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Correlational Analysis of Food and Nutrition Literacy and Academic Performance among Intermediate-Level Students

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ABSTRACT: This study aimed to determine the significant relationship between food and nutrition literacy and academic performance among intermediate-level students. Total population sampling was used which included fifty-three respondents. Through non-experimental quantitative descriptive-correlational research technique, validated questionnaire, Mean, and Pearson-Product Moment Correlation Coefficient (Pearson-r); results showed that the level of food and nutrition literacy was high or evident. It was also found out that the level of students' academic performance was satisfactory. There was a no significant relationship between food and nutrition literacy and students' academic performance. This means that the level of knowledge and skills about food and nutrition does not have a significant association to the academic performance of the students. In other words, whether a student knows a lot or a little about food and nutrition does not significantly correlate with their grades or academic success. The researchers recommended that teachers continue educating students about food and nutritional concepts, as well as developing academic performance. In addition to that, future researchers may conduct longitudinal studies to track the impact of food and nutrition literacy over time.

KEYWORDS: food and nutrition literacy, academic performance, intermediate-level students, correlational analysis, Philippines

I. INTRODUCTION

The academic performance of students has recently emerged as a significant research topic. It is regarded as a complicated aspect of a student's conduct that draws on a variety of skills, including memory, prior knowledge or ability, as well as psychological elements. Studies on academic performance have gained importance because student academic performance affects a nation's social and economic development. Nevertheless, even though many students put in a lot of time studying, their performance is often inadequate for a variety of reasons (Shahjahan et al., 2021). Moreover, according to earlier studies, the poor performance of academic students is impacted by social, psychological, economic, environmental, and personal factors. In fact, a lot of attention has been paid to measuring student academic performance. Additionally, academic literature might be tough (Mushtaq & Khan, 2012). Given that the researchers are education students who are really concerned about students' academic success and the factors influencing it, they are compelled to investigate the relationship between food nutrition literacy and intermediate-level students' academic performance.

If one loses its fuel, how can it sustain itself? In the study conducted by Cady (2014), one of the factors contributing to poor academic performance is food insecurity, which causes pupils to lack food and nutrition literacy. However, adequate food consumption is crucial beyond satisfying our hunger; it is also essential for optimal brain operation (Ekstrand et al., 2021). In fact, in the study by Gardener et al. (2018), it was perceived that one's adherence to a good dietary pattern contributes to the preservation of active cognition and brain structure.

Globally in Iran, a study conducted by Doustmohammadian et al. (2020) asserts that a high population of young people is practicing unhealthy habits such as skipping meals and inactivity, which results in non-communicable disease (NCD). In addition, South African students lack understanding of nutrition and food types, leading to unhealthy food choices. They buy unhealthy snacks and eat wholesome meals, influenced by peer pressure, availability, taste, desire, and hunger (Molotja et al., 2020).

In Asian countries like China, college students with low academic performance are associated with their lifestyle and poor physical fitness (Zhai, 2022). Moreover, India faces high malnutrition rates despite government initiatives for children's health and education (Rawat & Unisa, 2021). Further, in the Philippines, malnourished children, particularly those with stunted, wasted, and poor communication skills, score lower on social quotients, leading to higher absenteeism, illnesses, and lower academic achievement (Bustos et al., 2023). Locally, based on Calumba et al. (2023), teenagers who lived in non-poor households were much more likely to be overweight or obese than those who lived in poor households, with an obesity incidence of 11% in Davao City, Philippines.

This research is linked to the Hierarchy of Needs Theory by Abraham Maslow, which basically emphasizes the necessity to satisfy first the basic needs in order to achieve higher needs. In addition, the anticipation of academic performance among students is attainable when the basic need is met (Pelagio et al., 2022). It was also associated with Multiple Intelligence by Howard Gardner as a supporting theory, in which he discussed the seven distinct intellectual functions in the human body. By concentrating on bodily-kinesthetic intelligence, the research variables will make more sense. When learners possessed bodily-kinesthetic intelligence as a means of physical learning, such as doing or performing, they achieved academic success (Aydin, 2019). As another supporting theory, Bandura's Social Cognitive Theory (SCT) explains how personal experiences, other people's behaviors, and environmental circumstances affect a person's health behaviors. In addition to that, cognitive functions are impacted by a person's food and nutritional literacy, which affects one's health behavior (Schunk & Usher, 2012).

The study's independent variable is food and nutrition literacy, while the dependent variable is academic performance. According to Samruayruen and Kitreerawutiwong (2022), food and nutrition literacy has been advocated as a way to encourage good eating habits and is thought to lower the prevalence of obesity, overweight, and chronic diseases. The independent variable has two indicators with six subgroups, including: 1) cognitive domain: understanding and knowledge; 2) skill domain: functional, interactive, food choice, and critical skills. Cognitive refers to the individual's mental process involving understanding and knowing information. Then, skills refer to one's performance or execution on the basis of one's knowledge. On the other hand, academic performance is characterized as the measurement of a student's academic success (Shahjahan et al., 2021). The indicator of this variable is grade, which is defined as the mark or numerical representation of a student's academic performance.

The researchers were able to locate any studies that relate to food and academic performance. Nevertheless, some features, particularly those that pertain to the local environment, have not yet been fully studied. Therefore, the findings of this study might offer fresh, pertinent information. The local community may benefit from this study's quantitative results by understanding how students' academic performance is impacted by their food and nutrition literacy. School management may act in the school setting to address the issues that children on Samal Island have with food and nutrition literacy. Future researchers will also be able to use the study's findings about elementary students' food and nutritional knowledge as a foundation for developing fresh, reliable data.

The purpose of this paper was to determine the significant relationship between food and nutritional literacy and academic performance of intermediate-level students. Particularly, it will address the following questions:

1. What is the level of food and nutrition literacy of intermediate-level students in terms of:
   1.1. Cognitive domain
   1.1.1. Understanding; and
   1.1.2. Knowledge;
   1.2. Skill domain
   1.2.1. Functional;
   1.2.2. Interactive;
   1.2.3. Food choice; and
   1.2.4. Critical?
2. What is the level of academic performance of intermediate-level students in terms of grades?
3. What is the relationship between food and nutrition literacy and academic performance?

Food and nutrition literacy is significant in making conscious decisions, particularly in making healthy food choices. In a world where consuming processed food is more convenient, acquiring food and nutritional literacy can make huge differences not only in social settings but also in global scope (Silva et al., 2023).

The importance of this study is to determine the level of food and nutrition literacy of intermediate-level students. The findings of the study are expected to benefit the following:

The result of this study is beneficial for school administrators as it will help them make informed decisions and provide appropriate support to ensure and enhance food and nutritional literacy among schoolchildren. Moreover, this study will provide an outlook for teachers about the significance of promulgating nutritional literacy inside and outside of the school. It will also help them to incorporate nutritionally related knowledge into the teaching and learning process. In addition, this study will serve as a parent's guide in nurturing their child, and it encourages them to monitor their children's food and nutrition. Also, this study will raise awareness among students about how food and nutritional literacy affect their performance in school. Further, the findings of this study will eventually be beneficial for future researchers, as they will serve as their source and guide for their research.

II. METHODS

A. Research Respondents

The respondents of the study are the intermediate-level students of Panggubatan Elementary School. The researchers chose fifty-three students using total population sampling. Various correlational studies (Darunday et al., 2024; Morales et al., 2024; Delice,

2010) mentioned that a sample size between 30 and 500 is generally sufficient for many researchers. Alternatively, Thomas et al. (2023) asserted that the observable fact the researchers are interested in can be fully understood by using total population sampling. Making analytical generalizations about the population under study is made possible by this.

B. Materials and Instruments

The Food and Nutrition Literacy (FNLIT) scale was adapted from the study conducted by Doustmohammadian et al. (2017) was used as the questionnaire for the study. The questionnaire measured two domains with six sub-scales, including: 1) cognitive domain: understanding (12 items) and knowledge (5 items); 2) skill domain: functional (10 items), interactive (8 items), food choice (6 items), and critical skills (4 items). The questionnaire has a Cronbach's alpha coefficient ranged from 0.48 to 0.80 for various domains. This 45-item survey utilized a 5-point Likert type scale (from Very Low to Very High). On the other hand, the academic performance was measured using the final grade of the students and was interpreted using the Department of Education K to 12 grading system.

C. Design and Procedure

Research Design: McCombes and van den Eertwegh (2019) stated that finding the answers to numerous questions is accomplished through the study's strategy, which is typically referred to as the research design. It consists of a framework for gathering, analyzing, and interpreting data, as well as procedures and processes. This study utilized a non-experimental quantitative, descriptive correlation method of research to determine the level of food and nutrition literacy and academic performance of the students. The relationship between the two variables was also sought. Seeram (2019) claimed that descriptive correlational design is a method used in studies to establish the relationship between various variables and to offer static descriptions of events. Without claiming that one thing caused another, it seeks to explain the relationship between two or more different variables.

Data collection: The researchers sought approval from the Dean of College of UM Peñaplata College and School's Division Superintendent of Island Garden City of Samal, after the approval, the letter was sent to the School Principal prior to the administration of the research instrument. Consent was also sought from the respondents for voluntary participation. Respondents were given ample time to complete the tool. Retrieval on the said instrument was done immediately after the respondents answered the tool completely. Respondent's grades were also accessed after given the permission. After gathering the necessary data, these were tabulated, subjected to statistical treatment, and interpreted accordingly.

Statistical Tools: Each questionnaire response was recorded, examined, and then assessed in accordance with the goal of the report. Due to the fact that a correlative study analyzes the relationship between two variables, the goal of this investigation was to ascertain how other variables relate to intermediate-level students' academic performance and the knowledge of food and nutrition. The following statistical analysis was used to examine the data that will be gathered. The following statistical tools were used in the study:

Mean was utilized to determine the level of food and nutrition literacy and academic performance of the students. Pearson-Product Moment Correlation Coefficient was used to determine the significant relationship between food and nutrition literacy and academic performance.

Ethical Consideration: The study was carried out with strict adherence to ethical norms. Additionally, the researchers managed the population and data according to the study protocol's assessments and established criteria. The researchers adhered to ethical guidelines in order to develop ethical considerations (Akaranga & Makau, 2016).

III. RESULTS AND DISCUSSION

A. Food and Nutrition Literacy of Intermediate-Level Students

Table 1 presents the level of food and nutrition literacy of the intermediate-level students. Data revealed that the overall mean of food and nutrition literacy ($\bar{x} = 3.47,\ SD = 0.473$) was described as high, which means that the knowledge and skills of the students in food and nutrition were evident. This further means that even at a young age, students gained an understanding of health, the ability to comprehend certain health-related information, and the capacity to create an informed healthy decision by selecting and engaging in healthy food choices, activities, and experiences. Bröder et al. (2017) cited that children should be the core target of health literacy while they are still in their formative years, with the aid of their social structure. In addition, based on the study of Zwierczyk and Duplaga (2021), children's well-being and making appropriate health decisions are encouraged by good health literacy.

On the other hand, cognitive domain ($\bar{x} = 3.41,\ SD = 0.525$) was described as high. This indicates that students perceive that being informed of food choices, understanding nutritional requirements, choosing healthy cooking methods, staying active, limiting the consumption of sweets, avoiding food packaging without standard signs and health licenses, as well as ensuring food

safety are integral components of maintaining good health and preventing diseases. As highlighted by Silva (2023), food and nutrition literacy are crucial in preventing chronic illnesses like obesity, diabetes, and cardiovascular disease, and in enhancing overall health outcomes. However, when comparing the two sub-scales, understanding ($\bar{x} = 3.77,\ SD = 0.567$) appeared higher whereas knowledge($\bar{x} = 3.06,\ SD = 0.844$) scored lower. This suggests that students are more proficient at understanding food and nutrition information than merely obtaining knowledge on food and nutrition, lifestyle, as well as food safety. This result is similar to the study conducted by Doustmohammadian et al. (2017) which acknowledged that students scored higher in understanding than knowledge sub-scale.

Meanwhile, skills domain ($\bar{x} = 3.53, SD = 0.548$) was described as high or evident. This means that students underscore the value of informed nutrition choices. This includes daily consumption of diverse vegetables and fruits, promoting healthy eating, seeking nutritional advice, and choosing healthy snacks. Mindful eating is reflected in choosing healthy foods over unhealthy ones, even when dining out. Ensuring food quality and safety by buying certified, non-expired, and properly stored food is crucial. Trying new foods enhances dietary diversity, and independent healthy choices are commendable. According to Jafari et al. (2024), nutritionally literate people possess the capacity to take in, process, and comprehend the principles of nutrition—a vital skill for managing and preventing disorders linked to nutrition. Prioritizing nutrition literacy is essential since it plays a big part in encouraging good eating habits. When comparing the five different sub-scales, functional ($\bar{x} = 3.66,\ SD = 0.713$) appeared highest while, interactive ($\bar{x} = 3.31,\ SD = 0.621$) turn out to be lowest. This means that students showed to be more functional particularly in accessing and applying healthy eating behaviors, and food choices rather than having interactive skills in which encompasses other skills such as emotional skills, and discussion skills. This is aligned with the study of Doustmohammadian et al. (2020), which highlights that students encompass functional domains rather than interactive skills.

Table 1. Food and Nutrition Literacy of Intermediate-Level Students, n=53

Indicators		$\bar{x}$	**SD**
Cognitive	Understanding	3.77	0.567
	Knowledge	3.06	0.844
	Overall	3.41	0.525
Skills	Functional	3.66	0. 713
	Interactive	3.31	0.621
	Food Choice	3.49	0.755
	Critical	3.64	0.868
	Overall	3.53	0.548
Total		**3.47**	**0.473**

B. Academic Performance of Intermediate-Level Students

Table 2 below displays the level of academic performance of the 53 intermediate-level students. It appeared that academic performance obtained a mean described as satisfactory ($\bar{x} = 83.64, SD = 3.685$). It suggested that students at this level have developed the fundamental knowledge and skills, and core understandings, and with little guidance from the teacher and/or some assistance from peers, can transfer these understandings through authentic performance tasks. The result of this study was parallel to the study of Alog (2012), conducted at Central Philippine University Elementary School, with 313 intermediate-level respondents, which concluded that the performance of intermediate pupils was satisfactory.

Table 2. Academic Performance of Intermediate-Level Students, n=53

Indicator	$\bar{x}$	**SD**
Grades	83.64	3.685

C. Correlation Matrix of the Measures of Food and Nutrition Literacy and Academic Performance

Table 3 presents the correlation matrix of the measures between food and nutritional literacy and academic performance. The significance level for the investigation was set at $p<.05$, if the data's result is above $p<.05$, it simply signifies no significant difference between the variables. This shows that food and nutrition literacy does not impact the general academic performance of the intermediate-level students. Hence, students are able to endure through the difficulties they encounter when studying. A study by Ashoori et al. (2021) revealed an insignificant correlation between food and nutrition literacy and academic performance.

Based on the data, the overall computed r-value is .002, p>0.05. Therefore, the result of the correlation of this study has no significant relationship between food and nutrition literacy and academic achievement.

Table 3 shows that the overall result of the correlation between cognitive domain and academic performance is .054, while the results of its sub-scales—knowledge and understanding—are -0.017 and 0.125, respectively. Conversely, the association between the skill domain and academic achievement is -.049; its functional sub-scale is likewise -.049; the interaction sub-scale is -.129; the food choice sub-scale is -.192; and the crucial sub-scale is.099. This means that food and nutrition literacy does not have a significant association to the academic performance of the students. In other words, whether a student knows a lot or a little about food and nutrition does not significantly correlate with their grades or academic success. Thus, the result of this study confirms the study conducted by Guiné et al. (2023) uncovered that academic performance is not significantly related to food literacy of the students. In addition to that, Cadenas-Sanchez et al. (2020) confirmed that food and nutrition literacy did not show significant association with academic achievement.

Table 3. Correlation Matrix of the Measures of Food and Nutrition Literacy and Academic Performance

Food and Nutrition Literacy	**Academic Performance**
	Overall
Understanding	.125
Knowledge	-.017
Cognitive Domain	.054
Functional	.049
Interactive	-.129
Food Choice	-.192
Critical	.099
Skills Domain	-.049
Overall	.002

p*<.05

IV. CONCLUSION AND RECOMMENDATION

A. Conclusion

This study showed that the level of food and nutrition literacy of intermediate-level learners at Panggubatan Elementary School was high. This means that the knowledge and skills of the students in food and nutrition were evident. This result further means that even at a young age, the students gained an understanding of health, the ability to comprehend certain health-related information, and the capacity to create an informed healthy decision by selecting and engaging in healthy food choices, activities, and experiences.

On the other hand, the academic performance of the students was satisfactory. This means that the students at this level have developed the fundamental knowledge and skills, and core understandings, and with little guidance from the teacher and/or some assistance from peers, can transfer these understandings through authentic performance tasks.

Lastly, there was no significant relationship between food and nutrition literacy and academic performance of the intermediate-level students. This means that the level of knowledge and skills about food and nutrition does not have a significant association to the academic performance of the students. In other words, whether a student knows a lot or a little about food and nutrition does not significantly correlate with their grades or academic success.

B. Recommendation

Although this study found that there is no significant correlation between food and nutrition literacy and the academic performance of the learners, the researchers still recommend that school administrators to improve implementing programs such as feeding programs, the culmination of Nutrition Month, and the Gulayan sa Paaralan program to strengthen food and nutrition literacy. It is also recommended that they continue to establish supportive working environments among teachers, where ideas and suggestions on how to improve teaching strategies will be shared to meet the academic demands of their students. Moreover, teachers develop educating students about food and nutritional concepts, as well as developing academic performance through classroom activities, nutrition-related class discussions, and the use of resources like textbooks.

Furthermore, parents are encouraged to monitor their children's food choices well when purchasing meals at school. It is also recommended that parents encourage their children to practice healthy eating habits at home and involve them in meal planning and preparation. They may assist students in their academic endeavors by offering direction on homework and projects that they undertake after school. Meanwhile, this study advises students to work even harder to improve their food and nutrition literacy,

advancing to a very high descriptive level. Also, students are urged to put in even more effort to raise their academic performance, which will lead to success in school.

Consequently, the research verified that there is no notable correlation between food and nutrition literacy and academic performance. Similar studies or investigations into other aspects of food and nutritional literacy's potential impact on academic performance may be conducted by future researchers. Future researchers may conduct longitudinal studies to track the impact of food and nutrition literacy over time. This could provide more insights into how food and nutrition knowledge and skills influence students' academic performance and overall development in the long run.

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