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Assessment of Arteriovenous Fistula Care Practices and Associated Demographic Factors Among Haemodialysis Patients

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ABSTRACT

Arteriovenous fistula is regarded as the gold standard of vascular access in patients undergoing haemodialysis, and the maintenance of it is crucial in avoiding complications and making treatment successful. The purpose of the current study was to measure the degree of arteriovenous fistula care practices and evaluate their relation to the chosen demographic variables in patients receiving haemodialysis in a tertiary care hospital in Bhubaneswar. The research design was a quantitative one, descriptive cross-sectional. Fifty-five haemodialysis patients who have arteriovenous fistula were also chosen through the non-probability convenience sampling method. A statistical analysis revealed no significant relationship between the practice of care and the chosen demographic variables at the. 05 level of significance.

Keywords: *Arteriovenous Fistula, Haemodialysis, Care, Vascular Access, Practice.*

I. INTRODUCTION

The state of one's health is ever-changing, making it an inherently dynamic process. We all go through healthy patches, bad patches, and maybe even really sick patches. Our level of health fluctuates in tandem with the way we live our lives. A healthy person has access to strong mental and social supports in addition to their physical health. A person's health is not an aim in itself, but rather a means to an end—supporting their function in society. Indirectly impacting the global death and morbidity rate, serious health concerns impact people's health. A substantial public health cost is borne by those with chronic renal disorders.

Kidney disease is a non-communicable illness that affects over 8 million individuals globally. Disorders of the kidneys are sometimes called "silent diseases" because few patients realise they have impaired kidney function and occasionally no outward symptoms at all. A loss of hydroelcetrolytic and metabolic balance systems, together with a steady and unstoppable reduction in renal function, are the defining features of Chronic Kidney Disease (CKD). The acronym ESRD stands for end-stage renal disease. Globally, chronic renal disease affects an estimated 10.4% of men and 11.8% of women, making it the most common form of kidney sickness. The annual expected number of Indians suffering from end-stage renal failure is around 20,000.

The kidneys, among the most vital organs in the human body, are responsible for maintaining the body's extracellular fluid balance. In severe instances of renal failure, haemodialysis can be used as a synthetic replacement for the kidneys. In the same way that normal kidneys filter blood of excess water and waste, this therapy does the same. Maintaining an appropriate mineral balance, including calcium, sodium, and potassium, and controlling blood pressure are both helped by haemodialysis. Dialysis is a way to filter the blood and remove excess water and waste. Dialysis can only manage its operations to a certain extent by diffusion and ultrafiltration; nonetheless, it cannot completely restore lost kidney function. Although haemodialysis cannot cure renal failure, it does alleviate symptoms and increase survival time. Treatment for chronic renal failure begins when the patient's glomerular filtration rate falls below 15 ml/min/1.73 m2.

A fistula or graft is a therapy option for patients with chronic renal failure who are expected to need haemodialysis. The abbreviation "AV" stands for "autogenous arteriovenous," which describes a direct connection between an artery and a vein. Because of this, blood from the arteries can flow into the veins. The outcome is venous engorgement and expansion, which allows for a blood flow rate of 600 mL/min during haemodialysis.

In 1966, Cimino and Brescia recorded the establishment of a subcutaneous AV Fistula from the radial artery to a neighbouring arm vein. Haemostasis access via vascular means is a common use case for this technique. Among American dialysis patients, only 16.9% start the treatment with an AVF, and among those who start haemodialysis one year later, 65% dialyse only with an AVF. It is recommended to wait at least six months before starting haemodialysis treatment, according to the National Kidney Foundation. Vein maturation, access development and assessment, and other necessary maturation-enhancing operations can all take place in this time frame, allowing for a smooth cannulation process. Patients in the fourth or fifth stages of chronic kidney disease (CKD) should receive information on vascular access procedures to provide ample time for access placement.

II. REVIEW OF LITERATURE

Bülbül, Elif et al., (2023) Keeping vascular access patency—essential for maintaining haemodialysis treatment—requires self-care behaviours pertaining to arteriovenous fistulas, health literacy, and self-care agency. The researchers set out to examine the self-care practices of patients undergoing continuous haemodialysis for arteriovenous fistulas and how these practices connect to the patients' health literacy and self-care agency. A total of 216 individuals undergoing chronic haemodialysis provided data for this descriptive correlational research. The percentage of patients exhibiting high levels of self-care behaviours was 83.96%. Education, work position, and age were the sociodemographic characteristics that were substantially associated with self-care behaviours linked to AVF. The self-care behaviours of patients with longer AVF duration in managing symptoms and findings were shown to be better ($p < 0.05$). Patients' self-care behaviours linked to AVF also rose when their health literacy and self-care agency both increased ($r = 0.421$, $p < 0.001$). Several factors were shown to influence self-care behaviours linked to AVF, including age, education level, health literacy, and self-care agency.

Manov, John et al., (2022) Globally, more and more people are dealing with end-stage renal illness. If a patient needs vascular access for haemodialysis, an arteriovenous fistula is the way to go. The significance of interventionist physicians who manage and repair arteriovenous fistulas will rise in proportion to the increasing patient population with these conditions. The purpose of this study is to acquaint practitioners with the current state of the art regarding arteriovenous fistula care and preservation, the reasons for creating fistulas, and methods for detecting fistula malfunction. A concise overview of the current disputes is provided.

Pottal Ray, Supriya et al., (2021) Ensuring the body's haemostasis is the principal role of the kidneys. The inability of the kidneys to regulate fluid balance or excrete metabolic waste is known as renal failure. Dialysis is a therapy for renal failure that mimics the kidneys in many ways. The use of arteriovenous fistulas (AVFs) has increased to above 50%. One way to get access to haemodialysis is through an arteriovenous fistula, or AVF. Arteriovenous fistulas (AVFs) are created when veins and arteries in the arm come together. The most essential thing for dialysis patients is to take care of their fistula by strengthening it, exercising it, keeping it clean, etc. During therapy, the patient receives information about the AV fistula, but they either do not receive all of the information or have trouble understanding the care routine. Arteriovenous fistula treatment is complicated, and people often don't know what to do because

of a lack of education and information. The current research set out to determine whether there was a correlation between demographic characteristics and dialysis patients' level of understanding about arteriovenous fistulas and their treatment.

Iqbal, Qura et al., (2018) In order to find out how haemodialysis patients with end-stage renal illness know, feel, and do about AV fistulacare. Study that compares two groups side by side. ESRD patients at Lahore General Hospital's Nephrology Department by the use of a self-administered questionnaire. Time span of six months beginning in January 2017 and ending in June 2017. About 141 individuals with chronic renal disease who were undergoing haemodialysis through an AV fistula were included in the research. We used a questionnaire that we developed ourselves to gather data. We used SPSS version 22 to analyse the data. It is well-known that when caring for an arteriovenous fistula, one should avoid doing things like monitoring blood pressure or inserting an intravenous line into the arm that bears the fistula, as well as avoiding trauma and heavy lifting on that arm. In particular, there was a lack of information on what to do in the event of oedema. The majority of our research population claimed to take maximal preventive measures most of the time, however the proportion of practice does not match that (85.1% vs. 74.7% respectively), despite the good attitude toward AV fistula treatment. Only 36.9% of people in our survey really elevated their limbs when they felt swelling. Despite the fact that most participants exhibited a positive attitude towards practicing precautionary measures for fistula care, the number of patients actually putting this knowledge into practice is lower than the number of patients who have adequate knowledge about them.

Stolic, Radojica et al., (2017) Because of their long lifespan and little risk of problems, arteriovenous fistulas (AVFs) are the vascular access method of choice for haemodialysis (HD). Our research set out to identify potential variables that impact AVF performance. A two-year period of data was extracted from the electronic health record system of the Clinic of Urology and Nephrology, Clinical Center, Kragujevac, Serbia. Patients who wanted AVFs recreated as a subsequent operation were the ones we looked at. Thromboses in the atrial fibrillation (AVF) occurred in 112 individuals (95% male and 65% female). We looked at every possible clinical and laboratory variable that may have an effect on AVF survival and function. Magnesium ($P < 0.001$), triglycerides ($P = 0.041$), smoking ($P = 0.001$), antiplatelet treatment ($P < 0.001$), and type of HD (bicarbonate vs. hemodiafiltration) ($P < 0.001$) were shown to be statistically significant predictors of the length of the fistula in the univariate logistic regression analysis. Antiplatelet treatment (B - 1.042; $P = 0.04$) and high magnesium concentrations ($B = 7434$; $P < 0.001$) were shown to be substantially linked to the duration of AVF function in the multiple logistic regression model. The maintenance of fistula patency is of the utmost importance following the successful formation of an AVF. There is a lot of research going on right now on what influences the AVFs' functionality. Our findings suggest that clinical variables, such as magnesium content and antiplatelet treatment, may impact the length of long-term fistulas.

III. RESEARCH METHODOLOGY

Research Approach

The present study used quantitative research approach.

Research Design

Descriptive cross-sectional design were used in the study.

Variables

Outcome Variables: AV fistula care practice of Haemodialysis patients with AV fistula.

Demographic Variables: Age, gender, occupation, type of family, number of Haemodialysis, exposure to AV fistula education.

Population

Hemodialysis patients with AV fistula in a selected tertiary care hospital in Bhubaneswar.

Sample and Sampling Technique

The urology outpatient department and dialysis unit saw 55 haemodialysis patients with AV fistula. The individuals were selected using a non-probability convenience sampling approach.

IV. DATA ANALYSIS AND INTERPRETATION

Table 1: Demographic Profile of the Respondents

Demographic Variables	Category	Frequency	Percentage
Age	26-30	2	3.6
	31-35	2	3.6
	>35	51	92.7
	Total	55	100.0
Gender	Male	35	63.6
	Female	20	36.4
	Total	55	100.0
Job	Sedentary	3	5.5
	Moderate	21	38.2
	Heavy	3	5.5
	Not working	28	50.9
	Total	55	100.0
Family	Joint	14	25.5
	Nuclear	41	74.5
	Total	55	100.0
Number of HD underwent	10	1	1.8
	11-50	17	30.9
	>50	37	67.3
	Total	55	100.0
Exposure	Yes	15	27.3
	No	40	72.7
	Total	55	100.0

Table 1 shows the demographics of the 55 people with AV fistula who were part of the trial who were on haemodialysis. A total of 92.7% of respondents were older than 35, with only 3.6% falling into the 26–30 and 31–35 age brackets, respectively. Gender distribution: men made up 63.6% of the sample, while females accounted for 36.4%. Over half of the people who filled out the survey were not working (50.9%), with 38.2% having mediocre jobs. Both sedentary (5.5% of the total) and physically demanding (5.5% of the total) participation was rather low. When asked about their family structure, most people (74.5% to be exact) identified as nuclear, while 25.5% were part of joint families. When looking at the total number of haemodialysis sessions, 67.3% of respondents had had more than 50 sessions, 30.9% had had 11-50 sessions, and 1.8% had had 10 sessions or fewer. When asked about their familiarity with AV fistula education, 27.3% had received it, while 72.7% said they had never heard of it.

Table 2: Mean and Standard Deviation of Level of AV Fistula Care Practices

Variable	Mean	Standard deviation
Level of AV fistula care practice	30.22	3.23

Table 3: Distribution of respondents according to their level of AV fistula care practices

Level of AV Fistula Care Practices	Frequency	Percentage
Poor (<20)	0	0
Good (20-30)	22	40.0
Very good (30-36)	33	60.0
Total	55	100.0

According to the data in the table above, 60% of the participants had excellent care practices for their AV fistula, while 40% had good practices. The participants' AV fistula treatment habits were all excellent.

Table 4: Association Between AV Fistula Care Practice and Selected Demographic Variables

Demographic Variables		AV Fistula Care Practices		Chi Square/Fishers Exact Value	P Value
		Good	V. Good		
Age	26-30	0	2	1.352	0.509
	31-35	1	1		
	>35	21	30		
Gender	Male	14	21	.401	0.526
	Female	8	12		
Occupation	Heavy	1	2	3.127	0.372
	Moderate	9	12		
	Sedentary	1	2		
	Not working	11	17		
Family	Joint	6	8	2.719	0.099
	Nuclear	16	25		
Number	<10	1	0	2.207	0.332
	11-50	7	10		
	>50	14	23		
Exposure	Yes	6	9	-	-
	No	16	24		

Level of significance at < 0.05 level

At the 0.05 level of significance, no correlation was found between care practices and any of the demographic factors shown in Table 4, which illustrates the association between AV fistula care practices and chosen haemodialysis patients' demographics. The link between age and very excellent care practices was not significant ($\chi^2 = 1.352$, $p = 0.509$), even though a greater proportion of respondents above the age of 35 showed it. Men and women engage in similar activities, as gender did not demonstrate a significant association ($\chi^2 = 0.401$, $p = 0.526$). With $\chi^2 = 3.127$ and $p = 0.372$, the differences in outcomes across the various occupational groups were also not statistically significant. No significant connection was found between family type and very excellent practices, however there were more respondents from nuclear households ($\chi^2 = 2.719$, $p = 0.099$). Similarly, care practices were not substantially affected by the total number of haemodialysis sessions, even though patients who had more sessions generally had better outcomes ($\chi^2 = 2.207$, $p = 0.332$). A similar lack of correlation was observed with exposure to AV fistula education.

V. CONCLUSION

the lack of bad practices, a significant percentage of the patients did not have a previous experience of any formal education on fistula care, which demonstrates that there is a void in teaching the patients. Moreover, the study revealed no statistically significant relationship between arteriovenous fistula care practices and the demographic variables like age, gender, occupation, type of family, number of haemodialysis sessions, and previous exposure to education. This implies that other factors other than the simple demographic features might affect the care practices. The results highlight the significance of the ongoing education of patients, reinforcing their self-care measures, and the role of medical workers, especially nurses, in advancing best fistula care. The introduction of additional efforts to improve educational practice in dialysis units may additionally improve patient outcomes and lower the risk of complications related to the presence of arteriovenous fistula.

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