

CHAPTER I

INTRODUCTION

1.1 Research Background

Anemia is a concerning disease in which the oxygen-carrying capacity of the blood is insufficient. According to the World Health Organization (WHO), there are two billion people suffering from Anemia worldwide and 50% of these cases are caused by iron deficiency. The prevalence of iron deficiency anemia in Indonesia is 72.3%¹. In general, anemia in the elderly has a prevalence rate of 10% to 24% and this rate can increase to 50% with age. According to data from the World Health Organization (WHO). The prevalence of anemia worldwide in people aged 60 years and above is 39.1% with 54.1% of these cases occurring in Asia².

A lack of red blood cells in our bodies can cause anemia, which can lead to other health problems. The following is the word of Allah contained in Q.S Al-Furqon verse 2:

الَّذِي لَهُ مُلْكُ السَّمَوَاتِ وَالْأَرْضِ وَلَمْ يَتَّخِذْ وَلَدًا وَلَمْ يَكُنْ لَهُ شَرِيكٌ فِي الْمُلْكِ
وَخَلَقَ كُلَّ شَيْءٍ فَقَدَرَهُ تَقْدِيرًا ۝٢

Meaning: “(That is) the one to whom belongs the kingdom of the heavens and the earth, (He) has no son and there is no partner in His dominion. He has created everything, then determined its measurements precisely.”

From the above verse, it can be inferred that Allah is the owner of the kingdom of heaven and earth. His power is so perfect and his abilities are limitless. Allah has no partners, so he does not need help, and Allah created everything and determined its measurements, from the largest to the smallest, precisely, meticulously, usefully, and full of wisdom. In this verse, Allah created everything with perfect detail and adjustment. When we consider that Allah

¹ Kaimudin NI, Lestari H, and Afa JR, “Skrining Dan Determina Kejadian Anemia Pada Remaja Putri Sma Negeri 3 Kendari Tahun 2017,” *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat* 2, no. 6 (2017): 1–10.

² Pratiwi Anggraini, Theophany Margareta Kurniawan, and Ima Arum Lestari, “Diagnosis and Management of Anemia in The Elderly,” *Jurnal Biologi Tropis* 23, no. 4 (2023): 150–53.

SWT created something as small as a cell, we can witness the miracle of how Allah SWT created such a tiny element that is so vital to the human body. The cells in the body were created perfectly according to their roles and functions. Cells serve as the foundation for all aspects of life and are responsible for all bodily activities³. For example, red blood cells functions to transport oxygen throughout the body.

A deficiency of red blood cells can lead to anemia in the body. A decrease in the number of red blood cells due to their inability to perform the function of delivering sufficient oxygen to peripheral tissues is known as anemia. Anemia is a symptom of various underlying diseases, not a disease in itself⁴. Anemia is a common health problem in CKD patients. Anemia affects patients quality of life and expectancy⁵. CKD is a common disease with clinical consequences, however public awareness of this disease is very low. Only 6% of the general population and 10% of the high-risk population worldwide are aware of their chronic kidney failure status⁶.

The World Health Organization (WHO) estimates that the annual number of deaths worldwide directly caused by CKD is 5-10 million⁷. In Indonesia, the population of CKD patients aged over 15 years is 0.38% or 713.783 people. Of the patients, 19.3% undergo haemodialysis. This decline in kidney function results in reduction of erythropoietin hormone, and CKD is often associated with anemia⁸. The World Health Organization (WHO)

³ Rahmadina et al., "Teori Sel Prokariotik, Eukariotik Dan Penyusun Membran Sel," *Biology Education, Science, and Technology* 7, no. 2 (2024): 36–42.

⁴ I Made Bakta, "Pendekatan Diagnosis Dan Terapi Terhadap Penderita Anemia," *Bali Health Journal* 1, no. 1 (2017): 36–48.

⁵ Desi Salwani, Maimun Syukri, and Abdullah Abdullah, "Anemia Pada Penyakit Ginjal Kronis," *Jurnal Kedokteran Nanggroe Medika* 6, no. 2 (2023): 31–38.

⁶ Bogdan Ene-Iordache et al., "Chronic Kidney Disease and Cardiovascular Risk in Six Regions of the World (ISN-KDDC): A Cross-Sectional Research," *The Lancet Global Health* 4, no. 5 (2016): e307–19.

⁷ Valerie A. Luyckx, Marcello Tonelli, and John W. Stanifer, "The Global Burden of Kidney Disease and the Sustainable Development Goals," *Bulletin of the World Health Organization* 96, no. 6 (2018): 414–422C.

⁸ Catherine Ilona, Rahajoe Imam Santosa, and Mulyadi Mulyadi, "Angka Kejadian Anemia Pada Pasien Penyakit Ginjal Kronis Di Unit Hemodialisis Rsud Dr. M. Soewandhie Surabaya Periode Januari 2021-Agustus 2022," *Medika Kartika Jurnal Kedokteran Dan Kesehatan* 7, no. Volume 7 No 2 (2024): 124–134.

estimates that the number of patients with chronic kidney disease (CKD) in Indonesia will increase by 41.4% from 1995 to 2025. According to Indonesian Nephrology Association (Pernefri), there are 70.000 patients with kidney disease in Indonesia, with CKD cases continuing to rise by approximately 10% each year⁹.

Patients with ens-stage CKD usually undergo haemodialysis to address issues arising from chronic or acute kidney dysfunction, allowing them to maintain metabolism and electrolyte balance¹⁰. Declining kidney function can exacerbate anemia, therefore anemia therapy is administered to increase haemoglobin levels and prevent complications in CKD patients. The anemia therapies used in CKD patients are epoetin alfa and beta, folic acid, iron and vitamin B complex. A combination of anemia therapies can be used according to the patient's indications¹¹. The maintenance Hb target for anemia therapy in CKD is 10-12 g/dL, Right dosing is required¹².

1.2 Research Problems

1. How is the profile of anemia therapy for increasing hemoglobin in patients with *Chronic Kidney Disease* hospitalized at Dr. Moewardi Solo Hospital?
2. How is the rationale for anemia therapy for increasing hemoglobin in patients with *Chronic Kidney Disease* hospitalized at Dr. Moewardi Solo Hospital?
3. How is the effectiveness of anemia therapy for increasing hemoglobin in patients with Chronic Kidney Disease hospitalized at Dr. Moewardi Solo Regional Hospital?

1.3 Research Objectives

The objectives of this research are:

⁹ Syari Mislina, Aries Purwaningsih, and Ela Melani MS, "Analisa Perubahan Kadar Hemoglobin Pada Pasien Gagal Ginjal Kronik (GGK) Yang Menjalani Hemodialisa Di Rumah Sakit Annisa Cikarang," *Cerdika: Jurnal Ilmiah Indonesia* 2, no. 2 (2022): 191–98.

¹⁰ N Sari, V Srikartika, and D Intannia, "Profil Dan Evaluasi Terapi Anemia Pada Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisa Di BLUD RS Ratu Zalecha Martapura Periode Juli-Oktobre 2014," *Jurnal Pharmascience* 2, no. 1 (2015): 65–71.

¹¹ Sari, Srikartika, and Intannia.

¹² Salwani, Syukri, and Abdullah, "Anemia Pada Penyakit Ginjal Kronis."

1. To determine the profile of anemia therapy use to increase hemoglobin in hospitalized patients with *Chronic Kidney Disease* at Dr. Moewardi Hospital, Solo.
2. To determine the rationale for anemia therapy to increase hemoglobin in hospitalized patients with *Chronic Kidney Disease* at Dr. Moewardi Hospital, Solo.
3. To determine the effectiveness of anemia therapy on increasing hemoglobin in hospitalized patients with *Chronic Kidney Disease* at Dr. Moewardi Hospital, Solo.

1.4 Research Benefits

1. Theoretical Benefits

The results of this research can add to scientific knowledge and can be used as a reference for further research on anemia therapy and its effectiveness for Chronic Kidney Disease (CKD) patients to determine the increase in haemoglobin in CKD patients undergoing anemia therapy.

2. Practical Benefits

The results of this research are expected to provide further information to other studies and clinical departments regarding anemia therapy for increasing haemoglobin levels in Chronic Kidney Disease (CKD) patients. This will generate information related to the increase in haemoglobin levels in CKD patients at Dr. Moewardi General Hospital.

1.5 Authenticity of the Research

Research on the evaluation of anemia has been conducted by several researchers, as shown on the table below:

Table 1. Authenticity of the Research.

Research Title	Type of Research	Variables	Results	Research Differences
Haemoglobin Levels in Chronic Kidney Failure Patients	Descriptive Survey with Cross-Sectional Approach.	Dependent: Haemoglobin Levels Independent: Gender, Age, Duration of Illness, and	Average total haemoglobin: 8,065 gr/dL.	Dependent: Prospective Independent: descriptive evaluation of anemia therapy in CKD patients using purposive sampling. Anemia therapy

Research Title	Type of Research	Variables	Results	Research Differences
Undergoing Hemodialysis ¹³ .		Duration of Hemodialysis.		
Management of Anemia in Chronic Kidney Disease ¹⁴	Literature Review	Dependent: Haemoglobin levels in patients with Anemia due to chronic kidney disease Independent: Administration of iron (oral or intravenous) and administration of erythropoiesis stimulating agents (ESA)	The use of ESA can significantly increase haemoglobin levels, and it is important to evaluate iron status before administering ESA to maximise the effectiveness of therapy	Dependent: The research was conducted prospectively and descriptively using medical record data Independent: Anemia therapy
Analysis of Anemia Treatment in Chronic Kidney Failure Patients at Dr. Drajat Prawingara Regional General Hospital 2022 ¹⁵ .	Retrospective descriptive method by reviewing patient medical records.	Dependent: Patient haemoglobin level (average 8,8 g/dL) Independent: Anemia therapy (PRC transfusion, folic acid, and combination therapy) and patient characteristics (age, gender)	It was found that 73.8% of patients with chronic renal failure suffered from Anemia. The most commonly used Anemia treatment was PRC transfusion.	Dependent: Prospective descriptive method using medical record data. Independent: Measuring dosage accuracy, Right Right indications.

¹³ Ardiya Garini, "Kadar Hemoglobin Pada Pasien Gagal Ginjal Kronik Yang Menjalani Hemodialisis," *JPP (Jurnal Kesehatan Poltekkes Palembang)* 13, no. 2 (2019): 111–16.

¹⁴ Nurfana J. Mohtar, Cerelia E. C. Sugeng, and Octavianus R. H. Umboh, "Penatalaksanaan Anemia Pada Penyakit Ginjal Kronik," *Journal E-Clinic 11*, no. 1 (2022): 51–58.

¹⁵ Nurul Insani, Marianti A. Manggau, and Hasyim Kasim, "Analisis Efektivitas Terapi Pada Pasien Anemia Gagal Ginjal Hemodialisis Di Rsup Dr. Wahidin Sudirohusodo Makassar," *Majalah Farmasi Dan Farmakologi* 22, no. 1 (2018): 13–15.