

Original Research Article

Food addiction among medical college students in Bengaluru city: a cross sectional study

Marvel K. Soman*, Vidya G. S., Shashikala M.

Department of Community Medicine, Rajarajeswari Medical College & Hospital, Bangalore, Karnataka, India

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*Correspondence:

Dr. Marvel K. Soman,

E-mail: marvelksoman@gmail.com

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ABSTRACT

Background: Food addiction has specific connotations with respect to obesity which often results from the imbalance of food intake and energy expenditure. In countries like India, with relative abundance of food in recent years, and reduction in physical exercise, the rates of obesity have been on the rise. Obesity itself has been associated with the occurrence of metabolic syndrome which becomes a risk factor for diabetes mellitus and dyslipidaemia. This study aimed to assess the proportion of food addiction among medical college students in Bengaluru city.

Methods: A descriptive study was conducted over a period of three months. The sampling technique employed was convenient sampling. The study population consisted of undergraduate medical students. The study involved a total of 174 participants. Inclusion criteria for participation included 1st year to 4th year MBBS students. The study tool utilized was the Yale Food Addiction Scale (YFAS).

Results: Out of 174 respondents, the rate of occurrence of food addiction was 27.4%. Persistent desire or repeated unsuccessful attempts to quit was the most common symptom domain endorsed. Food addiction showed statistically significant association with BMI (Body Mass Index).

Conclusions: This exploratory study suggests that food addiction may be present in a proportion of young aged medical students. The association of food addiction with higher weight and BMI suggests propensity to develop metabolic syndrome, and the need to evaluate interventions that could modify phenomenological expression of food addiction.

Keywords: Body mass index, Food addiction, Yale food addiction scale

INTRODUCTION

Food addiction has received scientific interest in recent decades.^{1,2} The addiction to meals that are heavy in fat, sugar, and salt has been likened to the addiction to other pleasurable psychoactive substances such as alcohol and tobacco. The concept of food addiction has been brought to attention in response to the phenomenon where certain individuals have strong desires for specific foods and engage in excessive consumption, despite the detrimental consequences such as obesity. From a phenomenological perspective, there is a connection between hyper-

palatable food variety and certain aspects of drug addiction, Advancing the notion that food addiction is comparable to drug use disorders.³ Neurobiological research indicates that there are similarities in the brain circuits associated with both food addiction and drug use disorders.^{4,5} Food addiction is characterized by a particular meaning when it comes to obesity, which frequently occurs due to an imbalance between the amount of food consumed and the amount of energy expended.^{1,6}

In nations such as India, where there has been an increase in the availability of food and a decrease in physical activity, the prevalence of obesity has been increasing. Obesity is linked to the development of metabolic syndrome, which increases the risk of diabetes mellitus and dyslipidemia. The prevalence of uncontrolled food cravings and excessive consuming habits poses a challenge in managing obesity and addressing concurrent dyslipidemia and diabetes mellitus.⁷⁻⁹ Various features of food addiction can be captured by the deployment of questionnaire-based scales and tools. Among the questionnaire-based measures diagnosing food addiction, the Yale Food Addiction Scale (YFAS) is arguably the most widely used one. A meta-analysis has been done to determine the prevalence of food addiction in the public, which has integrated findings from 25 research with 196,211 individuals.¹⁰ The prevalence rates of food addiction have been observed to range from 5.4% to more than 50% across different research which have employed the YFAS. The prevalence rates, from this systematic study covering close to 200,000 people, shows that food addiction is greater in women and those from the clinical community, rather than the general population. There is only one research from India which found the rate of food addiction to be 32.5%, using the English version of YFAS.¹¹ Given the demanding nature of medical education and the associated stressors, understanding the prevalence and characteristics of food addiction among medical college students is crucial. This study aimed to explore the extent of food addiction in this demographic, identify key sociodemographic factors, and analyze specific behaviors linked to food addiction. By shedding light on these aspects, the research seeks to inform potential interventions and support mechanisms to address food addiction in this vulnerable population.

METHODS

The study employed a descriptive design to investigate the prevalence of food addiction among undergraduate medical students over a period of three months, from February 2023 to March 2023. Convenient sampling was utilized to recruit a sample size of 174 participants from the target population, comprising 1st to 4th-year MBBS students from Rajarajeswari medical college and hospital, Bengaluru. All the students attending first year MBBS to final year MBBS classes were included in the study and the students who did not consent were exempted from the study. The Yale Food Addiction Scale (YFAS) was employed as the primary study tool to assess food addiction among participants. Data were collected through the administration of the YFAS questionnaire, ensuring clarity of instructions and questions to facilitate accurate responses. Subsequently, statistical analysis was conducted to calculate the prevalence of food addiction among the study population and identify any associated factors. Ethical considerations were observed throughout the study, including obtaining informed consent from participants and ensuring the confidentiality of their

responses. Limitations, such as potential bias introduced by convenient sampling and reliance on self-reported data, were acknowledged. The findings of the study were summarized, and recommendations for future research or interventions targeting food addiction among undergraduate medical students were provided based on the results.

RESULTS

The prevalence of food addiction among medical college students in Bangalore city was determined to be 27.4%. This indicates a substantial portion of the student population may be experiencing challenges related to their relationship with food. The study encompassed a cohort of 174 participants, comprising 52 males and 122 females, thus reflecting a gender distribution where females were more prevalent. Delving into dietary preferences, the analysis unveiled that 16 individuals adhered to a vegetarian diet, while 44 opted for a non-vegetarian regimen. A substantial majority, comprising 114 participants, reported consuming a mixed diet, showcasing a diverse spectrum of dietary habits within the cohort. Regarding Body Mass Index (BMI) classification, the findings delineated that 32 participants fell under the category of underweight, while a significant majority of 109 individuals were classified as having a normal BMI. Notably, 25 participants were categorized as overweight, while 8 individuals were identified as obese. These sociodemographic insights provide a comprehensive understanding of the sample population's demographic profile, dietary inclinations, and BMI distribution, thereby laying a foundation for further analysis on food addiction among medical college students in Bangalore city (Table 1).

The analysis of responses to the Yale Food Addiction Scale (YFAS) questionnaire among the 174 participants provided valuable insights into the prevalence of addictive eating behaviours among medical college students in Bangalore city. The findings revealed a range of concerning behaviours related to food consumption. Notably, a significant proportion of participants reported experiencing distress and impairment due to their eating habits. Specifically, 17.8% acknowledged that food consumption had caused significant psychological problems, while 8.6% reported experiencing physical problems or exacerbating existing ones due to their eating patterns. Furthermore, 14.4% admitted to persistently consuming food despite facing emotional or physical challenges. These results highlight the complex nature of food addiction and emphasize the need for further research and interventions to address this issue among medical college students. Additionally, a considerable portion of participants expressed a desire to cut down or stop consuming certain foods, with 25.3% indicating such intentions. Encouragingly, 27.6% reported success in their attempts to cut down or abstain from these foods, suggesting potential avenues for intervention and support.

Nonetheless, challenges persisted for some participants, as evidenced by the 16.1% who reported multiple attempts to cut down or stop certain foods within the past

year. These findings underscore the importance of raising awareness and providing resources to address food addiction among this vulnerable population (Table 2).

Table 1: Sociodemographic details.

Sociodemographic details	Frequency	Percentage
Gender		
Male	52	29.9
Female	122	70.1
Diet*		
Veg	16	9.2
Non veg	44	25.3
Mixed	114	65.5
BMI		
Underweight (<18.4)	32	18.4
Normal weight (18.5-24.9)	109	62.6
Over weight (25-29.9)	25	14.4
Obesity (≥ 30)	8	4.6

*Vegetarian- Who doesn't consume meat/fish at all; Non vegetarian- Who consumes meat/fish more than 4 times a week.

Mixed- Who consumes meat/fish once a week

Table 2: Responses to the YFAS questionnaire items.

Items	Frequency N (n=174)	%
Eating much more than planned	5	2.9
Continuing to consume certain foods even though no longer hungry	0	0.0
Eat to the point where I feel physically ill	10	5.7
Worry about Not eating certain types of food or cutting down on certain types of food	8	4.6
Spend a lot of time feeling sluggish or fatigued from overeating	17	9.8
Find self constantly eating certain foods throughout the day	6	3.4
Going out of the way to obtain certain food when they are not available	14	8.0
Missing out on other activities	20	11.5
Dealing with negative feelings of overeating	6	3.4
Avoided professional/social situations due to fear of overeating	11	6.3
Avoided professional/social situations as could not consume certain food there	9	5.2
Withdrawal symptoms on cutting down or stopping certain foods	4	2.3
Consumed food to prevent feelings of anxiety, agitation or other physical symptoms	8	4.6
Elevated desires or urges to consume certain types of foods	16	9.2
Significant distress	6	3.4
Significant problems inability to function effectively	7	4.0
Food consumption has caused significant psychological problems	31	17.8
Food consumption has caused significant physical problems or made a physical problem worse	15	8.6
Kept consuming though having emotional and/or physical problems	25	14.4
Over time, need to eat more and more to get the desired feeling	19	10.9
Same amount of food does not reduce negative emotions or increase pleasurable feelings as it used to	17	9.8
Want to cut down or stop eating certain kinds of food.	44	25.3
Tried to cut down or stop eating certain kinds of food	47	27.0
Been successful at cutting down or not eating these kinds of food	48	27.6
Number of times in past year tried to cut down or stop certain foods	28	16.1

The analysis of the Yale Food Addiction Scale questionnaire domains among 174 participants revealed

prevalent addictive eating behaviours (Figure 1). The most common domain was "Persistent desire or repeated

unsuccessful attempts to quit" (45.4%), indicating challenges in controlling eating habits. Additionally, significant proportions reported spending much time on food-related activities (19.0%) and experiencing tolerance (18.4%). Furthermore, impairments in social, occupational, or recreational activities (17.8%) and

continued use despite adverse consequences (14.4%) were notable. Withdrawal-like symptoms were reported by 12.1% of participants. Overall, these findings emphasize the multifaceted nature of food addiction and the need for targeted interventions among medical college students in Bangalore city.

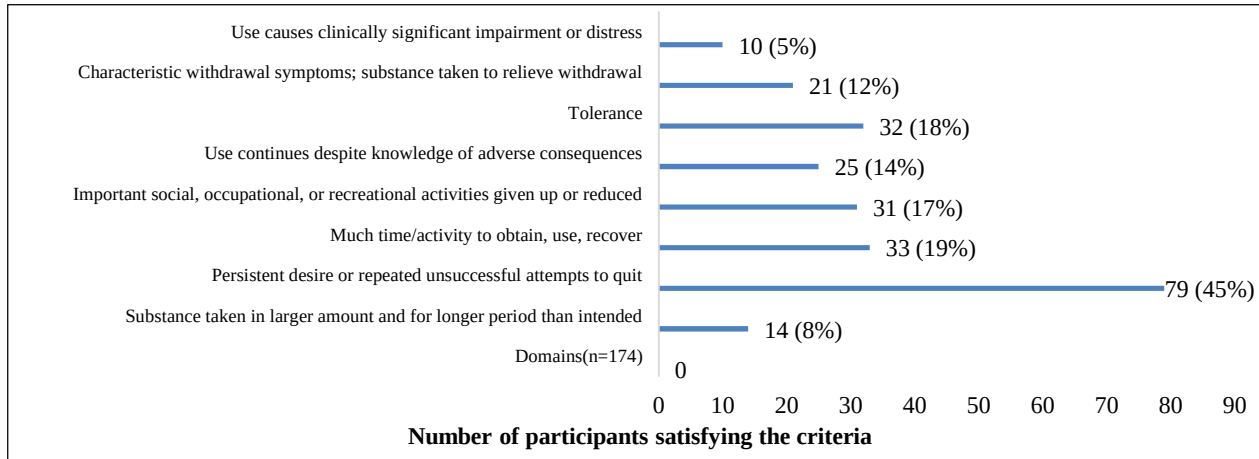


Figure 1: Domains of YSAF (n=174).

Table 3: Gender and food addiction.

Gender	Food addiction		Chi-square value	P value	Significance
	Absent	Present			
Male	38	14	0.0163	0.89	No significance
Female	88	34			

Table 4: BMI and food addiction.

BMI	Food addiction		Chi-square value	P value	Significance
	Absent	Present			
<18.4 (Underweight)	27	5	19.6606	0.0002	Significant
18.5-24.9 (Normal)	82	25			
25-29.9 (Overweight)	15	10			
≥30 (Obese)	1	7			

Table 3 presents an analysis of the relationship between gender and food addiction, revealing no statistically significant association. The chi-square test results show a chi-square value of 0.0163 and a p-value of 0.89. The p value, which is much greater than the common significance threshold of 0.05, indicates that we fail to reject the null hypothesis. Therefore, there is no significant difference in the presence of food addiction between males and females in this sample. Specifically, out of the males surveyed, 38 had no food addiction and 14 had food addiction, while among females, 88 had no food addiction and 34 had food addiction. The analysis concludes that any observed differences in food addiction prevalence between genders are likely due to random variation rather than a true effect of gender.

The analysis of the relationship between Body Mass Index (BMI) categories and food addiction reveals a significant association. The data indicates that among individuals with a BMI of less than 18.5 (underweight), 27 had no food addiction while 5 had food addiction. In the normal weight category (BMI 18.5-24.9), 82 individuals did not have food addiction, whereas 25 did. For those in the overweight category (BMI 25-29.9), 15 were without food addiction and 10 were with it. Notably, in the obese category (BMI ≥30), only 1 individual was without food addiction, while 7 had it. The chi-square test yielded a value of 19.6606 with a p-value of 0.0002. This suggests that higher BMI categories are more likely to be associated with the presence of food addiction (Table 4).

DISCUSSION

This study found 27.4% food addiction among medical college students in Bangalore, which is similar to Ghosh et al findings among Indian adolescents.¹² While more women (27.9%) reported food addiction than men (26.9%), the chi-square test indicated no significant gender-based differences (chi-square value =0.0163, $p=0.89$). This data supports Ghosh et al observation that food addiction affects both genders equally in Indian adolescents.

Comparing BMI categories and food addiction showed significant variations between the two trials. Food addiction was significantly associated with higher BMI categories (chi-square =19.6606, $p=0.0002$). Overweight and obese people were more likely to have food addiction, with 87.5% of obese people having it. Ghosh et al found no significant association between BMI and food addiction, suggesting that BMI may affect food addiction differently among young groups.

These conflicting findings emphasize the relevance of BMI in food addiction risk and prevalence assessments. Our result emphasizes the need for focused therapies for overweight and obese people, although Ghosh et al study found no significant BMI-food addiction association, suggesting that other psychological aspects may also be important. Thus, resolving food addiction in Indian kids requires a holistic strategy that addresses physical and psychological factors.

The present research's findings on food addiction among medical college students in Bangalore coincide with the observations made by Nanjappan and Amutha in their descriptive study on the adverse effects of junk food among undergraduate students in a chosen Bangalore college.¹³ This study showed a 27.4% incidence of food addiction, emphasizing major concerns with dietary patterns and food-related behaviors among young individuals. Nanjappan and Amutha's study also underlined the widespread use of junk food and a noticeable lack of understanding regarding its bad health impacts.

While our study identified no significant gender differences in food addiction rates (chi-square value =0.0163, $p=0.89$), it did highlight significant connections between higher BMI categories and food addiction (chi-square value = 19.6606, p value = 0.0002). This shows that overweight and obese pupils are more prone to food addiction. Similarly, Nanjappan and Amutha's findings suggested that a lack of understanding regarding the detrimental affects of junk food adds to poor dietary choices, potentially leading to higher BMI and related health difficulties.

Both results underline the need for greater education and awareness campaigns. This study results demonstrating that 27.6% of participants effectively cut down on

problematic items and 25.3% indicated a willingness to do so, accord with Nanjappan and Amutha's suggestions for focused educational interventions to encourage healthy eating habits. The similar findings amongst the research imply a significant need for comprehensive initiatives to prevent food addiction and the intake of junk food through better education, support networks, and health promotion activities among undergraduate students in Bangalore.

The study finding, the prevalence rate of 27.4%, shares significant insights with the review paper by Arya and Mishra on the impact of junk food and drinks on adolescents' health.¹⁴ Both findings illustrate the harmful influence of poor food habits on young persons' physical and psychological well-being. Our study's findings suggest strong connections between higher BMI categories and food addiction (chi-square value =19.6606, $p=0.0002$), indicating that overweight and obese pupils are more prone to food addiction. This corresponds with Arya and Mishra's review, which underlines that excessive intake of junk food and sugary beverages leads to the increased incidence of obesity and related health concerns among teenagers. Both research underline the crucial relationship between poor food patterns and unfavourable health outcomes.

Additionally, our study's discovery that 17.8% of participants reported major psychological concerns related to food intake resonates with Arya and Mishra's discussion on the mental health consequences of junk food consumption. They underlined how low nutrition quality is connected with mood disorders, depression, and other psychological difficulties in teenagers. Furthermore, our finding that 27.6% of participants effectively decreased or refrained from hazardous meals provides possible routes for intervention, supporting Arya and Mishra's demand for comprehensive efforts to limit junk food intake among young. Both findings call for greater educational and legislative efforts to encourage better eating habits and minimize the accessibility and allure of junk food. In conclusion, the consistent themes across both studies emphasize the urgent need for multifaceted approaches to address food addiction and the consumption of unhealthy foods among young populations, highlighting the importance of educational initiatives, supportive environments, and policy interventions.

A limitation of this cross-sectional study on food addiction among medical college students in Bengaluru is the inability to establish causality due to its observational design. Self-reported data may also introduce bias, as participants might underreport or misinterpret their eating behaviors. The study's focus on a specific group medical students in one city limits the generalizability of the findings to other populations or geographic regions. Additionally, external factors like stress or academic pressure, which could influence eating patterns, may not

have been fully controlled or accounted for in the analysis.

CONCLUSION

This exploratory study unveils a concerning trend indicating the potential presence of food addiction among a proportion of young medical students. The correlation observed between food addiction and higher weight and BMI levels suggests a worrisome propensity towards the development of metabolic syndrome within this demographic. Metabolic syndrome encompasses a cluster of risk factors including elevated blood pressure, high blood sugar levels, excess body fat around the waist, and abnormal cholesterol or triglyceride levels, all of which significantly elevate the risk of cardiovascular disease, type 2 diabetes, and other serious health conditions. The implications of this association extend beyond mere statistical correlations. They underscore a pressing need to delve deeper into the aetiology and manifestation of food addiction among young individuals pursuing medical education. Understanding the phenomenological expression of food addiction within this specific population is pivotal for devising targeted interventions aimed at mitigating its adverse health effects. Moreover, the observed correlation underscores the imperative for early intervention strategies tailored towards preventing the progression of food addiction-related behaviours towards more severe metabolic complications. Interventions could encompass multifaceted approaches ranging from dietary modifications and behavioural therapy to pharmacological interventions where appropriate. However, the efficacy of these interventions in modifying the phenomenological expression of food addiction within the context of medical education warrants rigorous evaluation. This study thus underscores the urgency for further research endeavours aimed at unravelling the intricate interplay between food addiction, metabolic health, and the unique stressors and lifestyle factors inherent to medical education. By elucidating these dynamics, we can pave the way for the development of targeted interventions that not only address the immediate health concerns associated with food addiction but also empower young medical students with the knowledge and tools necessary to prioritize their own well-being amidst the demanding rigors of their academic pursuits.

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