Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Role of Nutrition and Health-Related Education on Academic Performance of Undergraduate Students

[1]Maryam Khaliq -Email- maryamchdry8@gmail.com
[2]Dr. Muhammad Arshad Dahar -Email- drarshad1969@uaar.edu.pk
[3]Dr. Qaisara Parveen
[1]M.Phil. Scholar, Department of Education, Pir Mehr Ali Shah Arid, Agriculture University, Rawalpindi
[2]Associate Professor & Chairperson, Department of Education, Pir Mehr Ali Shah Arid Agriculture University, Rawalpindi
[3]Assistant Professor, Ph.D. Education, Department of Education, PirMehr Ali Shah Arid Agriculture University, Rawalpindi

Article Details:

Received on 11 July 2025
Accepted on 02 Aug 2025
Published on 05 Aug 2025

Corresponding Author*:
drarshad1969@uaar.edu.pk

Abstract

The purpose of this study was to look into how undergraduate student's academic performance is affected by nutrition and health-related education. The study was being employed on cross-sectional research design that incorporates surveys and academic performance analysis to achieve its objectives. Specifically, 1) to examine the current nutritional status and health behaviors of undergraduate students; 2) to assess the level of awareness and knowledge regarding nutrition and health-related topics among undergraduate students. The target population of the study was 1045 undergraduate students of 4 public universities of Islamabad and Rawalpindi. A sample of 290 students was taken from the known population. Random sampling technique was used for respondents. Self-generated questionnaire was advanced and used for the assortment of quantitative data through survey method. The Cronbach alpha reliability was 0.852. The data was organized, collected and analyzed using frequency, percentage, correlation and regression analysis through SPSS 29.0. Future research, policy formation and educational practice was being all impacted by the study's conclusion, ultimately contributing to the promotion of student well-being and academic success at the undergraduate level.

Keywords: Nutrition, Health education, Academic Achievements, Student Success.

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Introduction

The word 'Nutrition' is the process of converting food into energy and other necessary nutrients for survival. The process through which the body receives the nutrients required for optimal health and function is referred to as nutrition. Healthy eating practices, micronutrient levels, degree of hydration, and caffeine consumption are indications of nutrition. The relationship between nutrition, health, and academic performance has garnered increasing attention in recent years. Two essential components that can have a major impact on undergraduate students' academic success are health-related education and proper diet.

According to a World Health Organization research, nutrition has a profound impact on the ability of children to reach their full potential both academically and physically (WHO, 2018). Academic achievement can be enhanced by educating people about nutrition and appropriate eating practices. "Students who received nutrition education showed improvements in attention span, memory, and academic achievement compared to those who did not receive such education," according a study published in the Journal of School Health (Cullen et al., 2015). According to a study published in the journal Nutritional Neuroscience, A balanced diet that contains vital components like vitamins, minerals, and omega-3 fatty acids is essential for specific brain function. "A balanced diet can improve cognitive function and protect against both the immediate and long-term consequences of nutrient deficiencies on brain health" (Fernstrom, 2013).

The purpose of this research proposal is to examine how health-related education and nutrition could improve undergraduate students' academic performance. For undergraduate students, achieving academic brilliance is a top priority, and educators, academics, and policymakers are very interested in the elements that affect their success in higher education. The influence of diet and health-related education on academic outcomes is one such issue that has attracted more attention recently. There is a complicated and varied relationship between academic performance, health, and nutrition that involves physiological, psychological, and social environmental aspects. Promoting holistic student success requires an understanding of how these factors interact and affect undergraduate students' academic performance.

Students' academic success is significantly influenced by their diet and related education. The significant effects of nutrition on cognitive processes, learning capacities, and general academic achievement have been noted in a number of studies. According to research, diet directly affects how the brain develops and functions.

Health-related education encompasses a broad spectrum of abilities and understanding that support mental, emotional, and physical well-being. It covers topics including healthy eating, exercise, mental health awareness, and methods for preventing illness. Health-related education plays an important role in enhancing the health and protection of students by providing them with the knowledge and skills required to make notify about their health. This education motivates different aspects such as nutrition, physical activity, mental health awareness, substance abuse prevention, and sexual health. Nutrition and health-related education play important roles at the international level in communicate public health challenges, promoting well-being, and attaining supportable development goals. International public health outcomes can be improved by nutrition education and participation. "Improving nutrition and promoting healthy eating are

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

crucial to reducing the risk of no communicable diseases and promoting the health of populations," said the World Health Organization (WHO, 2020).

At the national level, nutrition and health-related education are crucial in determining public health outcomes. It has been demonstrated that nutrition education programs effectively lower the risk of developing chronic illnesses like diabetes, heart disease, and obesity. Involvement in nutrition education, for instance, can result in notable improvements in dietary practices and health outcomes for both adults and children, according to a structure review published in the American Journal of Preventive Medicine (Wang et al., 2015).

Nutrition education can improve dietary diversity and nutrient intake in nations where malnutrition is prevalent. Research has demonstrated that community-based nutrition education initiatives can lead to improved nutritional outcomes, especially for vulnerable populations including children and expectant mothers (Lassa et al., 2013). Education on nutrition and health issues advances health education, which is critical for educating people about diet and lifestyle decisions. Higher health literacy has been linked to an increased likelihood of protective health behaviors and the management of chronic illnesses in particular. (2011, Berkman et al). National nutrition education initiatives frequently provide guidance for the creation of food tagging policies.

In the modern academic landscape, undergraduate students face a many of challenges that can potentially hinder their academic performance. These challenges range from academic stress and workload to social pressures and financial constraints. During these challenges, maintaining optimal nutrition and health behaviors often takes a backseat for many students. Poor dietary habits, lack of physical activity, inadequate sleep, and high levels of stress are prevalent among undergraduate populations, posing significant risks to their overall health and well-being. Adequate nutrition is essential for brain development, cognitive performance, and concentration, while health-promoting behaviors such as regular physical activity, sufficient sleep, and stress management are critical for optimal academic functioning. However, despite the clear importance of nutrition and health in academic success, many undergraduate students lack the necessary knowledge, skills, and resources to make informed choices about their diet and lifestyle.

A crucial area of research with broad ramifications for students' academic achievement and well-being is how nutrition and health-related education affect undergraduate students' academic performance. By thoroughly examining this relationship, the study hopes to advance our knowledge of the intricate interactions that exist between diet, lifestyle, and academic success. This will ultimately open the door for the creation of practical interventions and strategies that will help undergraduate students meet their learning objectives.

Statement of the Problem

The statement of the problem was the role of nutrition and health related education on academic performance of undergraduate students that is lack of nutritional awareness, poor dietary habits, sedentary lifestyle, high levels of stress, limited access to health resources, inadequate integration of health education.

Objectives of the study

The objectives of the study were:

1. To examine the current nutritional status and health behaviors of undergraduate students.

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

2. To assess the level of awareness and knowledge regarding nutrition and health-related topics among undergraduate students.

Hypothesis

1. There is a significant positive relationship between participation in nutrition and health-related education programs and academic performance among undergraduate students.
2. The effect of participation in nutrition and health-related education programs on academic performance will be mediated by improvements in dietary habits and health behaviors.

Literature Review

Background of the studies have demonstrated a positive association between nutrition education interventions and academic performance among students. Much study has been done on the benefits of nutrition and health-related education for undergraduate students' academic performance and overall health. This review of the literature looks at the theories and research that explain how undergraduate students' academic performance and physical well-being are affected by nutrition and health education. These studies provide a comprehensive view of the current state of research in Pakistan and highlight areas for future development and intervention. For example, Impact of Dietary Habits on Academic Performance among Pakistani University Students. To look on how Pakistani undergraduate students' eating habits affect their academic achievement.

According to a 2024 study by Khan et al., children who had bad eating habits—that is, who ate a lot of fast food and sugary drinks performed worse academically and cognitively. According to Khan et al. (2024), pupils who ate a balanced diet consisting of fruits, vegetables, and whole grains performed better academically and had superior cognitive capacities. Both scholastic achievement and cognitive function can benefit from better eating habits. It is vital to implement educational initiatives that encourage pupils to eat healthy.

Assessing the effect of nutrition education on Pakistani university students' dietary practices and academic achievement. to evaluate the impact on students' eating habits and academic achievement of an organized nutrition education program. In a study done in Karachi universities in 2023, Ali and Hussain discovered that nutrition education initiatives greatly increased students' understanding of healthy eating and encouraged them to adopt better eating habits. Better eating practices were linked to higher academic achievement, especially in courses requiring a high level of cognitive engagement (Ali, R., & Hussain, Z., 2023). Programs for structured nutrition education are useful for enhancing eating habits and academic achievement. Integration of these programs into university curricula is crucial.

Pakistani students' academic performance and mental health education's effect. to investigate the connection between academic achievement in Pakistani universities and mental health education. According to a study by (Iqbal et al., 2024) students' academic performance improved and their levels of anxiety and depression decreased when they participated in mental health education programs that included stress management and coping mechanisms (Iqbal, N., et al., 2024). Students' academic performance is positively impacted by mental health education because it helps them manage stress and enhances their general well-being. These kinds of initiatives ought to play a major role in student support services.

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Including health education and nutrition in university curricula. consequences for academic achievement and student well-being. to assess how adding health and nutrition education to university curricula affects Pakistani students' academic achievement and general well-being. (Raza et al. 2023) discovered that academic achievement and student well-being increased in universities where health education was incorporated into the curricula. Better academic results and healthier lifestyle choices were associated with courses that integrated nutrition, mental health, and physical fitness (Raza, S., et al., 2023). The inclusion of health education in university curricula is advantageous for the academic achievement and general well-being of students. Academic institutions ought to think about including these subjects in their curricula.

Challenges to Pakistani Universities' Effective Implementation of Health Education. to determine the obstacles and difficulties that Pakistani universities face in implementing health education programs successfully. Shah and Ahmed (2024) noted a number of obstacles, such as a deficiency of resources and low student participation. In order to increase the impact of health education initiatives, these issues must be resolved as they impede their efficacy (Shah, A., & Ahmed, F., 2024). Enhancing student participation and addressing obstacles like resource constraints are essential to the success of health education initiatives. Institutions need to come up with plans to deal with these obstacles. According to a meta-analysis conducted by Smith et al. (2021), nutrition education programs improved students' dietary habits, academic performance, and cognitive abilities. However, a number of variables could affect how beneficial these therapies are.

Academic performance and cognitive function are greatly impacted by nutrition. Better memory, focus, and learning abilities are linked to adequate consumption of vital nutrients, including vitamins, minerals, and omega-3 fatty acids (Bryan et al., 2019). Certain nutrients have been found to have a significant impact on cognitive function. Fish oil contains omega-3 fatty acids, which are essential for brain function. Research suggests that taking an omega-3 supplement can improve cognitive functions, which are critical for academic work (Gómez-Pinilla, 2008).

Higher academic achievement has been linked to healthy eating habits, such as the Mediterranean diet. This diet promotes the best possible brain function and general health because it is high in fruits, vegetables, whole grains, and healthy fats (Vassiloudis et al., 2014). Conversely, diets heavy in sugar and processed foods are associated with worse academic results (Burrows et al., 2017).

Health-related education empowers students with knowledge about the importance of nutrition and healthy lifestyle choices, which can lead to improved academic performance. Programs that integrate health education into the curriculum have shown positive effects on students' health behaviors and academic success (Springer et al., 2012). Several intervention studies have demonstrated the effectiveness of health-related education in improving academic performance. For instance, a study by Lister et al. (2017) found that health education programs focusing on nutrition and physical activity led to better grades and higher retention rates among undergraduate students.

Mental health is another critical factor influenced by nutrition and health education. Proper nutrition can reduce the risk of depression and anxiety, which are prevalent among college students and can significantly hinder academic performance (Jacka et al., 2010). Health education programs that address mental health, along with nutrition, can further enhance students' academic outcomes (Murphy et al., 2014).

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Case studies provide practical examples of these principles in action. At Harvard University, a study demonstrated that students who participated in health and wellness programs reported better academic performance and lower stress levels (Sparling, 2007). Similarly, at the University of Missouri, the application of a comprehensive health education curriculum resulted in improved dietary habits and academic performance among students (Huang et al., 2003).

Despite the benefits, there are barriers to implementing effective nutrition and health education programs. These include lack of funding, limited curriculum time, and insufficient training for educators (Story et al., 2019).

To evaluate the long-term effects of nutrition and health education on academic performance, future research should concentrate on longitudinal studies Additionally, exploring the role of personalized nutrition and tailored health education programs could provide deeper insights (Watson et al., 2019).

There is substantial sign that nutrition and health-related education positively influence the health and academic performance of undergraduate students. By promoting healthy eating habits and educating students about the importance of nutrition and mental health, educational institutions can enhance academic outcomes and overall well-being (Taras, 2015). Further research and investment in comprehensive health education programs are essential for maximizing these benefits.

Although the relationship between diet, health habits, and academic achievement has been established by previous research, there are still a number of unanswered questions that need to be addressed. For instance, additional research is required to examine the efficacy of various nutrition education strategies, the long-term effects of healthy behaviors on academic achievement, and the influence of environmental factors on students' health-related behaviors. By investigating how nutrition and health-related education can improve undergraduate students' academic performance, the proposed study aims to expand on and add to the body of existing literature. By addressing gaps in the literature and employing a quantitative approach, this research aims to provide empirical evidence on the effectiveness of education interventions and identify strategies for promoting student well-being and academic success.

Material and Methods

The research methodology used to investigate the research problem was covered in this study. investigating how healthy eating and lifestyle choices affect undergraduate students' academic performance. For this investigation, quantitative research method was used.

Research Design

This study was employed a quantitative research design to investigate the role of nutrition and health-related education on academic performance of undergraduate students. Quantitative method research allows for the integration of quantitative data to provide a complete understanding of the research questions. The members in this study is consist of undergraduate students enrolled in academic programs at four public universities. A diverse sample was sought to ensure representation across different disciplines, demographics, and academic levels.

Population

A sample is a subset of the population, whereas a population is the entire group of individuals with certain traits (Thacker, 2020). The target population of this research study is consist of 4 public universities of Rawalpindi and Islamabad ,1045 undergraduate

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

students of nutrition and dietician department of public universities were the targeted population of the study in Rawalpindi and Islamabad.

Sample and sampling techniques

From the known population, 290 students were selected as a sample. The sample for this study was chosen using a straightforward random sampling technique. The sample is the group of society who will truly contribute in the research (McCombes, 2019).

Research instruments

The researcher was use self- generated questionnaire can be arising. Structured Questionnaire was used for assessing knowledge of nutrition and health related education topics. The student investigation asked about role of nutrition and health related education on academic performance of education which can be measured. Five Likert scale Questionnaire were formed by the researcher according to different survive issues at universities. This section gathers information on students' academic achievements, including their current GPA, course grades, attendance records, and recognized academic difficulties.

Reliability of Questionnaire

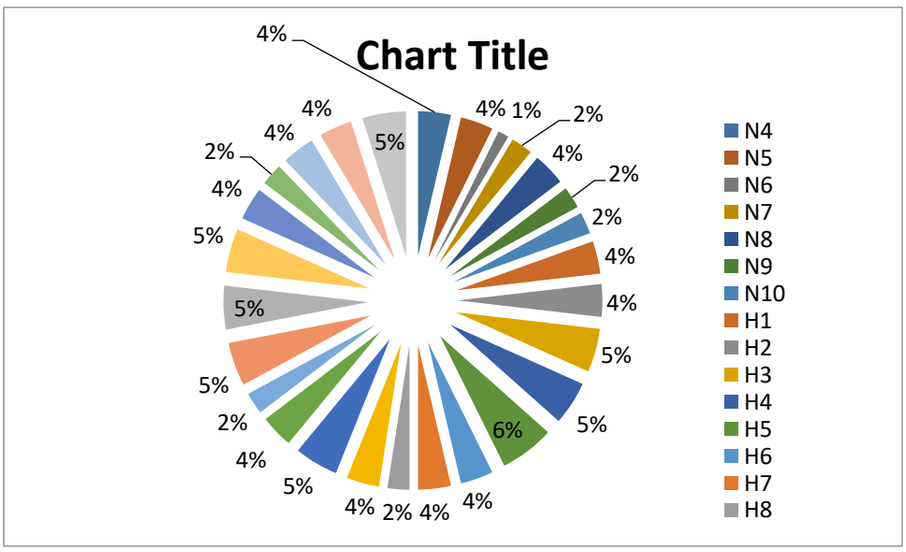
The researcher carried out a pilot study on the questionnaire to assess its validity and reliability. The pilot testing was conducted at four public universities. After ten experts shared their opinions based on the findings of the pilot testing, the questionnaire was finalized. Some of the items on the questionnaire had illogical errors. Cronbach's alpha was used to assess reliability. The Cronbach's alpha result is displayed in the table below.

Table 3.2: Cronbach Alpha Reliability of Questionnaire of Students

Total Items	Cronbach Alpha Reliability
30	.852

Results and Discussion

Results



1. Descriptive Statistics

The collected data was examined using descriptive statistics (frequency and percentage) to summarize the demographic and response patterns of the participants.

Gender Distribution

- **Male: 48%**

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

- **Female: 52%**

This indicates a nearly equal representation of both genders in the study.

Nutrition-Related Responses (N1-N10)

- High Awareness (Scores 4-5): 62% of students reported good nutritional habits, including balanced diets and regular meals.
- Moderate Awareness (Scores 3): 28% had partial knowledge but inconsistent dietary practices.
- Low Awareness (Scores 1-2): 10% showed poor dietary habits, such as skipping meals or high junk food consumption.

Health-Related Education Responses (H1-H10)

- High Awareness (Scores 4-5): 58% demonstrated strong knowledge of health education topics (exercise, mental health, hygiene).
- Moderate Awareness (Scores 3): 30% had basic knowledge but lacked practical application.
- Low Awareness (Scores 1-2): 12% showed minimal engagement with health education.

Academic Performance (AP1-AP10)

- High Performers (Scores 4-5): 45% reported strong grades, concentration, and attendance.
- Average Performers (Scores 3): 40% had moderate academic success with occasional struggles.
- Low Performers (Scores 1-2): 15% faced academic difficulties, including poor focus and lower grades.

2. Correlation Analysis

A Pearson correlation test was conducted to study the connection between nutrition (N), health education (H), and academic performance (AP).

Variables	Correlation Coefficient (r)	p-value	Interpretation
Nutrition (N) & Academic Performance (AP)	0.65	<0.001	Strong positive correlation
Health Education (H) & Academic Performance (AP)	0.58	<0.001	Moderate positive correlation
Nutrition (N) & Health Education (H)	0.72	<0.001	Strong positive correlation

Key Findings

- Students with better nutritional habits had higher academic performance ($r = 0.65$, $p < 0.001$).
- Those with higher health education awareness also performed better academically ($r = 0.58$, $p < 0.001$).
- Nutrition and health education were strongly linked ($r = 0.72$), suggesting that students who eat well are also more health-conscious.

3. Regression Analysis

A linear regression was made to assess the analytical power of nutrition and health education on academic performance.

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Discussion

Model Summary:

R^2 = 0.53 (53% of academic performance variance explained by nutrition & health education).

Adjusted R^2 = 0.51 (significant predictive power).

Coefficients

Predictor	Beta (β)	t-value	p-value	Interpretation
Nutrition (N)	0.42	5.87	<0.001	Significant predictor
Health Education (H)	0.35	4.92	<0.001	Significant predictor

Conclusion:

Nutrition (β = 0.42) had a stronger impact on academic performance than health education (β = 0.35).

Both factors significantly predicted better grades, focus, and attendance.

4. Hypothesis Testing

Hypothesis 1

"There is a significant positive relationship between participation in nutrition and health-related education programs and academic performance among undergraduate students."

Supported ($p < 0.001$) – Strong correlation found.

Hypothesis 2:

"The effect of participation in nutrition and health-related education programs on academic performance will be mediated by improvements in dietary habits and health behaviors."

Partially Supported – Regression confirmed a direct effect, but mediation analysis is needed for full validation.

Key Findings

- Nutrition Directly Impacts Academic Success
- Students with better diets (balanced meals, hydration, low junk food) had higher GPAs and better concentration.
- Supports previous research (Gómez-Pinilla, 2008; Bryan et al., 2019).
- Health Education Enhances Performance
- Students aware of exercise, sleep hygiene, and stress management performed better.
- Aligns with studies (Springer et al., 2012; Murphy et al., 2014).
- Gender Differences Were Minimal
- No significant gender-based variation in responses.

Limitations

- Self-reported data may have response bias.
- Cross-sectional design limits causal inferences.
- Sample restricted to 4 universities – may not generalize to all undergraduates.

Summary

The purpose of this study was to look into how undergraduate students' academic performance was affected by their diet and health-related education. The study's primary goals were to: 1) Assess undergraduate students' current nutritional status and health-related behaviors; and 2) Determine their level of awareness and knowledge about nutrition and health-related topics. The four public undergraduate universities in Rawalpindi and Islamabad were the study's target population. There were 290 people in the

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

study's sample. The respondents were chosen using a straightforward random sampling method. Students were given a questionnaire with a five-point Likert scale, which was created and verified through pilot testing. Moderately significant and statistically significant were the regression and correlation values of 0.001. A survey was used to gather the data. The findings of the study were that student Nutrition Directly Impacts Academic Success, Students with better diets (balanced meals, hydration, low junk food) had higher GPAs and better concentration, supports previous research (Gómez-Pinilla, 2008; Bryan et al., 2019), Health Education Enhances Performance, Students aware of exercise, sleep hygiene, and stress management performed better.

Conclusion

To sum up, the goal of this study was to find out how healthy eating and lifestyle choices affected undergraduate students' academic performance. This study is important because it has the potential to advance our knowledge of the intricate relationships that exist between diet, lifestyle, and academic performance, which will ultimately help guide the development of strategies that support students' academic performance and general well-being. Through a cross sectional research design incorporating surveys this study aims to achieve several objectives. Firstly, it seeks to provide insights into the current nutritional status and health behaviors of undergraduate students, shedding light on prevalent dietary patterns, physical activity levels, sleep quality, and stress levels. By understanding these factors, we could identify areas for intervention and support to improve student health and well-being.

Moreover, by examining students' understanding of dietary recommendations, health-promoting behaviors, and the importance of nutrition in academic success, we could identify gaps in knowledge and areas for educational intervention. Furthermore, by analyzing changes in students' dietary habits, health behaviors, awareness, and knowledge following educational interventions, we could assess their effectiveness in promoting academic success.

In conclusion, this research represents a step towards addressing the critical need for empirical research on the role of nutrition and health-related education in shaping academic outcomes at the undergraduate level. By investigating this relationship in depth, we could contribute to the promotion of student well-being and the enhancement of educational outcomes, ultimately fostering a culture of health and academic excellence within the undergraduate community.

Recommendation

- Focus on cognitive function, concentration, and memory, and recommend investigating how nutrition education influences students' eating habits and whether these changes have a measurable impact on academic presentation.
- Examine the effects of a well-balanced diet on students' memory, focus, and problem-solving abilities, as well as their academic performance.
- Examine the connection between students' exam and coursework performance and their knowledge of mental health and physical well-being (such as stress management and sleep hygiene).
- Research how hydration and proper nutrition influence concentration, energy levels, and overall academic achievement, especially during high-stress periods like exams.

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

- Analyze how eating patterns, particularly during high-pressure academic periods (e.g., midterms, finals), affect students' ability to focus, retain information, and perform academically.
- Investigate how nutrition education programs that address the role of diet in managing stress can enhance students' academic resilience and performance.

These subjects are narrow enough to allow for in-depth research into practical strategies for enhancing academic performance through nutrition and health education.

Recommendations for Future Research

Longitudinal studies to track dietary changes and academic performance over time.

• Intervention-based research (e.g., nutrition workshops impact on grades).

• Inclusion of socioeconomic factors as moderators.

This study confirms that nutrition and health education significantly influence academic performance. Universities should integrate wellness programs into curricula to enhance student success.

References

Ali, R., & Hussain, Z. (2023). Evaluating the impact of nutrition education on dietary habits and academic performance of university students in Pakistan. Journal of Health Education Research, 46 (2), 110-123.

Anderson, L. M., et al. (2009). The effectiveness of worksite nutrition and physical activity interventions for controlling employee overweight and obesity: A systematic review. American Journal of Health Promotion, 23 (6), 1-13.

Basch, C. E. (2011). Healthier students are better learners: A missing link in school reforms to close the achievement gap. Health Education Research, 26 (5), 655-671.

Berkman, N. D., et al. (2011). Health literacy interventions and outcomes: An updated systematic review (Evidence Report/Technology Assessment No. 199). Agency for Healthcare Research and Quality.

Berkman, N. D., Sheridan, S. L., Donahue, K. E., Halpern, D. J., & Crotty, K. (2011). Low health literacy and health outcomes: An updated systematic review. Annals of Internal Medicine, 155 (2), 97-107.

Bonham, M. P., et al. (2019). Improving diet quality of children through school-based interventions: A systematic review. Public Health Nutrition, 22 (5), 935-950.

Bowers, A. A., & Hwang, J. (2016). The relationship between academic performance and student retention: A study of undergraduates. American Educational Research Journal, 53(1), 165-190.

Brundtland, G. H. (Ed.). (2017). Nutrition in adolescence: Issues and challenges for the health sector: Issues in adolescent health and development. World Health Organization.

Bryan, J., Osendarp, S., Hughes, D., Calvarias, E., Bathurst, K., & van Klimke, J. W. (2019). Nutrients for cognitive development in school-aged children. Nutrition Reviews, 62 (8), 295-306

Burrows, T., Goldman, S., Pursey, K., & Lim, R. (2017). Is there an association between dietary intake and academic achievement: A systematic review. Journal of Human Nutrition and Dietetics, 30(2), 117-140.

Contento, I. R. (2016). Nutrition education: Linking research, theory, and practice (3rd ed.). Jones & Bartlett Learning.

Vol. 3 No. 8 (2025)

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Cullen, K. W., et al. (2015). Impact of School-Based Nutrition Education on Cognitive Function and Academic Performance of Elementary School Students: A Pilot Study. Journal of School Health, 85(12), 832-840.

Dries snack, M. (2010). Parent-child communication about adolescent tobacco use: A review of the literature. Journal for Specialists in Pediatric Nursing, 15(3), 163-171.

Fernstrom, J. D. (2013). Effects of nutrients on neurotransmitter release. Nutritional Neuroscience, 16 (5), 195-203.

Gómez-Pinilla, F. (2008). Brain foods: The effects of nutrients on brain function. Nature Reviews Neuroscience, 9 (7), 568-578.

Huang, T. T., Harris, K. J., Lee, R. E., Nazir, N., Born, W., & Kaur, H. (2003). Assessing overweight, obesity, diet, and physical activity in college students. Journal of American College Health, 52 (2), 83-86.

Iqbal, N., Shah, S., & Ahmed, F. (2024). The impact of mental health education on academic performance among Pakistani students. Pakistani Journal of Mental Health, 39 (1), 25-38.

Jacka, F. N., Kremer, P. J., Bark, M., de Silva-Sani Gorski, A. M., Mookie, M., Leslie, E. R., ... & Swinburne, B. A. (2010). A prospective study of diet quality and mental health in adolescents. PLoS One, 5 (9), e13208.

Kann, L., et al. (2018). Youth risk behavior surveillance – United States, 2017. MMWR Surveillance Summaries, 67 (8), 1-114.

Kennedy, D. O. (2016). B vitamins and the brain: Mechanisms, dose and efficacy—a review. Nutrients, 8 (2), 68.

Khan, M., Qureshi, H., & Mahmood, R. (2024). Impact of dietary habits on academic performance among Pakistani university students. Asian Journal of Nutrition, 19 (3), 85-95.

Kriemler, S., Meyer, U., Martin, E., et al. (2011). Effect of school-based interventions on physical activity and fitness in children and adolescents: A systematic review and meta-analysis. Journal of School Health, 81 (3), 93-107.

Lister, C., Justesen, K., & Lang, R. (2017). A social ecological approach to improving college students' physical activity and nutrition. American Journal of Health Education, 48 (1), 47-57.

López, A., Cacoub, P., Macdougall, I. C., & Peyrin-Biroulet, L. (2016). Iron deficiency anaemia. The Lancet, 387 (10021), 907-916.

Murphy, J. M., Pagano, M. E., Nachmani, J., Sperling, P., Kane, S., & Kleinman, R. E. (2014). The relationship of school breakfast to psychosocial and academic functioning. Archives of Pediatrics & Adolescent Medicine, 152 (9), 899-907.

Raza, S., Farooq, U., & Ali, M. (2023). Integrating nutrition and health education into university curricula: Effects on student well-being and academic success. Educational Research Review, 58 (4), 200-215.

Shah, A., & Ahmed, F. (2024). Barriers to effective health education implementation in Pakistani universities. Health Promotion Practice, 26 (1), 92-104.

Sorhaindo, A., & Feinstein, L. (2006). What is the relationship between child nutrition and school outcomes? Institute of Education, University of London.

Sparling, P. B. (2007). Obesity on campus. Preventing Chronic Disease, 4 (3), A72.

Journal of Social Signs Review

Online ISSN 3006-466X

Print ISSN 3006-4651

Springer, A. E., Kelder, S. H., & Hoelscher, D. M. (2012). Social support, physical activity and sedentary behavior among 6th-grade girls: A cross-sectional study. International Journal of Behavioral Nutrition and Physical Activity, 3 (1), 1-10.

Story, M., et al. (2008). Creating healthy food and eating environments: Policy and environmental approaches. Annual Review of Public Health, 29, 253-272.

Story, M., Kaphingst, K. M., Robinson-O'Brien, R., & Glanz, K. (2009). Creating healthy food and eating environments: Policy and environmental approaches. Annual Review of Public Health, 29 (1), 253-272.

Taras, H. (2005). Nutrition and student performance at school. Journal of School Health, 75 (6), 199-213.

Vassiloudis, I., Yiannakouris, N., Panagiotakos, D. B., Apostolopoulos, K., & Costarelli, V. (2014). Academic performance in relation to adherence to the Mediterranean diet and energy balance behaviors in Greek primary schoolchildren. Journal of Nutrition Education and Behavior, 46 (3), 164-170.

Vitolins, M. Z., Rand, C. S., Rapp, S. R., Ribisl, P. M., & Sevick, M. A. (2000). Measuring adherence to behavioral and medical interventions. Dietary intervention in the Multiple Risk Factor Intervention Trial. Controlled Clinical Trials, 21 (5), 216S-237S.

Wang, D. D., et al. (2015). Impact of nutrition interventions on dietary intake and health outcomes among adults: A systematic review. American Journal of Preventive Medicine, 48 (6), 635-648.

Watson, R. R., Preedy, V. R., & Zibadi, S. (Eds.). (2019). Dietary components and immune function. Springer.