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Association of eating habits, sleep quality and perceived stress with emotional eating behaviour among Indian adults: A cross-sectional study

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Abstract
Emotional eating, defined as the tendency to eat for coping with negative emotions, has been associated with cardiometabolic disorders. Lifestyle behaviours such as eating habits, sleep quality, and perceived stress may influence emotional eating tendency. However, these associations remain to be investigated within the socio-culturally diverse Indian context. This cross-sectional study aimed to determine the prevalence of emotional eating and the association of sociodemographic, eating habits, sleep quality and perceived stress with emotional eating behaviour among 18–60-year-old adults (n=1210), enrolled from pan-India. The participants completed an online survey incorporating the Emotional Eater Questionnaire, questions on Eating Habits, Pittsburgh Sleep Quality Index and Perceived Stress Scale. More than two-third (70.4%) of the participants reported to be low, emotional, or very emotional eaters. Total emotional eaters compared to non-emotional eaters reported significantly lower overall healthy eating habits score, higher global PSQI scores and higher perceived stress scores ($p < 0.001$). Young adulthood ($p = 0.001$), obesity ($p < 0.001$), lower healthy eating habits ($p = 0.050$), and high ($p = 0.009$) to moderate ($p = 0.025$) perceived stress were observed to be significantly associated with emotional eating behaviour. The findings raise concerns over the high pan-Indian prevalence of emotional eating which warrants close attention from policymakers to address this emerging health challenge. Improving eating habits, body weight status and perceived stress levels may present potential targets for interventions.

Keywords: food-mood connection, emotional eating, lifestyle behaviours, Indian adults

Introduction

Food intake is not only influenced by biological and physical needs, but also by the emotional state of an individual [1]. Recent developments in the food-behavioural science have accelerated interest towards the novel discipline of food mood connection, which studies the link between an individual's mood and food choices [2]. Under the purview of food-mood connection stems the phenomenon of emotional eating, which is defined as the tendency to eat in response to emotions, most commonly negative emotions [3].

Emotional eating behaviour is increasingly being explored for its links with psychological, physiological and cardiometabolic health burdens [4]. Its prevalence is found to vary considerably across different countries and sociodemographic characteristics. Studies conducted amongst adults in Norway and Spain reported the prevalence of emotional eating to be as high as 54% and 75.8% respectively [5, 6] while another population-based study reported 20.5% prevalence of emotional eating among U.S Latinos (21-85 years) [7]. Despite indications that emotional eating is common, documentation of this phenomenon is not as extensive in developing countries like India.

Additionally, although association between emotional eating and lifestyle disorders have been observed in the adult population, results from a systematic review does not support the same association among adolescents [8]. Hence, the present literature suggests that adults are an important target group to be focused upon while investigating emotional eating behavior as they bear the maximum burden of lifestyle disorders. However, only a few studies have studied the entire spectrum of adulthood. Furthermore, the clinical implications of emotional eating fuel the necessity to investigate its determinants so as to undertake targeted country-specific public health measures.

Sociodemographic characteristics such as socioeconomic status, age and sex have been studied for their association with emotional eating [9, 11]. The UK National Diet and Nutrition Survey suggests that emotional eating can results in a discrete pattern of eating behavior [2]. Poor sleep quality may affect the ability to adapt strategies for emotional regulation across the age groups which could subsequently trigger emotional eating [2]. Emotional eaters are likely to associate the negative emotions of stress with hunger, for which eating provides obvious solution [12].

Studies conducted in the Western population have investigated the predictive role of eating habits, sleep quality and stress in emotional eating [13, 14]. However, considering that country and ethnicity are strong determinants of emotional eating, it remains to be studied whether the same holds true in the Indian population which is socio-culturally diverse from the western population. The present study was hence conducted to: 1) determine the

prevalence of emotional eating among Indian adults; 2) compare eating habits, sleep quality and perceived stress between emotional and non-emotional eaters and 3) investigate the association of sociodemographic characteristics, eating habits, sleep quality and stress levels with emotional eating behavior in the target group.

Materials and methods

Study design, setting and participants

This observational cross-sectional study involved pan-India enrolment of 18–60-year-old community dwelling Indian adults through online data collection mode. Snowball sampling technique was employed for identification and recruitment of eligible participants. The questionnaire included screeners which excluded pregnant / lactating women; individuals diagnosed with binge eating disorders or sleep and / or psychiatric disorders.

An electronic invitation leaflet was distributed through emails and across multiple social media sites. Employees working in corporates with offices & presence across India were specifically targeted and encouraged to roll out the survey among their contacts so as to garner a pan-India reach with a diverse sample. The study protocol was reviewed and approved by Seva Mandal Education Society's Institutional Ethics Committee (SMES-IEC) and was registered with the Central Trial Registry of India (CTRI) (Registration number: CTRI/2022/05/042358). A digital informed consent was taken from all participants prior to commencement of data collection.

Sample size and sampling

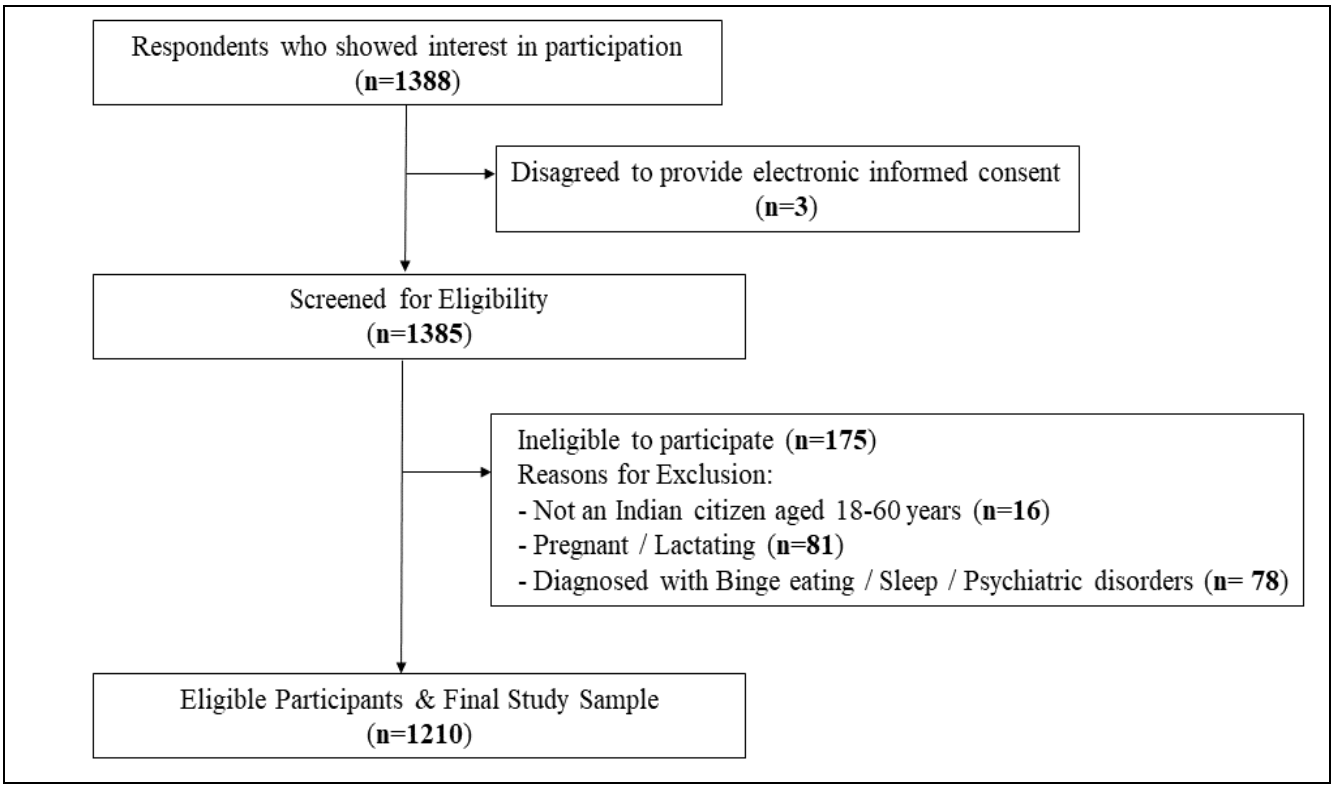

Fig1: Participants enrolled in the study and final sample size achieved

Based on previous Indian studies [10, 15, 16], prevalence of emotional eating among Indian adults was considered to be 50 %. To achieve statistical significance with 95 % confidence interval (C.I) and 5% margin of error, a minimum sample size of 384 participants was required as per results from Open Epi Version 3, recommended for use in medical research [17]. Considering a margin of 40% for dropout in web-based studies [18] and missing data, the sample size was estimated to be 640. As represented in Figure 1, a total of 1,388 participants displayed interest towards participation in the study. Recruitment and screening eventually led to final sample size of 1210 adults.

Data collection and variables measured

This study involved 6 weeks of data collection (17th Feb, 2022 - 6th April, 2022) through a digital questionnaire, comprising of 7 sections, created in English language on Google forms. The questionnaire was finalized post implementation of feedback received from a pilot survey, which was undertaken prior to the main large-scale study. The first section of the questionnaire comprised of Participant Information Sheet and Informed Consent Form. The participants who consented to participate progressed to the second section of the form which screened them for eligibility. Only the eligible participants proceeded to the remaining 5 sections of the form which comprised objective questions for assessment of the variables under investigation.

Sociodemographic characteristics

Sociodemographic information included questions pertaining to sex, age, state of residence, community, highest education qualification, employment status (unemployed, self-employed and service), marital status (married/unmarried), household size and monthly family income. As per the subcategorization followed by earlier studies [19, 20], 18–34-year participants were categorized as young adults and those aged 35-60 years as middle-aged adults.

Monthly family income of the adults was classified as low (< ₹ 30,000), medium (₹ 30,000 – ₹ 60,000) and high (> ₹ 60,000). Household size in the study was defined as number of people the participant resided with (including the participant). Based on government records of average Indian household size [21] two categories were formulated: household size of < 4 and ≥ 5 people. The state / UT of residence reported by the participants were grouped into 4 zones (north, south, east and west India), based on zoning followed in governmental reports [22, 23].

Anthropometric measures

Self-reported measures of height (cm) and weight (kg) of the participants were recorded and Body Mass Index (BMI) was computed. BMI calculated from self-reported anthropometric measures has been found to be in good agreement to that computed from researcher-assessed anthropometric measures among adults [24]. The World Health Organization (WHO) BMI cut-offs for the Asian adult population [25], were used for classification of adults as: Underweight (<18.5 kg/m^2), Normal weight (18.5-22.9 kg/m^2), Overweight (23-24.9 kg/m^2) and Obese (≥ 25 kg/m^2).

Emotional eating behaviour

The validated 10-item, closed-ended Emotional Eater Questionnaire (EEQ) [26] was used to determine the extent to which food intake and eating behaviours were influenced by emotions of the participants. The instrument has been commonly used in Indian studies among adults [10, 16], indicating its validity for the Indian adult population. Total EEQ score ranges from 0-30, on basis of which participants are classified as non-emotional eaters (0-5) and total emotional eaters (6-30), which includes low emotional eaters (6-10), emotional eaters (11-20) and very emotional eaters (21-30). Non-emotional eaters are defined as those whose eating behaviour is independent of their emotional state. Low emotional eaters and emotional eaters demonstrate increasing magnitude of emotional influence on their food choices while very emotional eaters represent the other end of the spectrum with their eating behaviours constantly influenced by their mood and feelings [26].

Eating habits

Questionnaire on eating habits were adapted from a previous study [27] and involved assessment of frequency of breakfast consumption, meal consumption with family, and outside food consumption. The response options - never, less than once a week, 1-2 days a week, 3-4 days a week, and every day - were scored 0-4 for frequency of breakfast consumption and meal consumption with family while they were reversely coded as 4-0 for outside food consumption frequency. This was to ensure that higher scores reflected healthier eating habits.

An additional question on meal time screen usage was also included with the responses (every time, most of the time, seldom and never) scored 0-3. The Likert scores obtained from aforementioned questions were aggregated to obtain an overall score of healthy eating habits (range 0-15), which were categorized into tertiles – low (0-5), moderate (6-10) and high (11-15) healthy eating habits score.

Sleep quality

The 19-item, self-rated Pittsburgh Sleep Quality Index (PSQI) was used for assessing sleep quality of the participants. Acceptable measures of internal homogeneity, consistency (Cronbach's alpha 0.83) and validity have been established for PSQI amongst South Asian adults [28]. PSQI comprises seven components (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction), scored on a scale of 0-3. The seven component scores are summed to acquire a global PSQI score that ranges 0-21. Lower the score, better the sleep quality. Global PSQI score > 5 identifies poor sleepers, with a diagnostic sensitivity of 89.6% and specificity of 86.5 % [28].

Perceived stress

The 10-item Perceived Stress Scale (PSS-10), based on a 5-point Likert scale, assesses degree to which participants consider events in their lives to be unpredictable, irrepressible, overburdening and thereby stressful [29]. The scores of individual PSS items range 0-4. The summed total PSS-10 score ranges 0-40, with higher score indicative of higher perceived stress levels. It is further stratified into three categories of perceived stress: low (0-13), moderate (14-26) and high (27-40) stress.

Statistical analysis

The data was analyzed using STATA v 14.2. Data from none of the respondents was observed to be invalid (missing / incomplete) and hence all the 1210 participants who completed the online survey were included in the final analysis. Descriptive statistics involved reporting of continuous variables as mean ± standard deviation (SD), while categorical variables were reported in terms of frequency (n) and percentage (%). Comparisons of variables was performed using Chi square test of Independence for categorical variables and independent sample t test or One-way ANOVA for continuous variables. Multivariable, binary, logistic regression analysis was performed keeping sociodemographic, BMI, eating habits, sleep quality and stress levels as independent variables and emotional eating as the dependent variable and accordingly odds ratio (OR) was computed. Two tailed analysis was conducted and p value ≤ 0.05 was considered statistically significant.

Results

Table 1: Sociodemographic characteristics of 18–60-year-old Indian adults (n=1210)

Sociodemographic characteristics	Overall (n=1210)
Age Categories	
18-34 years (Young adults)	657 (55.8)
35-60 years (Middle-aged adults)	535 (44.2)
Sex	
Males	742 (61.3)
Females	468 (38.6)
Region	

North Zone	373 (30.8)
South Zone	141 (11.7)
East Zone	64 (5.3)
West Zone	632 (52.2)
Religion	
Hindu	862 (71.2)
Muslim	226 (18.7)
Sikh	20 (1.7)
Christian	25 (2.1)
Others (Parsi, Buddhist, Jain)	77 (6.4)
Highest Educational Qualification	
Up to High-school	160 (13.2)
Graduate/Diploma	760 (62.8)
Post-graduate and above	290 (24.0)
Occupation	
Unemployed	374 (30.9)
Self-Employed	260 (21.5)
Service	576 (47.6)
Marital Status	
Married	710 (58.7)
Unmarried	500 (41.3)
Household Size	
< =4 people	842 (69.6)
> =5 people	368 (30.4)
Monthly Family Income	
Low income (< ₹ 30,000)	348 (28.8)
Medium income (₹ 30,000 – ₹ 60,000)	353 (29.2)
High Income (> ₹ 60,000)	509 (42.1)
Body Weight Status	
Underweight	27 (7.5)
Normal weight	115 (32.1)
Overweight	70 (19.6)
Obese	146 (40.8)

Note: Data is presented as n (%).

The study achieved pan-India participant enrolment with more than half of the participants belonging from West India (52.2%) followed by North (30.8%), South (11.7%) and East (5.3%) zone of India respectively. Of the 1210 participants, 61.3% were males, 55.8% were young adults, 58.7% were married, 69.6% resided in households comprising ≤ 4 people, 62.8% were graduate/diploma holders, more than two-third (69.1%) were employed (service/self) and 42.1% belonged to high income category. The prevalence of overweight and obesity were 16.9% and 49.6% respectively, while 5.8% were underweight (Table 1).

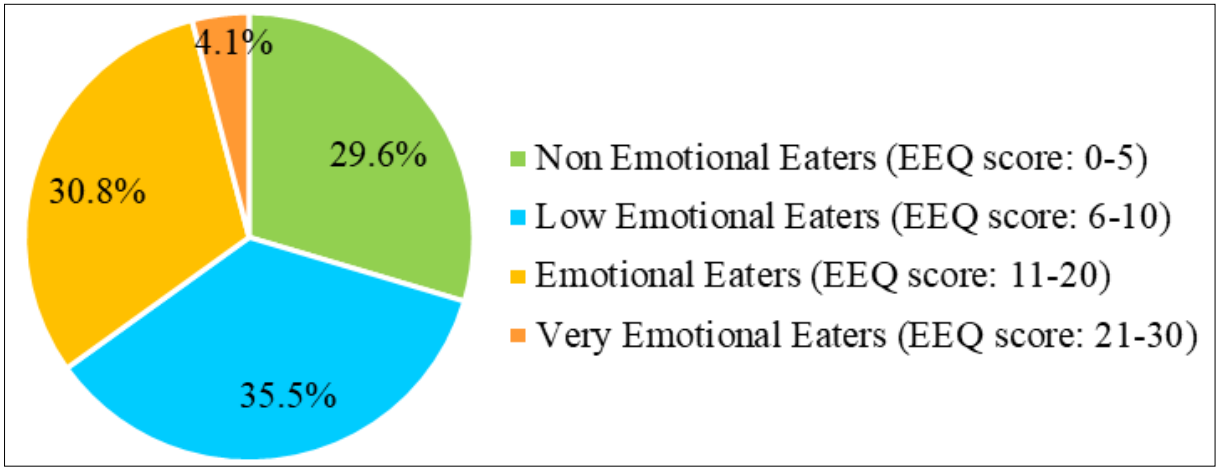

Fig 2: prevalence of emotional eating among Indian adults (n=1210), assessed using the emotional eater questionnaire (EEQ)

Among the Indian adults, the total prevalence of emotional eating was observed to be 70.4% with only 29.6% of the participants being classified as non-emotional eaters, as shown in Figure 2. Among the total emotional eaters, 35.5%, 30.8% and 4.1% of the participants were classified as low, emotional and very emotional eaters respectively.

Table 2: Comparison of eating habits, mean PSQI component scores and perceived stress scores between non-emotional and total emotional eaters aged 18-60 years in India (n=1210)

Variables	Non-Emotional Eaters [b] (n =358)	Total Emotional Eaters [c] (n = 852)	t, p-value
Eating Habits			
Frequency of Breakfast consumption in a week [c]	3.4 (1.0)	3.3 (0.9)	1.239, 0.216
Frequency of eating at least one meal together with family in a week [c]	3.3 (1.1)	3.1(1.1)	4.106, <0.001**
Frequency of eating out or ordering takeaways in a week [d]	2.3 (1.1)	2.4 (0.9)	-0.457, 0.662
Frequency of eating meals while watching a screen / reading / working [e]	1.6 (0.9)	1.4 (0.9)	4.584, <0.001**
Overall Healthy Eating Habits Score [f]	10.9 (2.3)	10.2 (2.2)	4.316, <0.001**
PSQI Components			
Subjective sleep quality	0.7 (0.7)	0.9 (0.7)	-2.667, 0.008*
Sleep latency	1.1 (0.9)	1.3 (0.9)	-3.025, 0.003*
Sleep duration	0.8 (0.7)	0.9 (0.7)	-0.761, 0.447
Habitual sleep efficiency	0.5 (0.9)	0.5 (0.8)	0.857, 0.392
Sleep disturbances	1.1 (0.6)	1.3 (0.6)	-6.030, <0.001**
Use of sleeping medication	0.1 (0.5)	0.2 (0.5)	-0.569, 0.569
Daytime dysfunction	0.4 (0.6)	0.8 (0.8)	-7.134, <0.001**
Global PSQI Score	5.1 (3.0)	6.1 (2.9)	-4.927, <0.001**
Perceived Stress			
Total PSS-10 score	16.3 (5.3)	19.4 (5.3)	-9.146, <0.001**

Note: Data is presented as mean (standard deviation).

Abbreviation: PSQI, Pittsburgh Sleep Quality Index; PSS-10, Perceived Stress Scale-10.

p-values obtained from independent sample t test; *p value ≤0.05,**pvalue≤0.001.

[a] Participants with EEQ score: 0-5.

[b] Includes low, emotional and very emotional eaters with EEQ score: 6-30.

[c] Frequency options scored on a scale of 0 to 4 (never to everyday).

[d] Frequency options scored on a scale of 0 to 4 (every day to never).

[e] Frequency options scored on a scale of 0 to 3 (everytime to never).

Comparison of eating habits between the two groups revealed that the total emotional eaters reported significantly lower frequency of meal consumption with family ($p < 0.001$), higher frequency of distracted eating ($p < 0.001$) and overall lower healthy eating habits score ($p < 0.001$), when compared to non-emotional eaters (Table 2). Prevalence of poor sleep quality and moderate to high perceived stress among the total emotional eaters was 54.1% and 89.7% respectively. The total emotional eaters, in comparison to non-emotional eaters, reported significantly greater difficulties in terms of subjective sleep quality (0.9 ± 0.7 vs 0.7 ± 0.7, $p = 0.008$), sleep latency (1.3 ± 0.9 vs 1.1 ± 0.9, $p = 0.003$), sleep disturbances (1.3 ± 0.6 vs 1.1 ± 0.6, $p < 0.0081$) and daytime dysfunction (0.8 ± 0.8 vs 0.4 ± 0.6, $p = 0.008$). Significantly higher mean global PSQI scores (indicating poor sleep quality) and PSS-10 scores were reported by the total emotional eaters as compared to the non-emotional eaters ($p < 0.001$) (Table 2).

Table 3 represents the results of the multivariable, binary, logistic regression (LR) analysis through the enter LR method. Middle-aged adults were less likely to report emotional eating tendencies than young adults (95% CI 0.41-0.79, $p = 0.001$). The odds of emotional eating tendency were 2.330 times higher among obese adults (95% CI 1.64-3.31, $p < 0.001$), and 1.354 times higher among those with moderate healthy eating habits score as compared to those who reported high healthy eating habits score (95% CI 1.00-1.84, $p = 0.050$). High perceived stress level (95% CI 1.34-8.24, OR = 3.324, $p = 0.009$) and moderate level of perceived stress (95% CI 1.06-2.29, OR = 1.555, $p = 0.025$) were also significantly associated with emotional eating tendency.

Table 3: Logistic regression analyses of factors associated with emotional eating (Emotional Eater Questionnaire score ≥ 6)

Independent (Predictor) Variables	Odds Ratio	95% CI	p-value
Sex			
Male	Reference	Reference	
Female	1.119	0.75, 1.67	0.582
Age Categories			
18-34 years (Young adults)	Reference	Reference	
35-60 years (Middle-aged adults)	0.566	0.41, 0.79	0.001**
Highest Educational Qualification			
Up to High-school	Reference	Reference	
Graduate/Diploma	0.742	0.47, 1.18	0.200
Post-graduate and above	0.852	0.50, 1.45	0.550
Occupation			
Unemployed	Reference	Reference	
Self-Employed	1.184	0.74, 1.88	0.470

Service	0.865	0.56, 1.35	0.522
Household Size			
<=4 people	Reference	Reference	
>=5 people	1.180	0.87, 1.60	0.289
Monthly Family Income			
Medium income (₹ 30,000-₹60,000)	Reference	Reference	
High Income (> ₹ 60,000)	1.094	0.74, 1.61	0.648
Low income (< ₹ 30,000)	1.321	0.90, 1.93	0.152
Body Weight Status			
Normal	Reference	Reference	
Underweight	0.779	0.43, 1.42	0.412
Overweight	1.299	0.86, 1.96	0.214
Obese	2.330	1.64, 3.31	<0.001**
Overall Healthy Eating Habits			
High healthy eating habits score	Reference	Reference	
Moderate healthy eating habits score	1.354	1.00, 1.84	0.050*
Low healthy eating habits score	0.987	0.39, 2.47	0.978
Global PSQI Category [a]			
≤ 5	Reference	Reference	
> 5	1.130	0.84, 1.53	0.427
Perceived Stress Levels [j]			
Low stress	Reference	Reference	
Moderate stress	1.555	1.06, 2.29	0.025*
High stress	3.324	1.34, 8.24	0.009*

Abbreviation: CI, Confidence Interval; PSQI, Pittsburgh Sleep Quality Index.
*pvalue ≤ 0.05, **p value ≤ 0.001.
[a] Global PSQI Score: ≤ 5: Good Sleep Quality; > 5: Poor Sleep Quality

Discussion

The present study sought to determine the nationwide prevalence of emotional eating among community dwelling Indian adults and investigate its association with sociodemographic and lifestyle factors. Several key findings emerged from this study. First, a substantially high proportion of Indian adults demonstrate emotional eating behaviour and are found to be overweight or obese. Second, emotional eaters report poorer eating habits, lower sleep quality and greater perceived stress than non-emotional eaters. Third, significant associations were observed between emotional eating and age, BMI, eating habits, and perceived stress among the sampled adults.

In line with previous evidence [30, 31], two-third of the Indian adults (66.5%) were classified to be overweight or obese. Owing to erratic lifestyle behaviours and poor dietary patterns, an upward trend in prevalence of obesity is being reported in India [30] which raises concerns to undertake immediate stringent public health measures. The pan-Indian prevalence of emotional eating reported in the present study (70.4%) was observed to be to be higher than the reports of previous studies conducted in specific Indian cities, with a smaller sample size [10, 15]. Developed countries such as Spain [32] and Turkey [33] report a prevalence rate of 60-75% among their adult population. Alarmingly, similar trends are now being observed even in India owing to the ongoing nutrition transition and rampant lifestyle changes in developing countries.

Emotional eating may gravitate susceptible individuals towards adoption of unhealthy lifestyle behaviours, as is evidenced from lower healthy eating habits score, higher PSQI score and greater perceived stress amongst the emotional eaters than the non-emotional eaters in this study. Meal time social isolation and screen use have been linked to exacerbation of negative emotions [34, 35]. Healthy eating habits such as family meal time need to be particularly promoted among the emotional eaters to provide emotional stability and prevent further aggravation of emotional eating tendency.

Consistent with the present findings, a study amongst US adults [36] observed that those with higher emotional eating scores were prone to greater sleep difficulties while another study observed significantly higher scores of sleep latency, sleep disturbances and daytime dysfunction among emotional eaters than non-emotional eaters [37]. Several studies have reported a significant positive correlation between emotional eating behaviour and perceived stress scores [11, 38]. Presence of any degree of stress has been suggested to negatively affect emotional regulation, may promote unhealthy eating behaviour and hedonic eating. The higher perceived stress among emotional eaters needs to be addressed since stress and emotional eating are inextricably linked and stressed individuals exhibit greater proneness towards comfort eating [39].

The present study also explored the sociodemographic and lifestyle factors related with emotional eating. Multivariable analysis indicated that young adults (18-34 years) were more likely to be emotional eaters than middle-aged adults ($p = 0.001$). The finding construes with a cross-country comparative analysis involving Brazil, Portugal and Argentina [40] as well as population-based studies among US [9] and Norwegian adults [5], wherein younger age groups reported greater inclination towards emotional eating behaviour. Possible explanation could be that young adulthood is the phase wherein the family support system gradually wanes and the individuals start living independently. The maturity to handle unfavourable situations, the prudence to effectively mitigate hurdles, the ability of emotional self-regulation and self-control over food temptations tends to develop with age [9].

Lack of significant association was found between sex and emotional eating behaviour, which reflects that the problem of emotional eating may affect both the genders equally. Obese participants reported 2.330 times greater odds of emotional eating when compared to those with normal weight status ($p < 0.001$). A plausible explanation could be that obese individuals are more likely to associate emotional

feelings with hunger and are less likely to perceive satiety signals [4]. In a study among Turkish adults, even one-unit increment in BMI led to 0.919 unit increase in negative emotional eating scores [41]. The predictive role of obesity in emotional eating is alarming and underlines the critical importance of alleviative measures since emotional eating behaviour among obese individuals could further drive increase in caloric intake that can subsequently lead to further weight gain in a vicious cycle [11].

Lower healthy eating habits score was found to be significantly associated with the presence of emotional eating behaviour ($p = 0.050$). These findings are corroborated by the results from a US national study [9] wherein ordered logistic regression analysis revealed that those demonstrating unhealthy eating habit of frequenting fast-food restaurants 2–3 times a week had 24% greater likelihood of reporting emotional eating tendencies in comparison to those who never or only once a week consumed outside food. Possible explanation of the present findings could be that better eating habits such as regular breakfast consumption, regular meal consumption with family and avoidance of meal time screen-use have been linked with greater emotional well-being, greater emotional support, and mindful eating practises [34, 35] which cumulatively is likely to result in lower emotional eating tendencies. Study findings suggest that even moderate level of perceived stress is associated with higher odds of emotional eating behaviour. Perceived stress was observed to be independently associated with higher odds of emotional eating (OR = 1.02) in a study among Brazilian samples [42]. Numerous physiological and psychological hypothesis suggest that stress may stimulate food cravings [43], and affect the levels of ghrelin, insulin, and leptin [39] which impact satiety, mood and food choices.

Despite a fairly large sample size and pan-India enrolment of participants, there are a few limitations to this study. One inherent limitation is its cross-sectional design which limits causal inferences. Second, the data was self-reported and hence could be subjected to recall bias and under or over-reporting of data by the participants. However, efforts were taken to minimize this limitation by administering reliable validated questionnaires, which are known to reduce measurement errors. Third, an in-person survey was not feasible on account of COVID 19 pandemic constraints. Hence an online mode of data collection was adopted, which may have introduced a selection bias against those who were not proficient with the digital medium. However, the online questionnaire was pilot tested and careful consideration was paid to improve its user-friendliness. Nevertheless, the online mode of data collection facilitated pan-India enrolment of adults which would not have been feasible through an off-line survey owing to geographical, commute, financial, manpower and other resource constraints.

The study has several key strengths that must be noted. One, to the best of our knowledge, it is the first to assess nationwide prevalence and predictors of emotional eating among Indian adults. Second, in spite of the COVID-19 pandemic constraints, the study could achieve data from a large enough sample size that allowed analyses with high precision. Third, the study succeeded in achieving participant enrolment from every region of India. It was also able to ensure heterogeneity through collection of data from participants belonging to diverse socio-economic strata of the society. Fourth, only a few studies till date have assessed emotional eating patterns across the entire spectrum of adulthood and among both the sexes, particularly in developing nations. This study significantly contributed towards filling the potential lacunae in literature and provides valuable inputs to the fields of food-mood science, public health, preventive & clinical nutrition.

Based on the results of the present study, it is recommended to formulate appropriate preventive, therapeutic multidisciplinary strategies and guidelines since emotional eating behaviours may gravitate susceptible individuals towards adoption of poor lifestyle patterns. The outcomes highlight that emotional eating tendencies among individuals should be carefully assessed so as to ensure more effective dietary intervention programmes. While planning risk assessment of emotional eating, public health measures, preventive actions and interventions for the Indian population, it may be useful to take into account the predictors identified in the present study. The groups found susceptible to emotional eating, such as young adults and obese individuals, need to be more carefully evaluated and provided with elaborate nutritional counselling and education to prevent development of emotional eating tendencies among them. Furthermore, obesity, low healthy eating habits, poor sleep quality and high levels of perceived stress among the Indian population needs to be pertinently addressed for their links with higher emotional eating tendencies and cardiometabolic disorders.

Conclusion

The study raises concerns over the high prevalence of emotional eating among Indian adults for its association with obesity, poor eating habits, sleep problems and higher stress. Close attention and committed efforts are warranted from policymakers to address this emerging health challenge, across both the sexes and particularly among the susceptible individuals, so as to take further steps in improving the emotional and nutritional well-being among Indian adults. Owing to the cross-sectional design of the present study, further longitudinal studies are recommended to be undertaken to determine and substantiate the cause–effect relationships. Future line of studies could employ objective techniques for gaining further insights into emotional eating behaviour of the population. High quality randomized controlled trials which examine therapeutic modalities for mitigation of emotional eating behaviours are recommended to be undertaken.

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Conflicts of Interest

The authors declare no conflict of interest.

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