

An Overview of Patient Responses During Hemodialysis in Chronic Kidney Disease

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ABSTRACT

Background: Chronic kidney disease (CKD) is a progressive and irreversible impairment of kidney function, leading to the body's inability to maintain fluid, electrolyte, and metabolic balance. Hemodialysis serves as an effective renal replacement therapy for patient with CKD; however, it may also cause adverse side effects.

Method: The study employed a case study design with a descriptive approach. A total sampling technique was used, involving 12 respondents. Data collection was conducted through observation sheets and interview guides.

Results: The responses observed in chronic kidney disease patients undergoing hemodialysis at RSUD Ajibarang included hypertension (91.7%), dizziness (33.3%), muscle cramps (25%), nausea (8.3%), fever (8.3%), chills (8.3%), and chest pain (8.3%).

Conclusion: The most common responses experienced by hemodialysis patient at RSUD Ajibarang were hypertension, dizziness, and muscle cramps.

Keywords:Chronic kidney disease,
hemodialysis, hemodialysis
response

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1. INTRODUCTION

Chronic kidney disease (CKD) is a progressive disorder in kidney function that occurs gradually and is irreversible, causing the loss of the kidneys' ability to regulate fluid, electrolyte, and metabolic balance in the body¹. This disease has become an increasingly significant health problem worldwide, including in Indonesia. According to data from the World Health Organization (WHO), by 2021, over 843 million people worldwide suffered from chronic kidney disease, and mortality rates due to kidney failure are projected to rise in the coming years². In Indonesia, the prevalence of chronic kidney disease was recorded at 0.38% in 2018, with a significant increase in patients requiring hemodialysis as a renal replacement therapy³.

Hemodialysis (HD) is the most commonly used treatment to replace kidney function in patients with chronic kidney disease⁴. Although hemodialysis can help filter waste products and regulate the body's fluid and electrolyte balance, this procedure is not without various complications and responses that can affect

patient comfort and quality of life. Some common responses that occur during or after hemodialysis include hypertension, hypotension, muscle cramps, dizziness, nausea, and other discomforts⁵. Research on the responses of patients during hemodialysis is crucial to help improve therapy management and provide appropriate interventions to address side effects that may arise.

RSUD Ajibarang, as a hospital serving many CKD patients in Purwokerto, is an ideal location for this study to analyze the symptoms experienced by patients undergoing hemodialysis. Based on a preliminary study conducted at RSUD Ajibarang in 2024, there were 5152 visits from hemodialysis patients, and the total number of patients undergoing regular hemodialysis was around 159⁶. This underscores the importance of research to understand the responses of patients during hemodialysis at this hospital.

This study aims to describe the characteristics and symptoms experienced by patients with chronic kidney disease undergoing hemodialysis at RSUD Ajibarang. Specifically, this study will explore the characteristics of patients based on age, gender, occupation, and duration of hemodialysis, as well as the types of responses patients experience during the procedure. This study also aims to provide a clearer understanding of the impact of hemodialysis therapy on patients, hoping to contribute to future patient care and management.

Several previous studies have investigated patient responses to hemodialysis, but the results show differences in the frequency and types of responses experienced by patients. Research by Heri Triyono et al.⁷ found that hypertension and dizziness were the most common complaints experienced by patients during hemodialysis. Similarly, Lenggogeni et al.⁵ found that muscle cramps and nausea were common side effects. Furthermore, research by Susilawati⁸ showed that most patients experienced headaches and nausea during the third and fourth hours of hemodialysis. However, no study has specifically examined the symptoms experienced by hemodialysis patients at RSUD Ajibarang. Therefore, this study aims to fill this gap and provide new insights into the symptoms experienced by CKD patients undergoing hemodialysis at this hospital.

Based on the above description, this study formulates the main research question: "What are the responses of chronic kidney disease patients during hemodialysis?" The general objective of this study is to describe the responses of CKD patients during hemodialysis at RSUD Ajibarang. The specific objectives of this study are: (1) To determine the characteristics of CKD patients undergoing hemodialysis based on age, gender, occupation, and duration of hemodialysis, and (2) To determine the responses that arise in CKD patients during hemodialysis at RSUD Ajibarang. This study uses a descriptive approach with direct observation of symptoms experienced by patients.

Several related studies support this research, including Heri Triyono et al.⁷, who reported that hypertension and dizziness are the most common responses during hemodialysis, and Lenggogeni et al.⁵, who identified muscle cramps and nausea as frequent complications. Additionally, the study by Marianna & Astutik⁹ emphasizes the importance of monitoring physiological changes in patients during hemodialysis and providing appropriate interventions to ensure patients undergo the procedure more comfortably. Research by Susilawati⁸ also showed that nausea and dizziness most frequently occur during the third and fourth hours of hemodialysis. This study aims to complement the lack of information on hemodialysis symptoms in Indonesia, especially at RSUD Ajibarang.

Thus, this research contributes to expanding knowledge about the symptoms experienced by CKD patients undergoing hemodialysis and provides guidance for healthcare providers in designing more effective care strategies to improve patient quality of life.

2. RESEARCH METHOD

This study used a descriptive design with a case study approach to identify the responses of patients with chronic kidney disease (CKD) undergoing hemodialysis at RSUD Ajibarang. The study was conducted in the hemodialysis unit of RSUD Ajibarang.

The population in this study consisted of all CKD patients undergoing hemodialysis at RSUD Ajibarang. A total of 12 respondents were selected using total sampling technique. The inclusion criteria were patients diagnosed with chronic kidney disease, undergoing routine hemodialysis, and willing to participate in the study.

Data collection was carried out using observation sheets and interview guidelines to record patient characteristics and symptoms experienced during the hemodialysis process. The observed variables included age, gender, occupation, duration of hemodialysis, medical history, and physiological responses such as hypertension, dizziness, muscle cramps, nausea, fever, chills, and chest pain. Data analysis was performed using univariate analysis to describe the frequency distribution and percentage of each variable. The formula used to calculate the percentage is:

$$\text{Percentage} = \left(\frac{\text{Frequency of Symptom}}{\text{Total Respondents}} \right) \times 100$$

The results were then presented in the form of tables and narrative descriptions to facilitate interpretation.

3. RESULT AND DISCUSSIONS

3.1. Univariate Analysis

Table 1. Respondent Characteristics (n = 159)

Characteristic	Frequency (n)	Percentage (%)
Age		
≤ 45 years	6	50.0
≥ 45 years	6	50.0
Gender		
Male	6	50.0
Female	6	50.0
Occupation		
Not Working	2	16.7
Housewife (IRT)	5	41.7
Farmer	2	16.7
Self-employed	2	16.7
Teacher	1	8.3
Hemodialysis Duration		
< 6 months	6	50.0
> 6 months	6	50.0
Medical History		
Hypertension	4	33.3
Diabetes Mellitus	4	33.3
Gout	2	16.7
CHF	2	16.7

Based on Table 1, the respondents were evenly distributed in terms of age and gender. The most common occupation was housewife, and the duration of hemodialysis was equally divided between shorter and longer treatment periods. The most frequently reported medical histories were hypertension and diabetes mellitus.

Table 2. Response of Chronic Kidney Disease Patients During Hemodialysis

Hemodialysis Response	Frequency	Percentage (%)
Hypertension	11	91.7

Dizziness	4	33.3
Muscle Cramps	3	25.0
Nausea	1	8.3
Fever	1	8.3
Chills	1	8.3
Chest Pain	1	8.3
Hypertension	11	91.7

Based on Table 2, hypertension was identified as the most common response during hemodialysis, followed by dizziness and muscle cramps. Other symptoms such as nausea, fever, chills, and chest pain were reported less frequently, while no severe complications were observed in this study.

Figures 1, 2, 3, and 4 below show the changes in blood pressure in respondents during hemodialysis for each hour.

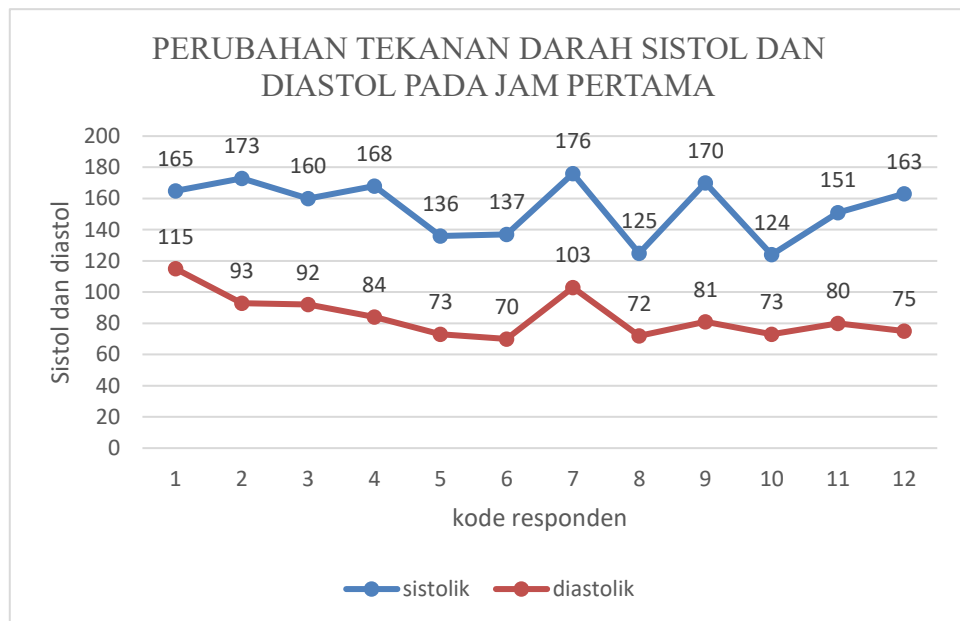


Figure 1: Systolic and diastolic blood pressure for each respondent in the first hour of hemodialysis.

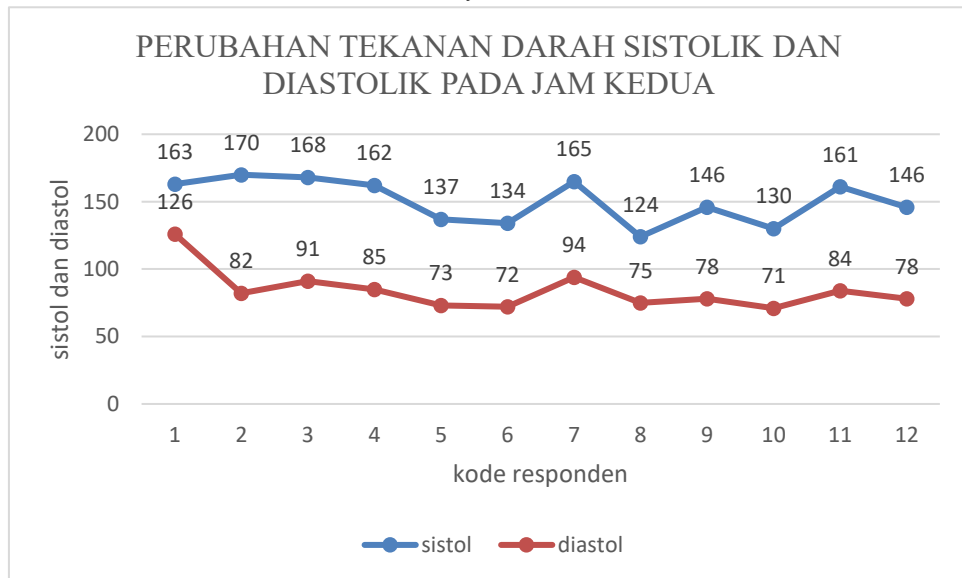


Figure 2: Systolic and diastolic blood pressure for each respondent in the second hour of hemodialysis.

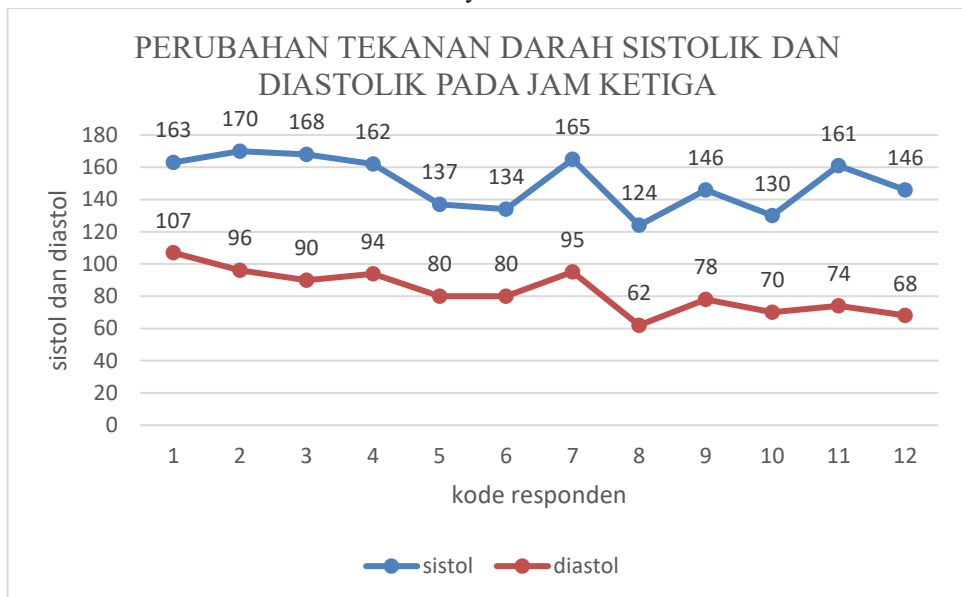


Figure 3: Systolic and diastolic blood pressure for each respondent in the third hour of hemodialysis.

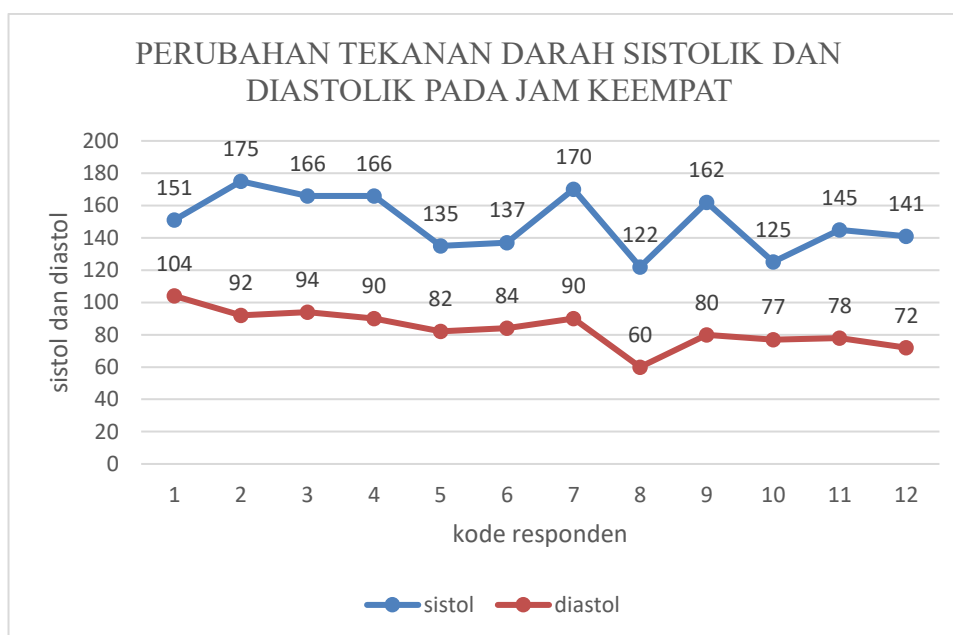


Figure 4: Systolic and diastolic blood pressure for each respondent in the fourth hour of hemodialysis.

Based on Figures 1, 2, 3, and 4, it can be observed that both systolic and diastolic blood pressure generally decreased during the first, second, and third hours of hemodialysis. However, during the third and fourth hours, both systolic and diastolic blood pressure began to increase.

In this study, hypertension was the most prevalent symptom, reported by 91.7% of the patients, which aligns with previous research findings^{5, 6}. Hypertension during hemodialysis is often related to fluid overload and changes in vascular resistance, which can increase peripheral vascular resistance and cardiac output, leading to elevated blood pressure⁹. Moreover, the study showed significant fluctuations in both systolic and diastolic blood pressure during the hemodialysis session, with drops in pressure observed in the first two hours and increases in the third and fourth hours. This pattern is consistent with physiological processes of fluid removal during hemodialysis¹⁰.

The relationship between hypertension and CKD is well-documented, as uncontrolled hypertension is a key risk factor for the progression of kidney disease¹¹. Dizziness was another significant symptom, experienced by 33.3% of patients. This symptom is commonly reported during hemodialysis due to hypotension or rapid fluid shifts⁵. The pathophysiology behind dizziness involves fluid shifts from the intravascular space into the dialysate, leading to decreased circulating blood volume and reduced brain perfusion¹².

Muscle cramps were reported by 25% of the patients. Muscle cramps during hemodialysis are often associated with electrolyte imbalances¹³. The rapid fluid removal during dialysis, along with changes in electrolyte concentrations, can disrupt neuromuscular function¹⁴. Muscle cramps are commonly experienced during later stages of hemodialysis¹⁵.

This finding supports previous studies emphasizing the need for careful monitoring of fluid balance and electrolyte levels during treatment⁵. Interventions such as stretching exercises may help alleviate discomfort¹⁶. Other symptoms such as nausea, fever, chills, and chest pain were reported by a smaller proportion of patients. These findings are consistent with previous research⁶. The occurrence of these symptoms may be linked to uremic toxicity and electrolyte imbalance¹⁷.

Interestingly, hypotension, which is commonly reported during hemodialysis¹⁸, was not observed in this study. Future research could explore psychological effects such as anxiety and depression, which are commonly observed in CKD patients¹⁹.

4. CONCLUSION AND RECOMMENDATION

Based on the findings of this study, it can be concluded that the most common responses experienced by patients with chronic kidney disease undergoing hemodialysis at RSUD Ajibarang were hypertension, dizziness, and muscle cramps. During the hemodialysis process, both systolic and diastolic blood pressure tended to decrease in the first and second hours, followed by an increase in the third and fourth hours. These findings indicate that hemodialysis can cause significant physiological changes, particularly in blood pressure and patient comfort, which require careful monitoring.

Therefore, it is recommended that healthcare providers continuously monitor patients' blood pressure and electrolyte balance during hemodialysis to prevent complications and improve patient comfort. In addition, patient education regarding dietary management and adherence to treatment is essential to minimize the risk of uncontrolled hypertension and other related complications. Future research is suggested to involve a larger sample size and longer observation period to obtain more comprehensive results and to further explore the psychosocial impacts experienced by patients undergoing hemodialysis.

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