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Relationship Between Hemoglobin Levels (Hb) and Nutritional Status with Academic Achievements of STIK KESOSI TLM Students in 2022

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Abstract

Students who excellence academically are always associated with good health status. One indicator of health status that is commonly used is hemoglobin (Hb) and nutritional status. Hb levels can be an indicator of anemia and nutritional status can be a measure of a person's brain development ability. The purpose of this study was to determine the relationship between hemoglobin (Hb) levels and nutritional status with the academic achievement of TLM STIK KESOSI students in 2022. The research design was cross-sectional, and sampling was carried out in October - November 2022. Sampling using a non-random technique, with a total sample of as many as 36 students. Data collection was carried out by measuring Hb levels, body weight, and height. The data obtained were analyzed by univariate and bivariate. The results showed that 47.2% of students were in the category of normal nutritional status, and 91.7% were not anemia. The relationship between Hb levels and student nutritional status on student academic achievement showed no significant relationship (P> 0.05). In conclusion, normal or not Hb levels and nutritional status did not affect student learning achievement. However, efforts are still needed to maintain the stability of Hb levels and nutritional status in students. So that the impact is not only to increase academic achievement but also to maintain the quality of long-term health.

Keywords: *TLM Students, hemoglobin, nutritional status.*

Abstrak

Mahasiswa yang berprestasi secara akademik selalu dikaitkan dengan status kesehatan yang juga baik. Salah satu indikator status kesehatan yang umum digunakan adalah hemoglobin (Hb) dan status gizi. Kadar Hb dapat menjadi indikator kondisi anemia dan status gizi menjadi ukuran kemampuan perkembangan otak seseorang. Tujuan penelitian ini untuk mengetahui hubungan kadar hemoglobin (Hb) dan status gizi dengan prestasi akademik mahasiswa TLM STIK KESOSI tahun 2022. Desain penelitian ini cross sectional, pengambilan sampel dilakukan pada bulan Oktober – November 2022. Pengambilan sampel dengan teknik non random, dengan jumlah sampel sebanyak 36 mahasiswa. Pengumpulan data dilakukan dengan mengukur kadar Hb, berat badan dan tinggi badan. Data yang diperoleh dianalisa secara univariat dan bivariat. Hasil penelitian menunjukkan 47,2% mahasiswa berada dalam kategori status gizi normal, dan 91,7% berada dalam kondisi tidak anemia. Hubungan kadar Hb dan status gizi mahasiswa terhadap prestasi akademik mahasiswa menunjukkan tidak ada hubungan yang signifikan (P>0,05). Kesimpulannya normal atau tidak nya kadar Hb dan status gizi ternyata tidak mempengaruhi prestasi belajar mahasiswa. Namun tetap diperlukan upaya untuk tetap menjaga kestabilan kadar Hb dan status gizi pada mahasiswa. Agar dampaknya bukan hanya kepada peningkatan prestasi akademik namun juga untuk menjaga kualitas kesehatan jangka Panjang

Kata kunci*: Mahasiswa TLM, kadar hemoglobin, status gizi*

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INTRODUCTION

Hemoglobin level is generally used as an indicator in determining anemia status in a person. The normal value of Hb levels based on WHO standards are 12 gr/dL. Anemia can be experienced by individuals in every age group, but children and women of childbearing age are a vulnerable group [1,2]. This problem is often referred to by most lay people as anemia. The impacts arising from this condition include endurance and inhibition of growth and development, and if in a pregnant condition it will certainly endanger the condition of the mother and fetus. Anemia itself is not a disease but a sign of a disease process rather than a disease in itself. Anemia conditions are directly correlated with nutritional status or intake of iron consumed.

College students in general are a community group of adolescents aged 10-24 years and are not married [3]. Based on the results of the population census in 2020, Indonesia is dominated by Generation Z and Millennial Generation. Proportion Gen. Z as many as 74.93 million people (27.94% of the total population) and as many as 69.38 million people Millennial Generation (25.87% of the total population). This generation has the potential to be actors in development to determine the future of Indonesia, that thing can be an opportunity as well as a challenge to Indonesia both in the present and in the future front [4].

One of the problems that often arise during adolescence is anemia. Symptoms of anemia that are often experienced include weakness, lethargy, dizziness, dizzy eyes, and a pale face. The diverse activities of adolescents in their daily life require a lot of nutritional intakes, especially iron [5]. Because iron is an important component in the manufacture of hemoglobin and is a micronutrient to help brain development [6]. If this is not sufficient, it can cause various effects such as decreased endurance. If the immune system decreases, the disease will easily attack, and the impact on learning activities and achievement will decrease as a result of decreased concentration [5].

Nutritional problems in adolescents can be caused by several factors, namely bad eating habits. This could come from bad eating habits in the family since childhood. In addition, adolescents have a wrong understanding of nutrition, such as limiting food to maintain a slim body and liking certain foods, such as eating only junk food [7]. A person's nutritional status is closely related to cognitive intelligence [8]. The learning process in a person will be disrupted if the incoming nutritional intake is not balanced with learning activities. In other words, nutritional intake in a person affects the learning process.

Several studies have explained the link between anemia and the achievement status of female students.

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There is a significant relationship between anemia status and learning achievement which is measured using the academic achievement index [9]. Nutritional status and anemia status among midwifery academy students in the Kendal Regency government have a significant relationship [7]. Nutritional status has a positive relationship with student achievement in midwifery FK UNS [10]. Other studies explain that iron consumption is not related to the incidence of anemia in students of SMP Negeri 27 Padang [11]. Based on some of these varied research results, researchers are interested in conducting an assessment to see the relationship between anemia and nutritional status with academic achievement in STIK KESOSI Medical Laboratory Technology students in 2022.

METHODOLOGY

This research is analytically observational with a cross-sectional approach. The sample was determined based on a non-random technique (consecutive sampling), with inclusion criteria: (1). Registered as an active student in the TLM study program, (2). Not currently taking iron supplements or blood-boosting tablets, (3). Maximum age of 22 years, (4). Not menstruating during the examination and (5). In good health or not currently suffering from an infectious disease (Diarrhea, TB, Malaria). Respondents who met the inclusion criteria then filled out a questionnaire and were explained informed consent. The questionnaires distributed contained open-ended questions regarding the characteristics of the respondents (age, GPA, Hb levels, nutritional status). The samples collected based on the inclusion criteria totaled 36 students. Student nutritional status is measured using Body Mass Index (BMI). The tools used to measure BMI are weight scales and a microtoise / height meter. Anemia status was measured by determining the students' hemoglobin (Hb) level using a Hb meter. Academic achievement/grade point (GPA) is determined by looking at the Student Study Result Card in the academic information system. Data analysis used a statistical program (SPSS ver 22) which included univariate and bivariate analysis. Univariate analysis was carried out to look at the characteristics of the students' weight, hemoglobin level, height, age, and GPA. Bivariate analysis was conducted to see the relationship between anemia and nutritional status with student academic achievement using the Pearson correlation test.

RESULT AND DISCUSSION

Based on the inclusion criteria, the number of student respondents collected in this study total 36 samples. Most of the students were in normal nutritional status (47.2%), and only a small number were obese (8.3%) (Table 1). Meanwhile, based on learning achievement, as measured by the grade

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point average (GPA) it was found that 72.2% were in the GPA range of 3.51 – 4.00 (Table 2). The measured student hemoglobin levels showed that most of the respondents (91.7%) were in good Hb condition or not anemic (>12 g/dL) (Table 3).

Table 1. Respondent distribution based on nutritional status

Nutritional status	n	F (%)
Normal	17	47,2
Underweight	6	16,7
Overweight	10	27,8
Obesity	3	8,3
Total	36	100

Table 2. Respondent distribution based on academic achievement

GPA	n	F (%)
2,76 – 3, 50	10	27,8
3,51 – 4,00	26	72,2
Total	36	100

GPA = achievement index

Table 3. Respondent distribution based on Hb levels

Hb levels (g/dL)	n	F (%)
<12 (anemia)	3	8,3
>12 (non-anemia)	33	91,7
Total	36	100

Hb = hemoglobin

The results of the examination of Hemoglobin (Hb) levels in TLM STIK KESOSI students showed that most of the students were in very good Hb condition (> 12 g/dL). This is an indication that TLM STIK KESOSI students in this case are generally free of anemia. Concerning learning achievement, it is known whether Hb levels are normal or do not affect student learning achievement. Low Hb levels or anemia are also said to not affect academic achievement in Al-Hikmah Jepara Islamic AKBID students [12]. Although the results of other studies argue that Hb levels in the body will affect cognitive function and the development of motor skills [13]. Poor cognitive function is usually characterized by poor memory, difficulty concentrating, fatigue, and decreased problem-solving abilities. Low Hb levels correlate with low student academic achievement [14,15]. However, student achievement is not only determined by Hb levels as an indicator of anemia status but as well as student nutritional status.

The relationship between Hb levels and nutritional status with student academic achievement was analyzed using the person correlation

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test. It was found that there was no relationship between Hb levels and student academic achievement (P> 0.05) (Table 4). Likewise, the relationship between nutritional status and student academic achievement showed no significant relationship (P > 0.05) (Table 5).

Table 4. Correlation test results for Hb levels and student academic achievement

r	P	correlation
-0,213	0,21	negative

Table 5. Correlation tests results of levels of nutritional status and student academic achievement

r	P	correlation
0,118	0,492	positive

Many factors can be behind the high and low academic achievement of a student. One of the determining factors is the motivation to learn and the learning experience. The higher the motivation and learning experience, the higher the student will get good learning achievement [16]. In addition, the competence of educators also provides opportunities for students to obtain good learning outcomes [17].

Nutritional status in this study was also found to be unrelated to student academic achievement. The same results were obtained for UNNES engineering faculty students in 2019, which stated that physical activity and nutritional status were not significantly related [18]. Likewise, the results of Nurzia's research (2018) stated that there was no significant effect between nutritional status on student achievement in semester III of the Prima Jambi Nursing Academy in 2016 [19].

Although no association was found between Hb levels and nutritional status with student academic achievement in this study, efforts are still needed to maintain the stability of Hb levels and nutritional status in students. So that the impact is not only on increasing academic achievement but also on maintaining the quality of long-term health

CONCLUSION

The results of the Pearson correlation test showed that there was no relationship between hemoglobin (Hb) levels and the nutritional status of TLM STIK KESOSI students in 2022 on academic achievement (P > 0.05).

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