

Analysis of Increasing Trends in Hemodialysis Patients and Its Implications for National Health Financing Burden in Indonesia: Literature Study

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ABSTRACT

The number of chronic kidney disease (CKD) patients undergoing hemodialysis in Indonesia continues to increase, putting great pressure on the national health financing system, especially the National Health Insurance (JKN). This study is a literature review that analyzes five scientific articles published between 2021 and 2024. Articles were selected through targeted searches in Google Scholar and PubMed, then synthesized narratively to describe trends and financing implications. The synthesis results show a significant increase in the number of hemodialysis patients each year, with therapy costs reaching trillions of rupiah. Payment rates set in the INA-CBGs system are often not in accordance with real costs in hospitals, risking a deficit in health facilities and BPJS Kesehatan. The increasing trend of hemodialysis patients places a large economic burden on the national health system. Cost control strategies are needed through primary prevention, early detection of CKD, adjustment of INA-CBGs rates, and development of alternative therapies to maintain service sustainability.

Keywords: Hemodialysis, Chronic Kidney Disease, Health Financing, JKN, INA-CBGs

INTRODUCTION

According to WHO, chronic kidney failure contributes to the global burden of disease with a death toll of 850,000 people per year.(Andreastra et al., 2024).Chronic kidney disease (CKD) in Indonesia continues to increase and drives the need for hemodialysis therapy. The prevalence of hemodialysis varies globally, influenced by economic conditions and health systems. High-income countries record figures of up to 1575 per million population, while low-income countries are only around 12.2 per million population(Anggraini, 2022). The financial burden of dialysis is enormous, with an average annual cost of 19,380 in high-income areas compared to only 4,310 in South Asia.

In 2023, cases of kidney failure in Indonesia will reach 1.5 million with a cost burden of IDR 2.9 trillion borne by BPJS Kesehatan. Since 2015, hemodialysis has become one of the most expensive services after heart disease, with a cost of IDR 2.78 trillion. Because it must be done continuously, hemodialysis poses a large economic burden to the health

system (Silvia Vinawaty Soetedja et al., 2022). According to data from the Indonesian Renal Registry (IRR) 2018, the number of chronic kidney disease (CKD) patients undergoing hemodialysis increased from 77,892 in 2017 to 132,142 in 2018. (Rahmi et al., 2021). This increase causes an increase in the need for medical funds, which has an impact on access and quality of health services. In the era of National Health Insurance (JKN), financing at FKRTL uses the INA-CBGs system through social insurance, but often the real costs exceed the set rates. (Fatonah et al., 2021).

Hemodialysis services are one of the services guaranteed by BPJS Kesehatan. Payment of JKN patients with INA CBGs rates is not without problems, some rates in INA CBGs do not represent the adequacy of health service financing for JKN patients when compared to hospital rates. (Indrawati & Viphindrartin, 2024). The cost of hemodialysis therapy is very high because it is repetitive and long-term, with the estimated cost of one procedure in a hospital ranging from Rp730,000 to Rp1,500,000, depending on the type of facility and method used. (Puspitasari et al., 2024).

The latest INA-CBGs tariff adjustment also shows an increase in costs, where the single-use hemodialysis rate in class B hospitals is IDR 896,700 and in class C IDR 844,800, while reuse actions are paid at 85% of the rate. Pharmacoeconomic studies in several hospitals show that the average direct medical cost per patient for one hemodialysis procedure can reach more than IDR 2 million (Nurtandhee, 2023).

This high cost burden puts great pressure on the national health financing system, especially BPJS Kesehatan, which in recent years has experienced a deficit due to a spike in claims for catastrophic diseases such as kidney failure. With the prevalence of CKD continuing to increase, the cost burden of hemodialysis therapy is projected to continue to rise, so strategic efforts are needed in controlling costs and increasing service efficiency. (Indrawati & Viphindrartin, 2024).

RESEARCH METHODS

This research involves the synthesis, summary, and review of a number of studies, by applying the literature review method. Writing a literature review means gaining an in-depth understanding of a topic that has been investigated and researched by others, and identifying key issues that arise in that context. The literature review was conducted by reviewing journals that have been published between 2021 and 2024. The search results were then compiled after a data cleaning process was carried out to ensure their relevance

to the research objectives, namely to analyze the increasing trend of hemodialysis patients and their implications for the burden of national health financing in Indonesia. From the search results, 5 articles were selected that met the research criteria sourced from Google Scholar, National Institutes Of Health (PubMead) to support the understanding and analysis of the increasing trend of hemodialysis patients and their implications for the burden of national health financing in Indonesia.

RESULTS AND DISCUSSION

Based on the analysis of several journal articles that have met the integration criteria, the results of this study are described in Table 1.

No.	Writer	Article Title	Year/Location	Research result
1.	(Hasibuan & Prasetyo, 2024) Volume 9 Number 1 June 2024	Overview of Dialysis Service Claims in Hospitals and Overview of Dialysis Service Claims in Hospitals and Policy Recommendations at the Regional Level: A Case Study of Pematangsiantar City	2024 / Siantar	This study analyzes the trend of dialysis service claims in Pematangsiantar City from 2017 to 2022 and projects the need for services until 2025. The results of the study showed a significant increase in visits and dialysis cost claims each year. The average dialysis service cost claim is 85 billion rupiah per year, with an increase in visits of 25.56% and cost claims of 23.52% per year. In 2021, dialysis visits increased by 91.6% with claims reaching IDR 128.2 billion. Projections until 2025 show an increasing trend with an estimated visit reaching 266,698. This study emphasizes the importance of maintaining the sustainability of health financing through the JKN program, adjusting the capacity of dialysis services, and prioritizing primary prevention efforts for kidney disease.
2.	The 1990s saw the birth of a child named Candra Eka Puspitasari, Mahacita Andanalusia, Yoga Dwi Saputra1, Ni Made Amelia Ratnata Dewil, Melda Putri Zakiah1, Ni Luh Ayu Sri Widyasari E-ISSN: 2774-8057 Volume 6 January 2024	Cost Analysis of Hemodialysis Therapy at Type B Hospitals in West Nusa Tenggara	2024 / West Nusa Tenggara	The results of this study analyzed the direct medical costs of hemodialysis therapy in chronic kidney disease (CKD) patients at Type B Hospitals in West Nusa Tenggara during the period from January to June 2023. The total direct medical costs incurred for hemodialysis therapy during the study period were IDR3,300,328,993.00. The average direct medical cost per patient for 6 months was IDR110,010,966.00. The average direct medical cost per one hemodialysis procedure per

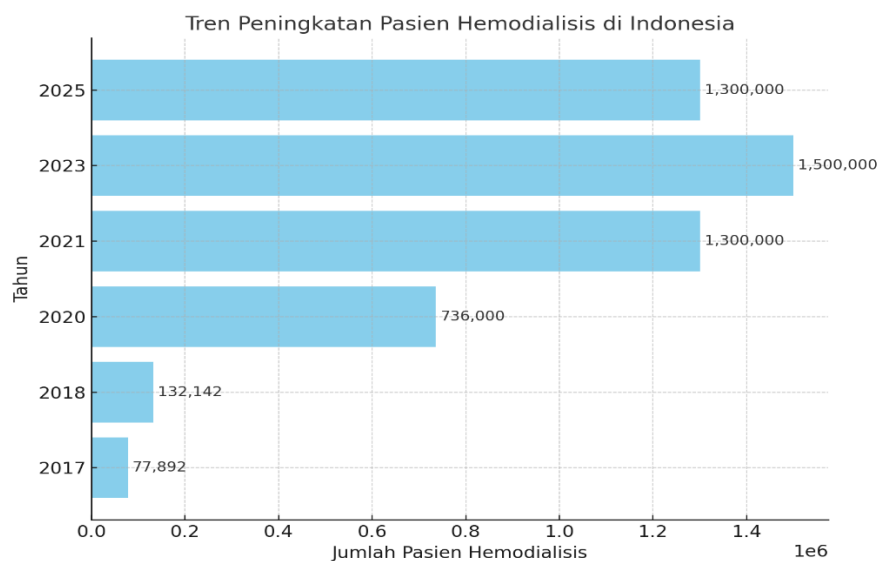
				<p>patient was IDR2,293,391.00. The largest cost component came from the cost of treatment procedures, which was a total of IDR2,113,073,500.00 or an average of IDR70,435,783.00 per patient. Most patients (96.67%) underwent hemodialysis twice a week, with an average of 48 procedures per patient for 6 months. The characteristics of the patients were dominated by men (66.67%) and the age group of 46–55 years (30%). The majority of patients also had comorbid hypertension (90%). All patients in this study used the National Health Insurance (JKN) financing system. Hemodialysis therapy at Type B Hospitals in West Nusa Tenggara requires very high direct medical costs, with the largest cost burden on treatment procedures. This indicates the need for special attention in managing financing and efficiency of hemodialysis services, especially in the JKN system, so that access and quality of service are maintained for PGK patients.</p>
3.	<p>Mutiara Nurtandhee, Volume 3 Number 2, (December, 2023). Pages 84 - 101</p>	<p>Estimation of Health Service Costs as an Effort to Prevent Social Security Fund Deficits for Kidney Failure Disease</p>	<p>2023 / Lampung</p>	<p>The results of this study examine the estimated cost of health services for kidney failure as an effort to prevent a deficit in social security funds in Indonesia, especially in the context of BPJS Kesehatan. Kidney failure is one of the catastrophic diseases with the highest cost burden in Indonesia, where in 2021 the cost of treatment reached IDR 6.5 trillion, an increase of 190% compared to 2020, along with the increasing number of sufferers which is projected to increase from around 736 thousand in 2020 to 1.3 million in 2025 with an average increase of 12.76% per year. The risk of kidney failure is higher in the age group over 45 years, with the highest prevalence at the age of 75-84 years and more common in men. Along with the increasing number of sufferers and hemodialysis cases, the total cost of treatment is estimated to reach between IDR 2.4 to 3 trillion per year in the period 2023-2025, while the number of JKN participants is projected to reach 264.7 million in 2025 with an average increase of 3.42% per year. The forecasting</p>

				methods used include Exponential Smoothing, Simple Moving Average, and Exponential Weighted Moving Average with accuracy validation using Mean Absolute Percentage Error. Policy implications indicate that cost control schemes such as cost sharing that have been effective in several countries, including the United States, are recommended to be implemented in Indonesia based on the results of kidney failure cost projections to control national health insurance spending.
4.	(Madania et al., 2022)2021; 1 (3): 190 – 202	Cost and Utility Value Analysis in Hemodialysis Patients Given Erythropoiesis Therapy in Hospital	2021 / Gorontalo	The results of this study indicate that chronic kidney failure patients undergoing hemodialysis often experience anemia due to decreased erythropoietin production, so erythropoietin (EPO) therapy is needed even though the cost is high. This prospective cross-sectional study in 45 patients used the EQ-5D-5L and EQ-VAS questionnaires to assess quality of life and a cost survey from the patient's perspective. The results showed that the most widely used EPO therapy was single Hemapo because it was more effective and cheaper, with an average total cost of hemodialysis therapy per month of IDR 7,112,000, transportation costs of IDR 50,111, and food costs of IDR 25,000. The average utility value of patients was 0.673 (fairly healthy) and a VAS score of 71.4, indicating a fairly good quality of life despite the high cost burden. This study emphasizes the importance of considering the costs and benefits of EPO therapy to optimize the quality of life of CKD patients undergoing hemodialysis with rational cost management.
5.	(Sinaga, 2023) Volume 14 Number 2, April 2023	EQ-5D-5L for Cost and Utility Index Measurement in Chronic Kidney Failure Patients with Hemodialysis	2020 / Samarinda	This study examined the effect of complications on therapy costs and utility index in chronic kidney failure (CKF) patients undergoing hemodialysis at RSUD Abdoel Wahab Sjahranie Samarinda. The results showed that the real cost per month reached IDR 972,540,696 with an average cost per patient of IDR 12,796,588, and the cost per hemodialysis episode was IDR 972,540,696 with an average cost per patient of IDR 12,796,588, and

				<p>the cost per hemodialysis episode was IDR 119,582,312 with an average of IDR 1,573,451. The overall patient utility index was 0.645 ± 0.210. Statistical analysis showed that complications had a significant effect on the utility index ($p=0.012$), meaning that complications reduced the patient's quality of life. However, the impact of complications on therapy costs was not significant ($p=0.095$), so complications did not significantly increase therapy costs in this study. The most common complication found was anemia (78.46%). In conclusion, complications in CKD patients with hemodialysis have an impact on decreasing quality of life (utility index), but do not have a significant effect on increasing therapy costs.</p>
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DISCUSSION

Increasing Trend of Hemodialysis Patients in Indonesia

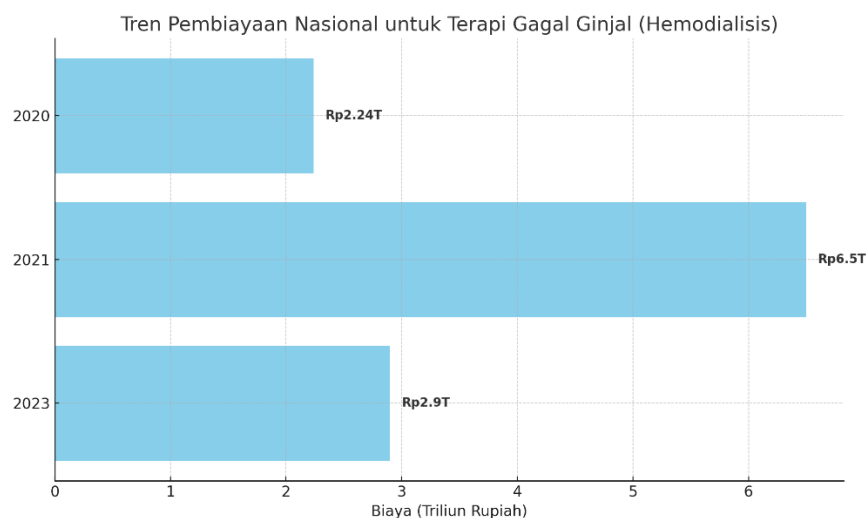


Based on the graph "Trend of Increasing Hemodialysis Patients in Indonesia", there is a significant increase in the number of hemodialysis patients in Indonesia over the past few

years. The data shows a spike from 77,892 patients in 2017 to 132,142 in 2018, and this number continues to grow, projected to reach 1,500,000 in 2023 and 1,300,000 in 2025. This increase is largely due to lifestyle changes, increasing prevalence of diabetes mellitus and hypertension, and higher public awareness of early detection of kidney disease.

The increasing number of chronic kidney failure (CKD) patients undergoing hemodialysis in Indonesia has shown a very significant trend in recent years. Indonesian Renal Registry (IRR) data shows a spike in patients from 77,892 (2017) to 132,142 (2018), and this number continues to increase every year (IRR, 2019). A recent study by Andreastra et al. (2024) confirmed that Indonesia is experiencing an increasing burden of chronic kidney disease, in line with the global burden of disease published by WHO. The main factors for this increase are changes in lifestyle, increasing prevalence of diabetes mellitus and hypertension, and increasing public awareness of early detection of kidney disease (Anggraini, 2022). Research by Puspitasari et al. (2024) also found that urbanization and the growth of the elderly population contributed to the increase in CKD cases.

Implications for National Health Financing Burden



The graph "National Financing Trends for Kidney Failure Therapy (Hemodialysis)" illustrates the significant financial burden due to this increase in patients. The cost of treating kidney failure increased from IDR 2.24 trillion in 2020 to IDR 6.5 trillion in 2021, although it decreased slightly to IDR 2.9 trillion in 2023. This high cost burden is putting great pressure on the national health financing system, especially BPJS

Kesehatan, where hemodialysis is one of the services with the highest claims after heart disease (BPJS Kesehatan, 2023).

Research by Indrawati & Viphindartin (2024) highlighted that the INA-CBGs tariff system used by BPJS Kesehatan often does not cover the real costs of services, so that hospitals experience deficits. A pharmacoeconomic study by Nurtandhee (2023) also showed that direct medical costs for one hemodialysis procedure could exceed IDR 2 million, far above the set INA-CBGs tariff. In addition, research by Fatonah et al. (2021) identified that this high cost burden has the potential to reduce the quality of services and patient access to optimal therapy. This is exacerbated by the BPJS budget deficit due to the spike in claims for catastrophic diseases such as CKD.

Furthermore, this cost pressure has not only fiscal impacts but also on patients' quality of life. Studies by Madania et al. (2022) and Sinaga (2023) showed that complications such as anemia and chronic fatigue significantly reduced patients' utility index, with an average score of only 0.645–0.673 on the EQ-5D scale (range 0 to 1). Patients also have to undergo procedures twice a week, sacrificing time, transportation costs, and productivity. These non-medical burdens are often overlooked in policy calculations, even though they have a direct impact on the well-being of patients and their families.

Challenges and Policy Recommendations

The increasing need for hemodialysis requires cost control strategies and service efficiency. Some recommendations that can be considered based on the literature:

Optimization of Prevention, Primary prevention through community education about CKD risk factors (diabetes, hypertension, diet). Increasing Early Screening, Early detection and management of chronic kidney disease to suppress progression to the final stage (CKD).

INA-CBGs Tariff Reform, Tariff adjustments to better match the real cost of services, and development of outcome-based payment models. Development of Alternative Therapy Modalities, such as self-paced peritoneal dialysis at home to reduce hospital burden. A study by Wulandari et al. (2023) showed that promotive and preventive interventions can reduce the incidence of CKD by up to 20% in 5 years, which has an impact on saving national health costs.

CONCLUSION

The number of hemodialysis patients in Indonesia continues to increase every year due to unhealthy lifestyles, high cases of diabetes and hypertension, and increased early detection of kidney disease. This condition burdens BPJS Kesehatan financing, with the cost of kidney failure therapy reaching IDR 2.9 trillion in 2023. The INA-CBGs tariff system that does not reflect real costs causes hospitals to experience deficits and risks reducing the quality of service. To overcome this, strategies are needed such as primary prevention, early screening, INA-CBGs tariff reform, and the development of alternative therapies such as peritoneal dialysis, because promotive and preventive efforts have proven effective in reducing the incidence of kidney failure and reducing national health costs.

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