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# The Characteristics and Knowledge of Family of Patients with CKD about AV- Shunt At Dr. Zainoel Abidin General Hospital

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## ABSTRACT

**Introduction:** Identifying the CKD progression of the patient should be presented with a range of choices for renal replacement treatment. Therefore, establishing vascular access for hemodialysis is significantly correlated with the survival rate of patients as well as knowledge related to access. Thus, in this study, we aim to report the characteristics and knowledge of the family of patients with CKD about AV-shunt at Dr. Zainoel Abidin General Hospital.
**Method:** This research is *descriptive* research with a *retrospective* approach. This study evaluated the "Social Demographic and Medical Character" and "Knowledge towards AV Shunt" family of patients with CKD at RSUD Dr. Zainoel Abidin in Banda Aceh. The samples in this study were all patients undergoing hemodialysis who had carried out AV-shunt at the hemodialysis installation at RSUD Dr. Zainoel Abidin from July 1 to July 31, 2021. The data were analyzed descriptively by using SPSS.
**Results:** From 80 respondents, an average age of 50.39 ± 12.594. Most AV Shunt care trainers are from doctors, and the rest are from doctors and nurses (6,3%). Regarding our study, 88,8% of the patients' families received education related to the AV-shunt, and only 11,3% did not.
**Conclusion:** Regarding this study, we can conclude that the patient's family knows about AV Shunt but must still be evaluated to maintain good AV Shunt function.

**Keywords:** AV-shunt, knowledge, CKD.
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## INTRODUCTION

Chronic kidney disease (CKD) is characterized by either kidney damage or an estimated glomerular filtration rate (eGFR) below 60 ml/min per 1.73 square meters, lasting at least three months. Renal failure is a condition characterized by a gradual decline in kidney function, eventually leading to the need for renal replacement treatment, such as dialysis or transplantation.[1] Approximately 10% of the global adult population is 500 million individuals annually. The occurrence and frequency of CKD are higher in developing nations.[2,3]

Identifying CKD progression of the patient should be presented with a range of choices for renal replacement treatment.[1] In the last years of the Second World War, dialysis was used as an investigative measure to sustain the lives of individuals with CKD who were experiencing renal failure. The practice of dialysis advanced throughout the 1970s and emerged as a crucial treatment for individuals with chronic kidney disease (CKD) who reached the stage of kidney failure and needed renal replacement therapy (RRT), including dialysis. The current difficulty lies in determining the appropriate methods of providing treatment for people with CKD. A comprehensive understanding must identify the optimal and durable approach for preserving or establishing hemodialysis access to achieve longer life expectancies.[4,5]

The establishment of vascular access for hemodialysis is significantly correlated with the survival rate of patients. Furthermore, vascular access is crucial in determining increased life expectancy, improved dialysis efficiency, and enhanced patient quality of life. Significant advancements have been made in vascular access for hemodialysis, including establishing atriovenous access using the techniques pioneered by Cimino and Brescia. Multiple alternatives exist for establishing a connection between chronic kidney disease (CKD) patients and a hemodialysis machine. An example of persistent vascular access is atriovenous access. Establishing vascular access is crucial for effective hemodialysis treatment by creating a direct pathway to the patient's circulatory system. An optimal hemodialysis access should satisfy three specific characteristics. Firstly, the ideal dialysis device should possess a long-lasting lifespan, deliver a blood flow rate that is enough to achieve the desired dialysis dosage and have a minimal occurrence of related problems. While no hemodialysis access technique fully satisfies all three requirements, the AV shunt is considered one of the most effective approaches for meeting these criteria.[5] Hence, patient awareness of AV-shunt is another crucial

element. Another investigation showed that arteriovenous fistula (AVF) self-care varied between 59% and 99% in separate investigations.[6] Unfortunately, the research on AV-shunt is limited. Therefore, in this study, we reported the characteristics and knowledge of the families of patients with CKD about AV-AV-shunt at Dr. Zainoel Abidin General Hospital.

## METHODS

This research is *descriptive* research with a *retrospective* approach. This study evaluated "Social Demographic and Medical Character" and "Knowledge towards AV Shunt," "Social Demographic and Medical Character," and "Knowledge towards AV Shunt" families of patients with CKD at RSUD Dr. Zainoel Abidin in Banda Aceh. The samples in this study were all patients undergoing hemodialysis who had carried out AV-shunt at the hemodialysis installation at RSUD Dr. Zainoel Abidin from July 1 to July 31, 2021. The sampling technique was purposive sampling. We conducted interviews with patients using questionnaires with data collected, namely social demographics, medical characteristics, and knowledge and Attitudes of patients towards AVF. The inclusion criteria of this study were all of the patients with CKD on HD who had carried out an AV-shunt and were registered in the RSUD with Dr. Zainoel Abidin from July 1 to July 31, 2021. The exclusion criteria in this study were that the patient refused to be a research sample, and the data was incomplete. This study's procedure is to select the sample based on the inclusion and exclusion criteria. Then, the sample is interviewed using the social demographics, medical characteristics, and patient's knowledge and attitudes toward the AVF questionnaire. In addition, some patient-related data were collected from medical records. After data collection, the data were coded in SPSS for further analysis. The data were analyzed descriptively and reported in mean ± SD, frequency and percentage data.

## RESULT

This research was conducted from July 1, 2021, to July 31, 2021, at the Hemodialysis Installation of RSUDZA Banda Aceh. From the results of the study, respondents who met the inclusion and exclusion criteria were 80 respondents. The characteristics of respondents in this study will provide an overview of the frequency distribution of age and gender. The following will present data on the distribution of general characteristics of respondents in Table 1. The distribution of respondent characteristics in Table 1 shows that most respondents have an average age of 50.39 ± 12.594. According to gender, the highest number of respondents were respondents with male gender, which was 48 respondents (60.0%), while female respondents amounted to 32 respondents (40.0%).

**Table 1. Characteristics of CKD with AV Shunt patients**

| Characteristic | Sample (n=80) |
|---|---|
| **Age (years)** | |
| Average | 50.39 ± 12.594 |
| Min-max | 20-80 |
| **Gender, n(%)** | |
| Man | 48(60,0) |
| Woman | 32(40,0) |
| **Marital Status, n(%)** | |
| Unmarried | 8(10,0) |
| Divorce | 4(5,0) |
| Married | 68(85,0) |
| **Education, n(%)** | |
| College | 28(35,0) |
| Elementary | 9(11,3) |
| High School | 32(40,0) |
| Senior High School | 7(8,8) |
| **Occupation, n(%)** | |
| Work | 30(37,5) |
| Not Working | 50(62,5) |
| **AV Shunt Installation Location, n(%)** | |
| Radial artery-left cephalic vei[n] | 0(0) |
| Radial artery with right cephalic vei[n] | 25(31,25) |
| Brachialis artery- left cephalic vein | 55(68,75) |
| Brachialis artery- right cephalic vei[n] | 0(0) |
| **Number of AV Shunt Installs, n(%)** | |
| First | 69(86,3) |
| Second | 9(11,3) |
| Fourth | 1(1,3) |
| Third | 1(1,3) |
| **AV Shunt Care Trainer, n(%)** | |
| Doctor | 75(93,8) |
| Doctors and Nurses | 5(6,3) |
| **AV Shunt maintenance resources, n(%)** | |
| Doctor | 75(93,8) |
| Doctors and Nurses | 5(6,3) |
| Internet | 0(0) |
| Other patients | 0(0) |
| Healthcare providers | 0(0) |
| **The patient's family received training, n(%)** | |
| No | 9(11,3) |
| Yes | 71(88,8) |

The most common AV Shunt installation was found in the brachial artery with the left cephalic vein (55 people, 68.75%), followed by the radial artery with the right cephalic (25 people, 31.25%). Moreover, none of the studies had an AV-Shunt installation location in the radial artery-left cephalic vein or brachialis artery-right cephalic vein. Most

samples received their first AV shunt installation (86,3%). Most AV Shunt care trainers are from doctors, and the rest are from doctors and nurses (6,3%). Regarding our study, 88,8% of the patients' families received education related to the AV-shunt, and only 11,3% did not.

## DISCUSSION

The training provided must meet subjects such as ensuring the AV Shunt remains in good condition, preventing complications such as infection, thrombosis, and stenosis, ensuring aseptic conditions, and protecting blood vessels. The patient's family must also attend AV Shunt treatment training with the patient. In this study, 88.8% of patients' families received such training and information from doctors, and 11.2% did not receive proper training. Although some still have not received training in families, this figure is significant compared to research by Ozen *et al.,* which is only 5.7% of the 335 total respondents.[7] According to the meta-analysis study, it was found that AVF self-care varied between 59% and 99% in different studies, with an overall prevalence of 81% (95% CI, 68% to 94%) when the data was combined using a random pooling method. In that study, they found that AV-shunt knowledge is determined by the education level, age, duration of hemodialysis treatment, and guidance from healthcare professionals.[6]

Guidance from health professionals routinely is important. In this study, most of the patients received training from doctors (93,8%). According to research by Ozen *et al.*, 80.9% of patients did not receive training from medical personnel. Similarly, Sousa *et al.* study on validating the AV-Shunt treatment questionnaire alone still showed a lack of information delivery rates in HD patients. Although our study was quite high, regular training by doctors and nurses in HD installations should be carried out periodically.[7,8]

The hemodialysis access among CKD patients is usually made in the arm by connecting a vein to the radial or ulnar artery. This creates an inflow of blood flow from the arteries to the veins, causing the veins to dilate and undergo epithelialization. The AV shunt (access) location used in hemodialysis varies widely. In Indonesia alone, surgeons use femoral access, which is used up to 2% of the time; jugular access in 1% of hemodialysis cases; and subclavian access in up to 3% of cases. The access used is vascular access.[4,9] According to this study, we found that the most common AV Shunt installation was found in the brachial artery with the left cephalic vein (55 people, 68.75%), followed by the radial artery with the right cephalic (25 people, 31.25%). Moreover, none of the studies had an AV-Shunt installation location in the radial artery-left cephalic vein or brachialis artery-right cephalic vein.

Although AV Shunt insertion is the best option in HD treatment patients, some adverse complications such as thrombosis, aneurysm, infection, ischemic, and edema of the arm can occur. Therefore, information about complications and factors causing complications must be immediately expressed to patients. These factors include not taking blood, not measuring blood pressure, and not installing an IV line on the arm with an AV Shunt.[10]

Patients should regularly assess the vascular access arm by "seeing, hearing, and palpation" the AV Shunt area to detect early vascular access complications and to prevent vascular access from being lost entirely. In our study, 95% of patients knew and checked the AV Shunt's function daily. The level of knowledge includes not wearing tight clothes, not carrying heavy items, and not sleeping on arms with an AV Shunt to protect good function; this is similar to the research of Cingoz and Aktas. HD is a *life-saving treatment* and can only be done if there is vascular access. This shows that continuing HD is only possible if the AV Shunt functions well so that they know what to do.[10]

Infection with AV Shunt can cause clinical manifestations such as cellulitis or other bacterial infections, and research says HD patients have more bacteria on their skin than the rest of the general population. Therefore, the skin around the AV Shunt must be disinfected before canalization, and one way by washing hands with soap and water has been shown to reduce infection.[8]

This study has limitations, such as it was only conducted in one center, so we did not know about the knowledge in other centers, and no follow-up was carried out, so it could not evaluate knowledge in the long term.

## CONCLUSION

Regarding this study, we can conclude that the patient's family knows about AV Shunt but still must be evaluated to maintain good AV Shunt function. Thus, to support this condition, periodic training is needed.

## DISCLOSURE

### Ethical Statement

The ethics committee has approved this study.

### Funding

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### Conflict of Interest

No conflict of interest.

### Author Contributor

MAR, FJ, and DA were involved in conceiving, designing, and supervising the manuscript. MAR, SAK, and YM conducted the study. All authors prepare the manuscript and agree for this final version to be submitted to this journal.

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