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A Study on Prevalence of Food Addiction and Binge Eating Behaviors among Grade I Obese Women

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Abstract
Adults with obesity are at greater risk of developing eating disorders (EDs), and often the symptoms are unidentified and untreated. Tools or instruments have been developed by the psychologist specifically to screen and diagnose eating disorders in normal and obese individuals. This study was aimed to determine the prevalence of food addiction and binge eating behaviors' among obese women. Total of 155 adult grade I obese women (BMI > 30 kg/m^2) aged between 20 and 40 years living in urban areas of Madurai, Tamil Nadu, India were selected as respondents for the study based on purposive sampling method. General Health Questionnaire (GHQ – 12) and Eating Disorder Inventory (EDI – 64) were used to measure the eating disorder occurrence among the respondents and Yale Food Addiction Scale (YFAS) and Binge Eating Disorder Questionnaire (BED – 16) were used to assess the prevalence of food addiction and binge eating behavior in the respondents. Data on socioeconomic background of the respondents were collected using scheduled questionnaire. The results were analyzed statistically using chi square test. GHQ 12 and EDI 64 analysis revealed that majority of the respondents (65.8%) had poor mental health and 24.5 percent of them were victims of eating disorder respectively. Food addiction among the respondents was 62.6 percent and 63 percent of them had severe binging habits which may be due to body dissatisfaction, ineffectiveness, interpersonal distrust etc. The findings suggest that eating disorders are widely prevalent among obese individuals and more focus needed on channelizing mental disorder or illness associated to obesity.

Keywords: Obesity, Eating disorders, General Health Questionnaire, Eating Dietary Inventory, Food Addiction Scale, Binge Eating Disorder Questionnaire

1. Introduction
Obesity continues to grow as major public health problem around the world and it is estimated that almost 10 and 14 percent of adult men and women are obese respectively. If nothing is done to reverse the epidemic, more than 1 billion are projected to be obese by 2030 (Huppert & Whittington 2003) [12]. Addiction to certain types of food, particularly highly processed, hyper-palatable foods could be one of the factors contributing to overweight and obesity. The voluntary eating of smaller or larger portions of food than usual is common, but for some people this develops into a compulsion and the eating behaviors become extreme. Eating disorders involve a serious of disturbance in eating behavior (either eating too much or too little) in addition to great concern over body size and shape (Muir *et al*., 1999) [19] and it may cause long-term psychological, social and health problems (Kelly *et al*., 2008) [15].

Researchers have found that the development of disordered eating in adults has been traced to behaviors and attitudes expressed at an early age. A variety of psychological and physical risk factors such as high levels of negative emotionality, body dissatisfaction, and early age of menarche influences later disordered eating in adults (Leon *et al*., 1995) [17]. Most prevalent eating disorders among adults are anorexia nervosa and bulimia nervosa. Anorexia nervosa characterized by refusal to eat by the persons particularly to maintain normal body weight, due to intense fear of gaining weight and has a distorted perception of the shape or size of their bodies (American Psychiatric Association, 1994) [1]. Bulimia nervosa refers person undertake binge eating and then use compensatory methods to prevent weight gain, such as induced vomiting, excessive exercise or laxative abuse. Persons with anorexia or bulimia may develop serious health problems such as heart conditions, electrolyte imbalance

and kidney failure that can lead to death (American Psychiatric Association, 1994) [1]. Eating disorders are complex syndromes strongly associated with other mental illnesses such as mood swinging, personality and anxiety disorders. Most mental health problems diagnosed in adulthood is started by the age of 14 and it increases to three fourths by the age of 24 (Hoek *et al*., 2004) [11]. The ability to manage mental health problems and learning disorders, can affect adult functioning in areas such as social relationships and participation in the workforce. Hence this study was aimed to assess the mental health of obese women and to determine the prevalence of food addiction and binge eating behavior.

2. Materials and Methods

Total of 155 adult grade I obese women (BMI > 30 kg/m^2) aged between 20 and 40 years living in urban areas of Madurai, Tamil Nadu, India were selected as respondents for the study based on purposive sampling method. The selected respondent's socio economic background was determined using scheduled questionnaire. General Health Questionnaire (GHQ – 12) developed by (Goldberg *et al*., 1997) [9] was used to assess the mental health of the selected respondents. Eating Disorder Inventory (EDI – 64) was used to determine the prevalence of eating disorder among the respondents (Garner, 1983) [7]. Yale Food Addiction Scale (YFAS) and Binge Eating Disorder Questionnaire (BED – 16) were used to assess the prevalence of food addiction and binge eating behavior in the respondents (Gearhardt *et al*., 2009; Gormally 1982) [8, 10]. Likert point scale was used to value the responses and total score was calculated as described in the literatures (Goldberg *et al*., 1997; Garner, 1983; Gearhardt *et al*., 2009; Gormally 1982) [7, 9, 8, 10]. Collected data were coded, analyzed and expressed as percentage, mean ± standard deviation. To test the level of significance, chi square analysis was done.

3. Results and Discussion

Socioeconomic background of the respondents is presented in Table 1. Chronological age of the respondents was ranged from 20 to 40 years and the mean chronological age was 30.55 ± 6.22 years. Nearly 53 percent of the respondents were 20-30 years old and 47 percent of them belong to 31 - 40 years age group. Although there were no Christians among the respondents, the followers of Hindu religion were slightly higher (53%) than the followers of Muslim religion (47%). All of the respondents belong to backward community (BC). Above 30 percent of the respondents were graduates and approximately 28 percent of them has gone to middle school. Sixteen percent of the respondents were postgraduates and higher secondary as educational qualification and less than 10 percent of them were educated up to primary school level. The major occupation of the respondents was home maker, student and office worker which were 54.19, 29.68 and 16.13 percent respectively.

Family income of the respondents was ranged from less than Rs.25000 to above 200000 per annum. Nearly 68 percent of the respondent family income was Rs. 50000-100000, 14 percent of them earn Rs. 200000 and above, 8 percent of the respondents getting Rs. 100000 -150000 and Rs. <50000, and 2 percent of them receiving Rs.150000-200000 per annum. Marital status of the respondents showed that 79 percent of them were married and the remaining was single (unmarried, widow and divorcée). Nuclear family system was higher among the respondents (62.6%) than joint family system (37.4%). Socioeconomic background shows that majority of the respondents chronological age was 31 years on average, belong to Hindu religion, comes under backward community, hold under- or post- graduate degree as educational qualification, home maker as occupation, Rs. 50000-100000 per annum as family income, married and belong to nuclear family system.

Table 1: Socioeconomic background of the respondents

S. No	Parameters		No. of respondents	%
1	Age (years)	20-25	43	27.7
		26-30	39	25.2
		31-35	32	20.6
		36-40	41	26.5
		Total	155	100
		Mean ± Std. Dev	30.55 ± 6.22	
2	Religion	Hindu	78	50.3
		Muslim	73	47.0
		Christian	4	2.6
		Total	155	100
3	Community	Backward (BC)	155	100
		Most Backward (MBC)	-	-
		Scheduled Caste (SC)	-	-
		Scheduled Tribe (ST)	-	-
		Total	155	100
4	Educational Qualification	Primary	14	9.0
		Middle	43	27.8
		Higher secondary	25	16.1
		Under graduate	48	31.0
		Post graduate	25	16.1
		Total	155	100
5	Occupation	Home makers	84	54.2
		Students	46	29.7
		Office Work	25	16.1
		Total	155	100
6	Annual Income (Rs.)	< 50,000	12	7.7
		50,000-1,00,000	105	67.7
		1,00,000-1,50,000	13	8.4
		1,50,000-2,00,000	3	2.0
		>2,00,000	22	14.2
		Total	155	100
7	Marital Status	Single	33	21.3
		Married	122	78.7
		Total	155	100
8	Type of Family	Nuclear	97	62.6
		Joint	58	37.4
	Total		155	100

Table 2: Prevalence of eating disorder among the respondents

S. No	Particulars	No. of respondents	%	Mean ± Std. Dev.
General Health Questionnaire (GHQ-12)				
1	Good Mental Health (scored>5)	53	34.2	5.98 ± 0.13
2	Poor Mental Health (scored<5)	102	65.8	4.48 ± 1.50
	Total	155	100	
χ^2- 5.572; p>0.97; df-4				
Eating Disorder Inventory (EDI – 64)				
3	Presence of Eating Disorder (scored <42)	38	24.6	29.65 ± 7.89
4	Absence of Eating Disorder (scored >42)	117	75.4	69.05 ±21.19
	Total	155	100	
χ^2- 0.48; p>0.97; df-4				
Yale Food Addiction Scale (YFAS)				
5	Presence of Food Addiction (scored ≥3)	97	62.6	6.53 ± 1.88
6	Absence of Food Addiction (scored ≤ 3)	58	37.4	2.37 ± 0.96
	Total	155	100	
χ^2- 3.069; p>0.97; df-4				
Binge Eating Disorder (BED – 16)				
7	Non – Binging (Scored <17)	5	3.2	16.08 ± 0.44
8	Moderate Binging (Scored 18-26)	49	31.6	22.69 ± 2.70
9	Severe Binging (Scored >28)	101	63.2	35.08 ± 5.06
	Total	155	100	
χ^2- 7.244; p>0.97; df-4				

Prevalence of eating disorder among the respondents was assessed using standard questionnaire and the results are presented in Table 2.

GHQ-12 analysis showed that only 34 percent of the respondents had good mental health and the remaining exhibited poor mental health (65%). The World Health Organization quoted that "there is no health without mental health" (Spitzer *et al*., 1990) [21]. GHQ is a self-report measure of psychometric properties of an individual and extensively used in epidemiological research to indicate the severity of symptoms of most common mental disorders such as anxiety and depression (Weich and Lewis, 1998; Weich *et al*., 2001 & 2003) [26, 27]. Huppert and Whittington (2003) [12] reported that positive mental health and symptoms of mental disorder are independent of one another to a degree. A cross sectional study was conducted on association between body mass index and mental health using GHQ 12 among 37272 Scottish adult populations and reported that nearly 15.4 percent of the adults had poor mental health based on GHQ 12 analysis. They concluded that being underweight at all ages or obese at a young age was associated with significantly poorer mental health in women (Blackwell, 2014). Another health survey report indicates that one in six adults live in United Kingdom were experienced mental disorder. More than 50 percent of the participants had mixed depression and anxiety disorder, and one in three had generalized anxiety disorder or depression (Adult Psychiatric Morbidity in England, 2009).

Based on Eating Disorder Inventory (EDI – 64) evaluation, eating disorders were observed in the respondents (24.6 %) however 75.4 percent of the respondents do not have eating disorders. The Eating Disorder Inventory (EDI) is a self-report instrument designed different cognitive and behavioral symptoms of anorexia nervosa and bulimia nervosa (Garner, 1983) [7]. Although the prevalence rates of eating disorders are relatively small, with the rate for anorexia nervosa at 3% and the rate for bulimia nervosa around 1% when using strict diagnostic criteria, eating disorders might affect a large number of individuals, particularly women. De Zwaan (2001) [6] found that treating the disordered eating behaviors in obese persons before treating obesity showed better results for weight loss.

Above 62 percent of the respondents were shown food addiction evaluated by using YFAS and the remaining did not show any symptoms of food addition (37%). The term "food addiction" has been used in combination with specific eating behaviors to describe an abnormal pattern of excessive consumption. Addiction to certain types of food, particularly highly processed, hyper-palatable foods, could be a factor contributing to overeating and obesity in parallel with dramatic changes in the food environment.

BED evaluation reveals that binge eating disorder were noticed among the respondents (>90%) and around 63 and 31 percent of them had severe and binge eating habits respectively. BED is characterized by recurrent episodes of binge eating in the absence of regular extreme compensatory strategies designed to prevent weight gain (American Psychiatric Association, 2000). About 30% of individuals who seek treatment for obesity also suffer from a co-morbid condition called Binge Eating Disorder (BED) (Spitzer *et al*., 1993). Binge eating behaviors were higher in individuals meeting the diagnostic criteria for FA (Davis *et al*., 2011) [5]. Researchers have found that almost 60% of obese individuals with BED also suffer from food addiction (FA) (Gerhardt, *et al*., 2012).

4. Conclusion

This study examined the relationship between prevalence of food addiction and binge eating behaviors and eating disorder among adult obesity. The findings suggest that obese women had poor mental health and presence of food addiction and severe binging was also high among obese women. In India, mental health has not gained much attention, probably because of battling with the physical health related issues. Of late mental health has begun to gain some notice, there are only scant initiatives to address mental health problems in the country.

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