

A Comparative Study of Eating Behaviour between Obese and Non-Obese Adults with respect to Gender

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Abstract

In order to understand an escalation in cases of obesity, one of the primary highlighted aspect; the 'behavior' associated with eating, has to be reflected upon. The main aim of the study was to understand and evaluate the eating behaviour in adults with high body mass index. The research tool applied was Three-Factor Eating Questionnaire (TFEQ R-18) with three dimensions: cognitive restraint, uncontrolled eating, and emotional eating. Research sample constituted of 120 equally grouped male and female adults; 60 obese individuals and 60 control individuals; in the age range of 20-60 years, using purposive sampling technique as a method of selection from clinics of Ahmedabad city, Gujarat. Method of t-test was performed to analyse the data statistically. Results indicated lower cognitive restraint, higher uncontrolled eating and higher emotional eating in individuals with high BMI compared to their control counterparts. Eating behaviour is an essential determining factor in maintenance of body weight.

Keywords: Cognitive restraint, Uncontrolled eating, Emotional eating, Eating behaviour, Obesity.

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Introduction

India, the second most populous country in the world with 1.3 billion people, is presently experiencing rapid epidemiological transition (Worldometers, 2017). Under nutrition which was one of the commanding issues years ago has been swiftly replaced by the subject of obesity (Mohan V. et al., 2006). Two of these significant growth contributors in the prevalence rate of obesity are industrialization and urbanization (Pradeepa et al., 2015). According to the World Health Organization (2000), 'obesity is one of the most common, yet among the most neglected, public health problems in both developed and developing countries'. Obesity in India more than doubled in children and tripled in adults between 1980 and 2015, showed an analysis of data from 195 countries from the Global Burden of Disease Study (Kaul, R; 2017). The corresponding rise in men was from 1% to close to 5% in 1980, and from 2% to

7% in women in 2015 (Global Burden Disease, 2015).

Generalized obesity and abdominal obesity are mainly two types of obesity. J R Joshi concluded in a study that Asian Indians are highly susceptible to have abdominal obesity and he termed it as 'Asian Indian phenotype' (Joshi et al., 2003; Deepa et al., 2006). An obesity surgeon, Apurva Vyas, of NM Virani Hospital, stated the number of people suffering from obesity in the state of Gujarat itself to be about 75 lakh (DNA, 2009).

Eating behaviour is a complex interplay of physiological, psychological, social, and genetic factors that influence meal timing, the quantity of food intake, and food preference (Grimm et al.; Nutrition Reviews, 2011). Along with the energy intake, the quality of food chosen and eaten, the amount of physical activity carried out, the time duration of sitting around watching television and internet usage

determines eating behaviour. The pattern of eating fluctuates with attitudes, knowledge, emotional state, experiences and various social and cultural contexts.

Food being a primary need has always been an attraction for both humans and animals.

Interestingly, the phrase 'eat to live' has completely interchanged to 'live to eat' over the years. Globalisation has increased the possibility to experience the cuisines from all over the world. Such easy access to myriad food styles has been making people more curious to explore the novelty. Most of these contain energy-dense foods, which many studies have proved, resulting in weight gain. Other than the environmental aspects, the individual characteristics such as appetite, desire, control, stress and tolerance also control food preference.

Weight gain and higher BMI in adults is strongly associated with disinhibition, and moreover, dietary restraint may weaken this association when disinhibition is high (Hays N. et al., 2002). Eating behaviour is much influenced by stress and such stress-induced eating may aggravate the development of obesity (Torres & Nowson, 2007). A longitudinal study concluded that body mass index at 31 years was highest among stress-driven eaters and drinkers, especially among women (Laitinen, Ek & Sovio, 2002). Relationships were found between emotional eating and negative feelings of physical competence; between external eating and negative feelings of self-worth; and between both eating styles and various aspects of problem behaviour (Braet & Van Strien, 1997).

Research Materials and Methods

Objectives

● To compare cognitive restraint, uncontrolled eating, and emotional eating as parts of eating behaviour in obese and non-obese adults.

● To compare eating behaviour (cognitive restraint, uncontrolled eating, and emotional eating) in males' and females' obese group.

● To differentiate between obese and non-obese males as well as obese and non-obese females with respect to their eating behaviour (cognitive restraint, uncontrolled eating, and emotional eating).

Sample and Procedure

A total of 120 subjects were carefully chosen by purposive sampling method for this research study examining eating behaviour. The sample was equally categorised into two groups, namely: Obese and Non-Obese (Control). Equal numbers of males and females were selected as a part of the study. Every subject was provided informed written consent prior to the study involvement. Rapport was established with each subject explaining the purpose of the study and ensuring confidentiality and anonymity. They were administered with Three-Factor Eating Questionnaire (TFEQ-R18). Detailed and clear instructions about the test were provided. Privacy and comfortable atmosphere were ensured throughout the data collection. Responses of each respondent on the test were scored with the help of the scoring key in the manual and were tabulated accordingly.

Inclusion criteria were the years of education to be at least 12 years for all the subjects under study, the obese group to have Body Mass Index (BMI Classification, WHO; 2006) more than 30 kg/m² (high BMI range) while the non-obese group to have BMI between 18.5 to 24.9 kg/m² (normal BMI range). Exclusion criteria encompassed the history of neurological disorder or injury, any history of alcohol or drug abuse (DSM-IV-TR criteria), history of severe psychiatric illness, history of a learning disorder or developmental disability (DSM-IV-TR criteria).

Research Tool

Three Factor Eating Questionnaire (TFEQ-R18): TFEQ-R18 (Karlsson et al., 2000) refers to current dietary practice and measures three different aspects of eating behaviour: cognitive restraint, uncontrolled eating, and emotional eating. Internal-consistency reliability coefficients for each of the three scales were above the 0.70 standards and below the 0.90 limit recommended for individual assessment.

Results

Descriptive and frequency statistics were conducted to examine eating behaviour test performance of the subjects under study. Students t-test (SPSS 16.0) was then performed to determine group differences between obese group and non-obese control group on eating behaviour.

Table 1. Mean, SD and t scores of obese and non-obese adults on dimensions of Three Factor Eating Questionnaire (TFEQ R-18).

Eating Behaviour	Obese (60)		Non-Obese (60)		't' values
	Mean	SD	Mean	SD	
Cognitive Restraint	15.52	3.85	17.77	4.67	2.88**
Uncontrolled Eating	24.00	5.84	16.78	3.55	8.18**
Emotional Eating	7.00	2.81	4.71	1.67	5.41**

* p .05, **p .01

Table 1 shows a significant difference of .01 level of significance in all the three dimensions namely Cognitive Restraint, Uncontrolled Eating and Emotional Eating between obese and non-obese group. The mean

scores in obese group were found to be higher in Uncontrolled Eating and Emotional Eating than the non-obese counterparts while the cognitive restraint score of obese were less than that of non-obese.

Table 2. Shows the difference in eating behaviour between males and females of obese group and males and females of non-obese group on the dimensions of Three Factor Eating Questionnaire (TFEQ R-18) with the help of Mean, SD and 't' values.

Type of Sample group	Dimensions of Eating Behaviour	Gender	Mean	SD	't' values
Obese	Cognitive Restraint	Males	14.06	3.41	3.13**
		Females	16.96	3.75	
	Uncontrolled Eating	Males	25.70	6.52	2.34*
		Females	22.30	4.56	
	Emotional Eating	Males	06.86	2.47	0.37
		Females	07.13	3.14	
Non-Obese	Cognitive Restraint	Males	18.53	4.53	1.28
		Females	17.00	4.74	
	Uncontrolled Eating	Males	17.23	3.49	0.98
		Females	16.33	3.61	
	Emotional Eating	Males	04.10	1.18	3.06**
		Females	05.33	1.86	

* p .05, **p .01

Table 2 shows a significant difference in Cognitive Restraint ($p < .01$) and Uncontrolled Eating ($p < .05$) between males and females of the obese group. The mean score of Cognitive Restraint for obese males was higher as compare to obese females while the mean score of Uncontrolled Eating was higher in obese

females than obese males. There was no significant difference found in Emotional Eating in obese males and females whereas in non-obese group, a significant difference in Emotional eating was found between the males ($t = 4.10$) and females ($t = 5.33$) at .01 level of significance.

Table 3. Shows the difference in eating behaviour between of obese and non-obese males and obese and non-obese females on the dimensions of Three Factor Eating Questionnaire (TFEQ R-18) with the help of Mean, SD and 't' values.

Gender	Dimensions of Eating Behaviour	Type of Sample group	Mean	SD	't' values
Males	Cognitive Restraint	Obese	14.06	3.41	4.31**
		Non-Obese	18.53	4.53	
	Uncontrolled Eating	Obese	25.70	6.52	6.27**
		Non-Obese	17.23	3.49	
	Emotional Eating	Obese	06.86	2.47	5.53**
		Non-Obese	04.10	1.18	
Females	Cognitive Restraint	Obese	16.97	3.75	0.30
		Non-Obese	17.00	4.74	
	Uncontrolled Eating	Obese	22.30	4.56	5.61**
		Non-Obese	16.33	3.61	
	Emotional Eating	Obese	07.13	3.14	2.69**
		Non-Obese	05.33	1.86	

** $p < .01$

Looking into table 3, there was a significant difference found in all the three dimensions of Eating Behaviour (Cognitive Restraint, Uncontrolled Eating and Emotional Eating) between obese and non-obese males whereas when obese and non-obese females were compared, a significant difference of .01 level of significance was found in two dimension of Eating behaviour (Uncontrolled Eating and Emotional Eating) and no difference was seen in Cognitive Restraint.

Discussion

The primary aim of this research work was to study and compare the dimensions of eating behaviour in obese individuals with BMI higher than 30 kg/m², comparing them with the non-obese individuals (Normal BMI; BMI between 18.5 to 24.9 kg/m²) with respect to gender. TFEQ- R 18 measures three eating behaviours: Cognitive Restraint, Uncontrolled Eating and Emotional Eating. Cognitive Eating Restraint (CER) is defined as 'the intent to limit food intake, to prevent

weight gain or to promote weight loss' (Van Loan, MD & Kaim, 2000). It is the ability to take a decision to restrict the quality and quantity of food intake to maintain a healthy weight. Uncontrolled Eating (UE) comprises of 'excessive overeating and loss of control to stop eating'. Emotional Eating (EE) is medically defined as 'the practice of consuming large quantities of food in response to feelings instead of hunger' (MedTerms medical dictionary).

All of these are related to emotional and psychological control. The question arises whether there is a difference in the behaviour related to consuming food between the two BMI groups and the two genders selected in this research study. Moreover, there is a reflection of an idea whether a change in these eating behaviour patterns help reduce obesity faster. The result of the present research study showed a significant difference in all the three eating behaviour dimensions between obese and non-obese individuals.

This study showed that in comparison with healthy weight individuals, overall, obese group had a lower level of Cognitive Restraint and higher levels of Uncontrolled Eating and Emotional Eating. Obese subjects when interviewed, mentioned their craving for eating at any time regardless of their meal timing, especially their favourite dishes which mostly contained sugary, junk and fatty foods. They were as if addicted to eating. Such an addiction makes the brain desensitized to the pleasures attained from sugary and fatty foods leading to continuous weight gain. *Journal of Neuroscience*

published a research study where brains of women as they drank a milkshake were scanned. It was observed that the sugary drink activated an area called the striatum. The experiment was repeated after six months on the same women some of whom had gained some weight. They found that the more weight the women had put on in the interim, the less their brains responded to the milkshake in the latter experiment (Rettner, 2010).

Within the obese group, males had a lower Cognitive Restraint and higher Uncontrolled Eating than females ($p < .01$) while Emotional Eating was found to be similar in both genders. It was observed in male obese subjects that with lower cognitive restraint of eating behaviour, there was more of overeating as compared to female obese subjects. It was explicitly noted that these subjects were aware of their uncontrolled eating but lacked the ability to monitor their food intake. Most of the subjects under study went through an episodic dieting schedule. They started with exercise and body workouts with all enthusiasm to begin with but fail to continue that spirit for losing weight going back to no exercise at all. This may further induce guilt of not sticking to a routine leading to emotional eating. As outdoor eating is one of the favourite pass-times for people in India, avoidance of such energy-dense and junk foods become incredibly challenging. When this cycle keeps repeating, it is called episodic dieting schedule. Ergo, putting a cognitive restraint on unhealthy eating becomes problematic. Considering exercise as one of the factors in eating behaviour, it

was noticed that 60% of the non-obese group involved in some kind of an exercise during the day and the percentage of that observed in the obese group was only 20%.

Professionals estimated emotions to be the cause of overeating 75% of the times. It has been observed that mild stress results into hyperphagia whereas severe stress situations lead to actions of hypophagia (Wardle J & Gibson EL.; 2002). Eating style and amount of food intake are linked to cortisol reactivity to stress. Emotional eating, restraint and external eating had a strong association with snack intake in high cortisol reactors (Newman, E., O'Connor, D. B., & Conner, M.; 2007). When looking at an emotional aspect of society, energy-dense foods have often been used as sweet bribes to children by their elders for them to behave appropriately, agreeing to parent's terms and conditions, getting good grades in a school test and more. Where the answer to every multifaceted situation becomes food, there, such legacy of emotionally handling situations induces and reinforces adults to use food to distract themselves from difficult, complicated and stress-oriented feelings. Unawareness about such habit formations unconsciously drives people towards emotional eating. More than the disease itself, the level of empowerment towards the disease is of utmost importance. Therefore, working on personality and counselling the overweight and obese right from their early age can help prevent emotional eating later in their lives.

Conclusion

The current study indicates lower cognitive restraint, higher uncontrolled

eating and higher emotional eating in both male and female obese subjects with BMI more than 30 kg/m² when compared to the healthy weight subjects with BMI between 18.5 to 24.9 kg/m². When comparing male and female obese subjects, obese females had higher cognitive restraint, emotional eating and lower uncontrolled eating as compared to obese males. The lifestyle and behaviour towards eating influences obesity. Thought processes, internal power of control and emotions play an essential role in manipulating the intake of food and maintaining body weight. Increasing mindfulness and frequent monitoring towards eating behaviour and healthy lifestyle in adults, children and parents can help prevent excess body weight and promote health.

Like every research, this study also had few limitations. The study was conducted on a limited sample. BMI alone was considered as an obesity indicator although all the obese participants under study were clinically diagnosed as obese by their clinicians. The inclusion of other cognitive functions as memory and problem solving may enhance the research altogether.

References

- BMI Classification. (2006). World Health Organisation. Retrieved from: http://apps.who.int/bmi/index.jsp?introPage=intro_3.html
- Braet, C., & Van Strien, T. (1997). Assessment of emotional, externally induced and restrained eating behaviour in nine to twelve-year-old obese and non-obese children. *Behaviour research and therapy*, 35(9), 863-873. Retrieved from <https://www.sciencedirect.com/science/article/abs/pii/S0005796797000454>

- Cognitive flexibility. (2017, November 26). In *Wikipedia, The Free Encyclopedia*. Retrieved from https://en.wikipedia.org/w/index.php?title=Cognitive_flexibility&oldid=812194228
- Countries in the world by population. (2017). *Worldometers*. Retrieved from <http://www.worldometers.info/world-population/population-by-country/>
- Deepa R, Sandeep S, Mohan V. (2006). *Abdominal obesity, visceral fat and type 2 diabetes- Asian Indian phenotype*. Type 2 diabetes in South Asians: epidemiology, risk factors and prevention. New Delhi, India: Jaypee Brothers Medical Publishers (P) Ltd.; p. 138-52.
- Emotional Eating. (2016). MedTerms Medical Dictionary. Retrieved from <https://www.medicinenet.com/script/main/art.asp?articlekey=46450>
- Global health risks: mortality and burden of disease attributable to selected major risks. (2009). Geneva: Switzerland, *World Health Organization (WHO)*. Retrieved from http://www.who.int/healthinfo/global_burden_disease/GlobalHealthRisks_report_full.pdf
- Grimm, E. R., & Steinle, N. I. (2011). Genetics of eating behavior: established and emerging concepts. *Nutrition reviews*, 69 (1), 52 - 60 . Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/21198635>
- Hays, N. P., Bathalon, G. P., McCrory, M. A., Roubenoff, R., Lipman, R., & Roberts, S. B. (2002). Eating behavior correlates of adult weight gain and obesity in healthy women aged 55–65 y. *The American journal of clinical nutrition*, 75(3), 476-483. Retrieved from: <http://ajcn.nutrition.org/content/75/3/476.short>
- Joshi, S. R. (2003). Metabolic syndrome- Emerging clusters of the Indian phenotype. *Journal-Association of Physicians of India*, 51, 445-446. Retrieved from <https://pdfs.semanticscholar.org/cbbe/39b420f0a766519baab96343e87eda9ad398.pdf>
- Laitinen, J., Ek, E., & Sovio, U. (2002). Stress-related eating and drinking behavior and body mass index and predictors of this behavior. *Preventive medicine*, 34(1), 29- 39. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/11749094>
- Mathur, K., & Shah, M. (2018). Dissertation submitted to the Department of Psychology, Gujarat University, Ahmedabad, Gujarat.
- Karlsson et. Al. (2000). *Three Factor Eating Questionnaire*. [PDF File]. Retrieved from <http://www.med.umich.edu/pdf/weight-management/TFEQ-r18.pdf>
- Kaul, R. (2017). *In 35 years, obesity doubled among children and tripled in adults: Study*. Hindustan Times. Retrieved from : <http://www.hindustantimes.com/health/in-35-years-obesity-doubled-among-children-and-tripled-in-adults-study/story-aGkRFiY9FAQXgOJdfQYUCL.html>
- Mohan, V., & Deepa, R. (2006). Obesity and abdominal obesity in Asian Indians. *The Indian journal of medical research*, 123 (5), 593- 6. Retrieved from https://www.researchgate.net/publication/6912403_Obesity_abdominal_obesity_in_Asian_Indians
- Newman, E., O'Connor, D. B., & Conner, M. (2007). Daily hassles and eating behaviour: the role of cortisol reactivity status. *Psychoneuroendocrinology*,

- 32(2), 125-132. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/17198744>
- Obesity: preventing and managing the global epidemic. (2000). Report of a WHO consultation. World Health Organ Tech Rep Ser; 894: i-xii, 1-253. Retrieved from https://www.who.int/nutrition/publications/obesity/WHO_TRS_894/en/
- Pradeepa, R., Anjana, R. M., Joshi, S. R., Bhansali, A., Deepa, M., Joshi, P. P., & Subashini, R. (2015). Prevalence of generalized & abdominal obesity in urban & rural India-the ICMR-INDIAB Study (Phase-I)[ICMR-INDIAB-3]. *The Indian journal of medical research*, 142(2), 139. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/26354211>
- Press Trust of India. (2009, June 11). In Gujarat, 75 lakh people are suffering from obesity: Expert. *Daily News and Analysis*. Retrieved from: <http://www.dnaindia.com/health/report-in-gujarat-75-lakh-people-are-suffering-from-obesity-expert-1265786>
- Rettner R. (2010). *5 ways obesity affects brain*. Retrieved from: <https://www.livescience.com/35286-how-obesity-changes-brain-101221.html>
- Torres, S. J., & Nowson, C. A. (2007). Relationship between stress, eating behavior, and obesity. *Nutrition*, 23(11), 887-894. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/17869482>
- Tuschl, R. J. (1990). From dietary restraint to binge eating: some theoretical considerations. *Appetite*, 14(2), 105-109.
- Tuschl, R. J., Platte, P., Laessle, R. G., Stichler, W., & Pirke, K. M. (1990). Energy expenditure and everyday eating behavior in healthy young women. *The American journal of clinical nutrition*, 52(1), 81-86.
- Van Loan, M. D., & Keim, N. L. (2000). Influence of cognitive eating restraint on total-body measurements of bone mineral density and bone mineral content in premenopausal women aged 18–45 y: a cross-sectional study. *The American journal of clinical nutrition*, 72(3), 837-843. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/10966907>
- Wardle J, Gibson EL. Impact of stress on diet: processes and implications. In: Stansfeld SA, Marmot M (eds). *Stress and the Heart*. BMJ Books: London, 2002, pp. 124–149.

