

Review Article

The Impact Of Free Nutritional Meal Program On Students' Physical Fitness And Mental Health: A Descriptive Study.

Tri Prasetyo

Department of Sports Science, Padang State University, Indonesia. **E-mail** : triprasetyodurai@gmail.com.

Abstract

The purpose of this study was to analyze the impact of the free lunch program on students' physical fitness and mental health. This study uses a descriptive qualitative approach with an analytical method. The phenomena analyzed in this study used research related to the topic discussed, namely the impact of the free lunch program on students' physical and mental health. The results showed that the free lunch program had a significant positive impact on students' physical and mental health. A person with better physical fitness and mental health also consistently had better academic achievement. Overall, the free lunch program for students not only improves students' physical and mental health but also plays an important role in achieving long-term development by producing a more productive and healthy generation. Every element that forms this program is very important to implement and must be considered carefully to achieve more substantial benefits. Therefore, improving student health and well-being through the free lunch program is an important step for the government to ensure student welfare and sustainable national development.

Keywords : Education, Nutrition, Fitness, Physical, Health, Mental, Students, Achievement.

INTRODUCTION

Donnison, et al., (2021) argue that the state has an obligation to ensure the welfare of all its citizens. This responsibility covers various aspects, including health, education, economy, and social security. According to Büchs, (2021) welfare is not only limited to the provision of basic services, but also includes creating an environment that supports the development of individuals and communities. The government needs to formulate fair and sustainable policies, which guarantee equal access for citizens to resources and opportunities, and protect their rights. In addition, the state must be sensitive to the needs of vulnerable groups and strive to reduce social disparities (Shi, & Stevens, 2021). Thus, the state's responsibility is to build a solid foundation for a prosperous and just life for the entire community.

In Indonesia, there are a number of laws and regulations that support public welfare. The 1945 Constitution is a constitutional basis that guarantees the welfare of the people. Article 31 of the 1945 Constitution states that every

citizen has the right to receive education. In addition, Article 28C paragraph (1) emphasizes the right of every individual to develop themselves. This includes fulfilling basic needs and access to education, science, art, and culture which are very important for improving the quality of life and public welfare. Therefore, the government has a responsibility to provide quality education, including adequate facilities and infrastructure such as classrooms, laboratories, and libraries (Ahmad, 2021). According to Agustin, & Mu'is (2023), good infrastructure greatly supports the learning atmosphere and the curriculum also needs to be adjusted to the needs of the times, and teachers must be trained to have adequate competence. Illøkken, et al., (2021) added that nutrition is also an important aspect, so free lunch programs or the provision of healthy food in schools are very necessary. In addition to academic aspects, students' emotional well-being must also be considered through psychological support programs. Education should be accessible to all children without exception (Benoit, & Gabola, 2021).

Herbert, C. (2022) argues that the welfare of society is

***Corresponding Author:** Tri Prasetyo, Department of Sports Science, Padang State University, Indonesia, **Email:** triprasetyodurai@gmail.com

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greatly influenced by the health and fitness of individuals, especially students. Good health is an important foundation for productivity and self-development. This opinion is reinforced by Chew, & Cerbin, (2021) who said that when students are in good physical and mental condition, they are more motivated to learn, have better concentration, and can absorb information effectively. Good fitness also helps reduce stress, improve mood, and improve social skills. In this way, the educational environment becomes more positive and productive. This prepares the younger generation to make a good contribution to society. So, improving the health and fitness of students is not only beneficial for themselves, but also improves overall social welfare (Sun, et al., 2024).

The Indonesian government runs various social welfare programs to improve the quality of life of the community, including students. These programs include educational assistance, scholarships, and other initiatives that ensure access to good education for all students (Amadi, et al., 2023). Currently, one of the main focuses is the free lunch program. According to Precious, et al., (2023) school lunch is very important for students' health. This program not only meets daily nutritional needs but also supports children's physical and mental development. All of these initiatives are part of the implementation of the 1945 Constitution, which emphasizes the importance of educating the nation. Lindberg, et al., (2022) argue that government programs that provide nutritious food in schools help ensure that students have enough energy and do not feel hungry while studying. In addition, Lundborg, et al., (2022) state that this program teaches the importance of a healthy diet from an early age, which is expected to be applied throughout life. Thus, students' physical health improves, as does their academic achievement and motivation to attend school. Then Cohen, et al., (2021) said that healthy lunch programs can also help reduce educational disparities, especially for students from families with limited access to nutritious food at home.

According to Zavitsanou and Drigas, (2021) good nutritional consumption is very important for physical health and cognitive, emotional, and motor development of students. Research shows that nutritional intake significantly affects these three aspects (Bustamante-Sanchez, et al., 2022; Abbas & Karim, 2023; Prabakar, et al., 2025). Kiani, et al., (2022) stated that good nutrition, especially rich in iron, vitamins, and minerals, can improve cognitive function. Malnutrition, such as anemia, iron deficiency, can interfere with concentration and learning ability. In addition, Verulava, & Devnozashvili, (2021) found that students who eat a nutritious breakfast tend to have better academic performance than those who do not. Magesh, P. (2022) showed that nutritional intake affects mood and behavior. Such as complex carbohydrates can increase serotonin production in the brain, which helps regulate mood. Research by Osiecki, et al., (2022) also showed

that students who had a nutritious breakfast had lower anxiety levels and were more enthusiastic about learning. Smolińska, et al., (2024) found that good nutrition, especially that rich in protein and omega-3 fatty acids, can improve students' motor skills.

Although there are a number of benefits from fulfilling nutrition for students, on the other hand Shinde, et al., (2023) said that malnutrition is a problem that has a major impact on student growth and development. Dukhi, N. (2020) explained that malnutrition can inhibit physical growth and brain development, as well as reduce their immune system. Then Kawafha, et al., (2024) in their research stated that malnutrition affects behavior, interaction, and academic achievement. Healthy adolescents are very important for the future of a country. The younger generation has an important role in the development and progress of the nation. Student health plays a major role in the progress of the country. This is emphasized by the opinion of Guo, et al., (2023) that healthy students tend to have better concentration, more optimal learning abilities, and higher resistance to stress. All of this helps them achieve better academic performance and prepare themselves for future challenges.

According to Prilleltensky, and Prilleltensky (2021) having good health allows young people to innovate and work more productively. It will also help them make a positive contribution to society. Baid, Hayles & Finkelstein, (2021) argue that by investing in students' health and fitness, we can reduce the economic burden in the future, reduce health care costs, and increase productivity. Therefore, Søvold, et al., (2021) suggest that prioritizing students' health and fitness through free lunch programs is an important step. This study highlights the impact of free nutritious meal programs on students' physical fitness and mental health. As we know, this program not only helps address malnutrition among children but also improves their concentration and academic performance. By ensuring that all students get adequate nutrition while attending school, we support their physical and mental development. In addition, this program can reduce socio-economic disorders by ensuring that all students, regardless of background, have equal access to healthy food. Thus, investing in free lunch programs is a long-term investment in the health and future of the nation.

METHOD

This study uses a qualitative descriptive approach and analysis method. This study refers to the theory of Taylor, S. J., Bogdan, R., & DeVault, M. L. (2015) that qualitative research is "a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior". This qualitative research focuses on the natural background holistically, treats humans as research tools,

conducts data analysis inductively, and emphasizes the process rather than the results of the research agreed upon by the researcher and the research subject. The research subjects used must reflect the relevance to the research phenomenon. The phenomena analyzed in this study utilize research that is relevant or related to the topic discussed, namely the impact of the free nutritious meal program on students' physical fitness and mental health.

RESULTS AND DISCUSSION

Vaivada, et al., (2022) explained that the free lunch program is an important social initiative in various countries that aims to help underprivileged communities and improve the welfare of children in schools. This program is usually supported by the government, non-profit organizations, or partnerships between the public and private sectors. Various studies have revealed the main benefits of this program, including reducing hunger and malnutrition among children, so that they can focus more and excel in school (Jomaa, et al., 2011; Wall, et al., 2022; Raveenthiranathan, et al., 2024). In addition, Wang, & Cheng (2022) said that this program also helps ease the burden of family costs, so that they can use the money for other more urgent needs. Although it has been around for years, the free lunch program continues to evolve and adapt to current community needs, including a focus on health and the desire for the food provided (Pastorino, et al., 2023).

Table 1. Legal Framework and Coverage of Free Lunch Programs in Various Countries.

Country	Legal Framework	Coverage
Brazil	Programa Nacional de Alimentação Escolar (1997)	Decentralization, local procurement, family farming, national nutritional guidelines.
Finland	Kansallinen Kouluruokailulaki (1945)	Universal access, free food, nutritional guidelines, Nordic nutritional recommendations.
South Korea	Hakgyo Geupsikbeop (1995)	Eligibility based on income, nutritional quality, portion size, nutritional adequacy figures for Koreans.
USA	Nation School Lunch Act (1946)	Federal funding, healthy eating education, nutritional guidelines for Americans
India	Mid-Day Meal Scheme (Constitutional Court Decision 2002)	Central/state funding, grades 1-8, standard menu with minimum nutritional requirements, decentralized implementation with community involvement.
Japan	Gakkou Kyuushoku-hou (1954)	Universal access, free food, local procurement, traditional Japanese cuisine, decentralization with national nutrition guidelines
German	School Lunch Program (based on state law, one of which Berliner Qualitätskriterien in Berlin, 2003)	Universal access, free/subsidized food, healthy food, balanced nutrition, recommendations of the German Nutrition Society, decentralization with state regulations.
France	School Canteen Services (based on regional regulations, namely Charte de Qualite de l'alimentation collective pour la restauration scolaire) (2022)	Universal access, high quality food, national quality charter, focus on sustainability
Philippines	Masustansyang Pagkain para sa Batang Pilipino Act (2017)	National level coordination, compliance with national standards and guidelines, and program monitoring.
Sao Tome & Principe	Law 4/2012 establishing the School Food and Health Programme (2012)	Budget procurement, program implementation, national level coordination, and program monitoring and evaluation

Each country has clear objectives and legal frameworks to ensure that student lunch programs run smoothly (WHO, 2021). Cheung, L. W. (2007) in his book explains that this program is designed to improve the health and well-being of students. Then Ibour, et al., (2022) said that by providing proper nutrition, students can be more focused and energetic throughout the day, thus supporting their academic achievement. Although the free lunch program has many benefits in supporting student development and growth, its implementation needs to consider several important aspects so that the desired goals can be achieved optimally (Cohen, et al., 2021). Gaddis & Jeon, (2022) argue that primary attention should be paid to the quality and nutritional value of the food served. This is because balanced and nutritious food will support students to be more concentrated

and active in the learning process (Karimov, et al., 2024). Perry, et al., (2024) emphasized that the sustainability of the program must be guaranteed, both in terms of funding and logistics of providing food, so that the program does not stop in the middle of the road. Then the aspects of food hygiene and safety must also be considered, to avoid health risks for students (Sanlier, & Konaklioglu, 2012). Another aspect of consideration that is no less important is the involvement of the local community, including parents and schools, in the planning and implementation of the program can increase effectiveness and ensure that this program really suits the needs of students (Gordon, & Ruffini, 2021). By considering these factors, the free lunch program can be an important pillar in creating a better learning environment so that all students in need can feel the benefits.

Physical Fitness

Marcus and Pekmezi (2024) argue that physical fitness is the body's ability to carry out daily activities well without feeling too tired, and still having energy to do additional activities. In the context of school, Jirout, et al., (2019) argue that physical fitness for students is very important because it directly affects their learning methods and academic achievement. One of the most influential factors is nutritional status. Good nutrition provides the energy and nutrients the body needs to function properly. Conversely, poor nutrition can interfere with physical performance and overall health (Hervás, et al., 2018). Therefore, good nutritional intake is a key factor in supporting students' physical fitness. Research shows a strong relationship between nutritional quality and fitness levels (Asigbee, et al., 2018; Obidovna & Sulaymonovich, 2022; Sepriani, et al., 2024; Ding, et al., 2024).

According to Herbert, C. (2022) optimal physical fitness not only plays an important role in health, but also contributes to students' academic achievement and mental well-being. Furthermore, Savarino, et al. (2021) in their research stated that a balanced diet, which includes carbohydrates, proteins, fats, vitamins, and minerals, greatly supports maximum body function. Research conducted by Efendi, et al. (2023) shows that students who consume nutritious foods have better levels of physical fitness compared to those who are malnourished. This opinion is reinforced by the results of research conducted by Da Silva Aniceto, & Suyoko, A. (2024) that optimal nutritional status can provide adequate energy, support bone and muscle growth, and strengthen the immune system. On the other hand, inadequate nutritional status can hinder children's physical and mental development, cause fatigue, and reduce the body's resistance to disease. In addition, Anokha, & Kachhi, (2025) argue that during periods of growth and development and dense activities, students need adequate nutritional and fluid intake. Lack of fluids can negatively impact concentration, alertness, and attention

span. Gutschall, M. D. (2024) emphasized that hydration is a very important element to support physical performance, where fluids play a role in maintaining body temperature and organ function optimally. Overall, a balanced and sufficient nutritional intake is crucial to support good physical performance for students during their growth and development (Zavitsanou & Drigas, 2021).

Chen, et al., (2022) in their research stated that physical fitness has a direct influence on influencing students' ability to concentrate while studying. The same opinion was also emphasized by Wlodkowski, & Ginsberg, (2010) who stated that students with good physical condition can follow intensive learning programs and can follow lessons more effectively. Therefore, they need sufficient and balanced energy intake to support learning activities. Thus, maintaining a healthy and balanced diet is a fundamental aspect that must be met in an effort to support student learning success (Benes, & Alperin, 2022). Various studies have shown that students with good nutritional status have higher aerobic capacity and endurance. Conversely, students with poor nutrition tend to tire quickly and are more susceptible to health problems that ultimately affect their ability to concentrate and perform well in school (Taras, 2005; Ross, & Anderson, 2010; Centeio, et al., 2021; Mukhamedzhanov, et al., 2023).

Adequate nutritional intake is very important to achieve optimal physical fitness for students, as stated by Fakolujo, et al., (2024). Students need to get the right balance of macronutrients and micronutrients, as well as enough fluids to support their health and physical performance. Willett, et al. (2017) emphasized the importance of students paying attention to their diet so that they can meet all the nutritional needs needed for school activities and extracurricular activities. As previously explained, physical fitness is closely related to the quality of learning. By maintaining fitness, students can improve concentration, endurance, and stamina, all of which contribute to academic and non-academic success. This discussion highlights the importance of nutrition education, both in the school environment and at home. Parents and educators must ensure that students receive nutritious and balanced food intake to support their physical health. Initiatives such as the provision of free nutritious meals in schools which are currently being implemented by the government can be an effective solution to improve the nutritional status and fitness of students, thereby optimizing the learning process.

Mental Health

Wren-Lewis and Alexandrova, (2021) said that mental health is very important for a person's well-being. It affects how people think, feel, and act. In schools, students' mental health is a major concern because it affects their ability to learn and interact with friends (Liu, et al., 2024). According to Levine, et

al., (2021) mental health is a state in which a person can cope with everyday stress, work well, and contribute to society. This shows that the more demands in learning, the greater the impact on students' mental health. Therefore, it is important to pay attention to students' mental health so that they can reach their full potential, cope with stress, and contribute well to society (Gueldner, et al., 2020).

Kobe, R. (2023) in his book entitled *Mental Health and Wellbeing* defines mental health as the ability to manage emotions, deal with stress, and adapt to changes in life. In addition, mental health also includes forming healthy relationships with others. In the context of school, this relates to how students interact on a daily basis with their peers, teachers, and school environment. Hyseni Duraku, et al. (2023) explained that when students face mental health challenges, it can hinder their potential. Mental health instability can make it difficult for them to achieve good performance, both academically and socially. Sahu, K., & Gupta, D. (2013) added that good mental health includes self-awareness and the ability to overcome life's difficulties. Furthermore, Luthans, et al. (2024) in their research revealed that mental health is related to the balance between thoughts, feelings, and behavior, where individuals with good mental health generally have a stable mood, maintain positive relationships, and are able to solve problems effectively.

Mental health is an important part of student development. According to Fusar-Poli, et al., (2021) mental health does not only mean the absence of disorders, but also the ability to function well in everyday life. Therefore, students need to maintain mental health in order to reach their potential and live a meaningful life. Herselman, et al., (2022) stated that students' mental health affects their learning ability, social interactions, and overall well-being. One important factor that affects mental health is the interaction between nutrition and brain neurotransmitters as explained by Chowdury, et al., (2025) that nutrients such as vitamins, minerals, and omega-3 fatty acids play a major role in brain health. These nutrients support the formation and maintenance of brain cells and help produce neurotransmitters, chemical compounds that enable communication between brain cells.

Lambert, et al., (2021) argue that happiness and emotional well-being are important foundations for healthy physical and mental development. This opinion is in line with Mega, et al., (2014) who said that when students feel happy and supported, they tend to have high learning motivation, are better able to face challenges, and develop important social skills. Therefore, Abbas, Z., & Karim, N. (2023) emphasized that a balanced nutritional intake plays an important role in supporting student development and growth. Proper nutrition helps improve concentration, memory, and energy, all of which are very important for academic success. Magesh, P. (2022) explains that nutrition affects the production of

neurotransmitters such as serotonin and dopamine, which are important for mood and emotions. Good nutrition can increase the production of these neurotransmitters. Conversely, oxidative stress can damage brain cells and contribute to mental problems such as depression and anxiety (Ji, et al., 2023). Based on research by Feng et al., (2023) to overcome this problem, compounds are needed that can fight free radicals and protect body cells from damage. The antioxidants needed can be obtained from vitamins C and E contained in fruits and vegetables, which play a role in fighting oxidative stress and maintaining brain health.

Mulyadi, (2024) conducted a study on preventive efforts to overcome mental health problems through nutritional improvement. The results of his study showed that individuals with poor mental health often lack essential nutrients such as vitamins, minerals, amino acids, and omega-3 fatty acids. The study also identified strategies in efforts to improve mental well-being to optimize the consumption of nutritious foods such as fish, green vegetables, nuts, and whole grains. In another study conducted by Shafiq, et al., (2024) which discussed mental health and nutrition. The results showed that unhealthy eating patterns were associated with higher levels of anxiety and depression in students. Then this study put forward a method for reducing mental health problems through healthy eating habits. The strategies and methods in efforts to prevent mental health that have been explained previously are supported by the opinion of Antonopoulou, et al., (2020) that good eating habits and normal nutrition are associated with better mental health. Students who regularly consume nutritious foods tend to have better mental well-being. Then, Agnafors, et al., (2021) investigated the development of the relationship between mental health and academic achievement during various developmental periods in childhood and adolescence by investigating the relationship between mental health and academic achievement. The results showed that mental health problems in early childhood and adolescence increase the risk of poor academic achievement, indicating the need for awareness and treatment to provide fair opportunities for education.

Mental health is greatly influenced by nutrition. A healthy diet can support stable mood and brain function. A healthy diet increases neurotransmitter synthesis, protects the brain from oxidative stress, and supports brain function. Several studies have shown a positive relationship between students' mental health and proper nutrition. To improve mental health and fulfill their potential in learning activities and in daily life, students must consume healthy foods. Healthy and nutritious foods are a source of energy, support the growth and repair of brain tissue, and maintain a stable mood. These are important components that are very important for student development and growth. Thus, a healthy diet can

contribute to improving the quality of mental health which ultimately has an impact on academic achievement and other areas.

CONCLUSION

The free nutritious meal program has a significant impact on students' health and well-being by ensuring that they receive adequate nutrition every day. This initiative supports students' cognitive, emotional, and physical development, which in turn improves their learning ability and academic achievement. In addition, the program plays a role in reducing social disparities by providing equal access to all students, including those from low-income families. Improving students' health is in line with national goals, as healthy students can make positive contributions to the country's economic and social progress. Therefore, it is imperative for the government and educational institutions to continue to support and expand this program. The results of the study indicate that prioritizing the free nutritious meal program is a strategic step by the government to ensure students' well-being and sustainable national development.

REFERENCES

1. Abbas, Z., & Karim, N. (2023). Opinion of Early Childhood Development Coordinators Regarding Importance of Nutrition for Cognitive Development of Young Children at ECD Level. *Journal of Asian Development Studies*, 12(4), 715-725.
2. Agnafors, S., Barmark, M., & Sydsjö, G. (2021). Mental health and academic performance: a study on selection and causation effects from childhood to early adulthood. *Social psychiatry and psychiatric epidemiology*, 56, 857-866.
3. Agustin, N. N., & Mu'is, A. (2023). Management of Infrastructure Facilities in Increasing Student Learning Motivation. *EDUTECH: Journal of Education And Technology*, 6(4), 578-585.
4. Ahmad, M. (2021). Management of facilities and infrastructure in schools. *Akademika*, 10(1), 93-104.
5. Amadi, A. S. M., Hasan, S., Rifanto, N. A., Wildan, M., Afifah, N. Q., & Nisak, N. M. (2023). Upaya Pemerintah dalam Menjamin Hak Pendidikan untuk Seluruh Masyarakat di Indonesia: Sebuah Fakta yang Signifikan. *Educatio*, 18(1), 161-171.
6. Anokha, V., & Kachhi, Z. (2025). Physical Health: Wealth for a Successful Student. In *Nurturing Student Well-Being in the Modern World* (pp. 489-518). IGI Global Scientific Publishing.
7. Antonopoulou, M., Mantzorou, M., Serdari, A., Bonotis, K., Vasios, G., Pavlidou, E., ... & Giaginis, C. (2020). Evaluating Mediterranean diet adherence in university student populations: Does this dietary pattern affect students' academic performance and mental health?. *The International journal of health planning and management*, 35(1), 5-21.
8. Asigbee, F. M., Whitney, S. D., & Peterson, C. E. (2018). The link between nutrition and physical activity in increasing academic achievement. *Journal of School Health*, 88(6), 407-415.
9. Baid, D., Hayles, E., & Finkelstein, E. A. (2021). Return on investment of workplace wellness programs for chronic disease prevention: a systematic review. *American journal of preventive medicine*, 61(2), 256-266.
10. Benes, S., & Alperin, H. (2022). The essentials of teaching health education: Curriculum, instruction, and assessment. *Human Kinetics*.
11. Benoit, V., & Gabola, P. (2021). Effects of positive psychology interventions on the well-being of young children: A systematic literature review. *International journal of environmental research and public health*, 18(22), 12065.
12. Büchs, M. (2021). Sustainable welfare: How do universal basic income and universal basic services compare?. *Ecological Economics*, 189, 107152.
13. Bustamante-Sanchez, A., Villegas-Mora, B. E., Martínez-Guardado, I., Tornero-Aguilera, J. F., Ardigò, L. P., Nobari, H., & Clemente-Suárez, V. J. (2022). Physical activity and nutritional pattern related to maturation and development. *Sustainability*, 14(24), 16958.
14. Centeio, E. E., Somers, C., Moore, E. W. G., Kulik, N., Garn, A., & McCaughy, N. (2021). Effects of a comprehensive school health program on elementary student academic achievement. *Journal of School Health*, 91(3), 239-249.
15. Chen, W., Gu, X., Chen, J., & Wang, X. (2022). Association of cardiorespiratory fitness and cognitive function with psychological well-being in school-aged children. *International Journal of Environmental Research and Public Health*, 19(3), 1434.

16. Cheung, L. W. (2007). Eat well & keep moving: An interdisciplinary curriculum for teaching upper elementary school nutrition and physical activity. *Human Kinetics*.
17. Chew, S. L., & Cerbin, W. J. (2021). The cognitive challenges of effective teaching. *The Journal of Economic Education*, 52(1), 17-40.
18. Chowdury, K. R., Kumar, V., Bindal, P., Singh, C., & Singh, A. (2025). Crosstalk between nutrients and brain neurotransmitters. In *Essential Guide to Neurodegenerative Disorders* (pp. 115-130). Academic Press.
19. Cohen, J. F., Hecht, A. A., McLoughlin, G. M., Turner, L., & Schwartz, M. B. (2021). Universal school meals and associations with student participation, attendance, academic performance, diet quality, food security, and body mass index: a systematic review. *Nutrients*, 13(3), 911.
20. Da Silva Aniceto, I., & Suyoko, A. (2024). Hubungan Status Gizi Terhadap Kebugaran Siswa Sekolah Dasar dikelurahan Lidah Wetan Surabaya. *Jurnal Prestasi Olahraga*, 7(6), 641-649.
21. Ding, Y., Lee, C., Chen, X., Song, Y., Newman, G., Lee, R., ... & Sohn, W. (2024). Exploring the association between campus environment of higher education and student health: A systematic review of findings and measures. *Urban forestry & urban greening*, 91, 128168.
22. Donnison, D., Chapman, V., Meacher, M., Sears, A., & Urwin, K. (2021). Social policy and administration revisited: studies in the development of social services at the local level. *Routledge*.
23. Dukhi, N. (2020). Global prevalence of malnutrition: evidence from literature. *Malnutrition*, 1, 1-16.
24. Efendi, M., Cahyono, D., Arief, I., Prastawa, S., & Supriatna, D. (2023). The Relationship Between Physical Activities, Consumption Pattern, Body Image and Nutritional Status of High School Students. *Journal on Education*, 5(4), 15852-15858.
25. Fakolujo, I. Y., Gbadeyan, O. M., Ibrahim, F. A., Oladele, J. O., & Oladiji, A. T. (2024). Nutrition and Fitness. In *Nutrition and Diet in Health* (pp. 169-180). CRC Press.
26. Feng, J., Zheng, Y., Guo, M., Ares, I., Martínez, M., Lopez-Torres, B., ... & Martínez, M. A. (2023). Oxidative stress, the blood-brain barrier and neurodegenerative diseases: The critical beneficial role of dietary antioxidants. *Acta Pharmaceutica Sinica B*, 13(10), 3988-4024.
27. Fusar-Poli, P., Correll, C. U., Arango, C., Berk, M., Patel, V., & Ioannidis, J. P. (2021). Preventive psychiatry: a blueprint for improving the mental health of young people. *World Psychiatry*, 20(2), 200-221.
28. Gaddis, J. E., & Jeon, J. (2022). Sustainability transitions in agri-food systems: Insights from South Korea's universal free, eco-friendly school lunch program. In *Social Innovation and Sustainability Transition* (pp. 121-137). Cham: Springer Nature Switzerland.
29. Gordon, N., & Ruffini, K. (2021). Schoolwide free meals and student discipline: Effects of the community eligibility provision. *Education Finance and Policy*, 16(3), 418-442.
30. Gueldner, B. A., Feuerborn, L. L., & Merrell, K. W. (2020). Social and emotional learning in the classroom: Promoting mental health and academic success. *Guilford Publications*.
31. Guo, J., Tang, X., Marsh, H. W., Parker, P., Basarkod, G., Sahdra, B., ... & Salmela-Aro, K. (2023). The roles of social-emotional skills in students' academic and life success: A multi-informant and multicohort perspective. *Journal of Personality and Social Psychology*, 124(5), 1079.
32. Gutschall, M. D. (2024). Toddler, Preschooler, And School-Age Child Nutrition. *Life Cycle Nutrition for Public Health Professionals*, 117.
33. Herbert, C. (2022). Enhancing mental health, well-being and active lifestyles of university students by means of physical activity and exercise research programs. *Frontiers in public health*, 10, 849093.
34. Herselman, M. F., Bailey, S., Deo, P., Zhou, X. F., Gunn, K. M., & Bobrovskaya, L. (2022). The effects of walnuts and academic stress on mental health, general well-being and the gut microbiota in a sample of university students: A randomised clinical trial. *Nutrients*, 14(22), 4776.
35. Hervás, G., Ruiz-Litago, F., Irazusta, J., Fernández-Atutxa, A., Fraile-Bermúdez, A. B., & Zarrasquin, I. (2018). Physical activity, physical fitness, body composition, and nutrition are associated with bone status in university students. *Nutrients*, 10(1), 61.

36. Hyseni Duraku, Z., Davis, H., & Hamiti, E. (2023). Mental health, study skills, social support, and barriers to seeking psychological help among university students: a call for mental health support in higher education. *Frontiers in Public Health*, 11, 1220614.
37. Ibour, S., Chaoui, B., Anarghou, H., Chahbi, H., Boutahar, K., Chigr, F., & Najimi, M. (2022). Links Between Eating Habits, Cognitive Skills Associated with Learning to Read, and Academic Achievement in Moroccan School-Age Children. *Current Research in Nutrition & Food Science*, 10(1).
38. Illøkken, K. E., Johannessen, B., Barker, M. E., Hardy-Johnson, P., Øverby, N. C., & Vik, F. N. (2021). Free school meals as an opportunity to target social equality, healthy eating, and school functioning: Experiences from students and teachers in Norway. *Food & nutrition research*, 65.
39. Ji, N., Lei, M., Chen, Y., Tian, S., Li, C., & Zhang, B. (2023). How oxidative stress induces depression?. *ASN neuro*, 15, 17590914231181037.
40. Jirout, J., LoCasale-Crouch, J., Turnbull, K., Gu, Y., Cubides, M., Garziona, S., ... & Kranz, S. (2019). How lifestyle factors affect cognitive and executive function and the ability to learn in children. *Nutrients*, 11(8), 1953.
41. Jomaa, L. H., McDonnell, E., & Probart, C. (2011). School feeding programs in developing countries: impacts on children's health and educational outcomes. *Nutrition reviews*, 69(2), 83-98.
42. Karimov, N., Turobov, S., Janzakov, A., Navotova, D., Ongarov, M., Inogamova, D., ... & Nematov, O. (2024). Exploring Food Processing in Natural Science Education: Practical Applications and Pedagogical Techniques. *Natural and Engineering Sciences*, 9(2), 359-375.
43. Kawafha, M., Al Maghaireh, D., Shawish, N., Abu Kamel, A., Al Kofahi, A., Sheyab, H., & Alsaqer, K. (2024). The effect of malnutrition on students' academic performance: Roy's model application. *Nutrition & Food Science*, 54(4), 795-804.
44. Kiani, A. K., Dhuli, K., Donato, K., Aquilanti, B., Velluti, V., Matera, G., ... & Bertelli, M. (2022). Main nutritional deficiencies. *Journal of preventive medicine and hygiene*, 63(2 Suppl 3), E93.
45. Kobe, R. (2023). *Mental Health and Wellbeing*. Richmond Kobe.
46. Lambert, L., Draper, Z. A., Warren, M. A., Joshanloo, M., Chiao, E. L., Schwam, A., & Arora, T. (2021). Conceptions of happiness matter: Relationships between fear and fragility of happiness and mental and physical wellbeing. *Journal of Happiness Studies*, 1-26.
47. Levine, G. N., Cohen, B. E., Commodore-Mensah, Y., Fleury, J., Huffman, J. C., Khalid, U., ... & American Heart Association Council on Clinical Cardiology; Council on Arteriosclerosis, Thrombosis and Vascular Biology; Council on Cardiovascular and Stroke Nursing; and Council on Lifestyle and Cardiometabolic Health. (2021). Psychological health, well-being, and the mind-heart-body connection: a scientific statement from the American Heart Association. *Circulation*, 143(10), e763-e783.
48. Lindberg, R., Cirone, K., Larkin, L., Ball, K., Laws, R., & Margerison, C. (2022). Strategies used by schools to tackle food insecurity and hunger: a qualitative enquiry in 15 Victorian schools. *Australian and New Zealand Journal of Public Health*, 46(4), 444-449.
49. Liu, S., Meng, Z., Wang, S., Wang, H., Fan, D., Wu, M., ... & Xie, Y. (2024). The role of anxiety in the association between nutrition literacy and health-related quality of life among college students. *Scientific Reports*, 14(1), 24618.
50. Lundborg, P., Rooth, D. O., & Alex-Petersen, J. (2022). Long-term effects of childhood nutrition: evidence from a school lunch reform. *The Review of Economic Studies*, 89(2), 876-908.
51. Luthans, F., Luthans, K., Luthans, B., & Peterson, S. (2024). Psychological, physical, and social capitals: A balanced approach for more effective human capital in today's organizations and life. *Organizational Dynamics*, 53(4), 101080.
52. Magesh, P. (2022). Food And Mood-The Interplay Between Nutrition, Mood, Brain, And Behavior. *IJO-International Journal of Social Science and Humanities Research (ISSN 2811-2466)*, 5(12), 01-12.
53. Marcus, B. H., & Pekmezi, D. (2024). Motivating people to be physically active. *Human Kinetics*.
54. Mega, C., Ronconi, L., & De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *Journal of educational psychology*, 106(1), 121.

55. Mukhamedzhanov, E., Tsitsurin, V., Zhakiyanova, Z., Akhmetova, B., & Tarjibayeva, S. (2023). The effect of nutrition education on nutritional behavior, academic and sports achievement and attitudes. *International Journal of Education in Mathematics, Science and Technology*, 11(2), 358-374.
56. Mulyadi, N. A. (2024). Optimizing Nutrient Intake as a Preventive Effort in Overcoming Mental Health Problems: A Literature Review. *Journal of Nutrition and Health Care*, 54-59.
57. Obidovna, D. Z., & Sulaymonovich, D. S. (2022). Physical activity and its impact on human health and longevity. *Достижения науки и образования*, (2 (82)), 120-126.
58. Osiecki, K., Barnett, J., Mejia, A., Burley, T., Nyhus, K., & Pickens, K. (2022). Studying hard while hungry and broke: Striving for academic well-being while navigating food insecurity. *Journal of Agriculture, Food Systems, and Community Development*, 11(4), 183-195.
59. Pastorino, S., Hughes, D., Schultz, L., Owen, S., Morris, K., Backlund, U., ... & Milani, P. (2023). School meals and food systems: Rethinking the consequences for climate, environment, biodiversity, and food sovereignty.
60. Perry, J., Horsey, B., Raneri, J., Hunter, D., O'Connor, S., Hyland-Wood, M., ... & Burkhart, S. (2024). Exploring school food provision programs and links to local foods in Pacific Island countries. *Proceedings of the Nutrition Society*, 83(OCE1), E20.
61. Prabakar, T., Jagadeesha, D., Narayan, S., & Kachhi, Z. (2025). Nurturing Student Well-Being in the Modern World: Nutrition and Its Effect on Cognitive Functioning. In *Nurturing Student Well-Being in the Modern World* (pp. 445-488). IGI Global.
62. Precious, F. K., Owhor, G. A., Opeyemi, M. O. A., Igwe, S. C., Beauty, O. C., Sy, F. A. R., ... & Lucero-Prisno III, D. E. (2023). Why nutrition programs for children remain important. In *Advances in Food Security and Sustainability* (Vol. 8, pp. 187-215). Elsevier.
63. Prilleltensky, I., & Prilleltensky, O. (2021). *How people matter: Why it affects health, happiness, love, work, and society*. Cambridge University Press.
64. Ross, A., & Anderson, D. L. (2010). *Nutrition and its effects on academic performance: How can our schools improve*. Michigan: At Northern Michigan Undersity.
65. Sahu, K., & Gupta, D. (2013). Life skills and mental health. *Indian Journal of Health and Wellbeing*, 4(1), 76.
66. Sanlier, N., & Konaklioglu, E. (2012). Food safety knowledge, attitude and food handling practices of students. *British Food Journal*, 114(4), 469-480.
67. Savarino, G., Corsello, A., & Corsello, G. (2021). Macronutrient balance and micronutrient amounts through growth and development. *Italian journal of pediatrics*, 47(1), 109.
68. Sepriani, R., Ockta, Y., Eldawaty, E., & Padli, P. (2024). How do physical fitness, nutritional status, and self-concept affect student learning outcomes in physical education with a focus on health and hygiene education?. *Jurnal Konseling Dan Pendidikan*, 12(3), 1-11.
69. Shafiq, I., Fatima, R., Waheed, W., Batool, S., Khan, M. A., Fatima, M., & Ghaffar, T. (2024). Mental Health and Nutrition: A Study on the role of Anxiety and Depression in Eating Habits in College Students. *Journal of Health and Rehabilitation Research*, 4(3).
70. Shi, L., & Stevens, G. D. (2021). *Vulnerable populations in the United States*. John Wiley & Sons.
71. Shinde, S., Wang, D., Moulton, G. E., & Fawzi, W. W. (2023). School-based health and nutrition interventions addressing double burden of malnutrition and educational outcomes of adolescents in low-and middle-income countries: A systematic review. *Maternal & Child Nutrition*, e13437.
72. Smolińska, K., Szopa, A., Sobczyński, J., Serefko, A., & Dobrowolski, P. (2024). Nutritional Quality Implications: Exploring the Impact of a Fatty Acid-Rich Diet on Central Nervous System Development. *Nutrients*, 16(7), 1093.
73. Søvold, L. E., Naslund, J. A., Kousoulis, A. A., Saxena, S., Qoronfleh, M. W., Grobler, C., & Münter, L. (2021). Prioritizing the mental health and well-being of healthcare workers: an urgent global public health priority. *Frontiers in public health*, 9, 679397.
74. Sun, H., Du, C. R., & Wei, Z. F. (2024). Physical education and student well-being: Promoting health and fitness in schools. *Plos one*, 19(1), e0296817.
75. Taylor, S. J., Bogdan, R., & DeVault, M. L. (2015). *Introduction to qualitative research methods: A guidebook and resource*. John Wiley & Sons.

76. Vaivada, T., Sharma, N., Das, J. K., Salam, R. A., Lassi, Z. S., & Bhutta, Z. A. (2022). Interventions for health and well-being in school-aged children and adolescents: a way forward. *Pediatrics*, 149(Supplement 6).
77. Verulava, T., & Devnozashvili, R. (2021). Nutrition and academic performance among adolescences. *Romanian Journal of Diabetes Nutrition and Metabolic Diseases*, 28(3), 275-283.
78. Wall, C., Tolar-Peterson, T., Reeder, N., Roberts, M., Reynolds, A., & Rico Mendez, G. (2022). The impact of school meal programs on educational outcomes in African schoolchildren: A systematic review. *International journal of environmental research and public health*, 19(6), 3666.
79. Wang, H., & Cheng, Z. (2022). Kids eat free: School feeding and family spending on education. *Journal of Economic Behavior & Organization*, 193, 196-212.
80. Willett, W., Skerrett, P. J., & Giovannucci, E. L. (2017). *Eat, drink, and be healthy: the Harvard Medical School guide to healthy eating*. Simon and Schuster.
81. Wlodkowski, R. J., & Ginsberg, M. B. (2010). *Teaching intensive and accelerated courses: Instruction that motivates learning*. John Wiley & Sons.
82. World Health Organization. (2021). *Action framework for developing and implementing public food procurement and service policies for a healthy diet*. World Health Organization.
83. Wren-Lewis, S., & Alexandrova, A. (2021). Mental health without well-being. In *The Journal of Medicine and Philosophy: A Forum for Bioethics and Philosophy of Medicine* (Vol. 46, No. 6, pp. 684-703). US: Oxford University Press.
84. Zavitsanou, A., & Drigas, A. (2021). Nutrition in mental and physical health. *Technium Soc. Sci. J.*, 23, 67.