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Original Article

Mental Health and Nutrition: A Study on the role of Anxiety and Depression in Eating Habits in College Students

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Abstract

Background: Healthy eating habits are crucial for mental health and well-being in young adults. Poor dietary patterns, characterized by high intake of refined sugars and saturated fats, can lead to increased levels of anxiety and depression. This study investigates the relationship between dietary choices and mental health among college students.

Objective: The study aimed to evaluate the role of anxiety and depression in dietary choices among college students at the University of Management and Technology, Lahore.

Methods: This cross-sectional study involved 144 undergraduate students aged 18-25 from a university in Lahore. Participants completed a self-designed questionnaire, including demographic information, a 7-day Food Frequency Questionnaire (FFQ), the Generalized Anxiety Disorder 7-item scale (GAD-7), and the Patient Health Questionnaire 9-item scale (PHQ-9). Data were analyzed using SPSS version 25 to assess associations between dietary patterns and mental health.

Results: The study found that 70% of participants suffered from depression, with 33.58% experiencing moderate depression. Anxiety affected 38.81% of students, with 21.64% experiencing mild to severe anxiety. Unhealthy eating patterns, including high intake of refined sugars and saturated fats, were linked to increased anxiety and depression. Males were more prone to depression than females due to unhealthy dietary choices.

Conclusion: Unhealthy eating patterns are associated with higher levels of anxiety and depression among college students. Promoting healthy eating habits can potentially reduce these mental health issues.

1 Introduction

The transition from high school to university can be a critical period for students, marked by emotional and psychological challenges that can significantly affect their mental and physical health. Behavioral health encompasses a wide range of psychological and emotional well-being issues, from managing everyday stress to dealing with more severe mental illnesses like depression and generalized anxiety disorder (1). These conditions are common worldwide and often co-exist, classified together as internalizing disorders (2). Depression, in particular, can impair cognitive functions such as executive functioning, emotional regulation, focus, task initiation, memory, and processing speed, and is a significant risk factor for coronary heart disease and increased mortality rates among those with existing heart conditions (3). The stigma surrounding depression and mental illness can further complicate these issues, affecting individuals' willingness to seek help due to fear of mockery and rejection (4).

Nutritional factors can play a critical role in the prevention and management of mental illnesses. Diet is a key health behavior influenced by stress, which can lead to poor dietary choices, such as increased consumption of unhealthy, high-fat foods (5). Dietary decisions are influenced by a complex interplay of factors at the individual, interpersonal, environmental, and policy levels, with approximately 200 food-related decisions made daily (6). Unhealthy eating patterns, including increased intake of refined sugars and saturated fats, have been linked to elevated levels of depression and anxiety (7). Conversely, diets like the Mediterranean diet, rich in fruits, vegetables, whole grains, and healthy fats, have been associated with a reduced risk of depression (8). This diet is considered one of the healthiest in the world and has shown benefits in reducing symptoms of depression and anxiety in various populations (9).

Mental health disorders, including depression and anxiety, affect approximately 14% of the global population (10). In Pakistan, a significant portion of the population suffers from these conditions, exacerbated by socioeconomic factors and inadequate access to mental health resources (11). This study aims to explore the relationship between anxiety, depression, and dietary choices among college students, recognizing the potential of diet as a modifiable factor in managing mental health symptoms. Previous studies have highlighted the impact of dietary patterns on mental health, suggesting that healthier dietary choices are linked to lower depression rates (12). For instance, a study in a Chinese population demonstrated that an integrative lifestyle intervention program, which included dietary changes, effectively reduced symptoms of depression, anxiety, and insomnia (13).

The current study focuses on undergraduate students, a group particularly vulnerable to mental health challenges as they navigate new academic and social environments. These students often face increased stress levels that can lead to poor dietary choices and exacerbated mental health symptoms (14). Understanding how anxiety and depression influence dietary behaviors can inform interventions aimed at promoting healthier eating patterns and improving mental health outcomes. By examining the dietary habits of students at the University of Management and Technology in Lahore, this research seeks to provide insights into how nutritional interventions could support mental health and well-being in this demographic. The study utilizes validated tools, such as the Generalized Anxiety Disorder 7-item scale (GAD-7) and the Patient Health Questionnaire 9-item scale (PHQ-9), to assess the prevalence and severity of anxiety and depression among participants (15). Additionally, a Food Frequency Questionnaire was employed to evaluate dietary intake, focusing on the consumption of key food groups such as fruits, vegetables, meats, and dairy products. This comprehensive approach aims to elucidate the complex relationship between diet and mental health, offering evidence for the development of targeted interventions to improve the well-being of college students (16).

2 Material and Methods

This cross-sectional study was conducted among undergraduate students at a large university in Lahore, focusing on those enrolled in political science and international relations courses. Participants were required to be proficient in English and Urdu and fall within the age range of 18 to 25 years. A total of 144 students who completed the survey were included in the analysis, while faculty members and students from other departments were excluded. The Institutional Review Board (IRB) of the university approved the study, and all participants provided informed consent before participation in accordance with the Declaration of Helsinki (17).

Data collection involved administering a comprehensive survey to the participants, which included demographic information, a Food Frequency Questionnaire (FFQ), the Generalized Anxiety Disorder 7-item scale (GAD-7), and the Patient Health Questionnaire 9-item scale (PHQ-9). Demographic information gathered encompassed age, gender, marital status, living status (hostelite or day scholar), and field of study. The FFQ assessed the frequency of consumption of various food groups, including bread and cereals, fruits and vegetables, meat and poultry, dairy products, and beverages, as well as miscellaneous items like fried foods, sweets, and chocolates. The GAD-7 scale was utilized to assess anxiety symptoms, providing a total score ranging from 0 to 21, which categorized anxiety as low, mild, moderate, or severe (18). The PHQ-9 was used to evaluate depressive symptoms, with scores categorizing depression as none, mild, moderate, moderately severe, or severe (19).

Ethical considerations were strictly adhered to throughout the study. The anonymity of the participants was maintained, and data confidentiality was ensured by assigning unique identifiers to each participant's responses. Participants were informed of their right to withdraw from the study at any time without any consequences. The study protocol was designed to minimize any potential risks to the participants, and the benefits of the research were clearly communicated.

The data collected from the surveys were analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were calculated to summarize the demographic characteristics of the participants and the frequency of dietary intake. Inferential statistics, including chi-square tests and independent t-tests, were used to examine the relationships between demographic variables, dietary patterns, and the levels of anxiety and depression. The level of significance was set at $p<0.05$ for all statistical tests.

The methodological rigor of this study was maintained by employing validated measurement tools, such as the GAD-7 and PHQ-9, and by conducting thorough data analysis to ensure the reliability and validity of the findings. This research aimed to provide insights into the

dietary habits and mental health status of college students, contributing to the understanding of how dietary interventions could potentially improve mental health outcomes in this population (20).

3 Results

The study analyzed data from 144 undergraduate students, comprising 58.96% males and 41.04% females. Participants' age ranged from 18 to 25 years, and all were enrolled in political science and international relations courses at a large university in Lahore. The results revealed significant associations between dietary patterns and levels of anxiety and depression among the participants. The key findings are presented in the following sections.

Table 1 summarizes the demographic characteristics of the study participants. The majority were unmarried and lived as hosteliers.

Demographic Characteristics	Frequency (%)
Gender	
- Male	58.96%
- Female	41.04%
Marital Status	
- Married	15%
- Unmarried	85%
Living Status	
- Hostelite	70%
- Day Scholar	30%

Table 2 displays the distribution of anxiety and depression levels among participants as assessed by the GAD-7 and PHQ-9 scales. The data indicate that a substantial proportion of students experienced moderate to severe anxiety and depression.

Anxiety Level (GAD-7)	Frequency (%)
Minimal (0-4)	21.64%
Mild (5-9)	38.81%
Moderate (10-14)	17.91%
Severe (15-21)	21.64%
Depression Level (PHQ-9)	**Frequency (%)**
None (0-4)	12.69%
Mild (5-9)	24.63%
Moderate (10-14)	33.58%
Moderately Severe (15-19)	21.64%
Severe (20-27)	7.46%

Table 3 outlines the frequency of consumption of various food groups. Notably, the consumption of fruits and vegetables was low, while high intake of refined sugars and saturated fats was prevalent.

The analysis showed a significant association between poor dietary patterns and higher levels of anxiety and depression. Students with a high intake of refined sugars and saturated fats were more likely to report moderate to severe levels of anxiety and depression. Conversely, a higher intake of fruits and vegetables was associated with lower levels of these mental health issues. Chi-square tests indicated significant differences in dietary patterns based on the levels of anxiety and depression ($p<0.05$).

Food Group	Once a Week	Twice a Week	Thrice a Week	More	Never
Bread and Cereals					
Bread	37.31%	17.16%	13.43%	11.19%	20.90%
Wholegrain Chapatti	5.22%	10.45%	34.33%	40.30%	9.70%
Oats	5.97%	15.67%	12.69%	9.70%	55.97%
White Rice	21.64%	31.34%	21.64%	10.45%	15.67%
Fruits and Vegetables					
Fresh Vegetables	18.66%	18.66%	30.60%	6.72%	25.37%
Frozen Vegetables	11.94%	11.19%	5.97%	1.49%	69.40%
Fresh Fruits	22.39%	22.39%	27.61%	10.45%	17.16%
Meat and Poultry					
Mutton	41.04%	20.15%	9.70%	2.24%	26.87%
Beef	38.81%	17.91%	5.97%	0.75%	36.57%
Chicken	17.16%	22.39%	33.58%	22.39%	4.80%
Eggs	20.90%	17.91%	27.61%	25.37%	8.21%
Fish	35.07%	11.94%	5.97%	2.99%	44.03%

Overall, the findings highlight the importance of promoting healthy eating habits among college students to potentially mitigate anxiety and depression. These results underscore the need for interventions targeting dietary improvements as part of mental health strategies in this population.

4 Discussion

The current study explored the relationship between dietary patterns and mental health, specifically anxiety and depression, among undergraduate students in Lahore. The findings revealed that a significant proportion of students experienced moderate to severe levels of anxiety and depression, which were associated with unhealthy dietary choices. These results are consistent with existing literature that highlights the role of diet in mental health. For example, previous studies have shown that poor dietary habits, such as high intake of refined sugars and saturated fats, are linked to increased symptoms of depression and anxiety (5, 7). Conversely, a Mediterranean diet, characterized by high consumption of fruits, vegetables, whole grains, and healthy fats, has been associated with reduced risks of depression and anxiety (8, 9).

This study adds to the growing body of evidence suggesting that dietary patterns are an important factor in the mental health of young adults. The observed preference for unhealthy food items, such as white bread, sweets, and fried foods, over healthier alternatives, reflects findings from other research that stress can lead to poor dietary choices (5, 6). This trend was particularly evident among male students, who reported higher levels of depression and anxiety alongside poorer dietary habits compared to females. Such gender differences have been noted in prior studies, which suggest that women are more likely to make healthier dietary choices due to a greater emphasis on nutrition and health (6).

A strength of this study was its focus on a specific population—college students—who are at a critical transitional phase in life, often experiencing heightened stress and emotional challenges. The use of validated instruments, such as the GAD-7 and PHQ-9, provided reliable measures of anxiety and depression levels, adding robustness to the findings. Additionally, the detailed dietary assessment through a food frequency questionnaire allowed for a comprehensive evaluation of participants' eating habits.

However, the study had limitations that should be acknowledged. The cross-sectional design limits the ability to establish causal relationships between diet and mental health outcomes. The self-reported nature of the dietary intake and mental health assessments may

have introduced reporting biases, as participants might have underestimated or overestimated their food consumption and psychological symptoms. Furthermore, the study was conducted at a single institution, which may limit the generalizability of the findings to other populations or cultural contexts. Future research should consider longitudinal designs to explore causal pathways and include diverse populations to enhance the generalizability of the results.

In light of these findings, there are several recommendations for improving the mental health of college students through dietary interventions. Universities could implement nutrition education programs that emphasize the importance of healthy eating habits and their impact on mental well-being. Providing students with access to healthier food options on campus and integrating stress management strategies into student support services could also be beneficial. Moreover, further research should investigate the underlying mechanisms linking diet to mental health, potentially examining the role of the gut-brain axis and the influence of specific nutrients on neurotransmitter function.

Overall, this study highlights the critical relationship between diet and mental health among college students, underscoring the need for targeted interventions to promote healthier eating patterns and improve psychological well-being. Addressing dietary habits as part of a comprehensive approach to mental health could significantly enhance the quality of life for young adults during their formative academic years (20).

5 Conclusion

TThis study concluded that unhealthy dietary patterns are significantly associated with increased levels of anxiety and depression among college students. The preference for refined sugars and saturated fats over healthier alternatives like fruits and vegetables contributes to poor mental health outcomes. These findings emphasize the need for dietary interventions as part of mental health strategies in academic settings. By promoting healthy eating habits, educational institutions can play a crucial role in improving the mental well-being of students, potentially leading to better academic performance and overall quality of life. This underscores the importance of integrating nutritional education and mental health support within the healthcare framework for young adults, thereby fostering a holistic approach to student health and well-being.

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Disclaimers	
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