

The Influence of Nutritional Status and Intelligence Quotient on Academic Achievement of Adolescents Aged 16-17 Years Old

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ABSTRACT: The purpose of this study was to determine the effect of nutritional status and intelligence quotient (IQ) on academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo. The study used descriptive research method with two independent variables and one dependent variable, sampling using quota sampling technique.

The research subjects were teenage students 16-17 years old at SMK Negeri 2 Purworejo which totalled 149 students. Data collection methods using tests and documentation analysis, data analysis using multiple linear regression analysis.

The results showed a significant effect of nutritional status on improving the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo with regression coefficient obtained a value of 0.017 smaller than the significance value of 0.05 and coefficient of determination 32%. There is no significant effect of intelligence quotient (IQ) on improving academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo with a regression coefficient obtained a value of 0.258 greater than the significance value of 0.05 and a coefficient of determination of 2%. Nutritional Status and Intelligence quotient (IQ) together there is a significant influence on improving the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo with regression coefficient obtained value of 0.010 smaller than the significance value of 0.05 and coefficient of determination 58%.

KEYWORDS: Achievement, Nutritional Status, Intelligence Quotient, Adolescents 16-17 years old

INTRODUCTION

Academic achievement is a common phenomenon that is often discussed, sought, and observed by almost all actors in the world of education. To achieve academic achievement requires effort from students supported by enthusiasm for learning, teacher guidance, and parental support. Achievement can be known after an evaluation of a process that is carried out. Many things affect student achievement, including the quality of the students themselves, which is closely related to the nutritional status of each individual (Padriyani, 2014). Learning achievement can be influenced by the level of energy consumption, protein, and nutritional status (Sunarto, 2015). So it can be concluded if there is an influence of nutritional status on student achievement (Ariyasa, 2016); (Nurmawati, 2014); (astuti & Fathonah, 2019); and (Fauzan *et al.*, 2021).

Lifestyle and behavioural awareness of consuming healthy and nutritious food causes individuals to control the food they consume. Lifestyle affects the eating habits of a person or group of people and has a certain impact, especially with regard to nutrition (Miko, 2017). Nutritional status is an expression of the state of balance in the form of certain nutritional variables (Sa'adah 2014). With good nutritional status, it will affect the process of growth and development of children, including the improvement of intellectual abilities that will have an impact on learning achievement. Some categories of nutritional status are very thin, thin, normal, fat and obese. Nutritional status in students is influenced by food intake, food availability in the community, and other factors such as health services, poverty, education, socio-culture, and lifestyle (Cakrawati & Mustikia, 2012). The condition of nutritional status can be measured by anthropometry. This tool is most often used in measurements with several indices, including BB/U, TB/U, BB/TB, IMT/U (Supariasa *et al.*, 2002).

Poor nutritional intake will result in abnormalities in brain tissue, one of which is a decrease in cognitive function which affects the willingness to learn. While excessive nutritional intake but minimal physical activity will also cause problems related to obesity. Nutritional intake should be balanced with physical activity carried out by students. In students with obese nutritional status

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categories have lower learning achievement, student academic performance is influenced by obesity and eating habits (Fontanilla, 2023). Obesity in children is a manifestation of metabolic syndrome that can affect the cardiovascular system such as pulse and blood pressure, caused by a combination of lack of physical activity and excessive diet. Malnutrition leads to impaired growth, a smaller body, followed by a smaller brain size. The number of cells in the brain is reduced and there is immaturity and imperfect biochemical organisation in the brain. This affects the development of brain intelligence.

Nutritional intake through food is an important factor in maximising brain function. If the need for nutrients can be fulfilled, it will have a good effect on optimal brain function. Nutritional status is a condition of the body caused by the balance between nutrient intake and needs. The balance can be seen in growth variables, namely body weight, height/body length, head circumference, arm circumference, and leg length. Nutritional adequacy is a very important need, especially for adolescents who are in the physical, physiological and emotional growth phase. Nutritional status in adolescents has a significant effect on brain growth as a support for the function of cognitive and intellectual processes in learning.

The relationship between intelligence and academic performance is a distinct but interrelated concept. The link begins with the assumption that intelligence is one of the most important cognitive factors and is responsible for variations in achievement scores (Akubuilu *et al.*, 2020). Intelligence is the ability to respond appropriately to new situations and use reason to solve problems (Muhajarah, 2022). General intellectual or quality intelligence usually refers to the function of a person's global or overall level of intelligence. In the process of educational activities, intelligence (IQ) is very important for independent participation. Environmental and biological factors as a strong influence on the level of intelligence (IQ). Global IQ provides an overview of an individual's ability to understand complex ideas, adapt to the environment effectively, learn by experience, engage in reasoning, and think through problems.

So intelligence does contain an element of mind or ratio. The high ratio factor used in every action or behaviour, shows high intelligence in action or behaviour. So that students who have high intellectual intelligence will more easily remember the material that has been taught to them. Intelligence is also related to the function of the brain in storing memory as a vital need in the learning process. The intellectual intelligence of a person can be measured using a test called an IQ test. Assessment in IQ tests is usually described through IQ (Intelligence Quotient) scores with the aim of knowing the level of intelligence possessed by individuals.

Based on the research findings that students who have a high level of intelligence (IQ) will easily get better achievement scores, whereas if there are students who have a low level of intelligence, these students will find it difficult to get good learning achievement scores, or it can be said that those with a low level of intelligence will get low achievement. But in reality, many students who have a high level of intelligence do not necessarily get good achievement scores either. Perhaps it is because most students who have a high IQ level are lazy to learn so that their achievements are not in accordance with their level of intelligence. Likewise, for those who have a low level of intelligence in the end not necessarily get a low achievement, sometimes students who actually have an ordinary level of intelligence get a good achievement because they have a strong enthusiasm for learning. The above information illustrates that nutritional status and intelligence (IQ) do affect the academic achievement of students. Several factors such as nutrition, education, socioeconomic status, age, gender, type of school, and family conditions can affect IQ and academic achievement Ejekwu (2012) in (Abu *et al.*, 2016).

Based on observations and interviews conducted, there are students who have unbalanced nutrition, some are less and some are even excessive. After the IQ test there is an average value and some are below average and above average. There is no data on the nutritional status of students, and there is even no data on the effect of nutritional status and intelligence on academic achievement. There are some students who have good nutritional status but their academic performance is not good, even with good intelligence it is not able to make their academic performance good. There are also those who have belowaverage intelligence and poor nutritional status but have good academic performance.

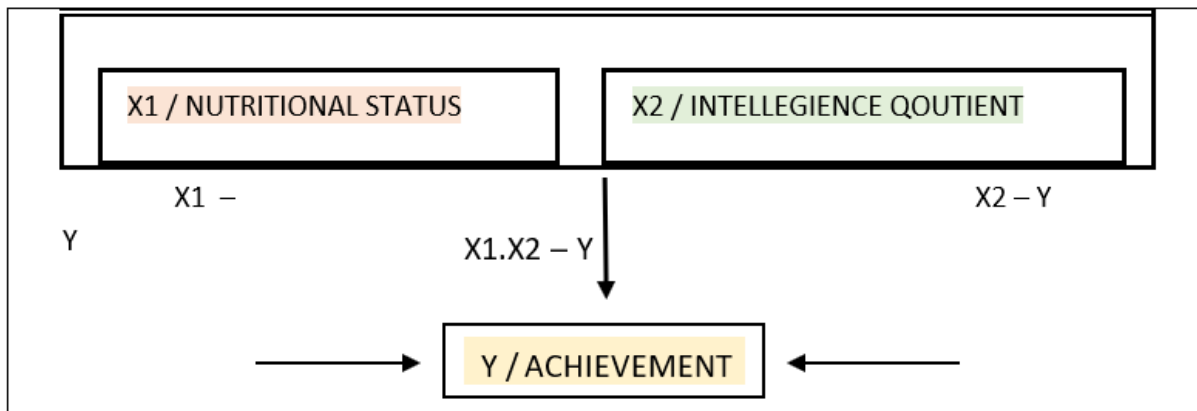
This study aims to determine 1) the effect of nutritional status on academic achievement of adolescent students, 2) the effect of intelligence on academic achievement of adolescent students, and 3) the effect of nutritional status and intelligence together on academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo.

METHOD

This research is a type of qualitative research. Qualitative research can be interpreted as a research method based on the philosophy of positivism, used to examine populations or samples, random sample techniques, data collection using research instruments, qualitative / statistical data analysis with the aim of testing predetermined hypotheses (Sugiyono, 2015). The design used in this study is Cross Sectional which is used to see the relationship between one variable and another.

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Figure 1. Design of the effect of X1 (Nutritional status), X2 (Intelligence Quotient) and Academic Achievement (Y).



The research was conducted from April 2024 to September 2024 at SMK Negeri 2 Purworejo. The population of this study were adolescent students aged 16-17 years at SMK Negeri 2 Purworejo, with sampling using quota sampling technique or set according to the target and the researcher set 149 students as samples. The instrument used to measure nutritional status by measuring body weight and height then converted using the Body Mass Index (BMI) formula. Instrument to measure Intelligence quotient using IQ scor taken from IQ test data. Academic achievement data uses data taken from the acquisition of report cards on the basis of the average score in the first semester.

The analysis technique uses multiple linear tests to determine the effect of independent variables (nutritional status and intelligence quotient) on the dependent variable (academic achievement). Stages of data analysis with data collection through survey methods, then data collection is carried out using predetermined instruments, namely Instruments for measuring BMI require height and weight measuring instruments (sadiometer and scales), Intellegience quotient instruments are taken with IQ tests, and Academic Achievement Instruments are taken from the average grade data of the first semester report card. Furthermore, the data were processed using inferential statistics and then continued with multiple linear regression analysis to test the hypothesis.

RESEARCH RESULTS

1. Description of Research Data

a. Nutritional Status

A description of the nutritional status data can be seen in table 1. next :

Table 1. Description of Nutritional Status data

No.	Total Grades	Interval	Frequency	Percentage (%)
1.	< 18.5	Low	67	44.9%
2.	18.5 – 22.9	Average	71	47.7%
3.	23 – 24.9	Excess	7	4.7%
4.	25 – 29.9	Obesity I	5	2.7%
5.	> 30	Obesity II	-	0%
Total			149	100%

It can be known that the nutritional status of 67 students (44.9%) in the low category, 71 students (47.7%) in the average category, 7 students (4.7%) in the excess category, and 5 students (2.7%) in the obesity category I. So it can be concluded that the nutritional status of adolescent students aged 16-17 years at SMK Negeri 2 Purworejo is in the good category even though there is only a small difference when compared to those with low nutritional status.

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b. Intelligence Quotient

The data describing the level of intelligence quotient (IQ) can be seen in table 2. next :

Table 2. Description of Intellectual Intelligence (IQ) Data Frequency)

Category	Rating	Frequency	Percentage (%)
Very High (TS)	140 – over	0	0 %
High (T)	120 -139	5	3.4%
Average Above (RA)	110 – 119	56	37.5%
Average (R)	90 - 109	88	59.1%
Below Average (RB)	80 – 89	0	0%
less (K)	70 – 79	0	0%
Very less (KS)	50 – 69	0	0%
Imbecile	20 – 49	0	0%
Ideot	Under 20	0	0%
Total		149	100%

From Table 2. the frequency of Intellectual Intelligence (IQ), it can be seen that the level of intelligence as many as 88 students (59.1%) is in the average frequency, as many as 56 students (37.5%) are in the upper average frequency category, as many as 5 students (3.4%) are in the high frequency category. So it can be concluded if the level of intelligence or intelligence quotient (IQ) of adolescent students 16-17 years old at SMK Negeri 2 Purworejo is in the high category.

c. Academic Achievement

The description data of the report card documentation obtained a maximum score of 88.2 and a minimum score of 78. The average score was 81.7, the standard deviation of 2.34 can be seen in table 3. next :

Table 3. Frequency of Academic Achievement data

Norm	Value Interval	Category	Frequency	(%)
M+1,5 SD ke atas	< 85,21	Very good (BS)	9	6%
M+0,5 SD s/d < M+1,5 SD	82,87 s/d < 85,21	Good (B)	21	15%
M-0,5 SD s/d < M+0,5 SD	80,53 s/d < 82,87	Medium (S)	38	25,5%
M-1,5 SD s/d < M-0,5 SD	79,18 s/d < 80,53	Less (K)	25	16,8%
M-1,5 SD ke bawah	> 78,19	Very Less (KS)	56	46,7%
Total			149	100%

From the data table 3. The frequency of academic achievement data was obtained by students with the least one category (KS) as many as 9 students, the Less (K) category as many as 21 students, the medium category (S) as many as 38 students, the good category (B) as many as 25 students, and the very good category (SB) as many as 9 students. It can be concluded that the level of academic achievement of adolescent students aged 16-17 years at SMK Negeri 2 Purworejo is in the category of less.

2. Data Analysis

a. Prerequisite Test

Normality testing using a single sample Kolmogorov Smirnov test provided that if the significance value is greater than 0.05, then the data is distributed Normal.

Table 4. Normality Test

One sample Kolmogorov Smirnov	Significance	Asymp.Sig. (2-Tailed)	Description
	0.05	0.069	Normal

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From table 4. indicates that the value of asymp.sig(2-Tailed) 0.069 is greater than the significance value of 0.05, so the data is said to be distributed Normal.

b. Uji Hypothesis

1) Hasil Uji Pengaruh Status Gizi Terhadap Prestasi Akademik

Data hasil perhitungan pengaruh status gizi terhadap prestasi akademik dapat dilihat pada tabel 5.

Table 5. Calculation of the coefficient of determination of nutritional status

Nutrition Status – Academic Achievement	Calculation results	Significance	Adjusted R Square	Description
	0.017	0.05	0.032	Significant effect

From table 5. can be obtained from the results of the significant value of nutritional status on academic achievement of 0.017 smaller than the specified significant 0.05. So it can be concluded that nutritional status has a significant effect on improving the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo. The coefficient of determination of nutritional status on academic achievement obtained a value of 0.032 or 32%. This means that nutritional status has a 32% influence in improving academic achievement.

2) Results of the Influence of Intelligence Quotient (IQ) Test

Data hasil perhitungan pengaruh Intelligence quotient (IQ) terhadap prestasi akademik dapat dilihat pada table. 6.

Table 6. Calculation of IQ Deduction Coefficient on Academic Achievement

Intelligence quotient – Academic Achievement	Calculation results	Significance	Adjusted R Square	Description
	0.258	0.05	0.002	No significant effect

From table 6. can be obtained the results of the significant value of intelligence quotient (IQ) on academic achievement of 0.258 greater than the specified significant 0.05. So it can be concluded that intelligence quotient has no significant effect on improving the academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo. The coefficient of determination of intelligence quotient on academic achievement obtained a value of 0.002 or 2%. This means that intelligence quotient has a 2% influence in improving academic achievement.

3) Test Results of the Effect of Nutritional Status and Intelligence Quotient on Academic Achievement

Table 7. Calculation of Coefficient of Determination of nutritional status and intelligence quotient (IQ) on Academic Achievement

Nutritional Status and Intelligence Quotient – Academic Achievement	Calculation results	Significance	Adjusted R Square	Description
	0.010	0.05	0.056	Significant effect

From table 7. can be obtained from the results of the significant value of nutritional status and intelligence quotient (IQ) on academic achievement of 0.010 is smaller than the specified significant 0.05. So it can be concluded that nutritional status and intelligence quotient (IQ) have a significant effect on improving the academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo. The coefficient of determination of nutritional status and intelligence quotient (IQ) on academic achievement obtained a value of 0.056 or 56%. This means that nutritional status and intelligence quotient (IQ) together have a 56% influence in improving academic achievement.

3. Discussion

In this study, an attempt to determine the relationship between nutritional status and intelligence quotient (IQ) on academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo was conducted. The results of the study are described according to the research questions as the objectives are described as follows :

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a. The Effect of Nutritional Status on Academic Achievement

The results of the study obtained a score of average academic achievement of 81.7 can be seen in table 3. The measure of nutritional status is taken from the Body Mass Index (BMI) in table 1. where it is obtained that most students are in good or average nutritional status. Of the sample of 149 students, 71 students were in average or good nutritional status. Almost half of the sample was well-nourished, namely 47.7% of the total sample used. There are 67 students or 44.9% who are undernourished and the rest are in the overnutrition status category, namely 7.4%, which is divided into the obesity I category as many as 5 students and overnutrition there are 7 students.

The results of regression analysis with statistical aids IBM SPSS version 26 between nutritional status with academic achievement obtained a calculated significance value of $0.017 < 0.05$. This means that there is a significant effect of nutritional status on the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo. The magnitude of the influence can be seen in table 5. where nutritional status is able to affect academic achievement by 32%. The magnitude of the influence of nutritional status on academic achievement is in line with the theory put forward by Djoko (2006) which assumes that nutrients which include carbohydrates, fats, proteins, vitamins, minerals, and water are substances that are needed by the body in the formation of health. With adequate intake of balanced nutrition, humans have good body quality so that the body's organs can work optimally, especially the brain as the nerve and mind control centre. This condition will help the smoothness of the learning process

The results obtained in this study are in line with the results of research conducted by Cahyanto et.al (2021) where nutritional status measurements use the BB / TB2 parameter to determine nutritional status and academic grades as an index of student achievement. The p-value of $0.006 < 0.05$, meaning that there is a significant relationship with a positive value between nutritional status and academic achievement index (Astuti, 2019). In line with research conducted by (Fontanilla, 2023) using a sequential mixed method design with a sample of 52 parents and guardians of students to determine the effect of nutritional status on academic achievement. The results of this study state that nutritional status is a key indicator of the success of student academic achievement.

Nutritional value is an important variable for students in the learning process, because it can increase intelligence, support physical and mental growth (Cahyanto et al., 2021). The effect of nutritional intake on child development can be through decreased or excess nutritional status. Poor nutritional status causes brain damage, illness, and physical and mental growth barriers. Meanwhile, excess nutritional status will also result in obesity disorders in children. Nutritional status disorders can be characterised by slow maturation of nerve cells, slow motor movements, lack of intelligence and slow social response.

b. The Influence of Intelligence Quotient (IQ) On Academic Achievement

Intelligence is the result of what is tested by intelligence tests (Gaugh, 2022). Another opinion says intelligence is the ability to think, the ability to understand and learn critically, make decisions and opinions based on reason (Landau, 2019). According to the Big Indonesian Dictionary, intelligence is the ability to react or adapt quickly and appropriately, both physically and mentally, to new experiences, making existing experience and knowledge ready for use in dealing with new conditions or realities (Bahasa, 2019). From these several definitions of intelligence, it can be concluded that intelligence is the ability to respond appropriately to new situations and use reason to solve problems (Muhajarah, 2022).

Academic achievement can be used as one of the factors that determine success in the world of education. Each level of education already has standards in providing the academic achievements of its students. This is the case with SMK Negeri 2 Purworejo by providing a report in the form of a report card every semester. This study was conducted on 149 adolescent students 16-17 years old at SMK Negeri 2 Purworejo to see the influence of intelligence quotient (IQ) on academic achievement. The research conducted gave the result that intelligence quotient (IQ) did not significantly affect academic achievement. Of the 149 students studied, 88 students (59.1%) were in the average frequency, 56 students (37.5%) were in the upper average frequency category, 5 students (3.4%) were in the high frequency category. It can be said that 16-17 year old adolescent students at SMK Negeri 2 Purworejo have a good level of intelligence. However, the results are not in line with the academic achievement obtained by the value of very less (KS) as many as 9 students, the category of less (K) as many as 21 students, the medium category (S) as many as 38 students, the good category (B) as many as 25 students, and the very good category (SB) as many as 9 students. It can be concluded that the level of academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo is in the less category.

Based on the explanation of the data results of intelligence quotient (IQ) with academic achievement, it can be concluded that intelligence quotient (IQ) does not have a significant influence on the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo. The results of regression analysis with statistical aids IBM SPSS version 26 between intelligence

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quotient (IQ) with academic achievement also obtained a calculated significance value of 0.258 > from the significance value of 0.05. This means that there is no significant influence of intelligence quotient (IQ) on the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo. The amount of influence can be seen in table 6. where intelligence quotient (IQ) is only able to affect academic achievement by 2%.

From Table 2. the frequency of Intellectual intelligence (IQ) can be known that the level of intelligence as many as 88 students (59.1%) are in the average frequency, as many as 56 students (37.5%) are in the upper average frequency category, as many as 5 students (3.4%) are in the high frequency category. So it can be concluded that the level of intelligence or intelligence quotient (IQ) of class X students at SMK Negeri 2 Purworejo is in the high category. However, if seen in table 3. The frequency of academic achievement data obtained by students in the category of very poor (KS) as many as 9 students, the category of less (K) as many as 21 students, the moderate category (S) as many as 38 students, the good category (B) as many as 25 students, and the very good category (SB) as many as 9 students. It can be concluded that the level of academic achievement of class X students at SMK Negeri 2 Purworejo is in the less category. It can be concluded from the data in table 2 and table 3 that, although 16-17 year old adolescent students at SMK Negeri 2 Purworejo have a high level of Intelligence quotient (IQ) category, the results of the achievements obtained seen from the report card scores are actually in the low or less category.

The level of intelligence and academic achievement has a complex relationship, but the results of this study provide challenges that need to be carried out more other studies. These results are supported by research from Physiology (2021) which states that there is no significant relationship between intelligence quotient and academic achievement using a total of 100 students (46 men and 54 women) (Physiology, 2021). This research is supported by Goleman's theory (2000) which states that intelligence quotient (IQ) plays no more than 20% role in supporting a person's life. The remaining 80% will be supported by other variables including emotional intelligence (EQ), innate, maturity, formation, interests and specialisations, and freedom.

c. The Influence of Nutritional Status and Intelligence Quotient (IQ) On Academic Achievement

After looking at the results of research data from adolescent students 16-17 years old at SMK Negeri 2 Purworejo, where individually there is a significant effect of nutritional status on academic achievement and there is no significant effect of Intelligence quotient (IQ) level on academic achievement. However, when nutritional status and intelligence quotient level are combined, it has a significant effect on the academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo. The results of calculations with statistical aids IBM SPSS version 26 obtained the value of nutritional status and intelligence quotient (IQ) together affect the achievement of academic achievement of 0.010 smaller than the significant determined 0.05. So it can be concluded that nutritional status and intelligence quotient (IQ) simultaneously have a significant effect on improving the academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo. The coefficient of determination of nutritional status and intelligence quotient (IQ) on academic achievement obtained a value of 0.056 or 56%. This means that the nutritional status and intelligence quotient (IQ) variables together have a 56% influence in improving academic achievement.

The development of brain intelligence is closely related to brain growth, and the main factor affecting brain growth is nutrition. Good nutrition will help children survive, develop healthily, avoid disease, and develop intelligence, emotions, and good behaviour (Hafsah et al., 2019). By paying attention to the magnitude of the influence of the two independent variables on the dependent variable, it can be seen that academic achievement is not only influenced by nutritional status and intelligence quotient (IQ) factors, but there are still many other variables that influence it. From table 3, it can be seen that the academic achievement data of most 16-17 year old adolescent students at SMK Negeri 2 Purworejo are in the good category, moderate and less categories are also many, only those at the excellent level are still few. There are several possibilities that affect these conditions including :

1) Internal Factors

a) Health

The condition of healthy children will have better learning time compared to students who have health disorders. This difference in learning opportunities will affect student learning achievement.

b) Intelligence and Talent

The high intelligence of students will provide better grasping power than students with the same time and learning materials in general.

c) Interests and Motivations

With high interest and motivation, students are able to maximize their efforts to achieve good academic achievements. Because each student has different interests and motivations, it will make the level of academic achievement of students diverse.

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d) How to Learn

Good learning by studying regularly and regularly should be well embedded in students. The desire to play strong is sometimes unbearable for students, but some students will choose to study to fill their free time. The desire to try new things in the outside world and the difference in learning methods make diversity in student achievement.

2) External Factors

a) Family environment

The support of harmonious family conditions will be the capital for students to learn optimally both at school and at home. Not all students can experience a harmonious family situation. So that the difference in the level of family harmony will also affect the level of academic achievement.

b) School Environment

Facilities and infrastructure from the school environment will affect the absorption of material learned by students. SMK Negeri 2 Purworejo is one of the pioneers of international schools, so it can be ensured that the facilities and infrastructure to support learning are good. It can be concluded that the absorption of material by students should be good if they can take advantage of the facilities and infrastructure that have been provided.

c) Community Environment

Socialization of students with the community environment will form the same thoughts and perspectives as the community. The high level of Community Education will affect students' motivation to learn. The diversity of the community where students live makes differences in students' thinking patterns and perspectives in their daily lives.

CONCLUSION

Based on data analysis, hypothesis testing, and discussion, conclusions can be drawn as follows :

1. There is a significant effect of nutritional status on improving the academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo. The regression coefficient obtained a value of 0.017 From table 5. can be obtained from the significant value of nutritional status on academic achievement of 0.017 smaller than the specified significant 0.05 and the coefficient of determination of nutritional status on academic achievement obtained a value of 0.032 or 32%. This means that nutritional status has a 32% influence in improving academic achievement.
2. There is no significant effect of Intelligence quotient (IQ) on improving the academic achievement of adolescent students 16-17 years old at SMK Negeri 2 Purworejo. The regression coefficient of intelligence quotient (IQ) on academic achievement of 0.258 is greater than the significant determined 0.05 and the coefficient of determination of intelligence quotient on academic achievement obtained a value of 0.002 or 2%. This means that intelligence quotient has a 2% influence in improving academic achievement.
3. There is a significant effect of nutritional status and Intelligence quotient (IQ) together on improving the academic achievement of adolescent students 16-17 years at SMK Negeri 2 Purworejo. The regression coefficient of nutritional status and intelligence quotient (IQ) together on academic achievement is 0.010 less than the significant determined 0.05 and the coefficient of determination of nutritional status and intelligence quotient (IQ) together on academic achievement obtained a value of 0.056 or 56%. This means that nutritional status and intelligence quotient (IQ) together have an influence of 56% in improving academic achievement.

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