

## THE EFFECT OF COMFORT ON CHANGES IN INTRA-DIALYTIC BLOOD PRESSURE

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### ABSTRACT

Hemodialysis is a long-term procedure for patients with end-stage renal disease. Blood pressure changes are one of the complications of hemodialysis therapy. Comfort nursing model is utilized to provide comfort and alleviate discomfort in patients undergoing hemodialysis therapy. The purpose of this study was to determine the effect of hemodialysis therapy on blood pressure changes. Cross-sectional research design, with the inclusion criteria of patients undergoing hemodialysis therapy 2x a week with a duration of 3-4 hours in each session. Sampling technique was convenience sampling with 52 respondents. Data analysis using t-test to determine the effect of hemodialysis therapy on changes in blood pressure. T-test analysis to get sig value. 0.000 (<0.05) indicates changes in blood pressure during hemodialysis therapy, both hypotension and hypertension. A total of 31 (58.9%) had hypertension before therapy, 7 people had an increase in systolic blood pressure > 20 mmHg. Respondents who had no change in blood pressure were 24 (17.7%). Psycho-spiritual and environmental comfort by modifying the environment in the hemodialysis unit, as well as the placement of people who are expected to be a support system, will impact the results of blood measurements shortly after therapy and minimize the side effects of therapy.

Keywords: Blood Pressure; Hemodialysis; Intradialysis

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### INTRODUCTION

The incidence of kidney failure in Indonesia is increasing annually. Dialysis aids in the removal of fluids and waste products from the body due to the kidneys' inability to function properly. Hemodialysis is a long-term procedure for patients with end-stage renal disease (ESRD) (Noradina, 2018). Hemodialysis is still considered an effective and safe routine therapy for patients with kidney failure to reduce mortality and improve quality of life. However, various intradialytic complications can occur during the procedure, with hypotension and intradialytic hypertension being among the most important. (Armiyati et al., 2021) (Taniyama, 2016).

In 2007, there were 80,000 cases of chronic renal failure in Indonesia. By 2010, this number had increased to 660,000. According to Riskesdas (2018), The prevalence of chronic

kidney disease in Indonesia has increased by 0.38%. Additionally, 19% of the population over 15 years old has been diagnosed with chronic kidney failure. The number of new patients with HD in Indonesia has increased from 4,977 in 2007 to 15,353 in 2011, representing an increase of over 30% in five years (Solihah et al., 2021).

Hypertension is a common condition that is often inadequately managed due to excess fluid volume and sodium retention being the primary causes (Bucharles et al., 2019). In 2018, the Indonesian Nephrology Association reported that 38.3% of patients experienced intradialysis hypertension. According to Pebriantari KG, (2018) in Bali, Intradialysis hypertension can lead to severe and even life-threatening increases in blood pressure. The incidence of complications associated with this condition is 52.4%.

In addition to intradialysis hypertension, hypotension is a frequent complication in patients undergoing hemodialysis therapy. Cases of intradialysis hypotension can reach 20% to 30% during each session (Geng, X. et al 2020). According to the National Kidney Foundation Disease Outcomes Quality Initiative (KDOQI), intradialytic hypotension is defined as a decrease in systolic blood pressure of at least 20 mmHg and a decrease in mean arterial pressure of at least 10 mmHg. Several factors can contribute to the occurrence of intradialytic hypotension. These include the use of hypertensive medication, cardiovascular disease, obesity, and certain aspects of the hemodialysis process, such as high dialysate sodium or calcium levels, high osmolarity, high dialysis fluid temperature, and the type of buffer used. Other factors, such as anemia, hypoxia, or concurrent infection, may also play a role. (Ignacak, E., et al, 2017).

In patients undergoing hemodialysis, it is necessary to manage hypotension and hypertension to prevent intradialysis hypotension, which can increase the risk of hospitalisation and death. (Armiyati et al., 2021). Katherine Kolcaba's Comfort nursing model is utilised to provide comfort and alleviate discomfort in patients undergoing hemodialysis therapy. The model is objective and employs precise subject-specific vocabulary to convey meaning accurately. Kolcaba assesses comfort by creating three taxonomic structures consisting of transcendence, ease, and relief. The three types of comfort are linked with four comfort experiences: physical, spikospiritual, sociocultural, and environmental (Alligood, 2014).

According to the results of a preliminary study carried out on 14 July 2023, patients undergoing hemodialysis therapy in the hemodialysis room will receive music therapy, a comfortable air-conditioned room and support from their family and other waiting patients. Music therapy, along with other techniques such as distraction, imagery and relaxation, is a non-pharmacological intervention that can be used to reduce changes in blood pressure. The use of music therapy has been shown to reduce the frequency of blood pressure changes. This is supported by (Akbar et al., 2022). The research

shows that there is a significant difference in blood pressure before and after music therapy. On average, there is a decrease of 20-21 mmHg. Therefore, further research is needed to investigate the incidence of intradialysis blood pressure changes using the Kolcaba comfort approach in health facilities that provide hemodialysis services. The aimed of this study was to determine blood pressure changes in intradialysis patients.

## METHOD

This study employed an analytical observational design with a cross-sectional research approach. Data on both independent and dependent variables were collected simultaneously. The population of interest comprised respondents who underwent hemodialysis at Karsa Batu Hospital. The sampling technique used was consecutive sampling, with a total of 52 respondents meeting the research criteria.

The study's inclusion criteria required patients who had undergone routine hemodialysis therapy for more than three months, twice a week, for four to five hours, were compos mentis, able to communicate verbally, aged between 18 and 70 years, and not using erythropoietin drugs. Patients using femoral/central venous access, experiencing complications and pain, unconscious, or in critical condition were excluded from the study. The study employed a standard calibrated digital sphygmomanometer to measure the patient's blood pressure before, during, and after hemodialysis. Blood pressure was measured 5 minutes before the dialysis needle insertion and 5 minutes after its removal. The data were analysed using the paired t-test analysis technique.

## RESULTS

**Table 1 Characteristics of respondents based on gender, ages, education, work, Marriage status in hemodialysis room (n=52)**

| Characteristics Respondent           | Intervention Group |            |
|--------------------------------------|--------------------|------------|
|                                      | f                  | %          |
| <b>Age</b>                           |                    |            |
| 20-35                                | 8                  | 15,2       |
| 36-50                                | 25                 | 27,5       |
| 51-60                                | 13                 | 24,7       |
| 61-70                                | 6                  | 11,4       |
| <b>Type Sex</b>                      |                    |            |
| Man                                  | 26                 | 50         |
| Woman                                | 26                 | 50         |
| <b>Category</b>                      | <b>f</b>           | <b>%</b>   |
| <b>Education</b>                     |                    |            |
| Diagnosis with Chronic Renal Disease |                    |            |
| Elementary School                    | 10                 | 19,2       |
| High School Equivalent               | 38                 | 73,1       |
| School Equivalent                    | 20                 | 38,4       |
| < 6 month                            | 23                 | 44,2       |
| high school equivalent               | 23                 | 44,2       |
| <b>Side effects of hemodialysis</b>  |                    |            |
| PT                                   | 2                  | 3,8        |
| Feel fresh                           | 2                  | 3,8        |
| Work                                 |                    |            |
| Feel hurt                            | 1                  | 1,9        |
| No Work                              | 39                 | 75         |
| Nausea                               | 9                  | 17,1       |
| Work                                 | 13                 | 25         |
| Dizziness                            | 7                  | 13,3       |
| <b>Total</b>                         | <b>52</b>          | <b>100</b> |
| drowning                             | 3                  | 5,7        |
| Stomach feel sick                    | 1                  | 1,9        |
| No complain                          | 29                 | 55,1       |
| <b>Total</b>                         | <b>52</b>          | <b>100</b> |

Table 1, the number of male and female respondents was equal, 26 (50%) each. While the age phenomenon of patients undergoing hemodialysis is mostly 36-50 years old as many as 25 people (47.5%). The most recent education level is high school (SMA) as many as 23 (44.2%). Among the respondents in this study, 14 (26.9%) did not work and 17 (32.7%) of them were divorced/widowed.

**Table 2 Side effects of haemodialysis therapy (n=52)**

Based on the results of the study in table 2, the respondents had only been diagnosed with kidney failure for 1-2 years, namely 38 (73.1%) and the most common complaints complained of by respondents after undergoing hemodialysis were nausea and dizziness, namely 9 (17.1%) and 7 (13.3). However, there were still more respondents who did not experience any symptoms after hemodialysis, namely 29 respondents (55.1%).

**Tabel 3  
Analysis of intradialysis blood pressure changes (n=52)**

| Group                  | Mean   | SD     | p value |
|------------------------|--------|--------|---------|
| Systole Pre dialysis   | 146,29 | 25,486 |         |
| Sistole intra dialysis | 152,33 | 28,991 | 0,000   |
| Systole pasca dialysis | 152,65 | 24,833 |         |

Table 3 shows that the results of the analysis using independent t-test showed that there was a significant change in blood pressure during haemodialysis therapy with a p value = 0.000 ( $p < 0.005$ ).

## DISCUSSION

The results of the research show that there are significant changes in blood pressure during and after hemodialysis treatment ( $p$ -value  $< 0.05$ ). Both hypotension and hypertension were observed in patients undergoing this treatment. The study found that 31 (58.9%) respondents had high blood pressure before hemodialysis therapy. After 4 hours of hemodialysis, 7 of them experienced an increase in systolic blood pressure greater than 20 mmHg. Many patients complained of nausea and dizziness after hemodialysis with changes in systolic blood pressure. According to Cahyaningsih

(2017), Changes in blood pressure during hemodialysis are caused by the movement of fluid, which leads to changes in blood density. This can cause an increase in salt levels in the blood, resulting in increased vascular resistance and heart rate. Patients may experience symptoms such as nausea, vomiting, dizziness, and headaches. The increase in systolic and diastolic blood pressure was caused by anxiety before haemodialysis. In addition, patients often experience other anxieties such as financial problems, family and work responsibilities, or fear of a poor prognosis and the likelihood of future disability. (Syaifudin & Purwanto, 2017).

In addition to patients with hypertension, 21 (32.3%) respondents had normal systolic blood pressure below 140 mmHg, two of whom experienced an increase in systolic blood pressure greater than 20 mmHg. Only one respondent in the study had a systolic pressure below 140 mmHg and experienced dialysis hypotension, dropping from 132 to 110 mmHg. Systolic pressures of 135 and 136 before dialysis increased to 162 and 155 mmHg. This is in accordance with Marianna & Astutik, (2018) After hemodialysis therapy, 61.6% of respondents experienced hypotension. The occurrence of dialysis hypotension is affected by the use of dialysate, low sodium dialysis, heart disease, and excess fluid weight (Brunner & Suddarth, 2016).

Respondents had been on hemodialysis for more than 2 years. 80% of them were aged 40-68 years. Among them, the decrease in blood pressure was only 20-30 mmHg, and the most common complaints were dizziness and abdominal discomfort. According to (Noradina, 2018) when a person experiences anxiety, fear and emotion, sympathetic stimulation increases, resulting in increased heart rate, cardiac output, and peripheral vascularity. Immediately after hemodialysis, the respondent felt anxious and uncomfortable with the therapy. This was despite being given a comfortable room, music and the company of family. The family and environment approach to improving comfort will have an impact on therapy (Alligood, 2014).

Out of the total sample, 24 (17.7%) experienced a non-significant increase in intra-

dialysis blood pressure. Quotation from Sarifuddin's research in Not all respondents experienced changes in blood pressure after hemodialysis. Monitoring during the intradialysis period when dialysate is removed is important because there are still several factors that affect a person's blood pressure, including blood viscosity. The respondents said they felt comfortable and not too stressed during the treatment so when the treatment was finished, the respondents said they had no complaints. According to Kolcaba in (Alligood, 2014) The consideration of psycho-spiritual and environmental comfort by modifying the environment in the hemodialysis room as well as the placement of people who are expected to be a support system will have an impact on the results of blood measurements shortly after therapy and minimise the side effects of therapy.

Only two respondents reported that they felt fresh after hemodialysis and had no symptoms. Their systolic blood pressure decreased from 170 mmHg to 159 mmHg after hemodialysis. This may be because the respondents were newly diagnosed with CKD and had been on hemodialysis for less than 1 year. The respondent said that he had prepared himself and his family before the therapy so that he would not be too scared or anxious during hemodialysis therapy. Blood pressure varies according to people's perceptions of their condition, family and environmental support and problems (Noradina, 2018). The limitation of this research is that in the extraction of further information, a skin study with an in-depth interview approach can be used.

## CONCLUSION

Hemodialysis therapy is one of the most widely used therapies in patients with chronic kidney failure. Changes in intra dialysis blood pressure is one of the complications of hemodialysis therapy. However, many factors affect the change in blood pressure. There is a need to explore more related to signs and symptoms before and after and therapy before hemodialysis to find out the factors that affect blood pressure in patients.

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