Research Article

Nutrition adequacy level and elementary school students' learning achievement

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Abstract

This study investigates the relationship between nutrition adequacy level and the elementary school students learning achievement. Using descriptive research design through a quantitative method, this research surveyed fifty-four student parents of class IV, V and VI of Elementary School or Sekolah Dasar Pembangunan Laboratorium, Universitas Negeri Padang, Indonesia. Through the descriptive and inferential statistic, some useful insights pertaining to the issue investigated is significantly obtained. The nutritional adequacy and sufficiency of students still in the moderate level and the learning achievement still in the low level or the achievement content in the learning is still does not achieve the expected level. These persismitic indicators from the practical aspect convey varying consequences and implications especially to the student parents and the school authority.

Keywords:
Nutrition, learning achievement; elementary school, student

1 Introduction

Indonesia similar to other countries is undoubtedly experiencing a rapid change in various fields, including education with the awareness and the importance of it is in a positive move. In relation to this, the success of education can be seen through the attainment of an educational goals which closely related to learning achievement. However, in the context of the Elementary School or Sekolah Dasar Pembangunan Laboratorium, Universitas Negeri Padang (UNP) Indonesia, the expected learning achievement could not be really realized by the students. This is based on results of the preliminary observations undertaken by the researchers that the students learning outcomes or learning achievement of grade IV, V and VI is in less satisfactory stage. Out of 54 students observed, only 25% or 14 students reached the Minimum Completeness Criteria or Kriteria Ketuntasan Minimal (KKM) compared to 75% or 40 students who have not reached the criteria.

It is known that the success in learning or learning achievement can be obtained through the learning process. Purwanto (2011) stated that the purpose of education is planned to be achieved in the process of teaching and learning and learning outcomes are the achievement of educational goals in students who follow the learning process. Thus, the success of learning or achievement can be obtained through the teaching and learning process whereby a good learning process will determine the results of a good learning. According to Suryabrata (2013) factors that influence learning are (i) Non-social factors - consisting of air condition, air temperature, weather, time, place, stationery used for learning and; (ii) Social factors or human factors in that whether humans are present or not. The presence of a person at the time of learning can interfere with the individual learning concentration. **(**iii) Physiological factors which can be divided into two namely: the state of tone or muscle tension and physical function.

Syah (2012) initially claimed that the factors which influence learning are (i) internal factors (factors within the students), i.e. the state/condition of the physical and spiritual students; (ii) External factors (factors outside the student) namely environmental conditions around students and; (iii) Factors approach to learning, believe in the type of student learning efforts that include strategies or methods used to conduct the learning activities and learning materials. Due to the influence of the above factors, students may have either chances of high achievement or underachievement or failed altogether. Thus factors that can affect success in learning, namely social, non-social and physiological factors.

It is worth mentioning that one factor that is a factor of strength and physical health can only be achieved through the adequacy of nutrition and in this sense to achieve good learning achievement, learners must have adequate nutrition. According to Muchtadi (1989) nutritional adequacy is the average daily nutritional intake sufficient to meet the nutritional needs. To meet the nutritional adequacy level of a school child, their daily nutritional intake should be fulfilled, of course, through the consumption of healthy and nutritious food balanced with the adequate amount and free of harmful materials that would interfere the health of the children. The level of nutritional

adequacy is very influential on student achievement especially the primary school children. Primary school-aged children (6-12 years old) have many characteristics of physical activities, as expressed by Anggraini (2003) that the nutritional adequacy level through a healthy diet requires children to get the balance nutrition. The nutritional balance gained through a healthy diet will have a positive effect on the health and development of the children. Parents in actual fact have a big role in managing the pattern of food that their child consumes. They must make sure that their children get enough nutrition from the food that they eat.

According to Devi (2012) parents should instil the children of how important the healthy diet is for their body. Any food that should and should not be consumed by children must be known early to the child. This is to ensure that when they are at school or play they do not consume the unhealthy snacks. Based on the field observations and interview with some students, researchers found that the low learning outcomes are caused by lack of nutritional adequacy level. Habits of students who do not have their breakfast at home caused them to be hungry and lead to snacking habit in the morning. Though snack foods are not necessarily guaranteed to affect good health and hygiene, the most favourite snack foods are the foods that contain lots of sugar and oil. Students are only concerned with the taste of food and the need to fulfil their hunger. Consequently, many students bought snack foods containing food additives such as flavourings, sweeteners, and dyes that can harm and risk to their health. Students tend to buy foods that contain excessive sodium (salt) like snack foods that taste salty for example chips that are packed in the plastic.

Besides the problems associated with the nutritional adequacy, the tendency of eating vegetables and fruits among the students are still scarce. The growth of body of the first and sixth-grade students is not much different as the height and weight are almost the same. Devi (2012) claimed that imbalance of food could decrease the body immunity against disease, physical growth disorders, developmental disorders, brain intelligence, low productivity and other nutritional and health disorders. It is understandable that to overcome the low achievement of the student one effort that can be done is to pay attention to the level of nutrition sufficiency of the child. Having say that, the objectives of the paper are to: (i) examine student nutrition adequacy level (ii) asesss student learning achievement and (iii) examine the relationship between nutrition adequacy level and student learning achievement.

2 Research Methodology

The type of research used is descriptive quantitative with the correlational approach. By the opinion of Denscombe (2014), descriptive research is one type of research that aims to describe the systematic, factual and accurate about the facts and the nature of a particular population or try to describe the phenomenon in detail. According to Cohen, West, & Aiken (2014), correlational research is a study intended to determine whether there is a relationship between two or multiple variables. Based on the description, besides the other two objectives this research is intended to analyse

the relationship between nutrition adequacy level and student learning achievement. The sample population for this study are parents of the students of class IV, V and VI of Elementary School or Sekolah Dasar Pembangunan Laboratorium, Universitas Negeri Padang, Indonesia. The survey instrument through food model form was developed to solicit the require information. On data collection, the parents of each 54 students were initially approached to obtain permission and attain their willingness to participate in the research survey. Upon agreement, the food model form survey was administered by the researchers during picking up period of children by their parents at school. Owing to the positive feedback, all 54 children parents completed the model form. The data retrieval technique was using a 2x24 hour Recall method (Widaman, Burnett, Miller, Witbract, Keim, & Laugero, 2015). The data was then proceeds with descriptive statistic while the correlation analysis was done using the Pearson Correlation Product Moment.

3 Result and Discussion

It is worth mentioning that this study consists of two variables that is nutrition adequacy (X) and student learning achievement (Y). Based on the description of the data, the mean (average), middle (median), frequent score (mode), standard deviation, lowest score (min), highest score (max) and the total score (sum) were explained. The category score and level of achievement of student from each research variable was also presented.

3.1 Nutrition Adequacy Level

The nutrition adequacy level of the students is obtained by calculating the nutritional adequacy based on recall method for two consecutive days. The result is presented in Table 1.

Table 1: Nutrition Adequacy Level Descriptive Statistics

Statistics	
Mean	91.09
Median	91.00
Mode	91
Std. Deviation	20.245
Minimum	50
Maximum	144
Sum	4919

N=54

What could be said from the table is that the nutrition adequacy of the elementary school students at the Universitas Negeri Padang, Indonesia is in the moderate level. In other word, the nutrition content in the food provided by students' parent at home is still inadequate. The frequency distribution of data based on the grade level of the nutritional adequacy level is illustrated in Table 2.

Table 2: Frequency Distribution of Variable Score of Nutritious Adequacy Level of the Students

Interval	Median	N	%
50–63	56,5	3	6
64–77	70,5	11	20
78–91	84,5	14	26
92–105	98,5	14	26
106–119	112,5	8	15
120–133	126,5	2	4
134–147	140,5	2	4

N=54

Looking at the table, the highest interval class is between 78-91 and 92-105 which both classes represented around 52% (n=28). This followed by interval class between 64–77 which amounted around 20% (n=11), interval class between 106–119 with 15% (n=8), interval class between 50-63 with 6 % (n=3). The lowest frequency is in the interval class between 120-133 which represented around 4% (n = 2) and similar result appeared on the interval class between 134-147. The description of the categorization of Average Score of Nutritional Adequacy Level (NRTKG) or *Nilai Rata-Rata Tingkat Kecupukan Gizi* manifestly indicate that level of substances in food that the students consumed at home is less or moderately nutritious.

Table 3 shows a categorization score of nutritional sufficiency of the students while Figure 1 indicate the nutrition adequacy category. Based on the table, 30% (n= 16) of the students have a good nutritional adequacy, 37% (n=20) in a moderate nutritional level, 19% (n=10) having less nutritional sufficiency and 15% (n=8) have deficit nutritional sufficiency. The result clearly indicates that subtantial number of students in this study still in the range of having less to moderate nutritional sufficiency.

Table 3: Categorization Score of Nutritional Sufficiency of the Students

Scores Range	Category	N	(%)
≤100% AKG	Good	16	30
80 - 99% AKG	Moderate	20	37
70 – 80% AKG	Less Good	10	19
< 70% AKG	Deficit	8	15

N=54

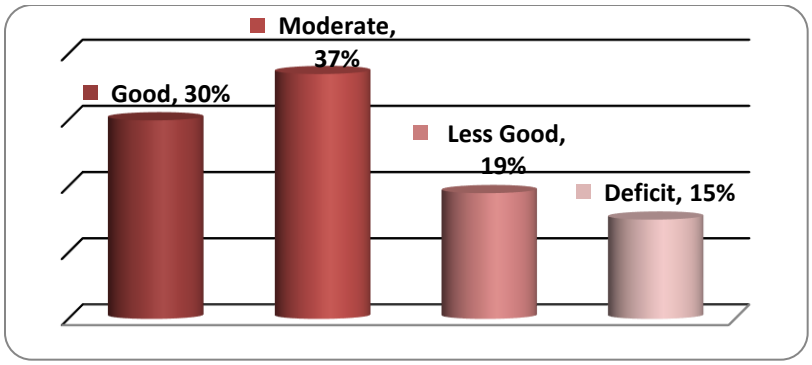

Figure 1: Nutrition Adequacy Category

The result in Table 3 is further supported with Figure 1 whereby most of nutrition sufficiency level of the students is in moderate category (37%). It can be said that the nutritional adequacy level of Laboratorium Pembangunan Elementary School of Universitas Negeri Padang is mostly still in the medium category. In other words, the nutritional needs of the students are still not met. Thus, parents should pay attention to the diet of the student so that the nutritional adequacy can be improved and if the level of nutritional adequacy of students is not improved more health issues will apparent. In this context, Soekirman (2002) explains that the imbalance between food consumed with the need will cause more nutritional problems, malnutrition which can lead to decreasing resistance to diseases or increase the number of diseases (morbidity), experiencing abnormal growth (short), low intelligence, low productivity and retardation of reproductive organs.

3.2 Student's Learning Achievement

Student learning achievement was obtained through the mean of final grade of the students in the last semester. The result is presented in Table 4.

Table 4: Student's Learning Achievement Descriptive Statistic

Statistics	
Mean	70.37
Median	70.00
Mode	70
Std. Deviation	8.479
Minimum	56
Maximum	90
Sum	3800

N=54

What could from the result is that the learning achievement of the elementary school students at the Universitas Negeri Padang, Indonesia is in the low level. In other

word, the achievement content in the learning is still does not achieve the expected level.

Table 5 illustrates the frequency distribution of data based on the grade level of the student learning achievement

Table 5: Frequency Distribution of Student Learning Achievement Scores

Interval Class	Median	n	%
56–60	58	2	4
60–64	62	9	17
64–68	66	7	13
68–72	70	14	26
72–76	74	11	20
76–80	78	2	4
80–84	82	3	6
84 –88	86	2	4
88 – 92	90	4	7

N=54

Looking at the result, the highest interval class is between 68-72 amounted around 26% (n=14). This followed by interval class between 72–76 which amounted around 20% (n=11), interval class between 60–64 with 17% (n=9), interval class between 64-68 with 13 % (n=7), interval class between 88-92 with 7 % (n=4) and interval class between 80-84 with 6 % (n=3). The lowest frequency is in the interval class between 56-60, 76-80, and 84-88 which all of classes represented around 12% (n = 6). The description of the categorization of average score of student learning achievement manifestly indicate that level of the learning performance is low or does not achieve the expected level.

The score-category of the data based on the grade level of the student learning achievement is illustrated in Table 6.

Table 6: Score-Category of Student's Learning Achievement

Value	N	(%)	C-Criterion
≥75	14	25%	Achieved
<75	40	75%	Not Achieved

N=54

Based on table 6, 25% (n= 14) of the students have achieved the learning achievement compare to 75% (n=40) which have not achieved the learning achievement. The result indicates that substantial number of students in this study still not achieved the learning achievement. Nawawi (1981) explains that achievement is the level of learning attainment of students to learn the subject matter in school**.** In other words, and in the context of this study, factors supporting the success of learning have

not been met perfectly by the students such as motivation, interest, discipline, and learning, or the external factors such as the atmosphere of learning at school and home.

3.3 Relationship between Nutrition Adequacy Level and Student Learning Achievement

The Pearson correlation analysis was conducted to see the correlation and directions between nutrition adequacy level and student learning achievement. Result show a strong positive correlation between both variable with r= .786*** and statistically significant. What could be said from this result is that the nutritional adequacy level well correlated with high learning achievement of students of the Elementary School or Sekolah Dasar Pembangunan Laboratorium, Universitas Negeri Padang, Indonesia. Suryabrata (2013) stated that nutritional adequacy with learning achievement is interconnected and he contended that students should be given enough nutrition because lack of that will result in less of physical tone (muscle tension), lethargy, quickly drowsy, tired, and so forth. The effect can be staggering for young children as the influence is immense. Some chronic diseases are very disturbing to learn. Diseases such as colds, influenza, toothache, cough, and the like are usually ignored because they are considered not serious enough however these kind of diseases are very disturbing and affects daily learning activities. The result of this study is also aligned with Isdaryanti (2007) which claimed that nutrition sufficiency is very important for growth of brain cells, especially for the school children, where their brain cells are growing rapidly. Thus, it could be concluded that the level of nutritional adequacy has a positive impact on children's learning achievement.

4 Implication and Conclusion

Despite require further clarification, some clear and valuable insights emerged in this study that the nutritional adequacy of students of the Elementary School or Sekolah Dasar Pembangunan Laboratorium, Universitas Negeri Padang (UNP) Indonesia still in the moderate level. It was also apparent that not only the level of nutrition sufficiency of the students still in the moderate category but the learning achievement of the elementary school students is in the low level or the achievement content in the learning is still does not achieve the expected level. These persismitic indicators from the practical aspect convey varying consequences and implications especially to student parents and the school authority.

This study clear provides a better understanding on the pattern of food consumption for children both at home and at school. What could be said from the result of this study is that the nutritional content in the food provided by students' parent at home is still inadequate. In this context and not to exaggerate that some parents probably still having less understanding and knowledge on the types food that contain nutritional value for their children**.** If this scenario persist, parents should be given attention by the school authority on the important of providing sufficient and adequate nutritional values to their children and not just emphasize on the taste alone.

In this sense, the high price of food does not determine the nutritional contents but most importantly parents should at least understand the types and sufficiency of food provided to the children. Finally, it would be more meaningful if there is a mutual relationship and good cooperation between parents and the school authority in sharing the information about providing the nutritional value of food to the school children as nutritional adequacy has a positive impact on children's learning achievement.

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