

Perception Matters: Exploring Patients' Perceptions on AV Fistula Formation at Hospitals in Urban Pakistan

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Abstract

A Chronic Kidney Disease (CKD) and End-Stage Renal Disease (ESRD) are growing global health issue that requires long-term dialysis. For hemodialysis (HD), an arteriovenous fistula (AVF) is recognized as the preferred vascular access due to its durability and lower risk of complications. However, patients are often reluctant to undergo AVF formation. Therefore, this study aimed to explore the patients' perceptions towards AVF formation in urban Pakistan. An exploratory descriptive qualitative design was used. Through purposive sampling, participants were recruited from urban hospitals. Data were collected through semi-structured interviews which helped to obtain in-depth perceptions. The Data were analyzed through Content analysis. Four categories emerged from data analysis of total ten interviews: 1) Reluctance towards AVF formation, 2) Acceptance and readiness for AVF creation, 3) Recommendations for AVF formation, 4) Awareness spectrum of AVF formation. This study concludes that patients' perceptions of AVF formation are influenced by physical, emotional, and sociocultural factors, which can lead to reluctance toward the procedure. The Exploration of these perceptions revealed concerns about fear of physical pain, daily life impact, and confidence in the healthcare system. Addressing these concerns is bases to providing patient-centered care.

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1 Introduction

Chronic Kidney Disease (CKD) is a persistent loss of kidney function for greater than three months, with a glomerular filtration rate (GFR) less than 60 mL/minute. GFR below 15 mL/minute is classified as End-stage renal disease (ESRD). Therefore, it requires renal replacement therapy in the form of dialysis or kidney transplantation. CKD is a global health concern; worldwide 13.4% are suffering from CKD. It became a significant health problem, while ESRD accounts nearly 0.1% of the population [1]. According to the Global Burden of Disease (GBD), in 2017, CKD was the twelfth leading cause of death and is expected to become the fifth leading cause by 2040 [2]. In Pakistan, the prevalence of CKD prevalence is between 16.6% and 25%, with the majority of patients diagnosed at advanced stages when curative treatment is no longer possible [3]. Around 22,000 patients need ongoing maintenance dialysis in Pakistan. Moreover, the leading causes of the CKD and ESRD are; type-II diabetes mellitus (30-50%) and hypertension (27.2%) [4].

According to studies, hemodialysis is one of the most common treatment methods of CKD and ESRD [5, 6]. Additionally, vascular access is necessary to perform hemodialysis, such as central venous catheter (CVCs), arteriovenous grafts (AVGs), or arteriovenous fistulas (AVFs). Among all, AVF is widely regarded as a preferred access for long-term HD. The AVF is formed through surgical connection of an artery to a vein, and requires a maturation period of approximately four months[7]. In addition, AVF access is associated with a shorter hospital stay, fewer infections, and a better patient survival rate[8].

Despite its various clinical benefits, the adoption of AVF varies significantly worldwide ranging as low as 01 % in Japan to as high as 44 % in Canada[9]. In Pakistan, limited literature is available regarding patients' perception of AVF formation, which poses a challenge to implement patient-centered care approaches. Barriers to AVF adoption include fear of surgery, limited awareness, cosmetic concerns, and delayed medical referrals. Evidences from studies in Palestine and Pakistan showed that misconceptions, lack of education, and insufficient healthcare communication as key factors limiting AVF formation[10, 11]. Moreover, body-image disturbance, dependence, and social stigma can lead to psychological and emotional issues[12]. Other alternative options such as AVG and CVC are available, however, cause higher risks. In terms of AVGs, it can be used within two to four weeks but are linked to higher risks of thrombosis and infection. On the other hand, CVCs, are intended for temporary use and are not suitable for long-term hemodialysis because of serious complications such as central vein stenosis and catheter-related infections[9, 13]. Worldwide healthcare system acknowledges the importance to educate patient about AVF. For instance, in UK, comprehensive guidelines and education materials are provided to patients before AVF creation[14]. However, such kind of initiatives remains limited in many developing countries, including Pakistan.

Despite clinical preferences for AVF, many patients delay its formation and prefer temporary vascular access. Understanding patients' perception is essential to improve counseling strategies, enhance shared decision-making and reduce catheter-related complications in Pakistani healthcare settings[15, 16]. To explore the perceptions, view, and decision-making factors influencing patients' acceptance or reluctance towards AVF formation in selected urban hospital in Pakistan.

2 Methodology

2.1 Study Design and Setting

This qualitative exploratory descriptive study was conducted from May 2024 to October 2024. Participants were selected from two tertiary care hospitals in urban Pakistan. The rationale behind the selection was to capture diverse perceptions among HD patients towards AVF formation.

2.2 Data Sampling

A total of ten participants were recruited from nephrology ward, outpatient department, and hemodialysis units, through a purposive sampling method. The study included participants aged 18 years and above who were recently diagnosed with CKD or ESRD and who had been referred to for AVF formation. The principles were applied in determining data saturation[17]. Saturation was assumed to be accomplished in case there were no new codes appeared in previous two consecutive interviews. A saturation grid was kept to monitor code repetition and emergence.

2.3 Data Collection and Analysis

Data were gathered through semi-structured face-to-face interviews with the participants. The interview guide was developed from the research questions and the existing literature. The guide was made out of open ended questions and contained probes. In addition, socio-demographic information was also

recorded such as age, sex, marital status, education level, and comorbidities. These characteristics of patients could affect perceptions about the formation of AVF. Field notes were also recorded during each interview to capture non-verbal communication between patients such as tone, pauses, expressions, and emotional reactions. These were incorporated in the data analysis to make better contextual interpretation. A mock interview was taken from one of the participants according to the study criteria, which helped to refine the interview process and questions[18]. All interviews were done in Urdu and taped with participants' consent, and safely stored.

Accuracy and consistency of the transcripts were validated by bilingual professionals. The data analysis was done through the traditional content analysis provided by Creswell and Creswell (2017). Categories were emerged inductively due to the limited literature on the subject[19]. Initially, the data were organized, transcripts were read, translated, and coded through thorough reading, by using a three-column format codes, narratives, and comments with bilingual support. Codes with similar meanings were gathered and redundant codes were narrowed to create sub-categories. The interpretation stage involved the identification of the key insights with the guidance of supervisors, making sure the alignment between participant quotes and emergent categories. The data organization also involved privacy of participants' information and securely storing field notes, audio-recordings, and transcripts. The rigor of the study was ensured by using Lincoln and Guba's (1986) criteria for trustworthiness: credibility was obtained through prolonged engagement in participants' interviews and member checking, in which the main points were summarized and confirm from the participants to ensure accurate interpretation of their perception regarding AVF formation. Dependability was ensured by keeping an audit trail which recorded all the stages of the research process. Confirmability was achieved through peer debriefing with the supervisory committee, who reviewed the coding and category development to minimize research bias. Transferability was maintained by providing thick description of the study setting and participants, allowing readers to assess the applicability of the finding to similar healthcare contexts[20].

3 Ethical Considerations

The research followed ethical protocols to protect participants' rights and emotional well-being. Approval was obtained from the hospital heads and the Institutional Review Board (IRB No. 177-24) following a detailed proposal. Informed consent was obtained from all participants, who were fully informed about the purpose of the study, potential risks, benefits, and their right to withdraw at any time. The interviews were conducted in a supportive and empathetic environment that allowed the participants to express themselves freely. Confidentiality was maintained using, participants were denoted through (P. No.) where the first letter represents the participant number, followed by gender, and age. This identification is mentioned at the end of each quote. Data were securely stored with restricted access. Although there were no direct benefits, sharing experiences may have offered participants therapeutic value.

3.1 Findings

In this study, a total of ten patients participated in expressing their perceptions regarding AVF formation as recommended by their doctors. Most of the participants were men (n= 06) as compared to women (n=04). The minimum age was 19 years old, and the maximum age was 55 years. Most participants were educated at the undergraduate or graduate level, with only one having no formal education. Regarding comorbidities, most of them were hypertensive (HTN), and few had no comorbidities, as shown in Table 1. The categories and subcategories identified in this study are shown in Figure 1:

Table 1: Demographic Characteristics (n=10)

Participants	Gender	Age (Years)	Qualification	Comorbidities
P1	Female	53	Primary	HTN
P2	Male	27	Masters	None
P3	Female	44	Masters	None
P4	Male	29	Bachelors	HTN
P5	Female	54	Nil	HTN
P6	Male	19	Intermediate	None
P7	Male	55	Intermediate	HTN
P8	Male	34	Masters	HTN
P9	Male	32	Masters	HTN
P10	Female	38	Bachelors	HTN

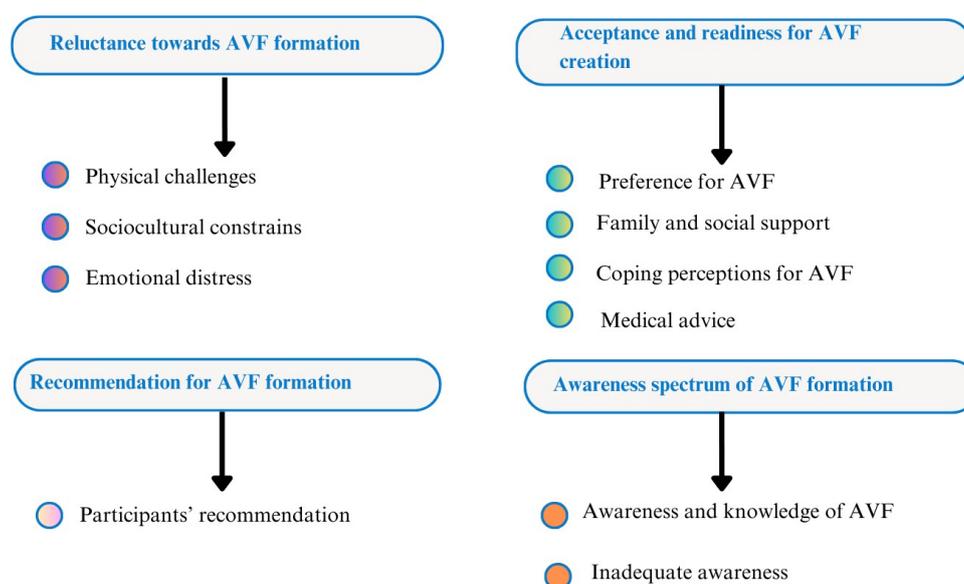


Figure 1: Categories and Sub-Categories.

Reluctance towards AVF formation was a prominent category, influenced by physical discomfort, socio-cultural factors, and emotional concerns. Many participants feared the pain and appearance of the AVF. One shared, “Those needle pricks in the AVF are quite painful and the appearance of swelling makes me avoid its formation” (P1, Female, 53 years). Their veins become swollen that can be visibly inflated” (P2, Male, 27 years). It was also observed that the participants had problems with body image: “Patients with AVF reported experiencing difficulties in wearing half sleeved shirts because of the bubbles” (P8, Male, 34 years). Problem with needling elicited anxiety: “Doctors prick into the AVF site and they fail to located the correct site and prick repeatedly, this is the reason why I am frightened” (P5, Female, 54 years). There was functional limitation issue: “With AVF, I can able to lift two or two and a half kilos. As I am young man and I cannot live my entire life with AVF” (P2, Male, 27 years), and fears of long-term complications were mentioned: “In case of the AVF blockage, I do not want to suffer myself by undergoing multiple surgeries” (P5, Female, 54 years).

Sociocultural constraints added to the reluctance. One participant shared, “My family told me not to go for it because people think it is embarrassing” (P2, Male, 27 years). Dependency concerns were evident: “I am concerned that with AVF, I’ll have to rely on my family even for simple things” (P6, Male, 19 years). Emotionally, participants felt stressed and anxious. “I heard from a widow that her AVF blocked twice. She underwent her third AVF, it is stressful for me” (P5, Female, 54 years). Another shared, “I am so anxious about the surgery. What if something goes wrong?” (P3, Female, 44 years). Observing others’ pain reinforced fears: “I have seen patients’ facial expressions of pain” (P1, Female, 53years).

One participant summarized this fear of dependence: “I am concerned I’ll have to rely on family even for cooking or cleaning” (P5, Female, 54 years). These physical, emotional, and social concerns strongly influenced participants’ reluctance to undergo AVF formation despite medical advice.

Participants’ acceptance and readiness for AVF formation were shaped by their preference for AVF, support from family and peers, coping abilities, and medical advice. Many participants viewed AVF as a preferable choice due to its longevity, lower infection risk, and cost-effectiveness. One shared, “I know AVF will last longer and has a lower to no risk of infection compared to the catheter. It feels like AVF will be a better choice for long-term care” (P7, Male, 55 years), while another added, “I prefer the AVF because I can take a shower without worrying too much and it needs less care” (P4, Male, 29 years). AVF was especially favored in the absence of a kidney transplant option, as stated by P2, Male, 27 years: “If one has no such option, they should go for AVF formation”. Family and social influences also played a role; (P1, Female, 53 years) mentioned, “A patient I met said that AVF is a good choice and the needle pricks only cause mild pain,” and (P5, Male, 55 years) added, “My family has always encouraged me to opt for AVF”. Some participants felt socially comfortable with AVF, with one noting, “AVF is fine and not visible like permacath” (P4, Male, 29 years). Coping perceptions were guided by faith and optimism; (P7, Male, 55 years) stated, “I accept this as it comes from God. I will accept the changes accordingly”, while others expressed readiness to create AVF: “I am not afraid related to AVF, I am ready for AVF formation” (P4, Male, 29 years). These opinions were reinforced by the constant recommendations by the medical professionals (P2, Male, 27 years), who stated that the doctors kept recommending the AVF. They said that AVF is best in the long run with least side effects,” and (P3, Female, 44 years) stated, “The doctor recommended me to make AVF since permacath has high risk of infections.” All these factors influenced and strengthened participants’ acceptance and willingness for AVF formation.

AVF formation was strongly recommended by the participants as the preferred approach to long-term HD. Because it is more durable, safe and less infection than short-term access such as permacath or Double Lumen Catheters (DLC). One of the participants said, “AVF would be the most suitable choice in the case of long-term dialysis, safer and more reliable in the long run than a catheter” (P6, Male, 19 years), highlighting the role of AVF role in reducing catheter-associated infections, another participant mentioned, “Patients often come to me, new ones, and in that case I always suggest AVF rather than permacath” (P4, Male, 29 years), which indicates a peer-to-peer recommendation based on personal experience and observation. Emphasizing on the simplicity of care, a participant added, “For long-term dialysis, it is better to make AVF because of its longevity, and it needs fewer care” (P2, Male, 27 years). These perceptions added to a common belief in AVF amongst participants who perceived it as a safer and more sustainable alternative, in particular, among patients with prolonged dialysis requirements.

The participants showed different levels of awareness regarding AVF formation with some demonstrating a clear understanding of its importance for enduring dialysis. One of the participants stated, “I know AVF is an essential approach because I need dialysis in my whole life” (P4, Male, 29 years), while other participant explained precautions, “I was advised by the doctors to be careful with my arm, no heavy lifting and no blood pressure measurement on my arm” (P2, Male, 27 years). Some of them knew that it had a long-lasting effect and fewer infections, stating, “AVF is utilized for dialysis, and it is an alternative to permacath because of its durability” (P3, Female, 44 years), and “AVF is formed by manipulation of veins in the arm and a low risk of infection” (P8, Male, 34 years). However, some participants had misconceptions. For example, one of the participants stated, “I don’t want to make AVF because it is irreversible” (P2, Male, 27 years) and “I do not need AVF since permacath is okay and I am fine with it” (P5, Female, 54 years), reflect limited knowledge of AVF benefits. Others misunderstood dialysis itself, as seen in “Dialysis is a long-term disease. Therefore, AVF is necessary” (P4, Male, 29 years), and “Dialysis sucks everything out of your body, and the AVF requires so much care” (P8, Male, 34 years). This range of awareness underscores the need for comprehensive education to support informed decision-making and improved adherence to treatment.

4 Discussion

Despite the benefits of AVF for HD patients, this research found that there is significant resistance among patients to undergo the AVF formation. The major obstacles were physical pain, psychological distress, and sociocultural factors which were relevant to previous studies[3, 20, 21]. Physical concerns were also discouraging like pain caused by needle pricks and changes in body appearance[22]. The social conditions that influenced the reluctance of patients including family opinions and fears about altered social roles [21, 14]. Other emotional issues like the fear of complications, the loss of independence, and narratives of other people who had negative experiences previously also added to the reluctance[23, 24].Lack of confidence in the healthcare system and body image issues also played a role towards reluctance[22, 25]. Also, patients in public hospitals were poorly counseled on AVF, resulting in delays and missed surgeries [11]. In spite of these barriers, some participants showed readiness for AVF due to its perceived advantages lower infection risk, reduced maintenance, and cost-effectiveness. Family, peers, and healthcare support were critical towards supporting acceptance[25, 14]. Patients were additionally motivated by spirituality and seeing other people having successful experiences. Strong recommendations from healthcare professionals also influenced patient decisions, in line with previous studies [25]. Notably, participants who understood benefits of AVF frequently recommended it to others, reinforcing literature that informed patients act as advocates[24, 25]. There was a wide awareness on AVF formation. Some participants understood it clearly, but some of them had misconceptions, including the perception that AVF is permanent or worse than permacath. These knowledge gaps in the education of the patient are well-reported as contributing suboptimal decisions[21, 24]. This study emphasizes the need to include patient-centered learning that covers not only medical knowledge but also emotional, social, and culture aspects. Effective listening and understanding creates trust and enhances AVF preparedness. Future research should further explore sociocultural challenges and the role of family in influencing decisions.

5 Recommendations

In order to enhance the patient outcomes and informed decision-making regarding AVF formation, some essential recommendations are proposed. To start with, structured counseling sessions with the patients referred to AVF can be introduced to allow them to solve their concerns, calms down their anxiety, and will develop a better understanding of how the procedure works. Patient decision-making can be further attributed by involving family members in such session. Moreover, it is necessary to train the healthcare providers in proper communication strategies that would allow them to express the significance of AVF empathetically and effectively address the issues of patients. Developing a standardized policy for AVF formation, covering the decision-making process and follow-up care, will promote consistency in patient education. Moreover, creating clear and accessible educational materials on AVF, including its benefits and potential complications, will empower patients to make informed treatment choices. Community awareness campaigns targeting both patients and healthcare professionals can also raise awareness about the significance of AVF for dialysis, potentially increasing timely referrals and improving outcomes. Finally, future studies are recommended to be done in more geographically diverse areas and longitudinally track patient experience to have a comprehensive understanding of AVF outcomes in the long-term.

6 Strengths and Limitations

The study offers several strengths that enhance its relevance and applicability. It gives a detailed discussion of the perception of patients and capturing a wide range of emotional, physical, and sociocultural factors that influence decision-making AVF formation. The study is relevant to clinical issues, because it specifically targets patients who are referred to AVF, making it applicable to real-life clinical issues and providing practical implications to the dialysis care providers. The study however has limitations as well.

It records the patient opinions at only one time period without evaluating on the possibility of changes in such opinions following AVF development. Also, the three participants who were representing the public sector might not truly reflect the perception of the participants in the public hospitals where differences in access to care could have a great impact on the perceptions and results.

7 Conclusion

The purpose of this study was to explore such factors that affect the perception of the patients towards AVF formation, including physical discomfort, emotional distress, and sociocultural influences. Although AVF is the most preferable form of dialysis through long term access, lots of participants were reluctant because of the fear of pain, body image, and complications. Nevertheless, acceptance became better with adequate information, excellent family support, and healthcare provider assurance.

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