Original Research Article

Overview of the incidence of anemia on the Student Achievement Index of the Nursing Study Program, Faculty of Medicine, Mulawarman University

Syahrun[1], Fanny Metungku[2], Sholichin[3], Afifah Putri Wahyuni[4], Dwi Nopriyanto [5]

[1,2,3,4,5] Nursing Program, Faculty of Medicine, Mulawarman University, Samarinda

Syahrun: nerssamarinda@gmail.com
phone number: 085878000003

Abstract

Background: Anemia is a serious problem in the world, including in Indonesia. Anemia is a decrease in erythrocytes in the blood which results in reduced oxygen carriers into the body which can cause impaired growth of body cells and brain. If anemia occurs in adolescents, it can result in decreased fitness, concentration and decreased academic achievement. **Purpose**: Describe the relationship between anemia and student achievement index as an early detection of anemia events. **Methods**: This is a descriptive study, the population of this study was 184 respondents with *consecutive sampling* techniques obtained 100 respondents who were examined. anemia variables using *GCHb Easy Touch*® *brand Blood Test* measurements and Grade Point Everage (GPA) variations obtained from the Student Academic Information System. Data analysis uses univariate in the form of frequency distribution. **Results**: The characteristics of respondents in this study were 14 male respondents and 86 female respondents consisting of students in Semester 2 (26%), Semester 4 (44%) and semester 3 (30%). From the results of hemoglobin examination in the blood, data were obtained on 6% of respondents who had mild anemia and the majority of Student Achievement Index was in the high category of 80%. **Conclusion**: The incidence of anemia in this study was relatively small with the majority cumulative grade point average being high

Keywords: Anemia; Grade Point Everage; Students

1. **INTRODUCTION**

Anemia is a serious problem in parts of the world including Indonesia which is a developing country, which affects health, economic conditions and social welfare (Priyanto, 2018). Anemia is a condition of erythrocytes in the blood whose number is reduced or hemoglobin (Hb) levels are less than normal resulting in being unable to perform its role as a carrier of oxygen throughout the tissue (Atik, Susilowati, & Kristinawati, 2022)

The prevalence of anemia in the world according to the *World Health Organization* (WHO) is estimated at 30% to occur at the age of 15-49 years which attacks children, adolescent girls and menstruating women, pregnant and postpartum women (WHO, 2017). In Indonesia based on the results of the 2018 Basic Health Research, 32% of anemia occurs at the age of 15-24 years (3 out of 10 children suffer from anemia) (Kemenkes, 2022) 23.90% occurred in women (Budiarti, Anik, & Wirani, 2021). As for the incidence of anemia according to data from the Samarinda City Health Office in 2016, there were 321 cases spread across 22 Primary health center in Samarinda (Suyatni Musrah, 2019).

Anemia causes inhibition of the growth of body cells and brain cells. Less hemoglobin content in the blood causes symptoms that are often known as 5L (Weak, tired, lethargic, tired, negligent), accompanied by dizziness, firefly eyes, easy sleepiness and difficulty concentrating due to insufficient amount of oxygen in the brain(Kemenkes, 2022). If anemia occurs inadolescents, it can result in decreased fitness and concentration as one of the reasons for decreased learning achievement and ability to participate in activities, as well as decreased antibodies that make the body easily infected (Isronim, 2020).

In research Sholikhah, Mustar, & Hariyanto (2021) in Surabaya that there is a significant relationship between anemia and academic achievement index, this is possible due to factors of residence, food intake, nutritional status and menstrual cycle. The same on literature review by Vera Dwi Apriani, Resha Rosalia dan Maya Arfania (2022) explained that the higher the hemoglobin level, the higher the student's learning achievement and vice versa. But the opposite results on the study Yuliandi, Apriani, Safitri & Manulang, (2022) Whether or not Hb levels and nutritional status of students have no effect on academic achievement, but it is necessary to stabilize Hb levels and nutritional status to maintain health quality in the long term. In line with other studies that explain that anemia is not related to attention, intelligence or memory in relation to academic achievement (Samson & Fischer, 2022). From the inconsistency of the results of the study, this study aims to describe the relationship between the incidence of anemiaand the student achievement index in the D3 Nursing study program, Faculty of Medicine, M ulawarman university as an early detection of the incidence of anemia.

2. **METHOD**

The design of this study is descriptive with the population being students of the D3 Nursing Study Program, Faculty of Medicine, Mulawarman University, Samarinda,

with a sample of 100 respondents. The sampling technique in this study *consecutive sampling* respondents have registered and met the inclusion criteria. The variables in this study were blood hemoglobin levels and Grade Point Everage (GPA). Hemoglobin levels measured using *Blood Test* merek *Easy Touch*® *GCHb* (picture 1) with the criteria for the results of the examination of Mild Anemia Hb 8 g / dL to < 11 g / dL, Moderate Anemia Hb 5 g / dL to < 8 g / dL and anemia Severe Hb < 5 g / dL . GPA data is obtained from the Student Affairs Academic Information System with low GPA criteria $\leq$ 2.25, Medium Category GPA 2.26 – 3.00 and High GPA category 3.01 – 4.00. Data analysis uses univariate to describe variables in terms of distribution and frequency.

3. RESULT AND DISCUSSION

Of the 184 students, as many as 100 students were willing to be respondents in this study. Unwilling respondents included illness, academic leave, and not being in place when data collection took place. The characteristics of respondents as in table 1 in this study are 14 male respondents and 86 female respondents consisting of students of Semester 2 (26%), Semester 4 (44%) and semester 3 (30%) listed in table 2. From the results of hemoglobin examination in the blood, data were obtained on 6% of respondents who had anemia as in table 3 and in table 4 it was seen that the majority of Student Achievement Index was in the high category of 80%.

Table 2. Distribution of Respondent Grade Level Characteristics (n=100)

Variabel	n	%
Gender		
Male	14	14 %
Female	86	86 %
Total	100	100%

Table 2. Distribution of Respondent Grade Level Characteristics (n=100)

Variabel	n	%
Level		
1	26	26 %
2	44	44 %
3	30	30 %
Total	100	100

Table 3. Distribution of Respondents' Anemia Categories (n=100)

Variabel		n	%
Anemia			
No Anemia		94	94 %
Mild Anemia		6	6 %
	Total	100	100

Table 4. Distribution of Grade Point Everage (GPA) (n=100)

Variabel		n	%
Grade Point Everage			
Low		1	1 %
Medium		19	19 %
High		80	80 %
	Total	100	100

Figure 1. Proofing Tools Hemoglobin *Easy Touch*® *GCHb*

This study confirms the results of previous studies that the incidence of anemia in a person is very weak relationship with learning achievement which statistically value p = 0.091 (p > 0.05) (Prasetya & Wihandani, 2019) This is supported by other studies that explain that reduced levels of Hb, malnutrition are not related to learning achievement and a person's academic achievement index (Yuliandi et al., 2022), (Samson & Fischer, 2022). The most determining Academic Achievement Index is the location of residence and choice of study programs other than gender, receiving scholarships, regional origin, parents' jobs, living costs (Tampil, Komaliq, & Langi, 2017) And the student's relationship with friends is also one that influences (Safitri Daruyani, Yuciana Wilandari, 2013) and length of study (Rifai, Sihite, & Pratiwi, 2018).

Although in this study anemia does not affect the learning achievement index, but must still pay attention to nutritional status to anticipate the incidence of anemia in order to maintain the quality of health in the long term (Yuliandi et al., 2022). In addition, this study found 6% of student respondents who were anemic in the mild category. So it is necessary to be aware of the long-term impact on the concentration and mental power of individuals as one of the effects of anemia (Aviana & Fatichatul Hidayah, 2015). The minimal incidence of anemia in respondents to this study is possible due to the adequate level of knowledge of students about anemia, as the results of the study Ambarwati & Pangesti (2018) Good knowledge of anemia affects the incidence of anemia in students.

This study has limitations in the form of examination methods using a rapid test system or *Point Of Care Testing* (*POCT)* but the accuracy of the examination is higher if

using a standardized laboratory, besides that the characteristics of the uneven comparison of male and female sex may be a consideration for future research.

4. CONCLUSION

The incidence of anemia in this study was relatively small with the majority cumulative achievement index was high. It is possible that a student's knowledge of anemia is adequate and potential factors, intelligence, mentality, learning methods, family environment and community affect a student's academic performance.

5. ACKNOWLEDGEMENT

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