

Overview of Hemoglobin Levels in Construction Workers in Tanjungsari Village, Sukaresik District, Tasikmalaya Regency

Vina Sylvia Fauziah^{1*}, Euis Tia Istianah¹, dr. Endang Octaviana Wilujeng²

¹ Diploma Medical Laboratory Technology, STIKes Muhammadiyah Ciamis, West Java, Indonesia

² Clinical Pathology Laboratory of RSUD Ciamis, West Java, Indonesia

*Corresponding author: vinasyviafauziah@gmail.com

SUBMITTED 27 September 2023 **REVISED** 14 October 2023 **ACCEPTED** 28 April 2024

ABSTRACT

Background & Objective: Hemoglobin is a tetrameric protein that binds iron (Fe) compounds that have an essential role in the body, namely transporting oxygen from the organs of respiration throughout the body and exchanging it with carbon dioxide from peripheral tissues to be released through the organs of respiration. Hemoglobin levels can be influenced by several factors, one of which is moderate to heavy-intensity physical activity. This study aims to determine hemoglobin levels in construction workers.

Method: This research is a descriptive study with a total sampling technique conducted in May 2023. Respondents in this study were 35 construction workers. Sampling was conducted in Tanjungsari Village, Sukaresik District, Tasikmalaya Regency, and the examination was conducted at the Hematology Laboratory of STIKes Muhammadiyah Ciamis. Measurement using the Cyanmethemoglobin method with the instrument used is a photometer. The examination results were processed and displayed in table format for narration.

Result: This study found normal hemoglobin levels in 23 respondents (66%) and 12 respondents (34%) with abnormal or below-normal hemoglobin levels in construction workers.

Conclusion: It can be concluded that the average results of hemoglobin levels in construction workers are typical. Future research is expected to research the relationship between working duration and hemoglobin in heavy workers.

Keywords: Hemoglobin; Cyanmethemoglobin; Construction Workers.

Introduction

Haemoglobin, along with globin and heme, is the main component of erythrocytes and has a porphyrin ring with iron atoms. The

four polypeptide chains comprising globin consist of two alpha and two beta chains. The alpha polypeptide chain contains 141 amino acids, while the beta polypeptide

chain contains 146 amino acids (Norsiah, 2015). Haemoglobin has two crucial roles in the human body: carrying protons and other protons from peripheral tissues to the respiratory tract for subsequent release and distributing oxygen from the respiratory system to these tissues. (Kosasi et al., 2016). Hb level in the blood is a clinical parameter used to determine the prevalence of anemia; anemia also refers to a condition where the hemoglobin in red blood cells decreases. (Mariani & Kartini, 2018).

Haemoglobin (Hb) levels based on the explanation of the Decree of the Minister of Health of the Republic of Indonesia Number 736a/Menkes /XI/1989 states that a person is said to be anemic if the Hb level is below a certain threshold such as 11.5 g / dL for children between the ages of 5 and 11 years, 12.0 g / dL for children between the ages of 12 and 14, 12.0 g / dL (Yushananta et al., 2021). Exercise is one of the factors that can alter blood hemoglobin levels. Extreme and moderate exercise fall under the physical activity category, and both can have mild to severe effects on hemoglobin levels. Changes in plasma, pH, and intravascular hemolysis can cause changes in hemoglobin levels. (Gunadi et al., 2016).

Physical activity has a significant impact on a person's blood hemoglobin level. People who exercise regularly have higher hemoglobin levels because their tissues and cells require more oxygen (O₂) during exercise. (Hasanan, 2018). Hb levels can change according to the type of activity, ranging from moderate to strenuous. In addition, Hb levels are also affected by age, gender, smoking, and diet, and in general, men have more muscle to perform strenuous activities than women, even at the same age. (Heriyanto et al., 2022).

Construction workers are a group of people who can build a building. One form of work that requires moderate to heavy physical

activity. The workforce comprises foremen, skilled laborers, carpenters, manual laborers, and security. (Gunadi et al., 2016). Due to solid muscle contractions during strenuous physical activity, blood vessels will be compressed, causing hemolysis, which impacts Hb levels in the blood. (Saputro & Junaidi, 2015).

Surah Al-Furqan verse 47 explains, "*And it is He who made the night for you (as) a garment, and sleep for rest, and He made the day to rise to do business.*" Based on Ahmad Seoqi Al-Finjari's explanation, every person needs 8 hours of sleep every day. Night is then made beneficial for humankind as a covering garment by Allah with His power. In addition, Allah makes people fall into a deep sleep so that they appear to be dead because they are wholly unconscious, and only the heart and some other organs remain functional. Therefore, he has the opportunity to rest completely, and Allah created the day for activity and endeavor. (Fitriah, 2016). For this reason, physically active people should take a Hb test to find out how their body is doing.

According to research conducted by Halim, (2014) Twenty respondents showed a decrease in Hb. Respondents' hemoglobin levels before and after Zumba exercise averaged 13.8 g/dL and 11.7 g/dL, respectively; typical Hb levels in women are 12-16 g/dL. Although Zumba exercise is moderate, people who do not exercise regularly can be considered high. Meanwhile, according to research conducted by Gunadi et al., (2016) About 28 people (93.4% of the total workforce) had normal Hb levels, slightly above average in one person (3.3%) and one person (3.3%) (Ningsih & Septiani, 2019).

Objective

To determine the hemoglobin levels in construction workers in Tanjungsari Village, Sukaresik District, Tasikmalaya Regency.

Method

The research method used is descriptive, which describes hemoglobin levels in flower workers in Tanjungsari Village, Sukaresik District, Tasikmalaya Regency. The population in this study were building workers in Tanjungsari Village, Sukaresik District, Tasikmalaya Regency, in May 2023, with as many as 35 people.

Sampling was done based on total sampling. The examination was carried out at the Hematology Laboratory of STIKes Muhammadiyah Ciamis.

The type of data used in this study is primary data obtained by conducting direct interviews and surveys.

Measurement using the Cyanmethemoglobin method with the instrument used is a photometer.

Data processing in this study will be explained in tabular form and described narratively.

Results

This study was conducted on May 23, 2023, by taking venous blood specimens from 35 construction workers in Tanjungsari Village, Sukaresik District, Tasikmalaya Regency, by examining hemoglobin levels in the Hematology Laboratory of D3 Health Analyst STIKes Muhammadiyah Ciamis with the cyanmethemoglobin method using a photometer. The normal value of hemoglobin levels in men is 14-18 g/dL and in women 12-16 g/dL.

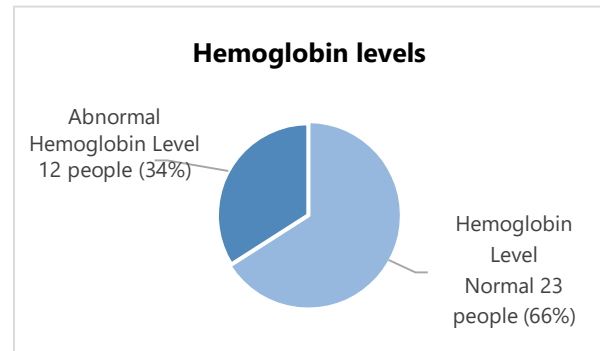


FIGURE 1. Hemoglobin levels

Based on Figure 1, it is obtained that hemoglobin examination in construction workers where the light blue part has a greater hemoglobin level of 66%, while the dark blue part has a result of 34%. This shows that the light blue has a more significant dominant part than the dark blue.

Discussion

The results of the study are comparable to those conducted by Ningsih & Septiani (2019) 20 out of 28 participants, or 71%, had normal hemoglobin levels, while 8 participants, or 29%, had abnormal hemoglobin levels. Based on the study Mas Indrayani et al. (2020) In Mangusada Hospital, 11 construction workers (73.3%) had normal hemoglobin levels, while four workers (26.7%) were abnormal, and in Nuban's research (2019), there were seven respondents (35%) and 13 respondents (65%) with abnormal hemoglobin levels.

Age, gender, smoking, and physical activity are some variables impacting hemoglobin levels. Physical activity can affect Hb levels, especially for those who often exercise. Can increase Hb levels, while people who do physical activity continuously can reduce Hb levels, such as construction workers (Prativi, 2013).

Figure 1 shows that 34% of construction workers have hemoglobin levels below normal, while 66% are within the normal range. According to the WHO explanation,

the normal level for men above 15 is 14.0-18.0 g/dL (Made Imas Saraswati, 2021). Anaemia can be caused by low colour, number, or size of red blood cells. According to the Decree of the Minister of Health of the Republic of Indonesia, Number 736a/Menkes/XI/1989, the hemoglobin (Hb) level in a person's blood is considered low if it is less than usual, which for adult men is 13.0 g/dL (Yushananta et al., 2021).

In this context, factors such as diet, age, gender, smoking, and physical activity can affect construction workers' hemoglobin and red blood cell levels. Food contains minerals or components that make hemoglobin, such as iron and protein. (Saputro & Junaidi, 2015). Due to solid muscle contractions during strenuous physical activity, blood vessels will be compressed, causing hemolysis, which impacts Hb levels in the blood. (Kurniasih et al., 2021).

In this study, all respondents were smokers. It should be noted that smoking can affect hemoglobin levels. Since carbon monoxide shifts, which has a greater affinity to hemoglobin, this likely reflects the body's compensatory strategy for the low oxygen binding to hemoglobin. As a result, hematopoiesis in the body increases, resulting in increased hemoglobin production due to the low partial pressure of oxygen, or PO₂, present in the body. (Rahmi, 2018). Therefore, construction workers need to gain an understanding of the adverse effects of smoking on their health and encourage them to stop smoking.

Overall, this study provides an overview of hemoglobin levels among construction workers in Tanjungsari Village, Sukaresik Sub-district, Tasikmalaya Regency. Although most respondents had hemoglobin levels within the normal range, the prevalence of anemia indicates the importance of health prevention and monitoring efforts in the work environment. Increased awareness of

the importance of good nutrition, regular check-ups, risk factor control, and overall health promotion can help improve the health and well-being of construction workers.

Conclusion

It can be concluded that construction workers' average results of hemoglobin levels are typical. Future research will be conducted on the relationship between working duration and hemoglobin in heavy workers.

Acknowledgment

Thank you to all parties involved for supporting this research so that this research can be realized.

Conflict of Interest

There were no conflicts of interest in preparing this research and article.

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