

**HUBUNGAN STADIUM PENYAKIT GINJAL KRONIS DENGAN KADAR
HEMOGLOBIN PADA PASIEN PENYAKIT GINJAL KRONIS:
STUDI LITERATUR NARATIF**



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ABSTRACT

RELATIONSHIP BETWEEN CHRONIC KIDNEY DISEASE STAGES AND HEMOGLOBIN LEVELS IN PATIENTS WITH CHRONIC KIDNEY DISEASE: A NARRATIVE LITERATURE REVIEW

By

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Chronic kidney disease is a global health problem with a continuously increasing prevalence. Anemia is one of the most common complications of chronic kidney disease and occurs as a result of decreased erythropoietin production, impaired iron metabolism, chronic inflammation, and the accumulation of uremic toxins. Reduced hemoglobin levels have been shown to be associated with increasing chronic kidney disease severity and contribute to higher patient morbidity and mortality.

This narrative literature review explored the available literature discussing the relationship between hemoglobin levels and chronic kidney disease stages in patients with chronic kidney disease. Literature searches were conducted using the PubMed and Google Scholar databases with keywords related to chronic kidney disease, hemoglobin, and estimated glomerular filtration rate. The included literature consisted of original research articles published in English between 2016 and 2026. By applying the predefined inclusion and exclusion criteria, a total of 12 articles were selected for review.

All reviewed studies demonstrated an association between hemoglobin levels and chronic kidney disease stages. Hemoglobin levels tended to decrease as estimated glomerular filtration rate declined and chronic kidney disease stage advanced. The prevalence of anemia increased progressively in advanced stages of chronic kidney disease, particularly stages G4 and G5. This relationship was influenced by decreased erythropoietin production, elevated hepcidin levels, chronic inflammation, shortened erythrocyte lifespan, and the accumulation of uremic toxins.

Hemoglobin levels are inversely associated with the stage of chronic kidney disease.

Keywords: chronic kidney disease, hemoglobin, anemia, estimated glomerular filtration rate, chronic kidney disease stage.

ABSTRAK

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Oleh

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Penyakit ginjal kronis merupakan masalah kesehatan global dengan prevalensi yang terus meningkat. Anemia merupakan salah satu komplikasi penyakit yang paling sering terjadi pada penyakit ginjal kronis yang terjadi akibat penurunan produksi eritropoietin, gangguan metabolisme zat besi, inflamasi kronis, dan akumulasi toksin uremik. Penurunan kadar hemoglobin diketahui berhubungan dengan peningkatan keparahan stadium penyakit ginjal kronis dan berkontribusi terhadap peningkatan morbiditas serta mortalitas pasien.

Studi literatur naratif ini mendalami berbagai literatur yang membahas hubungan kadar hemoglobin dengan stadium penyakit ginjal kronis pada pasien penyakit ginjal kronis. Pencarian dilakukan melalui basis data PubMed dan Google Scholar menggunakan kata kunci yang berkaitan dengan penyakit ginjal kronis, hemoglobin, dan *estimated glomerular filtration rate*.

Literatur yang diinklusi merupakan artikel penelitian orisinal berbahasa Inggris yang dipublikasikan pada tahun 2016–2026. Dengan menyesuaikan kriteria inklusi dan eksklusi, didapatkan sebanyak 12 artikel untuk ditelaah. Seluruh literatur menunjukkan adanya hubungan antara kadar hemoglobin dan stadium penyakit ginjal kronis. Kadar hemoglobin cenderung menurun seiring penurunan *estimated glomerular filtration rate* dan peningkatan stadium penyakit ginjal kronis. Prevalensi anemia meningkat secara progresif pada stadium lanjut, terutama stadium G4 dan G5. Hubungan tersebut dipengaruhi oleh penurunan produksi eritropoietin, peningkatan kadar hepcidin, inflamasi kronis, pemendekan usia eritrosit, dan akumulasi toksin uremik.

Terdapat hubungan terbalik antara kadar hemoglobin dan stadium penyakit ginjal kronis.

Kata kunci: penyakit ginjal kronis, hemoglobin, anemia, *estimated glomerular filtration rate*, stadium penyakit ginjal kronis.