

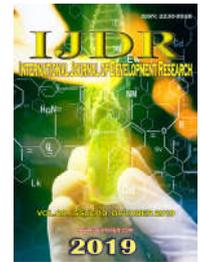


ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

# IJDR

International Journal of Development Research  
Vol. 09, Issue, 10, pp. 30631-30635, October, 2019



RESEARCH ARTICLE

OPEN ACCESS

## IMPACT OF EDUCATIONAL INTERVENTION PROGRAMME AND BIO CHEMICAL CHANGE ON OVERWEIGHT AND OBESITY AMONG ADOLESCENT SCHOOL CHILDREN IN CUDDALORE DISTRICT

<sup>1,\*</sup>Veeramani D.J. PhD and <sup>2</sup>Dr. Vijayanchali, S.S. PhD

<sup>1</sup>Scholar, Lecturer In Nutrition And Dietetics Rani Meyyammai College of Nursing, Annamalai University, Annamalai Nagar

<sup>2</sup>Associate Professor, Department of Home science Gandhigram Rural Institute (Deemed University), Gandhigram – 224 302

### ARTICLE INFO

#### Article History:

Received 20<sup>th</sup> July, 2019

Received in revised form

30<sup>th</sup> August, 2019

Accepted 17<sup>th</sup> September, 2019

Published online 23<sup>rd</sup> October, 2019

#### Key Words:

Knowledge, Dietary, Food Pattern in Formations, Intervention Overweight and Obesity, BMI, Adolescent.

### ABSTRACT

**Introduction:** Overweight and obesity among adolescent school children has been observed in recent years in most countries. The majority of overweight and obese adolescent children will become obese adults having an increased risk for chronic diseases associated with obesity, with a negative impact on their lifespan. **Objective:** Assessing the overweight and obesity and prevalence among adolescent school children and also to study the association of obesity with dietary food pattern in formations knowledge on overweight and obesity among adolescent. To determine the effectiveness of structured teaching programme. **Methods:** Out of the 1384 government and private schools, listed under the Directorate of Education, Cuddalore, Tamil Nadu, 20 schools were selected. The samples were selected by using a convenient simple random sampling technique. The samples sizes were selected for this study was 750 samples from that over weight are 512 and obese adolescents are 234. Totally 750 participants were included in the final study in Cuddalore District Tamil Nadu. **Results:** Thus the difference in the changes was confirmed by the obtained t-Test test value of Total Cholesterol TC (72.68) was significant at 0.001 levels, Triglycerides TG (59.81) was significant at 0.001 levels, and Low density lipoprotein LDL (99.33) was significant at 0.001 levels. High density lipoprotein HDL (-50.146) was significant at 0.001 levels. And Blood glucose level (BGL) (16.54) was significant at 0.001 levels. **Conclusion:** The present study concludes that the education intervention program me improved the dietary food pattern in formations knowledge of adolescents regarding overweight and obesity. Prevalence of obesity and over weight is on rise in Indian adolescent children, highlighting the possible role of change in the dietary pattern, and practicing day today life physical activities, and change the food habits, counting the calorie consumption, increase the fluid intake, avoid junk food and carbonated beverages and mental attitude will overcome the problems and along with parents and schools environmental play important role to overcome reduce obesity and overweight and its complications.

Copyright © 2019, Veeramani and Vijayanchali. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Citation:** Veeramani D.J. PhD and Dr. (Mrs.) Vijayanchali, S.S. PhD. 2019. "Impact of educational intervention programme and bio chemical change on overweight and obesity among adolescent school children in cuddalore district", *International Journal of Development Research*, 09, (10), 30631-30635.

### INTRODUCTION

Adolescence is the period of crucial growth. During this phase physical changes including growth, the onset of menarche for the girls, and increase in fat and muscle mass takes place (Obesity and overweight, 2014). Urbanization has a remarkable impact on socioeconomic status, and lifestyle; and also globalisation of food markets is the major force thought to underline the epidemic.

**\*Corresponding author: Veeramani D.J. PhD,**  
Scholar, Lecturer In Nutrition And Dietetics Rani Meyyammai College of Nursing, Annamalai University, Annamalai Nagar.

In addition to this, cultural factors such as dietary practices and attitude towards food are changing which ultimately contribute to the prevalence of incidence of obesity (WHO, 2004). About 25% of children are overweight or obese, according to newly established national criteria. These teens are having more risk for becoming obese adults, and adolescent obesity predisposes to variety of medical and psychosocial problems (Thakar, 2000). The best possibility of measuring abilities and knowledge is the use of multiple choice tests when all items show the same number of alternatives and only one of the answers to choose from is correct (Ben-Simon, 1997). To allow cross-cultural comparisons in nutritional knowledge and to link the data to food habits, a validated multiple choice

questionnaires designed for children and adolescents was considered the best option to assess nutritional knowledge within the HELENA Study (Diehl, 1999).

### Objectives

- To study the association of overweight and obesity with dietary food pattern in formations knowledge on overweight and obesity among adolescent.
- To determine the effectiveness of structured teaching programme

## MATERIALS AND METHODS

**Study area:** A cross-sectional study was conducted adolescent educational institute student in Cuddalore district. Tamil Nadu. The study included 2239 children of grades 11 to 12, from 20 schools. The weight and height have been measured and then the body mass index (BMI) calculated for each adolescent child. The body mass index is obtained through division of weight by square height. BMI was calculated. According to the BMI the student are categorised in to overweight and obesity. Based on their calculated BMI, each child has been included in one of the following.

**Categories: Body mass index (BMI):** The BMI-for-age percentile growth charts are the most commonly used indicator to measure the size and growth patterns of children and teens. BMI-for-age weight status categories and the corresponding percentiles were based on expert committee recommendations and are shown in the following table.

Weight Status Category	Percentile Range
Underweight	Less than the 5 <sup>th</sup> percentile
Normal or Healthy Weight	5 <sup>th</sup> percentile to less than the 85 <sup>th</sup> percentile
Overweight	85 <sup>th</sup> to less than the 95 <sup>th</sup> percentile
Obese	Equal to or greater than the 95 <sup>th</sup> percentile

(WHO2007)

**Sampling method:** Out of the 1384 government and private schools, listed under the Directorate of Education, Cuddalore, Tamil Nadu, 20 schools were selected. The samples were selected by using a convenient simple random sampling technique. The samples sizes were selected for this study was 750 samples from that over weight are 512 and obese adolescents are 234. Totally 750 participants were included in the final study in Cuddalore District Tamil Nadu.

**Data Collection Methods:** Data collection interview type questionnaire were administered, which included the following parts.

- Socio-demographic variables: age, parents' education, and family income.
- Nutritional knowledge questionnaire,
- Dietary in formations questionnaire,
- Health and life style pattern on obesity
- Physical exercise , questionnaire
- attitude questionnaire on obesity among student.

**Dietary Food pattern in formations:** Diet survey Food frequency method is including the sample are vegetarian or non vegetarian, meals per day, inclusion of vegetables, greens and fruits / day, meat, fish poultry consumption /week, consumption of milk and milk product/ day Consumption pattern of fats, oils and sugars / day, Consumption pattern of cereals, pulses and nuts products / day are find out by the researcher.

## Educational intervention programme on obesity

**Self Instruction Module (SIM):** A Self Instruction Module (SIM) is given to each adolescent student. After one month post test to be conducted .It takes one month for the researcher to complete the process of data collection which involved 750 adolescent students.

**Video teaching on obesity:** Video teaching on Overweight and obesity was given through LCD presentation

**Conducting exhibition on obesity:** Conducting exhibition on obesity regarding dietary modification, food selection, food included and food to be avoided, physical activates, and risk factors are focus on exhibition.

**Score interpretation instrument:** The scores were interpreted in the following way, appropriated answer were given high marks.

**Validity and Reliability:** The content validity was established by experts in the field of nutrition, biochemistry medicine and nursing. Based on their suggestions, corrections on the questionnaire were made. The reliability of the tool was established by test- retest method using an alpha-coefficient method. The reliability (r: 0.9) was found to be significant.

## MATERIALS AND METHODS

The study design selected group pre-test and post-test design. The present study was conducted among the 750 adolescents aged 12 to 18 years studying in 11<sup>th</sup> and 12<sup>th</sup> standard in government and private schools at in and around Chidambaram Cuddalore District Tamil Nadu. The samples were selected by convenience sampling technique. The tools used were baseline proforma, structured questionnaire with 32 questions and five point "Likert scale" with 10 items to assess the attitude regarding the overweight and obesity. A blueprint of the questionnaire was prepared and presented as knowledge, comprehension and application category.

### Nutritional knowledge

#### Laboratory method

**Blood Collection:** Blood for venous blood samples (10mL), collected from all individuals, after an overnight 12 hour fast, was drawn from the antecubital vein between 8:30 and 9:30 am. Sera, separated immediately after centrifugation with 3000 x g for 10 min, were stored at -70 C until biochemical analyses were performed.

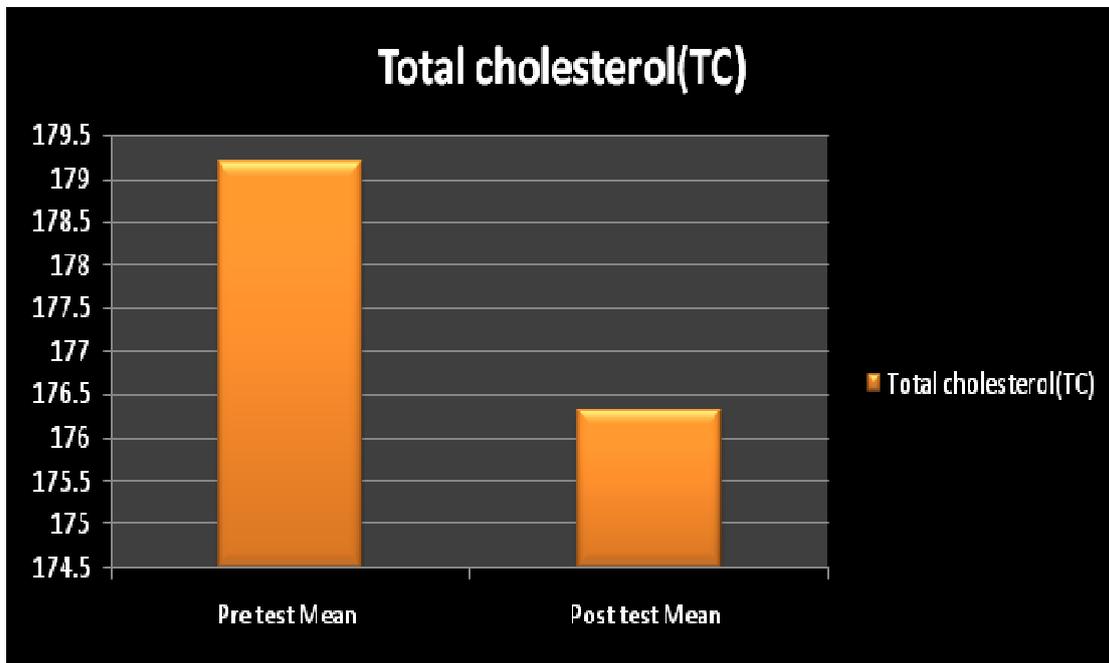
**Lipid profile level:** Total Cholesterol (TC), Triglycerides (TG) and High Density Lipoprotein Cholesterol (HDL-C) were estimated using auto-analyser while Low Density Lipoprotein Cholesterol (LDL-C) was calculated using Friedwald's formula ( $LDL-C = TC - TG/5 - HDL-C$ ). Serum total cholesterol was measured by cholesterol oxidase-peroxidase method. Serum triglyceride (TG) and serum HDL-C was measured by kit method. Serum LDL-C was calculated by a formula.

**Blood glucose level:** The blood samples were collected and fasting blood sugar were analysed using auto analyser. Serum glucose was measured by glucose - oxidase- peroxidase method. F.B.S (fasting blood sugar) 3.5-5.6mmol/l

**Table 1.**

N=750

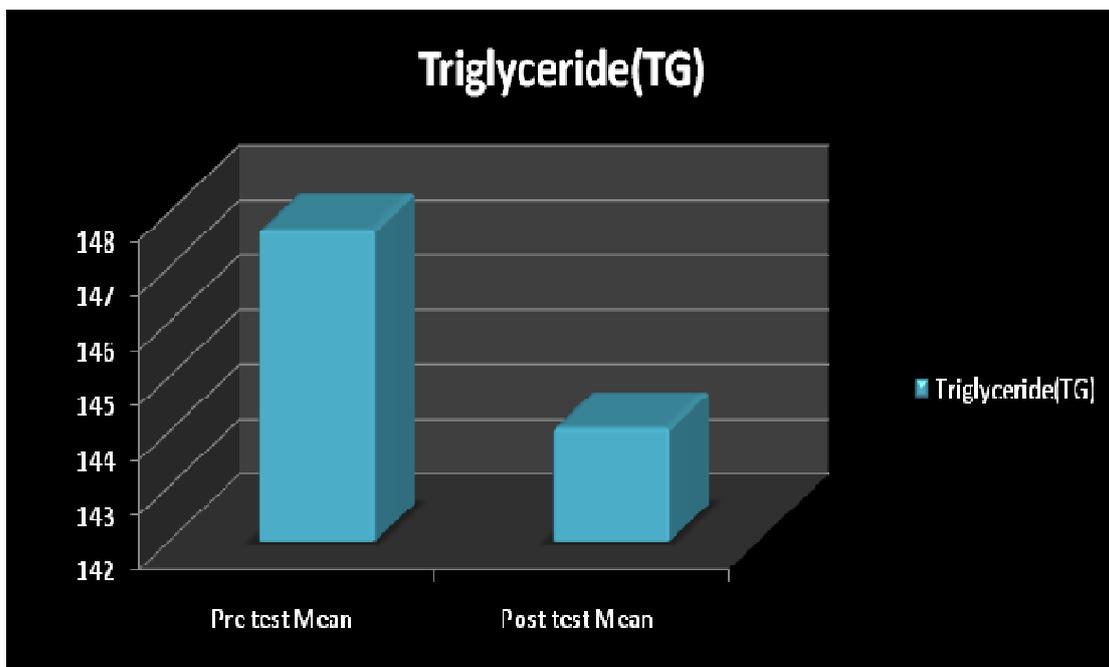
Group	N	Mean	SD	Correlation	t-Test	P-Value
Total CHOLPRE	179.1920	750	14.48116	.997	72.687	
Total CHOLPOST	176.3280	750	14.59682			<0.001



**Table 2.**

N=750

Group	N	Mean	SD	Correlation	t-Test	P-Value
TGLPRE	147.6853	750	14.75160	.994	59.812	<0.001
TGLPOST	144.0707	750	14.51721			



**Table 3**

N=750

Group	N	Mean	SD	Correlation	t-Test	P-Value
LDL PRE	98.4725	750	14.80121	.998	99.339	<0.001
LDL POST	95.4952	750	14.81790			

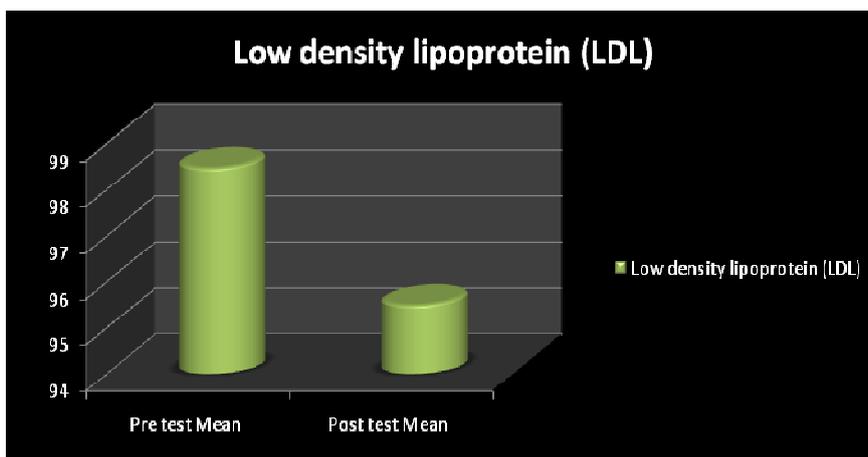


Table 4

Group	N	Mean	SD	Correlation	t-Test	P-Value
HDLPRE	36.8973	750	7.49696	.986	-50.146	<0.001
HDLPOST	39.3480	750	7.83135			

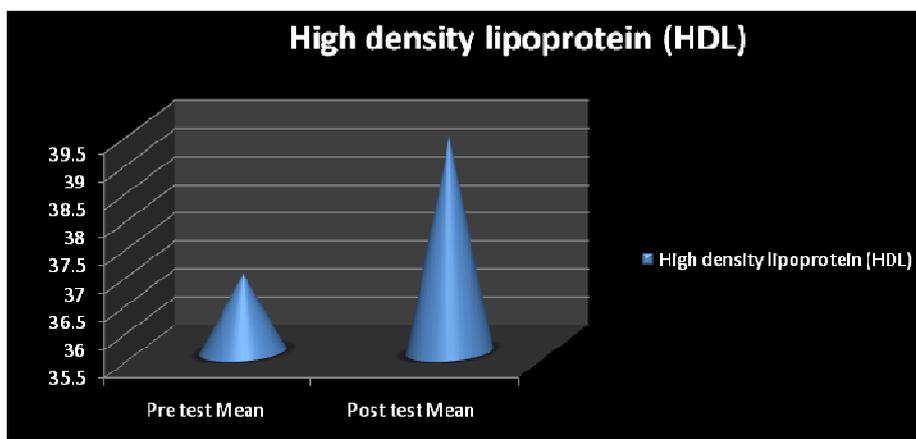
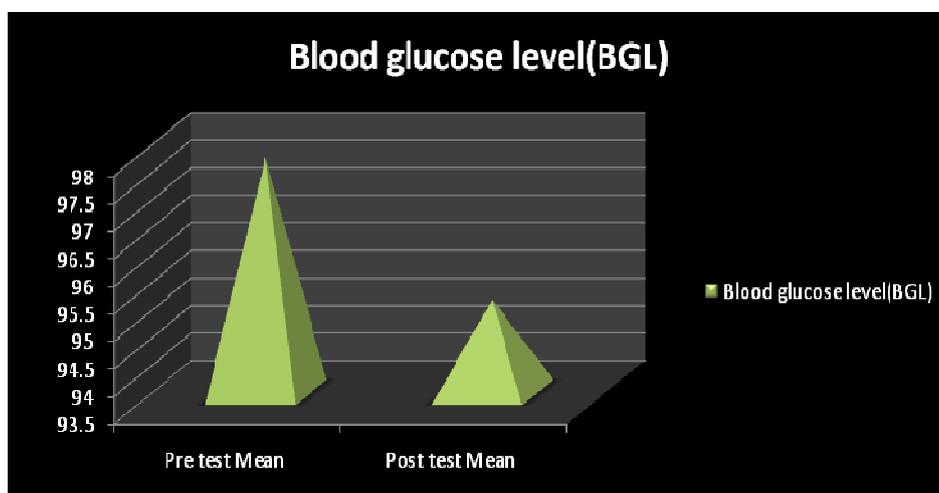


Table 5

Group	N	Mean	SD	Correlation	t-Test	P-Value
BGLPRE	97.7827	750	13.25319	.947	16.548	<0.001
BGLPOST	95.1827	750	13.24162			



**Bio chemical assessment of student with overweight and obesity student**

**Mean and SD of Total cholesterol pre-test and post- test assessment:** It is inferred from the table of Bio chemical

assessment post test adolescents mean value of Total cholesterol were decreased (176.32) than pre-test group (179.19). Thus the difference in the changes was confirmed by the obtained t-Test test value of TC (72.68) was significant at

0.001 levels. Hence the changes of the Bio chemical assessment value were due to the impact of education intervention programmes.

**Mean and SD of Triglyceride pre-test and post-test assessment:** It is inferred from the table of Bio chemical assessment post test adolescents mean value Triglyceride were decreased (144.07) than pre-test group (147.68). Thus the difference in the changes was confirmed by the obtained **t-Test** test value of TG (59.81) was significant at 0.001 levels. Hence the changes of the Bio chemical assessment value were due to the impact of education intervention programmes.

**Mean and SD of Low density lipoprotein pre-test and post-test assessment:** It is inferred from the table of Bio chemical assessment post test adolescents mean value of Low density lipoprotein were decreased (95.49) than pre-test group (98.47). Thus the difference in the changes was confirmed by the obtained **t-Test** test value of LDL (99.33) was significant at 0.001 levels. Hence the changes of the Bio chemical assessment value were due to the impact of education intervention programmes.

**Mean and SD of High density lipoprotein pre-test and post-test assessment:** It is inferred from the table of Bio chemical assessment post test adolescents mean value of HDL: High density lipoproteins were increased (39.34) than pre-test group (36.89). Thus the difference in the changes was confirmed by the obtained **t-Test** test value of HDL (-50.146) was significant at 0.001 levels. Hence the changes of the Bio chemical assessment value were due to the impact of education intervention programmes.

**Mean and SD of Blood glucose level pre-test and post-test assessment:** It is inferred from the table of Bio chemical assessment post test adolescents Bio chemical mean value of BGL; Blood glucose level were decreased (95.18) than pre-test group (97.78). Thus the difference in the changes was confirmed by the obtained **t-Test** test value of BGL (16.54)) was significant at 0.001 levels. Hence the changes of the Bio chemical assessment value were due to the impact of education intervention programmes.

## DISCUSSION

It is inferred from the table of Bio chemical assessment post test adolescents Bio chemical mean value of TC: Total cholesterol were decreased (176.32) than pre-test group (179.19). Bio chemical mean value of TG: Triglyceride were decreased (144.07) than pre-test group (147.68). Bio chemical mean value of LDL: Low density lipoprotein were decreased (95.49) than pre-test group (98.47). Bio chemical mean value of HDL: High density lipoprotein were increased (39.34) than pre-test group (36.89). Bio chemical mean value of BGL; Blood glucose level were decreased (95.18) than pre-test group (97.78). Thus the difference in the changes was confirmed by the obtained **t-Test** test value of TC (72.68), TG (59.81) LDL (99.33) HDL (-50.146) BGL (16.54)) respectively. This was significant at 0.001 levels. Hence the changes of the Bio chemical value of the adolescents due to the impact of education intervention programmes. Aires L *et al.* (2015) Favourable changes were observed for %BF, %TF, systolic BP and total cholesterol in the children with dietary counselling approach group. Subjects without individualised dietary counselling approach only increased light and moderate-

vigorous Physical Activity. In children with dietary counselling approach, significant effects for time \* group interactions were found for systolic BP, total cholesterol and LDL-cholesterol, indicating that counselling might add favourable changes in these markers, beyond those explained by Physical Activity and growth. Guo H *et al.*, (2015) After one-year intervention, it observed in the intervention group that BMI-Z score, WHR and WHtR had significant improvements, and there was a nonsignificant trend (P=0.053) for a decrease in BMI-P. Fasting plasma glucose, cholesterol (CH) and low-density-lipoprotein cholesterol (LDL-C) levels in the intervention group showed nonsignificant trend for a decrease (PFG=0.084, PCH=0.057, PLDL-C=0.098), compared with a significant increase of triglycerides (TG) and LDL-C levels in the control group (PTG=0.041, PLDL-C=0.038).

There were some positive dietary, physical activity, or sedentary behaviour changes found in the students of the intervention group as the scores of the questionnaire got significant improvement (P=0.04). The results of this study support school-based intervention including nutrition education as a part of a comprehensive school health program and provide needed research in the area of school-based programs to improve the current Grade III designation by the American Dietetic Association's Evidence Analysis Library ADA, 2005; Pyle, *et al.*, 2006). This study supported collaboration and community partnerships as a resource to improve health outcomes for children through a service learning program that worked with local kindergarten students (Hardy, 2007; Michael, Dittus, & Epstein, 2007). These findings support the hypothesis.

## REFERENCES

- Aires, L., Silva, G., Martins, C., Marques E., Lagoa, M.J., Ribeiro, J.C., Rêgo, C., Al-Kilani, H., Waly, M., Yousef, R. 2012. Trends of Obesity and Overweight among College Students in Oman: A cross sectional study. *Sultan Qaboos Univ Med J*, 2012 (1):69-76.
- Ben-Simon A, Budescu DV, Nevo B. 1997. A Comparative Study of Measures of Partial Knowledge in Multiple-Choice Tests. *Applied Psychological Measurement*; 21: 25-88.
- Diehl JM. Ernährungswissen von Kindern und Jugendlichen. *Verbraucherdienst* 1999; 44: 282-287.
- Guo, H., Zeng, X., Zhuang, Q., Zheng Y., Chen, S. 2015. Intervention of childhood and adolescents obesity in Shantou city. *Obes Res Clin Pract*. pii: S1871-403X (14)00790-X.
- Michael, S, Dittus, P, & Epstein, J. 2007. Family and community involvement in schools: results from the School Health Policies and Programs Study 2006. *J Sch Health*; 77(8):567-87.
- Obesity and overweight. World Health Organization 10/1/04. 1-4.
- Pyle, S. A., Sharkey, J., Yetter, G., Felix, E., Furlong, M. J., & Poston, W. S. 2006. Prevalence of and factors associated with overweight and obesity among Jordan university students. *Journal of Biological Sciences*, 9(7), 73S-74S.
- Thakar HG, Kumar P, Desai RK. 2000. Physical growth standards for urban adolescents (10-15 years) from South Gujarat. *Indian Journal of Community Medicine*; 25: 82-92
- WHO: Obesity and overweight 2004.