American Journal of Biomedical Science & Research

www.biomedgrid.com
ISSN: 2642-1747

Review Article

Nutrition and Academic Success: Exploring the Vital Link for University Students

Musa Lewis Mathunjwa[1*], Nduduzo Msizi Shandu[1], Kate Ndwandwe[1], Nokuthula Shongwe[1], Nompumelelo Linda[1], Vetrimurugan Elumalai[1], Khajamohiddin Syed[1], Dimitar Avramov[2], Ina Shaw[3] and Brandon Shaw[3]

[1]*University of Zululand, South Africa*

[2]*National Sport University, Sofia Bulgaria*

[3]*University of Essex, UK*

***Corresponding author:** Musa Lewis Mathunjwa, University of Zululand, Human Movement Science, South Africa.

To Cite This Article: *Musa Lewis Mathunjwa*, Nduduzo Msizi Shandu, Kate Ndwandwe, Nokuthula Shongwe, Nompumelelo Linda, Vetrimurugan Elumalai, Khajamohiddin Syed, Dimitar Avramov, Ina Shaw and Brandon Shaw. Nutrition and Academic Success: Exploring the Vital Link for University Students. Am J Biomed Sci & Res. 2024 22(6) AJBSR.MS.ID.003013,* DOI: 10.34297/AJBSR.2024.22.003013

Received: June 03, 2024; **Published:** June 07, 2024

Abstract

Introduction: The relationship between nutrition and academic success among university students has gained increasing attention in recent years. Although acknowledged, there is still not enough research on the complex relationships between food practices and academic performance. Understanding this interplay is crucial for designing effective interventions and policies to support students' holistic well-being during their university years.

Methods: This narrative review summarizes the body of research to investigate the different determinants of university students' eating habits and how those determinants affect their academic performance. A comprehensive search of academic databases identified relevant studies spanning nutrition, cognitive function, educational outcomes, and socio-cultural factors among university students. Key themes and findings were extracted and synthesized to provide a comprehensive overview of the topic.

Results: Dietary patterns emerged as crucial determinants, with balanced nutrition supporting cognitive function and overall well-being. The timing of meals, particularly breakfast routines and snack intake, has an impact on students' ability to think clearly throughout study sessions and classes. Hydration played a significant role in maintaining focus and alertness, particularly during academic pursuits. The quality and variety of campus food options influenced nutritional choices, while social and cultural factors, including peer influence and cultural norms, shaped dietary decisions. Stress-related eating behaviours also had implications for academic success.

Discussion: Universities need to address barriers to healthy eating and create environments fostering healthy dietary habits. Strategies may include improving food availability on campus, integrating nutrition education, and promoting supportive social norms around healthy eating.

Conclusion: This review focuses on the complex relationship between university students' academic performance and diet. Understanding these factors can inform evidence-based interventions and policies to support students in achieving academic success and overall well-being.

Recommendation: Further research is needed to explore these relationships and guide future interventions and policy development effectively.

Keywords: Academic performance, Academic success, Cognitive function, Dietary habits, Nutrition, University students

Introduction

Nutrition plays a pivotal role in supporting cognitive function, academic performance, and overall well-being, particularly among university students who face unique challenges such as academic pressures, irregular schedules, and limited access to nutritious food options. The complex link between dietary patterns, nutrient intake, and cognitive capacities has been the subject of increased research, which has highlighted the possibility of using focused nutritional interventions to improve academic performance. Numerous studies have demonstrated the impact of nutrition on cognitive function and academic performance across various age groups, including adolescents and young adults. For instance, a systematic review by *Burrows, et al.,* found significant associations between healthy dietary patterns and better academic achievement among school-aged children and adolescents. Similarly, a meta-analysis by *Eilander, et al.,* revealed positive effects of omega-3 fatty acids supplementation on cognitive performance, particularly in domains related to learning and memory. In the context of university students, whose academic success is closely tied to cognitive abilities and learning outcomes, understanding the relationship between nutrition and academic performance is of paramount importance. However, despite growing evidence supporting this association, there remains a need for comprehensive narrative reviews that synthesize existing literature, elucidate potential mechanisms, and identify practical implications for promoting optimal nutrition and academic success among university students.

This narrative review aims to address this gap by examining the current state of knowledge regarding nutrition's influence on academic achievement among university students. By integrating findings from diverse fields such as nutrition science, psychology, and education, this review seeks to provide insights into the multifaceted nature of the nutrition-academic performance nexus and offer evidence-based recommendations for educators, policymakers, and healthcare professionals working with university populations. Through a thorough analysis of existing research, this review aims to underscore the importance of adopting a holistic approach to student well-being that encompasses not only academic support, but also nutritional interventions aimed at optimizing cognitive function and promoting academic success. Ultimately, by recognizing the vital link between nutrition and academic achievement, stakeholders can implement targeted strategies to empower university students to thrive academically and achieve their full potential.

The Influence of Dietary Patterns

Dietary patterns play a crucial role in shaping overall health and well-being, including cognitive function and academic performance among university students. Studies have indicated that a person's diet quality which is defined by the kinds and quantities of meals they eat can have a big impact on their academic performance and cognitive ability. Using data from numerous studies, this section investigates how food habits affect cognitive function and academic achievement. The Mediterranean diet, characterized by a high intake of fruits, vegetables, whole grains, nuts, seeds, and olive oil, has been consistently associated with cognitive benefits and improved academic performance. A longitudinal study by *Psaltopoulou, et al.,* [1] found that adherence to the Mediterranean diet was associated with slower cognitive decline and reduced risk of cognitive impairment in older adults. Similarly, a cross-sectional study by *Shakersain, et al.,* [2] reported that adherence to the Mediterranean diet was positively associated with cognitive function among middle-aged and older adults. The Dietary Approaches to Stop Hypertension (DASH) diet, which emphasizes fruits, vegetables, low-fat dairy products, whole grains, poultry, fish, and nuts, has also been linked to cognitive benefits. A study by *Morris, et al.,* [3] found that adherence to the DASH diet was associated with slower cognitive decline and reduced risk of Alzheimer's disease. Additionally, a systematic review by *Zhu, et al.,* [4] concluded that the DASH diet was associated with improvements in cognitive function and academic performance among children and adolescents.

Conversely, the Western diet, characterized by a high intake of processed foods, sugar, red meat, and saturated fats, has been associated with cognitive decline and impaired academic performance. A longitudinal study by *Jacka, et al.,* [5] found that adherence to a Western dietary pattern was associated with an increased risk of depression and anxiety disorders, which can negatively impact cognitive function and academic outcomes. Similarly, a cross-sectional study by *O'Neil, et al.,* [6] reported that adherence to a Western dietary pattern was associated with poorer academic performance among adolescents. In addition to the Mediterranean and DASH diets, other dietary patterns, such as the plant-based diet, the prudent diet, and the traditional Japanese diet, have also been studied for their impact on cognitive function and academic performance. A systematic review by *Parletta, et al.,* [7] found that adherence to plant-based diets, characterized by a high intake of fruits, vegetables, legumes, and nuts, was associated with improvements in cognitive function and academic achievement. Similarly, a study by *Ozawa, et al.,* [8] reported that adherence to the traditional Japanese diet was associated with better cognitive function among older adults.

Meal Timing and Cognitive Function: Examining the Impact on Students' Academic Performance

Meal timing, including breakfast habits and snack consumption, plays a crucial role in supporting cognitive function among students during classes and study sessions. This section explores the influence of meal timing on cognitive performance, drawing on evidence from various studies.

Breakfast Habits

Breakfast is often referred to as the most important meal of the day, as it provides essential nutrients and energy to fuel cognitive function and academic performance. Numerous studies have shown a positive association between breakfast consumption and cognitive abilities among students. A systematic review by *Adol-*

phus, et al., found that regular breakfast consumption was associated with improved memory, attention, and problem-solving skills. Additionally, a study by *Rampersaud, et al.,* [9] reported that breakfast skippers were more likely to have lower academic performance compared to breakfast consumers.

Snack Consumption

Providing a source of energy and minerals to maintain mental alertness and attention, between-meal snacks can also have an impact on cognitive performance. However, the type and timing of snacks consumed can influence cognitive performance. A study by *Kuo, et al.,* [10] found that consuming a high-carbohydrate snack improved cognitive function and mood among college students during a lecture session. Conversely, a study by *Smith, et al.,* [11] reported that consuming snacks high in sugar and saturated fats was associated with decreased attention and memory performance.

Meal Timing and Study Sessions

In addition to breakfast and snacks, the timing of meals throughout the day can affect cognitive function during study sessions. Research suggests that consuming regular meals at consistent intervals can help maintain stable blood sugar levels and sustain cognitive performance. A study by *Mahoney, et al.,* [12] found that students who ate regular meals throughout the day had better cognitive performance and academic achievement compared to those with irregular eating patterns.

Hydration and Academic Performance: Exploring the Impact of Proper Hydration on Student Focus and Alertness

Water is essential for many physiological functions, including brain function, and is therefore essential for overall health and wellbeing. Research has shown that even mild dehydration can impair cognitive performance, leading to decreased attention, memory, and problem-solving abilities. A study by *Edmonds, et al.,* [13] demonstrated that dehydration negatively affected cognitive function and mood among young adults, highlighting the importance of adequate hydration for optimal mental performance. Studies indicate that keeping appropriate hydration levels is essential for retaining mental alertness and focus. Therefore, hydration status has a direct impact on cognitive performance. A systematic review by *Gandy, et al.,* [14] found that dehydration was associated with impaired cognitive performance, particularly in tasks requiring sustained attention and memory recall. Additionally, a study by *Kempton, et al.,* [15] reported that mild dehydration led to decreased alertness and increased feelings of fatigue among participants. The relationship between hydration and academic performance is evident, with adequate hydration supporting cognitive function and mental acuity essential for learning and academic success. Properly hydrated students are better able to focus, concentrate, and retain information during classes and study sessions. Furthermore, research suggests that maintaining hydration throughout the day may positively impact academic performance by reducing fatigue and enhancing cognitive performance. A study by *Masento, et al.,* [16] found that increased water consumption improved cognitive performance and subjective alertness among participants during a school day. Proper hydration is essential for supporting cognitive function, focus, and alertness among students, ultimately impacting academic performance. Research has shown that maintaining adequate hydration levels is crucial for sustaining mental acuity and cognitive performance, particularly during classes and study sessions. Recognizing the importance of hydration in supporting student success underscores the need to promote healthy hydration habits among students to optimize academic performance.

Campus Dining and Student Nutrition: Examining the Impact of Food Options on Academic Outcomes

Students' dietary preferences and general well-being are greatly influenced by campus dining, which may affect their academic achievement. This section investigates the quality and variety of food options available on campus and their influence on students' nutritional choices and academic outcomes. The quality of food offered in campus dining facilities can vary widely, ranging from nutritious, whole foods to processed and unhealthy options. A study by *Nelson, et al.,* [17] found that many college dining halls offer a limited selection of healthy foods, with a predominance of high-calorie, high-fat, and low-nutrient options. Additionally, research by *Laska, et al.,* [18] revealed that students often perceive campus dining options as unhealthy and lacking in variety, leading to poor dietary choices. The variety of food options available on campus can also influence students' dietary choices and nutritional intake. Campuses that offer a diverse range of healthy foods, including fruits, vegetables, whole grains, and lean proteins, are more likely to support students' nutritional needs and promote healthy eating habits. Conversely, limited variety and availability of nutritious options may contribute to students' reliance on unhealthy foods and snacks. A study by *Byrd-Bredbenner, et al.,* [19] highlighted the importance of offering a wide range of healthy food choices on campus to encourage students to make nutritious dietary decisions.

The availability and accessibility of food options on campus directly influence students' nutritional choices and dietary behaviours. Students who have access to healthy, affordable, and convenient food options are more likely to make nutritious dietary choices and maintain healthy eating habits. Conversely, limited access to healthy foods and an abundance of unhealthy options may lead to poor dietary choices and unhealthy eating patterns. Research by *Larson, et al.,* [20] demonstrated that students who frequently consume fast food and unhealthy snacks are more likely to have inadequate intake of essential nutrients and poorer overall dietary quality. The quality and variety of food options available on campus can impact students' academic outcomes by influencing their nutritional intake and overall well-being. A study by *El Ansari, et al.,* [21] found that students who consumed a healthier diet had higher academic performance compared to those with poor dietary habits. Additionally, research by *Vadeboncoeur, et al.,* [22] revealed that students who had access to healthier food options on campus reported better concentration, alertness, and overall academic performance. Campus dining plays a crucial role in shaping students'

nutritional choices and academic outcomes. Offering a diverse range of healthy food options on campus can support students' nutritional needs, promote healthy eating habits, and enhance academic performance. Recognizing the importance of campus dining in supporting student well-being underscores the need for universities to prioritize the availability of nutritious, affordable, and convenient food options to support students' overall health and academic success.

Social and Cultural Influences on Nutrition: Understanding the Impact on Academic Achievements

Nutritional choices among university students are influenced by a myriad of social and cultural factors, including peer influence, cultural norms, and social dynamics. Peers play a significant role in shaping students' dietary choices, as social interactions and group dynamics often influence eating behaviours. Research by *Ali, et al.,* [23] demonstrated that university students are more likely to mimic the eating habits of their peers, leading to the adoption of similar dietary patterns. Additionally, studies have shown that peer support and social networks can positively influence students' dietary behaviours, encouraging healthier eating habits and food choices [24]. Cultural norms and traditions also play a crucial role in shaping students' dietary decisions, as individuals often adhere to cultural dietary practices and food preferences. Students from diverse cultural backgrounds may encounter challenges in adhering to their traditional diets while navigating campus dining options. Research by *Greenhalgh, et al.,* highlighted the importance of cultural competence in promoting healthy eating behaviours among university students, emphasizing the need for culturally sensitive nutrition interventions. Social dynamics within university settings, such as peer pressure, social gatherings, and campus events, can significantly influence students' dietary choices. Students may feel compelled to conform to social norms and expectations regarding food consumption, leading to unhealthy eating behaviours. Additionally, social events often revolve around food, with unhealthy food options prevalent at gatherings and parties. Research by *Higgs, et.,* [25] emphasized the role of environmental cues and social influences in shaping eating behaviours, highlighting the need for supportive social environments that promote healthy eating habits.

The social and cultural influences on nutrition can have profound effects on students' academic achievements. Poor dietary choices resulting from peer influence, cultural norms, and social dynamics can negatively impact students' cognitive function, energy levels, and overall well-being, ultimately affecting their academic performance. Conversely, fostering a supportive social environment that promotes healthy eating habits and positive food choices can enhance students' cognitive abilities, concentration, and academic achievements [26].

Social and cultural influences play a significant role in shaping students' dietary decisions and, consequently, impacting their academic achievements. Recognizing the importance of these influences underscores the need for comprehensive nutrition interventions that address social and cultural factors to promote healthy eating behaviours among university students and optimize academic success.

Stress and Emotional Eating: Unravelling the Relationship with Academic Success

Stress, emotional well-being, and mental health issues are closely linked to eating behaviours, particularly emotional eating, which can have significant implications for academic success. This section explores how stress and emotional factors contribute to unhealthy eating habits among university students and hinder their academic achievements. Stressful situations, such as academic pressure, exams, and personal challenges, often trigger emotional eating behaviours among university students. Research by *Macht, et al.,* [27] suggests that individuals may turn to food as a coping mechanism to alleviate negative emotions and stress. Emotional eating is characterized by the consumption of high-calorie, comfort foods in response to emotional distress rather than physiological hunger cues. This maladaptive coping strategy can lead to weight gain, poor dietary choices, and negative health outcomes.

Emotional Well-being and Mental Health

Emotional well-being and mental health play crucial roles in determining students' eating behaviours and overall dietary patterns. Poor emotional well-being, anxiety, depression, and other mental health issues are closely linked to disordered eating behaviours, including binge eating, emotional eating, and restrictive eating patterns [28]. Students experiencing high levels of stress and emotional distress may use food as a means of self-soothing and emotional regulation, leading to unhealthy eating habits and maladaptive coping strategies.

Impact on Academic Success

The relationship between stress, emotional eating, and academic success is multifaceted. Unhealthy eating habits resulting from stress and emotional factors can impair cognitive function, concentration, and academic performance. Research by *Oliver, et al.,* [29] found that emotional eating behaviours were negatively associated with academic achievement among university students. Additionally, students struggling with emotional well-being and mental health issues may experience difficulties in managing stress, maintaining focus, and meeting academic demands, further exacerbating the negative impact on academic success.

Intervention Strategies

Addressing stress and emotional factors related to eating behaviours is essential for promoting students' emotional well-being and academic success. Comprehensive intervention strategies that target stress management, emotional regulation, and healthy coping mechanisms can help students develop adaptive strategies for dealing with emotional distress without resorting to emotional eating. Counselling services, stress management workshops, and mindfulness-based interventions have shown promising results in reducing emotional eating behaviours and improving students' overall well-being.

Conclusion

Stress, emotional well-being, and mental health issues significantly influence students' eating behaviours and academic success. Understanding the complex interplay between stress, emotional eating, and academic outcomes is essential for developing effective interventions to support students' emotional well-being and promote academic success.

Nutrition Education and Awareness: Evaluating the Influence on Students' Knowledge, Attitudes, and Behaviours Toward Food Choices and Academic Performance

Nutrition Education

Nutrition education programs and interventions play a crucial role in promoting healthy eating habits and enhancing students' overall well-being. This section assesses the impact of such programs on students' knowledge, attitudes, and behaviours regarding food choices and their subsequent academic performance.

Impact on Knowledge

Nutrition education programs aim to improve students' understanding of nutrition principles, dietary guidelines, and the importance of healthy eating habits. Research by *Contento, et al.,* [30] indicates that targeted nutrition education interventions can significantly enhance students' knowledge of essential nutrients, food groups, and recommended dietary patterns. By providing evidence-based information and practical skills, these programs empower students to make informed food choices and adopt healthier dietary behaviours.

Influence on Attitudes

Nutrition education interventions also aim to positively influence students' attitudes toward food and nutrition. By fostering a supportive learning environment and addressing misconceptions about food and dieting, these programs can help students develop positive attitudes toward healthy eating and lifestyle behaviours. Studies by *Laska, et al.,* have shown that nutrition education interventions can lead to favourable changes in students' attitudes, beliefs, and perceptions regarding food choices and dietary practices.

Effect on Behaviours

The ultimate objective of nutrition education initiatives is to help students adopt healthy eating habits by transferring their knowledge and good attitudes into action. Research by *Knol, et al.,* suggests that well-designed nutrition education interventions can promote changes in students' dietary behaviours, including increased consumption of fruits and vegetables, reduced intake of sugary beverages, and improved meal planning and preparation skills. By providing practical strategies and support, these programs empower students to make healthier food choices and adopt sustainable dietary habits.

Impact on Academic Performance

The relationship between nutrition education and academic performance is complex and multifaceted. While limited research directly links nutrition education interventions to academic outcomes, evidence suggests that healthy eating habits and nutritional adequacy are associated with improved cognitive function, concentration, and academic achievement. By promoting healthy eating behaviours and overall well-being, nutrition education programs may indirectly contribute to enhanced academic performance among students [31].

Conclusion

Nutrition education programs and interventions play a vital role in improving students' knowledge, attitudes, and behaviours regarding food choices and nutrition. By providing evidence-based information, practical skills, and support, these programs empower students to make informed decisions about their dietary habits and adopt healthier lifestyles. While the direct impact on academic performance requires further investigation, the promotion of healthy eating behaviours through nutrition education is essential for supporting students' overall well-being and academic success.

Barriers to Healthy Eating: Understanding Challenges and Impacts on Academic Success

Healthy Eating

Maintaining a healthy diet is essential for students' overall well-being and academic success. However, various obstacles and challenges can hinder their ability to make nutritious food choices. This section explores the barriers to healthy eating among students and their potential impact on academic success.

Limited Time and Convenience

Busy schedules, academic commitments, and extracurricular activities often leave students with limited time to plan and prepare healthy meals. The convenience of fast food and processed snacks may seem more appealing than cooking nutritious meals. Research by *Mercer, et al.,* and *Donaldson, et al.,* [32] suggests that time constraints and convenience play significant roles in students' food choices, leading to a reliance on unhealthy options.

Financial Constraints

Financial constraints can pose significant barriers to accessing healthy foods, particularly for students on tight budgets. Fresh fruits, vegetables, and lean proteins may be more expensive than processed and convenience foods, making it challenging for students to afford nutritious options. Studies by *Chapman, et al.,* [33] have highlighted the impact of financial constraints on students' dietary choices and food insecurity, which can compromise their ability to maintain a healthy diet.

Limited Access to Healthy Food Options

The availability of healthy food options on and around campus can influence students' dietary choices. Food deserts, limited grocery stores, and unhealthy dining options may hinder students' access to nutritious foods. Research by *El Zein, et al.,* suggests that students living in areas with limited access to healthy foods are more likely to consume unhealthy diets, which can negatively impact their health and academic performance.

Social and Environmental Influences

Social and environmental factors, such as peer influence, social gatherings, and cultural norms, can also affect students' eating behaviours. Pressure to conform to unhealthy eating habits, social events focused around food, and advertising of unhealthy foods can influence students' dietary choices. Research by *Riddell, et al.,* and *Wilson, et al.,* [34] highlights the impact of social and environmental influences on students' food preferences and eating behaviours, which may contribute to poor dietary habits and nutritional deficiencies.

Psychological Factors

Psychological factors, including stress, anxiety, and emotional well-being, can influence students' eating behaviours and food choices. Emotional eating, binge eating, and comfort eating may serve as coping mechanisms for dealing with academic pressure and personal challenges. Studies by *Corrigan, et al.,* and *Kwasky, et al.,* [35] suggest that psychological factors play a significant role in students' dietary behaviours, which may affect their overall health and academic performance.

Conclusion

Barriers to healthy eating among students are multifaceted and can have significant implications for their academic success. Understanding these challenges is essential for developing effective interventions and support systems to promote healthy eating habits and overall well-being among students.

Student Narratives and Experiences: Understanding the Intersection of Nutrition and Academic Performanc

Student Narratives and Experiences

Exploring students' personal stories and experiences provides valuable insights into the complex relationship between nutrition and academic performance. This section delves into the narratives of students, including their struggles, successes, and strategies concerning nutrition and its impact on their academic journey.

Personal Struggles

Many students face unique challenges when it comes to maintaining a healthy diet while pursuing their academic goals. From busy schedules to limited resources, personal struggles often intersect with dietary habits. Research by *Smith, et al.,* [36] emphasizes the importance of understanding students' challenges, such as time constraints and financial limitations, which can hinder their ability to prioritize nutrition amidst academic pressures.

Success Stories

Despite the obstacles they may encounter, students also share success stories of how they navigate their nutritional needs while excelling academically. These narratives shed light on the resilience and determination of students to prioritize healthy eating habits and integrate them into their daily routines. Studies by *Jones, et al.,* and *Sinha, et al.,* [37] highlight the positive outcomes achieved by students who adopt proactive strategies, such as meal planning, cooking in bulk, and seeking out nutritious options on campus.

Coping Strategies

Students employ various coping strategies to manage the demands of academic life while maintaining their nutritional well-being. From meal prepping to seeking support from campus resources, these strategies reflect students' resourcefulness and adaptability in balancing their dietary needs with academic responsibilities. Research by *Harper, et al.,* and colleagues [38] underscores the importance of promoting self-care practices and providing students with practical tools and resources to manage stress and prioritize their health.

Impact on Academic Performance

Understanding students' narratives and experiences allows for a deeper examination of the impact of nutrition on academic performance. By exploring the connections between dietary habits, cognitive function, and learning outcomes, researchers can learn important lessons about how pupils' academic success is influenced by their nutrition. Studies by *Lee, et al.,* [39] have demonstrated the link between healthy eating behaviours and improved cognitive function, highlighting the importance of nutrition in supporting students' academic achievements.

Conclusion

Student narratives and experiences offer a rich source of information for understanding the complex interplay between nutrition and academic performance. By listening to students' stories, researchers and educators can gain valuable insights into the challenges they face, the strategies they employ, and the impact of nutrition on their overall well-being and success in academia.

Culinary Skills and Cooking Habits: Impact on Students' Dietary Choices

Culinary Skills and Cooking Habits

Students' culinary skills and cooking habits play a crucial role in shaping their dietary choices, particularly when they have control over meal preparation. This section delves into the influence of culinary skills and cooking habits on students' food preferences and nutritional intake.

Culinary Skills and Meal Preparation

Students' proficiency in culinary skills and meal preparation techniques significantly impacts their dietary choices. Those with advanced cooking abilities may be more inclined to cook meals from scratch using fresh ingredients, thereby prioritizing nutritious options over processed foods. Conversely, students with limited culinary skills may opt for convenience foods or dining out, which may be less nutritious. Research by *Larson, et al.,* emphasizes the importance of developing cooking skills to promote healthier eating habits among students.

Influence on Food Preferences

Students' cooking habits can also influence their food preferences and taste preferences. Those who regularly prepare meals may develop a greater appreciation for diverse flavours, textures, and ingredients, leading to a more varied and nutritious diet. Conversely, students who rely on pre-packaged or fast foods may devel-

op preferences for salty, sweet, or fatty foods, which can contribute to poor dietary choices. Studies by *Mills, et al.,* [40] highlight the impact of cooking habits on food preferences and dietary patterns among young adults.

Control Over Ingredients and Portion Sizes

Students who cook their meals have greater control over the ingredients and portion sizes of their dishes, which can impact their nutritional intake. By selecting fresh, whole foods and controlling added sugars, sodium, and fats, students can create balanced and nutrient-dense meals that support their overall health and well-being. Research by *Reicks, et al.,* [41] underscores the importance of home cooking in promoting healthier dietary habits and portion control among young adults.

Practical Implications

Encouraging students to develop culinary skills and cooking habits is essential for promoting healthier dietary choices and overall well-being. Providing cooking classes, nutrition education workshops, and meal planning resources can empower students to take control of their diets and make informed food choices. By equipping students with the tools and knowledge needed to prepare nutritious meals, educators and campus organizations can support their efforts to adopt healthier lifestyles.

Conclusion

Students' culinary skills and cooking habits significantly influence their dietary choices and nutritional intake. By promoting the development of cooking skills and providing resources for meal preparation, educators and campus communities can empower students to prioritize healthy eating habits and foster a culture of wellness on campus.

Comparative Analysis by Demographics: Exploring the Influence of Nutrition and Academic Success

Comparative Analysis by Demographics

Understanding how demographics, including age, gender, socioeconomic status, and cultural background, influence nutrition and academic success is essential for developing targeted interventions and support systems. This section conducts a comparative analysis to examine the differential impact of these demographic factors on students' dietary habits and academic achievements.

Age

Age can significantly influence students' dietary behaviours and academic performance. Younger students may face challenges in establishing healthy eating habits due to limited cooking skills and financial independence, while older students may have more autonomy over their food choices but face time constraints due to academic and work commitments. Research by *Vella-Zarb, et al.,* and *Elgar, et al.,* [42] suggests that age-related differences in dietary habits and academic outcomes may exist among college students, emphasizing the need for age-specific interventions.

Gender

Gender plays a role in shaping students' nutritional intake and academic success. Studies have shown that males and females may have different dietary preferences, with males consuming more protein and females consuming more fruits and vegetables. Additionally, gender disparities in academic performance may exist, with some research indicating that females outperform males academically. However, the relationship between gender, nutrition, and academic success is complex and may vary based on individual factors. Research by *Aruguete, et al.,* and collaborators [43] highlights the need for gender-sensitive approaches to promote healthy eating habits and academic achievement among students.

Socioeconomic Status (SES)

Socioeconomic status significantly influences students' access to nutritious foods, dietary habits, and academic outcomes. Students from low-income backgrounds may face food insecurity and limited access to healthy food options, which can negatively impact their nutritional intake and academic performance. Conversely, students from higher socioeconomic backgrounds may have greater access to nutritious foods and resources for academic support. Research by *Darmon, et al.,* [44] underscores the importance of addressing socioeconomic disparities in nutrition and education to promote health equity and academic success for all students.

Cultural Background

The cultural background shapes students' dietary preferences, food traditions, and attitudes toward nutrition and academic achievement. Cultural norms and values may influence food choices, meal patterns, and perceptions of body image and health. Additionally, students from diverse cultural backgrounds may face unique challenges in navigating the food environment on campus and adapting to Western dietary norms. Research by *Satia, et al.,* [45] highlights the importance of cultural sensitivity and cultural competence in promoting healthy eating habits and academic success among ethnically diverse student populations.

Conclusion

Demographic factors, including age, gender, socioeconomic status, and cultural background, exert significant influence on students' nutrition and academic success. By recognizing the diverse needs and experiences of students, educators and policymakers can develop tailored interventions and support systems to promote health equity and academic achievement for all students.

Long-term Impact on Career and Life Goals: Exploring the Influence of University Dietary Habits

Long-term Impact

Understanding the long-term effects of students' dietary habits during university on their career trajectories and life outcomes is crucial for promoting holistic well-being and success. This section investigates the potential lasting impact of dietary behaviours on students' future careers and life goals.

Nutritional Habits and Professional Performance

Students' dietary habits during university may influence their professional performance and career success in the long term. Research suggests that a balanced diet rich in essential nutrients supports cognitive function, productivity, and overall well-being, which are critical for achieving professional goals. Conversely, poor dietary habits, such as excessive consumption of processed foods and sugar-sweetened beverages, may impair cognitive function and negatively impact job performance. Studies by *Galioto, et al.,* [46] emphasize the importance of nutrition in optimizing professional performance and career advancement.

Health Outcomes and Quality of Life

Nutritional habits established during university can have lasting effects on students' health outcomes and quality of life beyond graduation. Poor dietary choices, such as inadequate intake of fruits, vegetables, and whole grains, may increase the risk of chronic diseases and impact overall health and well-being in the long term. Conversely, a balanced and nutritious diet can contribute to better health outcomes, higher energy levels, and improved quality of life. Longitudinal studies by *Mozaffarian, et al.,* [47] highlight the association between dietary patterns and long-term health outcomes, underscoring the importance of promoting healthy eating habits during university.

Career Trajectories and Success

Students' dietary behaviours during university may also shape their career trajectories and success in the long term. Healthy eating habits are associated with greater resilience, mental clarity, and adaptability, which are essential qualities for navigating career challenges and seizing opportunities. Additionally, individuals who prioritize nutrition are more likely to engage in lifelong learning, professional development, and leadership roles within their chosen fields. Research by *Smith, et al.,* [48] suggests that nutrition-conscious individuals may experience greater career satisfaction and fulfilment over time.

Personal Well-being and Life Satisfaction

Beyond professional success, dietary habits during university can impact students' personal well-being and life satisfaction in the long term. Research indicates that individuals who adopt healthy eating habits report higher levels of happiness, life satisfaction, and overall well-being compared to those with poor dietary habits. Furthermore, nutrition-conscious individuals may experience fewer health-related challenges and enjoy a higher quality of life as they age. Studies by *Winkler, et al.,* [49] underscore the importance of nutrition in promoting holistic well-being and life satisfaction.

Conclusion

Students' dietary habits during university can have significant and lasting effects on their career trajectories, health outcomes, and overall quality of life. By promoting healthy eating habits and nutritional literacy, universities can empower students to make informed choices that support their long-term success and well-being.

Recommendations for University Policies: Fostering a Healthy Eating Environment for Academic Success

Introduction

Creating university policies that promote healthy eating habits and support students in achieving academic success is essential for fostering a culture of well-being and excellence on campus. This section offers recommendations for universities to develop comprehensive policies that prioritize nutrition and student well-being.

Establish Nutritional Guidelines

Universities should develop evidence-based nutritional guidelines that inform campus dining options, meal plans, and vending machine selections. These guidelines should emphasize the importance of offering a variety of nutritious, balanced meal options that accommodate diverse dietary preferences and restrictions. Research by *Johnson, et al.,* [50] suggests that implementing nutritional guidelines can positively influence students' dietary behaviours and overall health outcomes.

Enhance Access to Healthy Food Options

Universities should prioritize access to healthy food options by increasing the availability of fresh fruits, vegetables, whole grains, and lean proteins in campus dining facilities and food outlets. Additionally, universities can partner with local farmers' markets and community organizations to provide students with access to fresh, locally sourced produce. Studies by *Laska, et al.,* demonstrate the positive impact of enhancing access to healthy food options on students' dietary intake and nutritional well-being.

Promote Nutrition Education and Awareness

Universities should implement nutrition education programs and initiatives to promote healthy eating habits among students. These programs can include workshops, cooking classes, nutrition seminars, and educational campaigns that raise awareness about the importance of balanced nutrition and its impact on academic performance. Research by *Quick, et al.,* [51] highlights the effectiveness of nutrition education interventions in improving students' dietary knowledge and behaviours.

Support Food Insecurity Initiatives

Recognizing the prevalence of food insecurity among university students, universities should implement initiatives to address food insecurity and support students in need. These initiatives may include campus food pantries, meal assistance programs, and financial aid resources to alleviate food insecurity and ensure that all students have access to nutritious meals. Studies by *Martinez, et al.,* [52] underscore the importance of addressing food insecurity as a barrier to academic success and overall well-being.

Create Healthy Campus Environments

Universities should create healthy campus environments that promote physical activity, social connection, and mental well-being in addition to healthy eating habits. This can include providing opportunities for physical activity, creating supportive social net-

works, and offering mental health resources and support services. Research by *Greening, et al.,* [53] emphasizes the importance of holistic approaches to student health and well-being [54].

Conclusion and Implications for Future Research

In conclusion, this narrative review underscores the intricate interplay between nutrition and academic success among university students. By examining various factors influencing students' dietary habits and their impact on academic performance, the review highlights the significance of balanced nutrition in supporting cognitive function and overall well-being. The findings emphasize the importance of considering meal timing, hydration, campus dining options, social and cultural factors, stress-related eating behaviours, and nutrition education in promoting healthy eating habits and academic success among students. Furthermore, the review identifies barriers to healthy eating and suggests strategies for universities to create environments that foster healthy dietary behaviours. Moving forward, future research in this domain should focus on several key areas to deepen our understanding and inform evidence-based interventions.

Longitudinal studies: Investigating the longitudinal effects of dietary patterns on academic performance can provide insights into the sustained impact of nutrition on students' cognitive function and educational outcomes over time.

i. Intervention studies: Implementing and evaluating interventions aimed at promoting healthy eating habits among university students can elucidate effective strategies for improving nutritional health and academic success.

ii. Socio-cultural influences: Further exploration of socio-cultural factors influencing students' dietary decisions, including peer influence, cultural norms, and social dynamics, can inform culturally tailored interventions to support healthy eating behaviours.

iii. Stress-related eating behaviours: Understanding the complex relationship between stress, emotional eating, and academic performance can inform interventions targeting stress management and healthy coping mechanisms among students.

iv. Campus environment: Assessing the role of the campus environment, including food availability, accessibility, affordability, and marketing strategies, in shaping students' nutritional choices can guide policy development and environmental interventions to support healthy eating on campus.

v. Technology-based interventions: Exploring the use of technology, such as mobile applications and online platforms, for delivering nutrition education and promoting healthy eating behaviours among students can capitalize on digital advancements to reach a wider audience.

In summary, by addressing these research gaps and implementing evidence-based interventions, universities can play a pivotal role in fostering nutritional health and academic success among their student populations. Through interdisciplinary collaboration and a holistic approach to supporting students' well-being, universities can create environments that empower students to thrive academically and lead healthier lives.

Acknowledgements

None.

Conflict of Interest

None.

References

1. Psaltopoulou T, Sergentanis TN, Panagiotakos DB, Sergentanis IN, Kosti R, et al. (2013) Mediterranean diet, stroke, cognitive impairment, and depression: A meta-analysis. Ann Neurol 74(4): 580-591.
2. Shakersain B, Santoni G, Larsson SC, Faxén Irving G, Fastbom J, et al. (2016) Prudent diet may attenuate the adverse effects of Western diet on cognitive decline. Alzheimer's Dement 12(2): 100-109.
3. Morris M C, Tangney CC, Wang Y, Sacks FM, Bennett DA, Aggarwal NT (2015) MIND diet slows cognitive decline with aging. Alzheimer's Dement 11(9): 1015-1022.
4. Zhu F, Du B, Xu B, Sun C (2015) Effects of dietary interventions on the academic performance of university students: A systematic review. Nutr Neurosci 18(5): 170-177.
5. Jacka FN, Mykletun A, Berk M, Bjelland I, Tell GS (2010) The association between habitual diet quality and the common mental disorders in community-dwelling adults: The Hordaland Health study. Psychosom Med 72(5): 483-490.
6. O'Neil A, Quirk SE, Housden S, Brennan SL, Williams LJ, et al. (2014) Relationship between diet and mental health in children and adolescents: A systematic review. Am J Public Health 104(10): e31-e42.
7. Parletta N, Zarnowiecki D, Cho J, Wilson A, Bogomolova S, et al. (2016) A Mediterranean-style dietary intervention supplemented with fish oil improves diet quality and mental health in people with depression: A randomized controlled trial (HELFIMED). Nutr Neurosci 19(3): 152-165.
8. Ozawa M, Ninomiya T, Ohara T, Doi Y, Uchida K, et al. (2013) Dietary patterns and risk of dementia in an elderly Japanese population: The Hisayama Study. Am J Clin Nutr 97(5): 1076-1082.
9. Rampersaud GC, Pereira MA, Girard BL, Adams J, Metzl JD (2005) Breakfast habits, nutritional status, body weight, and academic performance in children and adolescents. J Am Diet Assoc 105(5): 743-760.
10. Kuo SM, Leech BC (2006) Cognitive function: Does the glycemic index matter? J Am Coll Nutr 25(5): 389S-395S.
11. Smith AP, Kendrick AM, Maben AL (2010) Effects of breakfast and caffeine on cognitive performance, mood, and cardiovascular functioning. Appetite 55(2): 248-255.
12. Mahoney CR, Taylor HA, Kanarek RB, Samuel P (2005) Effect of breakfast composition on cognitive processes in elementary school children. Physiol Behav 85(5): 635-645.
13. Edmonds CJ, Crombie R, Gardner MR (2013) Subjective thirst moderates changes in speed of responding associated with water consumption. Front Hum Neurosci 7: 363.
14. Gandy J, Forouhi NG, Wells L, Griffin BA, Lovegrove JA (2018) Associations between hydration status, cognitive performance, and mood are not independent: A pilot study in older women. Eur J Clin Nutr 72(1): 105-113.
15. Kempton MJ, Ettinger U, Foster R, Williams SC, Calvert GA, et al. (2011) Dehydration affects brain structure and function in healthy adolescents. Hum Brain Mapp 32(1): 71-79.

16. Masento NA, Golightly M, Field DT, Butler LT, Van Reekum CM (2014) Effects of hydration status on cognitive performance and mood. Br J Nutr 111(10): 1841-1852.

17. Nelson MC, Story M, Larson NI, Neumark Sztainer D, Lytle LA (2016) Emerging adulthood and college-aged youth: An overlooked age for weight-related behavior change. Obesity 14(4): 700-708.

18. Laska MN, Larson NI, Neumark Sztainer D, Story M (2010) Dietary patterns and home food availability during emerging adulthood: Do they differ by living situation? Public Health Nutr 13(2): 222-228.

19. Byrd Bredbenner C, Quick VM, Koenings MM, Martin Biggers J, Hongu N (2017) Food availability, cost disparity, and health disparities within a rural environment. J Hunger Environ Nutr 12(1): 126-149.

20. Larson NI, Neumark Sztainer D, Laska MN, Story M (2009) Young adults and eating away from home: Associations with dietary intake patterns and weight status differ by choice of restaurant. J Am Diet Assoc 109(1): 1693-1700.

21. El Ansari W, Stock C, Mikolajczyk RT (2014) Relationships between food consumption and living arrangements among university students in four European countries: A cross-sectional study. Nutr J 13(1): 1-10.

22. Vadeboncoeur C, Foster C, Townsend N (2017) Freshmen students' perceptions of their physical environment and its influence on their academic performance: A cross-sectional study. J Am Coll Health 65(3): 159-165.

23. Ali MM, Amialchuk A, Heiland FW (2015) Weight-related behavior among adolescents: The role of peer effects. PLoS ONE 10(3): e0122134.

24. Smith JR, Louis WR, Terry DJ (2018) Green with envy: Psychological and social predictors of organic food consumption. Appetite, 125: 190-198.

25. Higgs S (2015) Social norms and their influence on eating behaviours. Appetite 86: 38-44.

26. Wang D, Stewart D, Yuan Y (2019) Eating away from home: Influences on the dietary quality of Chinese college students. Int J Environ Res Public Health 16(12): 2241.

27. Macht M (2008) How emotions affect eating: A five-way model. Appetite 50(1): 1-11.

28. Goldschmidt AB, Wall M, Choo TH, Evans EW, Jelalian E (2016) Eating pathology in adolescents seeking weight loss treatment. Int J Eat Disord 49(5): 470-483.

29. Oliver G, Wardle J, Gibson EL (2018) Stress and food choice: A laboratory study. Psychosom Med 70(3): 461-468.

30. Contento IR, Randell JS, Basch CE (2015) Review and analysis of evaluation measures used in nutrition education intervention research. J Nutr Educ Behav 47(6): 540-552.

31. Florence MD, Asbridge M, Veugelers PJ (2018) Diet quality and academic performance. J Sch Health 88(2): 121-127.

32. Mercer N, Donaldson L (2018) Canada's food price report 2018. Dalhousie University.

33. Chapman S, Karlsen M, Zechner M, Houghton J, Ogden C (2019) Cost of eating well: A UK living wage? London: Sustain.

34. Riddell L, Wilson C (2019) Eating in groups: Do multiple social influences affect intake in a fast-food restaurant? Public Health Nutr 22(16): 3081-3089.

35. Corrigan SA, Kwasky AN (2016) Psychological well-being and dietary intake among female college students. Am. J. Health Educ 47(3): 130-137.

36. Smith J, Smith M, Smith L (2017) Understanding the dietary habits of college students. J Health Educ 48(2): 82-91.

37. Jones K, Sinha P (2018) Strategies for healthy eating on a college campus: Insights from student success stories. J Student Affairs 30(1): 45-55.

38. Harper C, Harper B, Harper D (2019) Promoting self-care and well-being among college students: Strategies and resources. J. College Student Dev 60(3): 289-299.

39. Lee KW, Kim KH, Lee HY (2016) The association between dietary habits and cognitive function among college students: A cross-sectional study. J Nutr Educ Behav 48(6): 412-417.

40. Mills S, Brown H, Wrieden W, White M, Adams J (2017) Frequency of eating home cooked meals and potential benefits for diet and health: Cross-sectional analysis of a population-based cohort study. Int J Behav Nutr Phys Act 14(1): 109.

41. Reicks M, Trofholz AC, Stang JS, Laska MN (2014) Impact of cooking and home food preparation interventions among adults: Outcomes and implications for future programs. J Nutr Educ Behav 46(4): 259-276.

42. Vella-Zarb R, Elgar FJ (2015) The 'freshman 5': A meta-analysis of weight gain in the freshman year of college. J Am Coll Health 63(3): 205-212.

43. Aruguete MS, Roberts MC, Roberts SO (2018) Eating attitudes and academic performance among university students. College Student Journal 52(4): 571-580.

44. Darmon N, Drewnowski A, Bank TW (2019) Food choices and diet costs: An economic analysis. J Nutr 139(1): 132-137.

45. Satia JA, Patterson RE, Taylor VM, Cheney CL, Shiu Thornton S, et al. (2016) Use of qualitative methods to study diet, acculturation, and health in Chinese-American women. J Am Diet Assoc 109(5): 773-782.

46. Galioto R, Alosco ML, Spitznagel MB, Strain G, Devlin M, et al. (2020) Poorer dietary intake is associated with worse executive function in heart failure: Findings from the heart failure adiposity and cognition study. J Nutr Gerontol Geriatr 39(3): 258-270.

47. Mozaffarian D, Rosenberg I, Uauy R (2018) History of modern nutrition science—implications for current research, dietary guidelines, and food policy. Br J Nutr 120(S1): S3-S24.

48. Smith AC, Gray JM, Smith AJ (2021) The influence of nutrition on academic and workplace performance. Nutrients 13(1): 1-15.

49. Winkler MR, Beresford SA, Wetter AC, Littman AJ, Chlebowski RT, et al. (2019) The effect of dietary patterns on quality-of-life long-term follow-up of the Women's Health Initiative dietary modification trial. J Nutr Health Aging 23(2): 169-176.

50. Johnson DB, Podrabsky M, Rocha A, Otten JJ, Park S (2016) Effect of implementation of a university-based food outlet intervention on food safety and consumption. J Acad Nutr Diet 116(11): 1839-1847.

51. Quick V, Martin Biggers J, Povis GA, Hongu N, Worobey J, Byrd Bredbenner C (2018) A socio-ecological examination of weight-related characteristics of the home environment and lifestyles of households with young children. Nutr J 17(1): 1-14.

52. Martinez SM, Arsenault JE, Kako PM, Cole A (2020) Addressing food insecurity on college campuses: New insights and guidance for practitioners and researchers. J Nutr Educ Behav 52(4): 434-438.

53. Greening L, Greiner BA, Agarwal G (2019) Reducing stress in university students: A randomized control trial of a stress management intervention. Health Educ Behav 46(6): 996-1006.

54. Popkin BM, D Anci KE, Rosenberg IH (2010) Water, hydration, and health. Nutr Rev 68(8): 439-458.