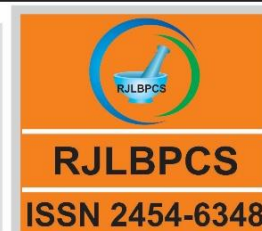


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**A CROSS-SECTIONAL STUDY ON FOOD ADDICTION, QUALITY OF
LIFE AND PERCEIVED STRESS AMONG ADOLESCENT GIRLS**

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ABSTRACT: Obesity among adolescents is increasing globally. Recent studies on obesity involve assessing the food addictive behaviours as a novel approach for weight loss intervention. There is dearth of studies assessing the food addictive behaviours among Indian adolescence; and impact of obesity on quality of life and stress. **Materials and Methods:** The food addiction behaviour and health status was measured by Yale food addiction scale and SF12 short questionnaire respectively. The stress levels were assessed using Perceived stress scale. **Results:** The prevalence of Food addiction among the studied normal and overweight/obese adolescents was 12% and 18% respectively. There was no significant difference in the frequencies of FA symptom in both the group. With regard to health status scores overweight/obese adolescent girls had higher scores for physical functioning, energy/fatigue and mental health domains while normal weight category had higher scores for role limitations in physical health, bodily pain, health perception and role limitation in mental health. There was no significant difference in stress levels between the two study groups. Majority of the subjects from both groups reported moderate level of stress. **Conclusion:** Propagation of positive health choices among adolescents such as healthy diet, indulging in physical activity and stress management are vital for a healthier future.

KEYWORDS: Obesity, Adolescents, Food Addiction, Quality of life, Perceived stress

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1. INTRODUCTION

Adolescence (10-19 years) is a critical age group when major changes in health and health behaviours such as smoking, substance abuse, unsafe sexual practices, poor eating, and lack of exercise occur, which may substantially impact health outcomes in later life[1]. According to WHO report (2016) [2] the prevalence of overweight and obesity among children and adolescents aged 5-19 has raised dramatically from 4% in 1975 to 18% in 2016. Recent reports from India also exhibit a similar rise in the prevalence of obesity among children and adolescents. Prasad et al., (2016) [3] reported a prevalence of 9.7% and 4.3% of overweight and obesity respectively among adolescents in Pondicherry. A higher prevalence rate of overweight (11.0%) and obesity (5.7%) was recorded among 10-19 years old in Delhi [4]. Obesity is considered as a strong risk factor for other metabolic disorders including diabetes, hypertension, dyslipidaemia, cardiovascular disease and even some cancers [5]. Obesity is a multietiological disorder and several factors contribute in its onset and development [6]. The rising prevalence of obesity worldwide could be contributed to Environmental factors, lifestyle preferences, and cultural environment [7]. Adolescence is a period when unhealthy eating behaviours are likely to develop such as consumption of energy dense and nutrient poor foods; low consumption of fruits and vegetables, and skipping of meals. Excessive food consumption has been recognized to show similarities with substance dependence. A growing body of evidence have demonstrated that addictive like eating behaviour of certain hyper palatable foods (i.e., high in salt, sugar, and/or fat) could be a contributing factor to obesity. The Yale Food Addiction Scale (YFAS) was developed to assess whether individuals exhibit patterns of consumption of highly palatable food consistent with substance dependence. Based on this scale the prevalence of food addiction among Diabetic patients was reported to be 6% [8]. Almarsukka et al., (2015) [9] in a cross sectional study on food addiction among Grade I obese women reported a prevalence of 62%. Obesity can have adverse effect on individual physical, social, and economic aspects of life that can negatively affect quality of life. Quality of life (QOL) is generally assessed through the use of health status measures where individuals are asked to rate different aspects of their life. The 12-item Short-Form Health Survey (SF-12) used in the present study is a multipurpose, generic 12-item questionnaire developed from the SF-36 [10, 11]. The SF-12 is a valid and reliable alternative to the SF-36. Adolescence is viewed as most critical time for mental health and wellbeing because it is a time of psychosocial as well as biological transition [12]. Additionally college students face multiple stressors such as academic overload, constant pressure to succeed, competition with peers as well as concerns about the future [13]. Food addiction as contributing factor to obesity has not been studied in Indian adolescents. And so is the impact of obesity on quality of life and stress levels of adolescents. Therefore the current study examines and compares the food addiction behaviour; health related quality of life and stress levels among 200 normal and overweight/obese adolescents.

2. MATERIALS AND METHODS

Research design and subjects

A cross sectional descriptive study was conducted in Women's Christian College, Chennai from November 2016 to March 2017. The study protocol was approved by the Independent Institutional Ethics Committee (approval number: WCC/HSC/IEEC-2016:63) organized by Department of Home Science, Women's Christian College, Chennai, India. The study recruited 200 adolescent girls aged 17-19 years using purposive sampling method. The study subjects were divided into two categories based on their BMI classification as Normal and overweight or obese. Informed consents were obtained from the participants prior to the study.

Tools used for Data Collection

A structured questionnaire was used to elicit information regarding socio-demographic data such as age, educational qualification, type of family, and to assess food addiction and quality of life related factors among the subjects.

Yale Food Addiction Scale [14]

This tool was used to assess the sign of food addiction in individuals. It is used to identify the person who exhibited symptoms of dependency towards certain foods. YFAS contains 25 self reported questions. Subjects are asked to refer to the past 12 month of behaviour. This tool is instructed to think of any foods or food groups that cause positive symptoms identified in the questionnaire. The YFAS questionnaire consists of the following foods ice cream, chocolate, cakes, candy, bread, pasta, chips, rice, crackers, pizza, French fries, cheeseburgers, soda pop.

SF-12 Health Survey

The participants rate the 12 item in SF-12 questionnaire. The SF-12 has eight domains including: (1) general health, (2) physical functioning, (3) bodily pain, (4) role limitation, physical, (5) role limitation, emotional, (6) mental health, (7) vitality, and (8) social functioning. Depending on the SF-12 question, respondents choose one of three or five responses that best describes their self-perception of their current or recent situation. These eight domains are scored from 0 to 100, with 0 being the worst and 100 representing the highest QOL.

Perceived Stress Scale [15]

This tool is designed to know the subjects feelings and thoughts during the last month. In this tool the subjects was asked to indicate how often they felt or thought a certain way. The subjects are asked ten questions to know about their stress level and how they cope with the resource during the last month.

Statistical analysis

The data obtained was coded and entered into MS Excel 2010. All statistical analysis was performed using SPSS (Statistical Package for Social Sciences). Descriptive statistics such as frequencies and

percentage, Student 't' test and chi-square test were used. Statistical significance was accepted at ($p < 0.05$) or ($p < 0.01$).

3. RESULTS AND DISCUSSION

The mean age of the study sample was 19.9 ± 1.4 years. Majority of the adolescent girls participated belonged to nuclear family. Socioeconomic status of the population was assessed using revised Kuppaswamy's socioeconomic status scale [16]. The percentage of overweight/obese adolescent girls under upper class category was 70%, while only 30% of the normal weight category subjects fell under upper class socioeconomic category.

Yale Food Addiction Scale

The prevalence rate of food addiction among the studied normal and overweight/obese adolescent girls was 12% and 18% respectively. The prevalence in our study is relatively high when compared with the prevalence rate (15.7%) among adolescents (11-18 years) reported by Ahmed and Sayed, (2017) [17]. Table 1 depicts the prevalence rate of individual symptoms of food addiction. Analysis of individual symptoms showed that the most common symptom was "Unable to cut down or stop followed by Tolerance i.e. needing larger amounts of food over time to achieve the desired emotional effect. There is no significant difference in the frequencies of the symptoms between the two BMI categories. Similarly we also observed higher YFAS symptom count scores and a higher frequency of individual symptoms among obese/overweight girls compared with underweight and normal weight girls. Systematic review on prevalence of food addiction assessed using Yale food addiction scale indicated that FA prevalence was double in overweight/obese population samples compared to those of a healthy BMI [18]. However the present study did not show a strong relationship between BMI and Food addiction. The association between BMI and food addiction has not been sufficiently proven. In a study by Flint (2014) [19], a strong association between BMI and food addiction among the two cohorts of middle aged and older women was observed. While Ahmed and Sayed (2017) [17] in his study among Egyptian adolescents showed that the food addiction diagnosis did not differ across different BMI categories. According to Berenson et al., (2015) [20] study among reproductive aged women, prevalence of food addiction did not differ by age group, race/ethnicity, education, income, or body mass index categories, tobacco and alcohol use, or physical activity, but it did differ by level of depression. It is identified that subjects with food addiction had significantly higher levels of depression, negative affect, emotion dysregulation, eating disorder psychopathology, and lower self-esteem [21].

Table 1: Prevalence of Food Addiction and its symptoms among study subjects

Participants (N=100)		Normal (%)	Over weight (%)	Chi-square value	‘p’ value
Consumed more than planned	Did Not Meet Symptom Criteria	80	73	1.363	.243 ^{NS}
	Meet Symptom Criteria	20	27		
Unable to cut down or stop	Did Not Meet Symptom Criteria	26	37	2.804	.094 ^{NS}
	Meet Symptom Criteria	74	63		
Great deal of time spent	Did Not Meet Symptom Criteria	80	76	.466	.495 ^{NS}
	Meet Symptom Criteria	20	24		
Important activities given up	Did Not Meet Symptom Criteria	63	70	1.10	.294 ^{NS}
	Meet Symptom Criteria	37	30		
Use despite consequences	Did Not Meet Symptom Criteria	49	41	1.29	.256 ^{NS}
	Meet Symptom Criteria	51	59		
Tolerance	Did Not Meet Symptom Criteria	37	29	1.44	.229 ^{NS}
	Meet Symptom Criteria	63	71		
Withdrawal	Did Not Meet Symptom Criteria	77	79	.117	.733 ^{NS}
	Meet Symptom Criteria	23	21		
Impairment or distress	Did Not Meet Symptom Criteria	86	79	1.69	.193 ^{NS}
	Meet Symptom Criteria	14	21		
NS- Not significant					

Quality of life (QOL)

Health-related QOL is a multidimensional concept that reflects one's subjective self-assessment of physical, emotional and functional status [22, 23], reflecting the World Health Organization's definition of health as 'a state of complete physical, mental and social wellbeing, and not merely the absence of disease or infirmity. Table 2 depicts the mean score obtained for the eight domains of SF 12 questionnaire.

Table 2: Mean scores for the 8 domains of SF-12 questionnaire of the subjects

Participants (N=100)		Mean± S D	‘t’ value	‘p’ value
Physical Functioning	Normal	43.83±29.83	-1.242	0.216
	Overweight	49.33±32.73		
Role limitations in physical health	Normal	64.60±30.07	0.421	0.674
	Overweight	62.85±28.65		
Bodily pain	Normal	70.25±22.29	2.516	0.013*
	Overweight	61.55±26.42		
Health Perception	Normal	63.60±29.06	0.819	0.414
	Overweight	60.50±24.25		
Energy/Fatigue	Normal	64.26±25.00	-1.391	0.166
	Overweight	69.00±23.15		
Social Functioning	Normal	68.25±27.49	0.000	1.000
	Overweight	68.25±25.33		
Role limitation in mental health	Normal	71.60±21.14	3.104	0.002*
	Overweight	60.75±27.83		
Mental health	Normal	65.33±16.13	-1.416	0.158
	Overweight	68.66±17.14		
*Significant at p<0.05 , NS-Not Significant				

From table 2 it can be inferred, overweight/obese adolescent girls had higher scores for physical functioning, energy/fatigue and mental health domains while normal weight category had higher scores for role limitations in physical health, bodily pain, health perception and role limitation in mental health. Significantly higher differences were found in Bodily pain (mean = 70.25 and 61.55, $p < 0.05$) and role limitation in mental health (mean = 71.60 and 60.75, $p < 0.05$) among the adolescents in normal and overweight/obese category. Results of Health related QOL indicate that obese/overweight adolescents had poorer score on physical health aspects than mental health. Earlier investigations have indicated that obesity is a stronger predictor of poor physical health than mental health [24] and changes in weight are more strongly associated with changes in physical health [25]. Excess body weight can cause muscle pain, articulation pain, and discomfort. Because the obese body is heavy and bulky, it expends more energy to move, consequently resulting in the need to rest more often [26].

PERCEIVED STRESS SCALE

The percentage distribution of the subject based on the perceived stress scale is presented in Table 3.

Table 3: Association between Perceived stress and BMI

Stress Level	Normal (%)	Overweight (%)	Chi-square value	‘p’value
Low stress	17	23	1.948	.378 ^{NS}
Moderate stress	75	66		
High stress	8	11		
NS- Not Significant				

PSS score can range from 0 to 40 with higher scores indicating higher perceived stress. Scores ranging from 0-13 are considered as low stress, scores from 14-26 as moderate stress and scores from 24-40 as high stress [27]. Table 3 indicates that there was no significant difference in PSS scores between the study subjects. Majority of the subjects from both groups reported moderate level of stress. Perceived stress are hypothesized to be a risk factor for obesity, but large scale studies relating stress and BMI have shown inconsistent results. The result obtained for PSS indicated that there was no significant association between stress and BMI.

4. CONCLUSION

The current study indicates that adolescents are likely to develop unhealthy lifestyles and dietary habits which could lead to developing a health condition in later life. Propagation of positive health choices such as healthy diet, indulging in physical activity and stress management are vital for a healthier future.

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