

NOURISHING MINDS: A LITERATURE REVIEW ON THE LINK OF NUTRITION, ACADEMIC ENGAGEMENT, AND STUDENT SUCCESS

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ABSTRACT

This study delves into the intricate relationship between nutrition, academic engagement, and student success, shedding light on the global challenge of malnutrition and its profound impact on health and education, particularly in developing nations. It examines the significance of school feeding programs in addressing malnutrition and fostering academic achievement. Additionally, it explores the role of academic engagement in shaping students' educational outcomes, emphasizing the influence of teachers, schools, and the learning environment. Furthermore, the study delves into the implementation of nutrition programs in schools, highlighting the importance of parental involvement and the challenges faced in ensuring program effectiveness and sustainability. Through demographic insights and literature review, the study underscores the need for further research and policy development to optimize the intersection of nutrition, academic engagement, and student success.

Key words: Malnutrition, Academic engagement, School feeding programs, Nutrition programs, Student success

INTRODUCTION

School-age is a dynamic period of active growth and mental development in childhood; thus, the nutritional needs of this age group are greater than those of the preschool years in order to sustain the approaching growth spurt, necessitating diets rich in macro and micronutrients. Malnutrition among this age group remains a significant public health problem in developing countries due to the increased nutrient needs to sustain the requirement (Best C, Neufingerl N, Van Geel L, Van Den Briel T, Osendarp S., 2010) More than 200 million schoolchildren worldwide are malnourished, particularly stunted, and the number is expected to increase fivefold if no action is taken (United Nations International Children Educational Fund, 2013).

Rural areas have a higher proportion of undernourished school-aged children, particularly among agricultural households, according to research from Africa, India, Zambia, and the Philippines (Capanzana M, Aguila D., 2020), and the Mallig Plain is one of the Region's agriculturally dependent areas. Agriculture workers and their families are among the most vulnerable groups because a variety of climatic factors affect their harvest and produce. Rural farming households are typically poorer than urban households. Meanwhile, children in larger households with lower economic status from the agricultural sector had poorer nutrition. Farming households, according to (Bhagowalia P, Headey D, Kadiyala S., 2012), have a slightly higher prevalence of wasting and stunting than non-farming households. Agriculture workers, including farmers, fishermen, and foresters, had the Philippines' highest poverty rate (Philippine Statistics Authority, 2016).

Undernutrition among school-aged children remains a public health concern in the majority of ASEAN countries, according to the United Nations Children's Fund. The prevalence was still higher in the Philippines, Myanmar, and Laos (World Health Organization, 2008). In the Philippines, undernutrition among this age group remains a major public health concern (Capanzana M, Aguila D., 2020). Underweight (31.2%), stunting (31.1%), and wasting (8.4%) among school-aged children 5-10 years old were identified as significant public health issues in the DOST-2015 FNRI's Updating of the Nutritional Status of Filipino Children and Other Population Groups. When compared to 2013 national estimates, there was a 2.1% increase in the prevalence of underweight and a 1.3% increase in stunting. Meanwhile, the prevalence of wasting has remained stable at 8.6% (2013).

In addition, the previous national perspective is consistent to the regional scenario regarding the nutritional status of the school-aged children. It is noted on the data from the Department of Science and Technology- Food and Nutrition Research Institute (2020) revealed that in the province and Cagayan, 56% of their school-aged children are malnourished which has a breakdown of the following: 21.2 as underweight, 21.4 stunted, 7.4 thin and 9.7 as overweight and obese. Majority of the learners in the school aged were noted to be malnourished. Same scenario goes to the province of Isabela in which the Mallig Central School Annex is situated. 20% 18.7 stunted, thin 5.3 and 10.7 percent for overweight and obese. Both provinces represent the major area of the Region. Furthermore, the data from the locale of the study, the Mallig Central School shows also the show quite the same scenario, though the statistics shows that majority of the respondents are normal in their nutritional status with 59.62 percent, the rest is on the malnourished state highlighting the wasted and severely wasted bracket. With this in mind, while it is true that the normal learners are in majority, the statistics will be expected to lower and the malnutrition numbers will increase as the faculty and staff were challenged in the implementation of the nutrition related program as a result of the impact of the COVID-19. Also, as verbalized by the staff, there is a need to recalibrate their knowledge and skills and materials should be purchased and proper recalibration of the equipment's are needed as they were not used during the lock down due to the COVID-19 thus this study came into being.

According to research, school-aged children are among the most vulnerable groups to malnutrition due to dietary inadequacy, food insecurity, unequal household food allocation, improper food preparation and storage, and the presence of infectious diseases. These factors can be exacerbated by the interaction of various biological factors, the economy, culture, environmental issues, and diseases. These factors interacting increased the prevalence of undernutrition among school-aged children (Degarege D, Degarege A, Animut A, 2015).

Undernutrition during a child's school years may impair physical and cognitive development, according to research. Malnutrition has an impact on the academic performance of school-aged children because of delayed physical and mental development associated with school dropout and late or non-enrollment, high absenteeism, and poor performance. Undernutrition during the school-age years may also jeopardize the health and survival of future generations (Best C, Neufingerl N, Van Geel L, Van Den Briel T, Osendarp S., 2010).

The presence of the COVID-19 pandemic may exacerbate the nutrition situation of this vulnerable group due to food system disruption and the diminishing impact of public health interventions (The World Bank, 2020). The COVID-19 food crisis's greatest challenge is not a lack of resources, particularly staple commodities, but rather the logistics of commodities from farms to consumers (Cullen Mt., 2020). As a result, policies relating to food insecurity, hunger, and undernutrition must be reviewed in order to reduce inequity by focusing on policies for sustainable

food systems that make healthy foods accessible to vulnerable groups such as children of all ages and those living in areas that rely heavily on agricultural products and services to survive during or after the pandemic (Ong M, Ong R, Reyes G, Sumpaico-Tanchanco L.,2020). As a result, the goal of this paper is to estimate school-aged children's nutritional status, identify significant factors influencing school-aged children's nutritional status at Mallig Plains Central School-Annex, and establish its relationship with their academic performance. This research can assist the school in planning and developing programs that are tailored to the needs of the vulnerable population. This will also be the primary data required by the Mallig Plains College community extension services office in order to take the necessary actions and plans to assist the central school in sharing resources to expand the sustenance of the nutrition programs. This will serve as a bridge between the institutions, allowing for a stronger partnership in the future. Finally, this study can provide critical information on the factors influencing the nutritional status of school-aged children, which will guide policymakers and stakeholders in developing policies and initiatives to improve the situation of Mallig Plain Central School- Annex school-aged children.

REVIEW OF LITERATURES

Malnutrition, in all of its forms, poses serious risks to human health (Global Child Nutrition Foundation, 2022). Today, the world is confronted with a double burden of malnutrition, including both undernutrition and obesity, particularly in developing countries. Hunger and poor nutrition contribute to the premature death of mothers, infants, and young children, as well as impaired physical and mental development in children. Simultaneously, rising rates of overweight and obesity around the world are linked to an increase in chronic diseases such as cancer, cardiovascular disease, and diabetes – conditions that are life-threatening and difficult to treat in places with limited resources and already overburdened health systems. Malnutrition's double burden focuses on undernutrition and overnutrition. Undernutrition affects approximately 104 million children worldwide in 2010; undernutrition accounts for approximately one-third of all child deaths. According to 2010 figures, 171 million children under the age of five are stunted (an indicator of chronic undernutrition), while 13 million are born with low birth weight or prematurely due to maternal undernutrition and other factors.

In addition, a lack of essential vitamins and minerals in the diet has an impact on immunity and healthy development. More than one-third of preschool-age children worldwide are Vitamin A deficient; maternal malnutrition, which is common in many developing countries, leads to poor fetal development and an increased risk of pregnancy complications; and maternal and child malnutrition account for more than 10% of the global disease burden. In terms of overnutrition, approximately 1.5 billion people worldwide are overweight, with 500 million being obese, according to 2008 figures, while approximately 43 million children under the age of five were overweight in 2010. Globally, rising rates of maternal obesity are increasing the risks of pregnancy complications, as well as birth weight and obesity in children.

Furthermore, at least 2.6 million people die each year as a result of being overweight or. In Asia, 50 million children under the age of five were wasted, with 16 million severely wasted, according to UNICEF Statistics. This equates to a prevalence of nearly 8% and slightly less than 3%, respectively. School feeding helps children's education and well-being. A hungry child will not grow, will not learn as well, and will face numerous health risks in the future. School feeding can keep children in school and out of trouble. It is much more than just providing food. They represent a financial investment in the world's poorest children.

They are a bet on our shared future and global stability. School feeding can keep children in school and out of trouble. Strong partnerships can increase the factors that encourage children to attend school. It serves as a launching pad for numerous positive outcomes for poor children and their families.

School feeding programs involve parents and communities in the promotion of public health, education, and the development of self-sufficiency. Few safety-net programs provide so many multi-sectoral benefits in one intervention-education, gender equality, food security, poverty alleviation, nutrition, and health. A hungry child not only cannot enroll in school at the appropriate age, but also cannot attend properly even if enrolled. Furthermore, such children are more likely to drop out of school because they must first meet their basic needs. Thus, low school enrollment, low class attendance, and high student dropouts are recurring issues in child education among poor households, particularly in areas of high food insecurity.

Because of these factors, many developing countries have low levels of education attainment, despite the fact that both private and social returns to education are recognized to be high. School meals, it has been argued, increase school participation by improving child nutrition in two ways. To begin, school meals improve nutrition by allowing children to consume more nutrients. Second, better nutrition leads to better academic performance. According to the study, "since child nutrition, child health, and child schooling reflect household preferences in human capital investments in the child, they may be correlated without any direct causal relationship." Another study found that School Feeding Programs can improve health by lowering morbidity and illness, thereby attracting more children to school.

Philippine Department of Education Response to Malnutrition

In the aim of the Philippine Government to have a healthy individual in the country, the Philippine Plan of Action for Nutrition (PPAN) 2017-2022 was made and it is an integral part of the Philippine Development Plan 2017-2022. It is consistent with the Duterte Administration 10-point Economic Agenda, the Philippine Health Agenda, and the development pillars of *malasakit* (protective concern), *pagbabago* (change or transformation), and *kaunlaran* (development), and the vision of *Ambisyon 2040*. This development plan has an objective is to anchor and commits the country in to the global community as embodied in the 2030 Sustainable Development Goals, the 2025 Global Targets for Maternal, Infant and Young Child Nutrition, and the 2014 International Conference on Nutrition. This plan further aims to address the pressing issue in nutrition in the country as the data they gathered illustrated that there were noted High levels of stunting and wasting among children under-five years of age, with levels that have remained unchanged over the years. Also stunting is relatively low among infants 0-11 months old, but is significantly higher among one-year old. The prevalence of stunting remains high for the older children such as the children such as the school- aged children. Also, vitamin deficiencies, over weighted and underweighted school-aged children and hunger among them is to be addressed in this perspective. In this note, having said all of the foregoing parameter in the implementation of such development plan, they identified that one of the stakeholders that will take part in the implementation of this program is the Department of Education as the main focus will be in the school-aged children (Philippine of Plan Action for Nutrition 2017-20220 Executive Summary).

Ever since, the Department of Education are already exerting an effort to safeguard the nutritional aspect of the learners in their school as evident by the Dep.Ed. Memorandum number 43 series of 2011(Dep.Ed. Memorandum number 43 series of 2011) which aims strengthen the

health nutrition program of the school in connection to the millennium development goal, the education for all. Also, to further strengthen the implementation of health and nutrition program of the schools, another Dep. Ed Memorandum circulated number 28 series of 2018, the *Oplan Kalusugan* which aims to enhance further the implementation of the nutrition and health of the learners in their own respective schools (Dep. Ed Memorandum circulated number 28 series of 2018). These are the efforts and the exhaustive effort of the Department of Education to respond to the call of the government as accord to the Philippine Plan of Action for Nutrition.

The above-mentioned perspective will be one of the perspectives of this study, thus the different literature cited can be the good source and foundation in understanding the context to guide the research in the preparation of the manuscripts and the tool for the assessment. This portion will be showing the synthesized literature in the perspective of the other country. They will be presented thematically for better and organized presentation to facilitate understanding.

Nutritional Status Causes and Impact to Academics

It has been noted in the literatures that nutrition can significantly affect the academic performance of the learners. It has been a wide knowledge about it and it is already proven that way. There is other perspective that need to dig in the perspective of the other country. Sources would indicate that age and monthly income of the family or the guardian is an important consideration for the nutritional status of the children as it indirectly equates to how the family will sustain the nutritional needs of the family (Biachew Asmare, Mekuanint Taddele, Sileshi Berihun and Fasil Wagnaw, 2018). Accordingly, it is also noted on their study that the said factors are associated to their nutritional status and to their academic performance as well and this presented result is concurred by other study which they also exclaimed that a well-nourished and well-fed children can do better academically (Florence Opoola, Samuel Sunday Adebisi, Augustine Oseloka Ibegbu, 2018; Om Raj Katoch and Aroon Sharma, 2017). With this in mind, it is suggestive that the nutritional status is a strong determinant of the academic performance of the individual or the learners.

Student Engagement and its Factors and the Academic Performance

One of the critical components of quality education is to ensure learner engagement. The need to effectively measure learner engagement is imperative to determine the performances and the successful achievements of learners. This is a two-way process of assessing the teacher's performance in the classroom because an engaged learners will eventually be an achiever. In one of the studies conducted, it explains that there is a correlation between the engagement to academic performance, the more the students are engaged in the learning process, the more that they will perform well in the class and as long as the learners keep motivated all throughout their academic journey the stronger the result in their academics (Yousra Banoor Rajabalee, Yousra Banoor Rajabalee, Frank Rennie, 2020). Specifically, there have a report in the analysis that cognitive, behavioral and the emotional as a factor or domains in engagement has strong positive correlation which means that if the other will be satisfied the other will follow (Estévez, I.; Rodríguez-Llorente, C.; Piñeiro, I.; González-Suárez, R.; Valle, A, nd). It has been shows that age, sex, year leave is a factor that considered in the engagement level of the learners and in this case, the level of engagement is a mediating variable in attaining the academic performance of the learners (Ribeiro L, Rosário P, Núñez JC, Gaeta M and Fuentes S, 2019). Likewise, age is an important variable in tenement because the higher your age is, the lower your level of engagement

it is because as we advance in age, there will be more activities we will be facing (Casuso-Holgado et al., 2013). Sex is also a variable to consider as female is more engaged than male (Al Munnir Abubakar, Yunusa Abubakar, Jacob Dabo Itse, 2017).

Nutritional Status Causes and Impact to Academics

Nutrition is an integral component of the student's life as it defines the success of the academic journey of the learners as the concept of nutrition is the fuel of the learners to keep going. However, it is sad to say that based on literature, they noted that 1/3 of the Filipino schools is undernourished because analysis shows that in every four (4) Filipino children they skip meals and 1.5 million in the country live without a single meal a day (Beredo, Aubrey Acheron, 2019). In addition, as reported by the Department of Education last 2019 based from their data-base, there were 1, 836,793 undernourished pupils from kindergarten to grade 6 alone which is according to them, the data is a large portion of the entire population of the schools aged-pupils (Mariepet A. Cristuta, Joanne E. Berongan, Manuelito D. Radam, Maureen S. Saladaga, Dr. Marilyn Miranda, 2019). The data given is also consistent to the data from the study of Kim (Kim Leonard G. dela Luna and Maria Theresa M. Talavera, 2021) which posits that malnutrition is still one of the public health concerns in the country even though agriculture is the primary source of income of the majority of the Filipino.

Having said the earlier context of the status of the school-aged learners in the Philippines, literature have identified essential aspects that malnutrition can be associated. These variables were essentially common to the literature which is localized in the country that can be used in this study. Variables identified were poverty, health condition, eating habits and low knowledge on nutrition (Beredo, Aubrey Acheron, 2019; Mariepet A. Cristuta, Joanne E. Berongan, Manuelito D. Radam, Maureen S. Saladaga, Dr. Marilyn Miranda, 2019). Further readings also made a unique perspective that poor dietary diversification and the socio-economic status or the wealth index is a significant factor to consider (Kim Leonard G. dela Luna and Maria Theresa M. Talavera, 2021). The given variables as based on the analysis in the different study gave a strong effect to the nutritional status of the learners.

It has been noted that there were gaps in the literature as to the effect and association of the national status of the learners to their academic performance based on the reviews that the researcher did. The study of Beredo (2019) shows that factors identified such as poverty, health conditions and eating habits do not have effect to the nutritional status and to the academic performance of the learners. In the contrary, there were studies and authors (Mariepet A. Cristuta, Joanne E. Berongan, Manuelito D. Radam, Maureen S. Saladaga, Dr. Marilyn Miranda, 2019; Sofia C. Naelga, 2016; Dr. Imelda C. Lipayon, LPT, 2019; Kim Leonard G. dela Luna and Maria Theresa M. Talavera (2021) which do not adhere to the study of the later context, which they exclaimed that the factors identified, nutritional status and the academic performance of the learners significantly related to each other which this present study will further look into it to clear the vague gaps in the literature and to contribute to the pool of knowledge and in the field.

Student Engagement and its Factors and the Academic Performance

In the realm of education, academic engagement is an important variable to observe, this will be a key indicator of the students' interest and it may spell out success in the academic performance of the students. Good academic engagement will be a foundation for a good academic performance but bad engagement will do otherwise. Having said that, educational

perspective paves way to the importance of academic engagement which then eventually part of the basic mandate of the teachers in teaching as posted in the context of domain four (curriculum and planning) of the August 2017 Philippine Professional Standards for Teachers which posits on the teachers' ability to translate curriculum content into learning activities that are relevant to the learners thus expecting the teachers to have an engaging activity for the learners. It is therefore a major challenge for the teachers to do activities that are engaging to affirm success in the teaching- learning process for the learners to wholeheartedly assimilate the concepts throughout their academic journey.

There were factors associated in the learner's academic engagement which the different literature already conformed, the teachers, schools and academic environment (Neal Nikko D. Espejo, 2018). Furthermore, as based on the previous authors cited, he explained further that the school environment should promote autonomy for learning and not an institution that is being controlled by the teachers. To promote effective engagement in the school, teacher transaction is the best predictor of it in which teachers should be competent, promotes autonomy, can relate to the students, open, approachable, friendly, motherly and has the mastery of the subject matter (Antonio Jr. T. Enerio, 2021).

There were set of variables prevailed in the literature as recommended by the scholars, the cognitive, behavioral and the emotional perspective in dealing with assessment of academic engagement (Dr. Armando P. Delfino, 2019; Eleazar Cacapit De Jesus, 2019). Student engagement is one of the important constructs that is used to understand the behavior of the student towards the teaching-learning process. Understanding the behavior of students in the academic institutions will provide a glimpse of how the instructions and academic practices are going on in the schools. As such, it could be used as a powerful tool by the teachers and academic supervisors to design an effective pedagogical technique to maximize the learning experiences of the students. Having said that, it is therefore and imperative for this variable to be included in this study.

Also, there were gaps in the results of the gathered literature because they posted in their study that academic engagement does not have significant relationship in the academic performance and other authors debate on the context but most of the literature supports the idea that it has a significant relationship and it may affect the learner's academic performance. This is another reason that this variable should be included in the study as a moderating variable to academic performance.

Concept of Nutrition and the Implementation of School-based Nutrition Program

Nutrition-related knowledge, attitudes, and practices (KAP) of both parents are important determinants of nutritional status and Contributors to malnutrition as they are the main stakeholders to implement the needed skills and follow ups of the different program of the school or the Department of Education in specific. Their full support and knowledge are highly regarded as a main ingredient managing malnutrition in the country as there is a data that shows in 2011 that about 32% of Filipino children 5–10 years were underweight, stunted (33.6%), and wasted (8.5%) (DOST-FNRI, 2011). In this note, knowledge of the parents is valuable as they can make the implementation successful as Knowledge may augment practice and attitude and those can be a contributory factor to uplifting the nutritional status of a children as this claim is already establish in the literature (Imelda Angeles-Agdeppa, Emilita Monville-Oro, Julian F. Gonsalves, Mario V. Capanzana, 2019).

In connection, while it is true that the nutrition program has been implemented in the Department of Education since 1997 through the conditional food transfer program up to date, through the Dep Ed Memorandum number 270 series of 2022 on the OPLAN KALUSUGAN sa DEP.ED (OK sa Dep.Ed) there has been limited documentation of the impact and the effects of the said activity as the main course of action of schools in response to the program is just the documentation of their accomplishment report not the impact or the effect of the program. There were authors who courageously document its impact however, result shows that after the implementation of the program, there is no significant difference on the nutritional status of the children based from the Body Mass Index and some factors considered (Mark Joseph M. Lu, Ramil L. Dacal, 2020). On a similar note, implementation of the program is not well defined thus the implementation and its result is not conclusive and not good, the following factors and reasons were considered in their study: not well managed program, not well oriented participants or the learners/guardians were not given proper orientation thus the nutrition program do not have strong influence to the nutritional status of the learners (Rosana D. Aguilar, Wyllyn Villanueva, Roshela Santos, 2020). There had been a literature which has been included in the list that is so essential in this study as they were able to have an assessment of the implementation of the feeding program of the Department of Education in a National Perspective and the following were the results of the investigation: Inconsistent documentation and verification documents, Insufficient documents to support measures done, no measure on the post implementation of the program, program falls short of its nutrition status goal, no sustainable program that would initiate the stakeholders to sustain the program in their own (Ana Maria L. Tabunda, Jose Ramon G. Albert, and Imelda Angeles-Agdeppa, n.d.). It is therefore a strong point that the implementation of the Nutrition Program in the adopted Community of the Institution to help in uplifting the nutritional status of the learners by sharing resources and expertise in a common filed.

The Role of Nutrition in the Academic Performance of Students

The academic achievement of the students is significantly impacted by the function that nutrition plays in their lives. When appropriate amounts of food are consumed, it gives the mind a boost of energy. The health and wellbeing of the pupils is directly correlated to their academic achievements. The amount of energy that students have available in their bodies and brains determines the significant function that nutrition plays in the growth of pupils in their respective areas of learning. It supplies the essential nutrients that are required in the body, especially in the brain, in order for them to improve their academic performance and their capacity for learning. It addresses the mental and physical demands of the kids with regard to the students' education as well as their nutrition, which in turn influences the students' overall health and ultimately their academic achievement. There is no doubt that getting an education and maintaining a healthy lifestyle go hand in hand. When a student is hungry, it is much more difficult for them to concentrate on their academics. Throughout the course of the enhancement of the lesson, the approaches to this knowledge investigate the part that nutrition plays in the knowledge that the students have acquired. It is aligned to foster innovative learning capacities among the student body, which corresponds with the goal of promoting innovation. The level of performance of students can be raised when there is a healthy development of their minds thanks to the nutrition that they have in their bodies, which nourishes their minds and their brains. This can be accomplished through the consumption of foods that are rich in vitamins and minerals.

In a similar vein, their sphere of learning will not materialize or function appropriately when the students are unable to absorb the lesson because they do not have sufficient nutrients that can assist them in developing their knowledge to enhance the learning process. This will cause

their sphere of learning to fail to materialize. The difficulties that students face across a variety of subject areas serve to reinforce their learning; nevertheless, this learning cannot be sustained by the students themselves due to a deficiency of nutrients in their brains, which can have an impact on the students' ability to learn. Students have a want to learn, but their brains have a finite capacity; this can even cause them to be physically present but intellectually absent due to a deficiency in the nutrients that their bodies require but which they do not have enough of to stimulate their minds for the purpose of learning. The improvement of their healthy mind and the maintenance of their forward momentum in learning and academic achievement are both dependent on proper nutrition. Nutrition is required as crucial. In order to progress the benchmark variance of their intrinsic drive to learn, it is necessary to determine the current state of the art in their diet. This presents a significant obstacle for the strategies and methods that teachers use to carry out the goals of their lessons in order to ensure that their pupils achieve a higher level of learning as a result. This has been demonstrated by the research that was carried out by Michaels (Michalos, A. C., 2017) for the education that will bring happiness because of the well-being scenario. This research defines the function of education for students that influences their enjoyment and happiness because of their well-being due to the nutritional value they have.

In addition, the pupils' nutritional value and capability both have an impact on their ability to study. It has been found that the vast majority of children are unable to concentrate on their lesson when they arrive at school having not eaten anything, and as a result, their overall performance inside the classroom is negatively impacted as a result. Students are given opportunities to improve their academic performance, which are then reinforced by the nutrition component of the school-based program. It gives a comprehensive grasp of the kids' point of view regarding the effect that nutrition plays on the learning skills of the pupils in the classroom. The attainment of this information gives a curriculum design for public school teachers to provide a program for their pupils regarding nutrition in order to assist students in improving their abilities in learning to carry out the goals of their academic performance and learning. The pupils' capacity to study will significantly improve if they are provided with relevant information regarding the impact of diet on academic achievement. When pupils have adequate nourishment, it is much easier for them to comprehend and understand the material being taught to them. To improve the students' academic performance, there is an absolute requirement to pay attention to the students' diets (Rathi, N., Riddell, L., &Worsley, A., 2017). It improves and enhances students' learning in terms of information and knowledge development as well as skills in learning that provide and reflect students' desire to learn and grab the privilege as an advantage to develop and practice their learning skills. Students' learning can be improved and enhanced by doing this. It investigates and enables learning because of the nutritional values that individuals have in their bodies, which can energize them in the process of fostering learning inside the classroom, management skills, and competency. Moreover, it does this in a way that empowers learning. Students are encouraged to work on improving their academic achievement through its use (Huda, M., Sabani, N., Shahrill, M., Jasmi, K. A., Basiron, B., &Mustari, M. I., 2017)).

In addition, the influence of nutrition on the behavior or attitude of students towards their studies is a key factor in the development of the students' academic skills. When students are eating the appropriate foods to maintain the nutrients in their bodies, it determines the effectiveness of their involvement in class participation inside the classroom. This is in contrast to students who are silent because they are either exhausted or have not taken in any food, which can cause them to be deficient in nutrients from the food they have eaten. The students themselves play a significant part in the importance of proper nutrition because it serves as the foundation for the achievement of their academic performance and is the direct result of their behavior and attitude, as well as their knowledge and sense of self-worth, in relation to their

studies. The quality of the students' diets can also play a role in determining their mentality toward their coursework and the growth of their self-assurance inside the confines of the classroom, both of which are necessary for improved academic success. A healthy diet contributes to both the physical and mental well-being of an individual. It encourages pupils to engage in less unhealthy behavior while they are participating in class activities inside the classroom. The behavior of kids is impacted when they do not consume sufficient amounts of nutritious food or do not consume sufficient amounts of nutritious meals. It is imperative that students have an adequate understanding of nutrition in order for them to be appropriately directed on the foods they consume. This is because the foods they consume will have a significant impact on both their physical health and their day-to-day lives. The consumption of nutritious food will make it less likely for pupils to act inappropriately while they are at school. Emphasis needs to be placed on the marketing of healthy dietary options (Hilger, J., Loerbroks, A., & Diehl, K., 2017).

Hence, improved academic performance can be accomplished when there is adequate nutrition available and when pupils observe correct dietary practices. Since the brain maintains the energy of the body and supplies the energy that the body needs, proper nutrition includes consuming the ideal meals for the upkeep of the brain. The brain supplies the energy that is needed by the body. The kids can gain knowledge by observing how their food choices affect the functioning of their bodies. Avoid eating items that are unhealthy such as junk food, noodles, and other meals like these because doing so can interfere with the nutrients that the brain needs and cause kids to have poor performance. The way of eating might sometimes interfere with the body's ability to absorb nutrients. The behavior of the students' bodies during the learning process is determined by the nutrients that are present in their bodies. The energy that goes into the pupils' schoolwork is kept in check by the body's proper distribution of the micronutrients that come from the food they eat (Aragon, A. A., Schoenfeld, B. J., Wildman, R., Kleiner, S., VanDusseldorp, T., Taylor, L., & Stout, J. R., 2017). Students who do not get enough nutrition in their bodies will experience a psychological element that will contribute to the difficulties they have with their schoolwork. Kids need to have both a healthy body and a clear head in order to perform well in their classes. Their improved academic performance can be attributed to the promotion of appropriate nutritional energy. They receive the benefits of increased self-esteem in their academic endeavors as a result of the elements and interventions. The ability of students to adjust their level of performance while they are present in the classroom is directly correlated to their level of self-compassion, eating behaviors, and nutrition behaviors (Rahimi-Ardabili, H., Reynolds, R., Vartanian, L. R., McLeod, L. V. D., & Zwar, N., 2018).

Data on the profile of the respondents in the literature in the Philippines which quantified that those 25-54 years of age or the 37.37 percent is the highest age group that comprises the population of the country and are in the working age group which makes living for their family (Statistica, 2021; Philippine Statistics Authority, 2020; Index Mundi, 2020).

The national and regional researches conducted by the Philippine Statistics Authority which their data shows that the male dominates female in the nation and the region perspective with the ration of 103 males per 100 females for both national and regional data (Statistica, 2021; Philippine Statistics Authority, 2020). Though it is not consistent to the existing literature as to the distribution of respondents according to their sex compared to the total population in region and national level, the possible explanation is that most of the women mostly engaged themselves in self-producing activities of household and taking good care of their family members (Philippine Statistics Authority, 2016).

The Philippine Statistics office (Philippine Statistics Authority, 2016) revealed that in the entire country, the family that belongs to the poor wealth index or the socio-economic status is in the agricultural sector like the farming, fishing and the child bearing family in which this is exactly the characteristics of the respondents of this study which will further be supported later on the succeeding tables (Province of Isabela Official Website, 2022). Some factors associated to their poverty is due to irregularities of their works in agriculture and catastrophes and aside from that, other factors considered that can worsen their situations are as follows: issues in the land ownership, debt, health condition and inadequacy of capital to finance the next cropping season (Jose Ramon G. Albert, Michael Ralph M. Abrigo, Francis Mark A. Quimba, and Jana Flor V. Vizmanos, 2020).

The Philippine Statistics Authority (PSA, 2013) and the World Bank (World Bank, 2022) showing that the majority of the citizens of the county are high school graduates, with their data at 19.1 percent for the year 2010 and 33.14 percent for the year 2020, respectively. To explain it further, the figure presented by the literature as a back-up to the result of the study can clearly show that the educational attainment population of the country is improving across years due to the different government subsidies and social amelioration to augment the educational and household needs of every family in the country and in the region (Update, Development Plan of the Philippines (2022).

CONCLUSION

In conclusion, the literature elucidates the intricate interplay among nutrition, academic engagement, and student performance, particularly within developing nations like the Philippines. It underscores the global predicament of malnutrition and its deleterious impact on health and scholastic achievements, stressing the pivotal role of school-based nutritional initiatives and governmental endeavors in tackling this pressing issue. Furthermore, it acknowledges the paramount importance of academic involvement in shaping students' scholastic trajectories, emphasizing the significance of educator proficiency, conducive school environments, and insightful comprehension of student conduct. Despite some discrepancies in scholarly discourse, there is a consensus regarding the pivotal role of academic engagement in nurturing student triumph. Additionally, the text underscores the necessity of nutritional instruction and parental backing in advocating for wholesome dietary practices and mitigating malnutrition. It identifies hurdles and constraints in existing nutritional schemes, underscoring the imperative for improved documentation, sustainability, and community participation. Lastly, the demographic data furnished offer invaluable insights into the socio-economic milieu wherein nutrition and academic performance converge, guiding forthcoming research and policy formulation endeavors. In essence, the text accentuates the importance of holistic strategies that amalgamate nutrition, education, and community involvement to ameliorate student welfare and academic outcomes.

IMPLICATIONS

The ideas presented in the literatures underscore the critical need for comprehensive strategies to address malnutrition and enhance academic engagement and performance among students.

The policymakers need to prioritize the implementation of holistic school-based nutrition programs that go beyond simply providing meals. These programs should incorporate educational components aimed at promoting healthy eating habits, nutritional literacy, and sustainable dietary

practices. By integrating nutrition education into the curriculum, schools can empower students to make informed choices about their diets, leading to improved overall health and well-being.

Moreover, there is a pressing need for better documentation and evaluation of nutrition programs to assess their effectiveness accurately. By rigorously monitoring and evaluating these programs, policymakers can identify successful interventions and allocate resources more efficiently. Additionally, fostering collaboration between government agencies, non-profit organizations, and community stakeholders can enhance program implementation and sustainability, ensuring that the benefits of nutrition interventions reach those who need them most.

Educators play a pivotal role in fostering academic engagement and performance among students. They must strive to create inclusive and supportive learning environments that cater to the diverse needs of students. Professional development programs should focus on equipping teachers with the necessary skills to engage students effectively, including strategies for differentiated instruction, personalized learning, and student-centered pedagogies. By incorporating innovative teaching methods and leveraging technology, educators can enhance student motivation, participation, and academic achievement.

Furthermore, parental and community involvement is crucial in supporting students' nutritional needs and promoting healthy lifestyle habits outside of school. Schools can collaborate with parents, local health organizations, and community groups to organize workshops, cooking classes, and health fairs aimed at promoting nutrition and wellness. Engaging families in these initiatives fosters a culture of health and well-being that extends beyond the school setting, positively impacting students' overall health outcomes and academic success.

Lastly, further research is needed to deepen our understanding of the complex interplay between nutrition, academic performance, and student engagement. Longitudinal studies, randomized controlled trials, and qualitative research can provide valuable insights into the mechanisms underlying these relationships and inform evidence-based policies and practices. By investing in research and innovation, stakeholders can develop targeted interventions that address the unique needs of diverse student populations, ultimately improving outcomes and narrowing equity gaps in education.

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