group (6.7 and 4.8 % in boys and girls, respectively, p< 0.05).[10]

In the present study, in dietary habits, there was a significant association among overweight adolescents with all variables except body mass index i.e. in experimental group and age in comparison group were found to be significant. The study findings were equally supported and contradictory to a cross-sectional study conducted by Natalija Smetanina, Edita Albaviciute, Veslava Babinska et al (2010) on Prevalence of overweight/obesity in relation to dietary habits and lifestyle among 7–17 years old children and adolescents in Lithuania. Lower meals frequency and breakfast skipping were directly associated with overweight/ obesity (p< 0.05).[10]

Conclusion

There was a significant difference in the mean score of dietary habits before and after teaching and text message based intervention. Hence, teaching and text message based intervention was effective in improving the dietary habits among overweight adolescents.

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Ethical Consideration: The ethical clearance was obtained from university research ethics committee of Maharishi Markandeshwar University Mullana, Ambala (MMU/IEC/775) and the study was carried out in accordance with the guidelines laid by Indian Council of Medical Research ICMR (2006). The permission was taken to conduct the study in the MM International School, Mullana and The S.D. Vidya School, Ambala Cantt (from Principals of the Schools). The assent from children and telephonic consent from their parents was collected prior to the study. The purpose for carrying out research project was explained and assurance of confidentiality was given to the participants.

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