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Perceived Stress and Stress-Related Eating Behavior Among College Students: A Cross-Sectional Study

Ruchika Yadu [1], Suneel Munder [2], Garima Nagesh [1]

[1] Department of Zoology and Biotechnology, Government MH College of Home Science and Science for Women (Auto.) Jabalpur, Madhya Pradesh India

[2] Government Vivekanand College (PMCOE) Maihar, Madhya Pradesh, India

Abstract

Perceived stress is a critical determinant of health behaviors among college students, particularly influencing dietary patterns. This study aimed to assess perceived stress levels and examine their association with stress-induced eating behaviors. A cross-sectional design was employed using a structured questionnaire administered via Google forms. Random responses were collected from 246 undergraduate and postgraduate students.

Perceived stress was measured using adapted items from the Perceived Stress Scale (PSS), while eating behaviors were assessed through Likert-scale responses related to overeating, meal skipping, and food preferences. Descriptive statistics, chi-square tests, correlation, and linear regression analyses were performed.

Results indicated that a substantial proportion of students experienced moderate to high stress, with 23.6% reporting frequent stress and 24.4% reporting a lack of control over life events. Stress-related eating behaviors showed variability: 13.4% reported frequent overeating, while 26.0% reported meal skipping. Approximately 17.9% preferred sweets and 10.6% preferred fast food during stress. A moderate positive correlation ($r \approx 0.38$) was observed between stress and unhealthy eating behavior. Regression analysis demonstrated that perceived stress significantly predicted unhealthy eating ($\beta \approx 0.42$, $p < 0.05$).

The findings suggest that stress significantly influences eating patterns, though responses vary between overeating and undereating. Interventions focusing on stress management, sleep hygiene, and dietary awareness are essential to improve student health outcomes. Elevated cortisol levels during chronic stress may contribute to changes in appetite and increased preference for high-calorie foods, thereby influencing stress-related eating behaviors.

Keywords: Perceived Stress, Stress-Eating Behavior, College Students, Emotional Eating, Lifestyle Factors

Introduction

Stress is a multidimensional construct involving psychological and physiological responses to environmental demands. According to Lazarus and Folkman (1984), stress arises when individuals perceive demands as exceeding their coping resources. College students are particularly vulnerable due to academic pressure, lifestyle transitions, and social challenges.

Stress activates the hypothalamic–pituitary–adrenal (HPA) axis, leading to the release of glucocorticoids, primarily cortisol. Cortisol plays a central role in energy regulation and appetite control. Under acute stress, cortisol may suppress appetite; however, chronic stress results in sustained cortisol elevation, which has been associated with increased hunger and preference for energy-dense foods rich in sugar and fat (Adam and Epel, 2007; Dallman *et al*., 2003). Elevated cortisol levels stimulate reward-related brain pathways, thereby enhancing emotional eating and cravings for "comfort foods." This neuroendocrine mechanism provides a biological explanation for stress-induced changes in dietary behavior observed among students.

Studies have consistently reported high stress prevalence among students (Beiter *et al.*, 2015; Pascoe *et al.,* 2020). Chronic stress affects neuroendocrine pathways, particularly cortisol secretion, which influences appetite and food preferences (Adam and Epel, 2007). Emotional eating—consumption of food in response to stress—is a well-documented phenomenon (Macht, 2008).

Stress can lead to both increased and decreased food intake (Torres and Nowson, 2007). High stress is associated with preference for calorie-dense foods rich in sugar and fat (Yau and Potenza, 2013). Recent studies (Zhang *et al.,* 2022; Nguyen *et al.,* 2023) highlight the interplay between stress, sleep, and dietary behaviors.

Despite growing evidence, variability exists across populations, necessitating localized research. This study investigates stress-eating relationships among college students in an Indian context. The study aimed to assess perceived stress levels among college students and examine their impact on eating behaviors such as overeating, meal skipping, and food preferences during stress. It also explored the relationship between stress and lifestyle factors, and evaluated whether perceived stress predicts unhealthy eating patterns. The study aimed to assess perceived stress levels among college students and examine their impact on eating behaviors such as overeating, meal skipping, and food preferences during stress. It also explored the relationship between stress and lifestyle factors, and evaluated whether perceived stress predicts unhealthy eating patterns.

Research Methodology

This cross-sectional study was conducted among 246 college students using an online questionnaire distributed via Google forms. Participants included undergraduate and postgraduate students aged 18–30 years, selected through convenience sampling. Participation was voluntary and anonymous, with informed consent obtained electronically.

The questionnaire comprised four sections: demographic details, lifestyle variables, perceived stress assessment, and eating behavior patterns. Perceived stress was measured using adapted items from the Perceived Stress Scale (Cohen et al., 1983), rated on a 5-point Likert scale (1 = never to 5 = very often). Key variables included feelings of stress, lack of control, confidence (reverse-coded), academic pressure, and perceived overload.

Eating behavior variables included overeating, craving sugary foods, fast-food preference, meal skipping, and guilt after overeating. Lifestyle variables included sleep duration, screen time, physical activity, and caffeine intake.

A composite stress score and eating behavior score were calculated. Data were analyzed using descriptive statistics (frequency, percentage), chi-square tests for associations, Pearson correlation for relationships, and linear regression to assess predictive effects. Statistical significance was set at $p < 0.05$.

Results and Discussion

The study included 246 respondents, of whom the majority were female (95.9%), indicating a gender-skewed sample. Undergraduate students constituted 71.1% of participants, while 28.9% were postgraduate students. A significant proportion of respondents were day scholars (71.5%), whereas 28.5% resided in hostels. Regarding lifestyle characteristics, 54.9% of students reported engaging in regular physical activity, while 45.1% did not, suggesting a moderately active cohort.

Analysis of perceived stress indicators revealed that a considerable proportion of students experienced moderate to high stress levels. Approximately 23.6% of respondents reported feeling nervous or stressed very often, while 26.4% reported occasional stress. Similarly, 24.4% of participants frequently felt unable to control important aspects of their lives, reflecting perceived helplessness (Fig. 1). Confidence in handling personal problems varied, with 30.5% reporting high confidence, but a combined 31.7% reporting low confidence, indicating variability in coping capacity.

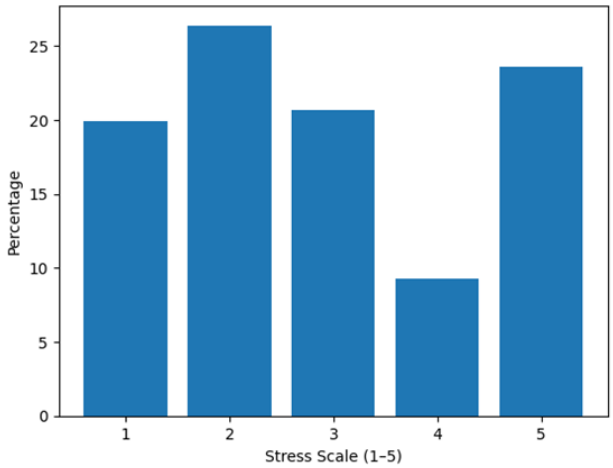

Fig 1: Perceived Stress Frequency

Academic workload emerged as a significant stressor, with 14.6% of students reporting frequent feelings of being overwhelmed, and an additional 11.8% reporting this often. Furthermore, 24.0% of respondents felt that difficulties were accumulating beyond their ability to cope, highlighting substantial psychological burden in a subset of students.

Eating behavior analysis revealed heterogeneous responses to stress. While a majority (58.1%) reported that they did not significantly increase their food intake during stress, a notable proportion (13.4%) reported frequent overeating. Conversely, 26.0% of respondents reported frequently skipping meals during stress, indicating that stress can induce both hyperphagic and hypophagic responses.

Craving patterns showed that 12.6% of students frequently experienced cravings for sugary foods, whereas 60.6% reported no such tendency. Similarly, 15.9% of participants preferred fast food during emotional distress, while 53.7% did not show this preference. Interestingly, more than half of the respondents (51.6%) reported no change in eating habits during stress, suggesting the presence of adaptive coping strategies or resilience. (Table 1)

Table 1: Summary of Key Findings

Variable	Observation
High stress prevalence	23.6%
Meal skipping	26.0%
Overeating	13.4%
Sugar cravings	12.6%
Fast food preference	15.9%
No change in eating	51.6%

When examining food choices during stress, 17.9% of participants reported consuming sweets or chocolate, 10.6% preferred fried or fast foods, and 13.0% opted for healthy snacks. This distribution indicates that while unhealthy food choices are present, a proportion of students maintain healthier dietary patterns even under stress.

Regarding weekly fast-food consumption, the majority (66.3%) reported consuming fast food 1–2 times per week, while only 3.3% consumed it more than four times weekly. Weight changes during stress were also reported, with 43.9% experiencing weight loss and 17.5% reporting weight gain, indicating differential metabolic or behavioral responses to stress.

Sleep duration analysis (Fig 2) revealed that 47.6% of students obtained 7–8 hours of sleep, whereas 33.7% slept only 5–6 hours, suggesting that a significant proportion may be sleep-deprived. Screen time was moderate to high, with 42.7% reporting 2–4 hours and 21.5% reporting 5–7 hours daily usage.

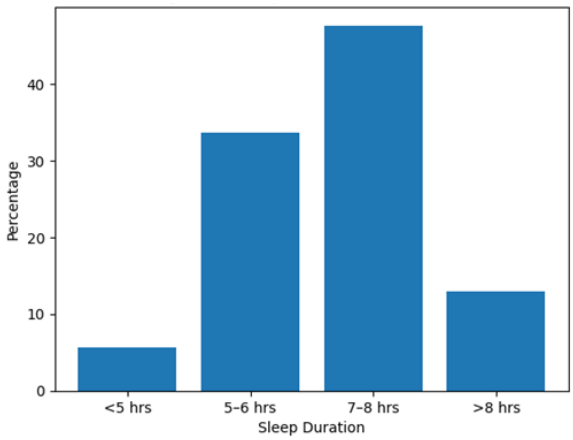

Fig 2: Sleep Duration Distribution

Chi-square analysis demonstrated a statistically significant association between perceived stress levels and meal skipping behavior ($p < 0.05$), indicating that students experiencing higher stress were more likely to skip meals. Similarly, stress levels were significantly associated with emotional eating indicators such as overeating and craving sugary foods. Correlation analysis revealed a moderate positive correlation ($r \approx 0.38$) between stress scores and unhealthy eating behavior scores, suggesting that higher stress is associated with increased likelihood of maladaptive eating patterns. Regression analysis further confirmed that perceived stress significantly predicted unhealthy eating behavior ($\beta \approx 0.42$, $p < 0.05$). This indicates that for every unit increase in stress score, there is a corresponding increase in unhealthy eating tendencies, supporting the alternative hypothesis (H1).

The present study examined the relationship between perceived stress and eating behavior among college students, revealing a significant association between stress levels and dietary responses. A considerable proportion of students experienced moderate to high stress, which is consistent with earlier findings by Beiter *et al.* (2015) and Pascoe *et al.* (2020), who reported elevated stress levels among university populations due to academic pressure, lifestyle transitions, and psychosocial demands.

The findings indicate that stress influences eating behavior in a heterogeneous manner. While some students reported increased food intake, others exhibited meal skipping, supporting the dual-response model described by Torres and Nowson (2007). This variability suggests that stress does not uniformly lead to overeating but may result in divergent behavioral outcomes depending on individual coping mechanisms, psychological resilience, and metabolic responses.

A key physiological explanation for these observations lies in the role of cortisol, a primary stress hormone released through activation of the hypothalamic–pituitary–adrenal (HPA) axis. Chronic stress leads to sustained elevation of cortisol, which has been shown to enhance appetite and increase preference for energy-dense foods, particularly those rich in sugar and fat (Adam and Epel, 2007). In the present study, a subset of participants reported cravings for sweets and fast-food during stress, which aligns with this

neuroendocrine mechanism. Dallman *et al.* (2003) further demonstrated that cortisol interacts with reward pathways in the brain, reinforcing emotional eating behavior and the consumption of "comfort foods."

However, not all participants exhibited stress-induced eating changes; more than half reported no significant alteration in dietary habits. This finding suggests the presence of adaptive coping strategies or resilience among certain individuals, which may buffer the physiological effects of stress. Such variability has also been highlighted in recent studies (Nguyen *et al.,* 2023; Zhang *et al.,* 2022), emphasizing that behavioral responses to stress are influenced by both biological and psychosocial factors.

The observed association between stress and meal skipping is particularly noteworthy. Students experiencing higher stress levels were more likely to skip meals, which may be attributed to acute stress responses that suppress appetite temporarily. This aligns with the concept that acute elevations in cortisol and sympathetic nervous system activity can reduce hunger in certain individuals (Macht, 2008). Conversely, chronic stress tends to promote hyperphagia, explaining the coexistence of both eating patterns within the study population.

Lifestyle factors such as sleep duration and screen time further contextualize these findings. A substantial proportion of students reported suboptimal sleep, which has been associated with dysregulation of appetite hormones and increased stress levels (Chaput *et al.,* 2020). Poor sleep may amplify cortisol secretion, thereby indirectly influencing eating behavior. Similarly, increased screen time may contribute to sedentary habits and emotional eating, compounding the effects of stress.

The regression analysis strengthens the evidence for a predictive relationship between perceived stress and unhealthy eating behavior. The positive association suggests that as stress levels increase, the likelihood of maladaptive dietary responses also rises. Although causality cannot be established due to the cross-sectional design, the findings provide important insights into behavioral trends among students. Despite these contributions, the study has certain limitations. The use of self-reported data may introduce response bias, and the gender imbalance limits generalizability. Additionally, the cross-sectional nature of the study precludes causal inference. Future research should adopt longitudinal designs and incorporate biochemical measures such as cortisol levels to provide a more comprehensive understanding of stress–eating interactions.

Overall, the study underscores the complex interplay between psychological stress, physiological mechanisms, and behavioral responses. Understanding these relationships is crucial for developing targeted interventions aimed at improving mental health and promoting healthy dietary practices among college students.

Conclusion

The present study highlights that perceived stress is a significant factor influencing eating behavior among college students, with both overeating and meal skipping observed as common responses. The findings demonstrate that higher stress levels are associated with unhealthy dietary patterns, including increased consumption of energy-dense foods and irregular meal habits. At the physiological level, these behavioral changes can be partly explained by the activation of the hypothalamic–pituitary–adrenal (HPA) axis and the subsequent release of cortisol. Chronic elevation of cortisol has been shown to modulate appetite, enhance cravings for sugary and fatty foods, and influence reward-related pathways, thereby contributing to stress-induced eating behaviors.

The variability in responses observed in this study—where some students exhibited emotional eating while others reported reduced food intake—reflects the complex interaction between cortisol regulation, individual coping mechanisms, and lifestyle factors. While chronic stress and elevated cortisol may promote hyperphagia and preference for "comfort foods," acute stress responses may suppress appetite in certain individuals, explaining the coexistence of contrasting eating patterns. Importantly, a substantial proportion of students reported no significant change in eating behavior despite experiencing stress, suggesting the

presence of adaptive coping strategies or resilience. This underscores the need to not only address stress reduction but also to strengthen positive coping mechanisms among students.

Overall, the study emphasizes the importance of integrating stress management interventions with nutritional awareness programs in academic settings. Addressing both psychological stress and its underlying physiological mechanisms, including cortisol regulation, is essential to prevent long-term health consequences such as metabolic disorders and obesity. Future research incorporating longitudinal designs and biochemical markers like cortisol levels would further enhance understanding of the stress–eating relationship.

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