



P-ISSN: 2349-8528

E-ISSN: 2321-4902

IJCS 2019; SP6: 672-676

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(Special Issue -6)  
3<sup>rd</sup> National Conference  
On

**PROMOTING & REINVIGORATING AGRI-HORTI,  
TECHNOLOGICAL INNOVATIONS  
[PRAGATI-2019]  
(14-15 December, 2019)**

## **Impact of educational intervention among overweight and obese college going girls of Prayagraj district of Uttar Pradesh, India**

**Gupta Alka and Tripti Verma**

**Abstract**

**Background:** Burden of obesity is linked with the range of non-communicable diseases resulted due to the dramatic change in lifestyle, consisting of physical inactivity, diet rich in fat, sugar and salt, mental stress. The (NFHS-4) report in India indicates, 27.1% of Indian women in urban population were found obese.

**Objective:** To study the prevalence of overweight and obesity among college going girls (aged 19-27 years) and to assess knowledge level of respondents before and after educational intervention through developed ICT materials.

**Methodology:** The present study was community based cross sectional study carried out on 200 college going girls (aged 19-27 years) of SHUATS, Prayagraj district of Uttar Pradesh, India. Pre-tested questionnaire was used to elicit the information on socio-economic profile, Anthropometric measurement, lifestyle behavior's, dietary intake and knowledge test about adverse health effects of overweight and obesity. Nutrition education was given to the respondents with the help of developed ICT materials.

**Results:** The prevalence of overweight and obesity was found 13% and 9.5% respectively. In Food habits, (39%) vegetarian and (61%) non-vegetarian were found in which 90% respondents reported consumption of junk food. Knowledge level of the students regarding adverse health effects of obesity like hypertension, cancer, PCOS and diabetes was 55.5%, 45.5%, 58% and 61% respectively. After the educational intervention Knowledge level of respondents was significantly increased.

**Conclusion:** The results from the study revealed that the need for immediate and comprehensive educational intervention to prevent the consequences and complication of obesity and overweight in future.

**Keywords:** Prevalence, non-communicable disease, nutritional intervention, overweight, obesity, ICT materials

**Introduction**

Health is affected by many predisposing factors, including-gender, family size, socio-economic status, residential condition, parental education, working status, nutritional knowledge of mothers, food availability, physical activity, social environment etc. (Mahgoub *et al.*, 2006) [1]. Obesity (OB) is defined as a condition of abnormal or excessive fat accumulation in adipose tissue, to the extent that health may be impaired (World Health Organisation [WHO] consultation on OB, 2000). It can be seen as the first wave of a defined cluster of noncommunicable diseases called "New World Syndrome" creating an enormous socio-economic and public health burden in poorer countries.

Anthropometric assessments commonly introduced for determining the nutritional status of a

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child include height, weight, body mass index (BMI), head circumference (HC), chest circumference (CC), mid-upper arm circumference (MUAC), skinfold thickness etc. Weight for height is considered as the most appropriate and reliable indicator of growth as it reflects wasting that may persist as a result of malnutrition or other predisposing factors like diarrhea, malaria etc. (Onis, 2001) [5].

According to World Health Organization (WHO) obesity has reached to epidemic proportions globally, with more than one billion adults overweight with 300 million of them clinically obese. Various studies conducted in India reported prevalence of overweight among adolescents ranging between 2.2% to 25.0%. (Tiwari *et al.* 2014) [7]. The (NFHS-4) report in India indicates, 27.1% of Indian women in urban population were found obese. (NFHS-4 2015-16) Non Communicable diseases (NCDs) have emerged as major public health problem in India, due to increase in ageing population and environmental driven changes in behaviour. The premature morbidity and mortality in most productive phase of life is posing a serious challenge to Indian society and economy. It is estimated that in 2005 NCDs accounted for 53% of all deaths in India. The estimated burden of NCDs in India is: 2.4 million Ischemic heart disease, 37.8 million diabetes, 2.4 million cancers and 0.93 million stroke. (Ghonge *et al.*, 2015) [11].

The two most important factors that contribute to a sudden increase in the incidence of obesity in our country are changes in dietary practices and urbanization. At present, there is the inclusion of more fats and oils, more sugar, and less fiber in the diets of people. Convenience foods, fast foods, and sugar-sweetened beverages have found increasing acceptance. Obesity is an entirely preventable disease which mainly needed to be started early with the effective intervention and prevention programs in order to reduce the negative health consequences in later life. Whereas much public health effort has been expended to restrict the adverse marketing of Junk food and color beverages, energy-dense, nutrient-poor foods and beverages similar effort now needs to be expanded and strengthened to protect older children from increasingly sophisticated marketing of sedentary activities and. Nutrition education is attracting ample of interest and concern for curbing health problems during adulthood, but it is yet to be incorporated in the school curriculum nationwide. Nutrition education is attracting ample of interest and concern for curbing health problems during adulthood, but it is yet to be incorporated in the college curriculum nationwide (Perez *et al.*, 2002) [15]. Our study was executed with an objective to assess the effect of nutrition education on the nutritional intake and health status of college going girls.

### Materials and methods

The project entitled "Impact of educational intervention among overweight and obese college going girls of Prayagraj district of Uttar Pradesh, India" was conducted with the objective to assess the nutritional status and provide nutritional education to the college going girls in the Department of Food Nutrition and Public Health, Ethelind Collage of Home Science, Sam Higgins bottom University of Agriculture Technology and Sciences, Prayagraj 211007, U.P. India.

**1. Selection of city:** The Prayagraj city was selected purposively for the study.

**2. Sample selection:** The research involved college going girls representing the district and effort were made therefore

made to locate the subject of varied socio economic background. The respondents selected from the SHUATS campus of Prayagraj. Total 200 college going girls (age 19-27 years) were selected.

### 3. Methods of enquiry and data collection

The survey method was used as the method of enquiry. The selected respondents was personally interviewed and necessary information collected using a pre-structured and pre-tested questionnaire. The questionnaire included aspects which led to the fulfillment of the objectives of this study. 24 hours dietary recall was done and average nutrient intake per day calculated of each respondents using the nutritive value for Indian foods by Gopalan *et al.* (2010) [17].

#### a) General profile survey

Data regarding general profile of the respondents was collected using the first part of the questionnaire. The section covered aspects including respondent's name, age, type of family, monthly income, monthly expenditure on food items

#### b) Dietary Survey

Diet surveys constitute an essential part of any complete study of nutritional status of individuals or groups, providing essential information on nutrient intake levels, sources of nutrients, food habits & attitudes. It helped to following information. A diet survey was conducted

#### c) 24 hour dietary recall

24-Hour dietary recall method is widely used in dietary surveillance. The interviewer asks the respondents questions to obtain information on the types and the amount actually consumed by an individual one or more specific days

#### d) Anthropometric measurement

Nutritional anthropometry is concern with the measurement of variations of physical dimensions, the gross composition and degree of nutrition. Hence, anthropometric measurements are useful criteria for assessing the nutritional status.

The anthropometric measurement including height and weight are recorded using the process prescribed by Gibson (1990).

#### i) Height measurement

Height (cm) of the subject was taken with the help of measuring tape in centimeters by sticking it to the wall. The subject was made to stand erect, look straight with buttocks, shoulders and head touching the wall, heels together, toes apart and hands hanging loosely by the sides

#### ii) Weight measurement

The weighing scale with maximum capacity of 120 kg and the minimum division of 0.5kg will be used to weigh all the subjects. The respondents was made to stand erect on the weighing scale with minimum of clothes, without footwear, not leaning against and holding anything and the weight was recorded in kg

#### ii) Body mass index (BMI)

BMI was calculated as the standard of nutritional status anthropometrically, by using the following formula derived from the weight and height (WHO, 1995).

$$BMI = \frac{Weight(kg)}{Height(m^2)}$$

**e) Clinical signs and symptoms**

The nails, lips, tongs, gums, neck, general appearance or other complication of each subject were examined, In order to find out the sign of the any other metabolic disorder associated with the overweight and obesity, the clinical Symptoms of hypothyroidism or hyperthyroidism is include extreme fatigue, cold intolerance, muscle cramps, constipation, and problems with memory or concentration

**4) Development of different ICT tools to create awareness about the maternal malnutrition among maternal age group****i) Selection of respondents**

All the respondents who have participated in nutritional intervention study approached to create awareness about obesity and associated health risks and to popularize the nutrient rich foods to prevent nutritional deficiency

**ii) Development of folder and poster to create awareness about the causes and related health effects of overweight and obesity**

Folder and poster developed to create awareness

**iii) Pre exposure awareness examination of respondents**

A semi-structured questionnaire was designed to assess the knowledge about causes and effects of overweight and obesity to the college going girls. The questionnaire was translated in to local language for better understanding. To assess the knowledge about causes and effects of overweight and obesity the respondents interviewed and responses were recorded. For the purpose of quantifying the qualitative data related to assessment of the extent of nutrition knowledge, responses were obtained under "yes" or "no" categories at the initial period i.e. before imparting nutritional awareness Correct answer was given score 'one' and incorrect answer was given score 'zero'.

**iv) Impact of awareness program on knowledge level of respondents**

Reviewing the baseline responses of the women, an assessment of prevailing knowledge levels and practices with respect to nutritional awareness was done to determine the existing gaps. Knowledge is a body of under stood information possessed by individual. Respondents was responsible for methods adopted for preparation and serving of food. They played a major part in influencing the dietary habits of their family members. The nutritional status of family members was influenced by sound nutrition knowledge of respondents and cooking practices followed by them. The phase involved two groups i.e. experimental and control groups. Each session followed by a group discussion to clarify any doubts regarding the message imparted. After the session respondents was asked to fill the same questionnaire again. Respondents from the control group were provided nothing.

After the exposure of film a post test was taken with same questionnaire and comparison between scores obtained in pre and posttest by the respondents had decided the impact of nutritional awareness created through short film among the target group.

$Gain\ in\ Knowledge = Score\ Gained\ in\ Post\ Test - Score\ Gained\ in\ Pre\ Test$

$Actual\ Gain\ in\ Knowledge = Gain\ in\ Knowledge\ of\ Experimental\ Group - Gain\ in\ Knowledge\ of\ Control\ Group$   
Aggregated scores was computed to find out the pre and post knowledge scores and gain in knowledge was determined. The total score for each parameter was combined and divided into three categories of adequate, marginally adequate inadequate.

**Classification of awareness level of respondents according to their scores**

Category	Score gained
Inadequate	Below 50%
Marginally Adequate	50-75%
Adequate	76 and above

**5) Statistical analysis**

The data was analyzed by using appropriate Analysis of variance technique (ANOVA), Critical Difference and other appropriate statistical analytical methods and interpret the data (Gupta *et al.*, 2002) [18].

**Results and discussion**

**Table 1:** Socio-economic, demographic characteristics of the sample population

Variable	Number(percentage) (N=200)
<b>Age (in years)</b>	
19-21years	116(58%)
21-24years	74(37%)
25-27years	10(5%)
<b>Religion</b>	
Hindu	170(85%)
Muslim	10(5%)
Christian	20(10%)
<b>Educational status of the respondent</b>	
Graduation	149(74.5%)
Post-graduation	43(21.5%)
PhD	8(4%)
<b>Total income(per month)</b>	
Below 25,000	28(14%)
25,000-50,000	115(57.5%)
Above50,000	57(28.5%)

Table 1 shows the general profile of the respondents as follows:

**Age:** The majority of respondents, 58 percent belonged to 19-21years and 37 percent respondent belonged to 21-24years.

**Religion:** According to the table most of the respondents were belonged to Hindu religion 85 percent and 5 percent were belonged to Muslim and about 10 percent belonged to Christian.

**Education of the respondents:** The majority of the respond belongs to the graduation that is 74.5 percent also 21.5 percent were postgraduate followed by Phd to 4 percent.

**Total family income:** Showed that 28 percent monthly income belonged to below 25,000 and 57.25 percent belong to 25000-50000, 28.5 percent monthly income belongs to above 50,000 rupees per month.

**Table 2:** Distribution of college girls according to BMI

BMI Range	Frequency (N=200)	Percentage
18.5 (underweight)	40	19.77
18.5-24.9 (normal)	100	50.36
25-29.9 (obese grade I)	14	7
30-40 (obese grade II)	27	13.37
40 (obese grade III)	19	9.5

Table 2 shows that 50.36 percent of girls normal BMI, 19.77 percent girls were underweight, 7 percent girls were belong to obese grade 1, 13.37 percent girls were obese (grade II), 9.5 percent girls were belong to obese (grade III). According to Verma *et al.* (2018) [20], in their study 33.33 percent of girls normal BMI, 16.67 percent girls were underweight and obese grade 1, and 26.67 percent girls were obese (grade II).

**Table 3:** Diet pattern among the study population

Type of diet	Number (N)=200
Vegetarian	78 (39%)
Non-vegetarian	122 (61%)
Fruits and vegetable consumption (per week)	Number(N)=200
Less than 5 servings	140 (70%)
More than 5 servings	60 (30%)
Fasting frequency	Number(N)=200
Yes	55 (27.5%)
No	145 (72.5%)
Dietary consumption of selected food items	Number (N)=200
Chocolate and sweets (per week)	
2-4 times	45 (22.5%)
5-9 times	89 (44.5%)
More than 9times	66 (33%)
Bakery items (per month)	
2-4 times	78 (39%)
5-9 times	79 (39.5%)
More than 9times	43 (21.5%)
Fast food consumption (per month)	
2-4 times	127 (63.5%)
5-9 times	64 (32%)
More than 9times	9 (4.5%)

Table 3 revealed that the majority number of respondents 61 percent were non-vegetarian, 39 percent were vegetarian. Most of the respondents are consuming fruits and vegetables less than 5 serving per week i.e.70 percent. Only 27.5percent respond were on fasting in week. The consumption of chocolates, sweets and bakery items and junk food is significantly higher among the college going girls. According to Gupta Pravita and Gupta Alka (2018) [13], Out of 30 respondents, 33.3 percent girls were vegetarians, 40 percent girls were non-vegetarian and 26.6 percent girls were eggitarian. 33.3 percent girls consumed fast foods once in a week, 13.3 percent girls consumed it twice a week, 53 3 percent girls consumed it once in a month.

**Table 4:** Knowledge about adverse health effects of overweight

Statement	Agree (%)	Disagree (%)	Don't know (%)
Obesity causes hypertension	111 (55.5)	32 (16)	57 (28.5)
Obesity causes heart problem	122 (61)	42 (21)	36 (18)
Obesity causes PCOS	116 (58)	54 (27)	30 (15)
Obesity causes diabetes mellitus	122 (61)	53 (26.5)	25 (12.5)
Obesity causes cancer	91 (45.5)	69 (34.5)	40 (20)
Obesity causes osteoarthritis	61 (30.5)	28 (14)	111 (55.5)

Table 4 shows that awareness of college going girls regarding adverse health effects of overweight was very less like 57

percent girls don't have idea about obesity causes hypertension and 36 percent girls had no idea about the relation of obesity and heart problem. 58 percent believed that obesity causes PCOS have health related risk. 61 percent were known that obesity causes diabetes mellitus. Majority of the respondents 45.5 percent were known that obesity and cancer and 55.5 percent were known that obesity causes osteoarthritis.

**Table 5:** Knowledge about adverse health effects of overweight (post intervention)

Statement	Agree (%)	Disagree (%)	Don't know (%)
Obesity causes hypertension	187 (93.5)	7 (3.5)	6 (3)
Obesity causes heart problem	172 (86)	18 (9)	10 (5)
Obesity causes PCOS	188 (94)	8 (4)	4 (2)
Obesity causes diabetes mellitus	189 (94.5)	9 (4.5)	2 (1)
Obesity causes cancer	186 (93)	12 (6)	2 (1)
Obesity causes osteoarthritis	177 (88.5)	13 (6.5)	10 (5)

Table 5 shows awareness of college going girls regarding adverse health effects of overweight after educational intervention was become significantly high like 93.5 percent girls well know about obesity causes hypertension and 86percent girls had idea about the relation of obesity and heart problem. 94 percent believed that obesity causes PCOS have health related risk. 94.5 percent were known that obesity causes diabetes mellitus. Majority of the respondents 93 percent were known that obesity and cancer and 88.5 percent were known that obesity causes osteoarthritis. Similar study done by Premlal *et al.* (2016) [19], concluded that moderate to high prevalence of overweight and obesity and lack of physical activity being the most common risk factors associated with obesity among highly active age groups (college going students). Awareness on obesity and overweight and the importance of good lifestyle changes has to be started to these types of the population to protecting them from developing the complications due to overweight and obesity.

## Conclusion

This study provides awareness, knowledge regarding adverse health effects of overweight college going girls. The prevalence of overweight and obesity was found 13% and 9.5% respectively. In Food habits, (39%) vegetarian and (61%) non-vegetarian were found in which 90% respondents reported consumption of junk food. Knowledge level of the students regarding adverse health effects of obesity like hypertension, cancer, PCOS and diabetes was 55.5%, 45.5%, 58% and 61% respectively. After the educational intervention Knowledge level of respondents was significantly increases. The results from the study revealed that the need for immediate and comprehensive educational intervention to prevent the consequences and complication of obesity and overweight in future.

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