



Study to Evaluate the Effectiveness of IEC Package on Knowledge Regarding Home Care of Cimino- Brescia Fistula (CBF) Undergoing Hemodialysis Patients of Selected Hospitals in Metropolitan City.”

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ABSTRACT:

Introduction: Chronic Kidney Disease (CKD) is a progressive and irreversible disorder characterized by the gradual loss of kidney function. Hemodialysis is a life-sustaining therapy for patients with end-stage renal disease (ESRD), requiring a reliable vascular access such as the Cimino-Brescia fistula (arteriovenous fistula). Proper home care of the fistula is vital to prevent complications and ensure treatment efficacy. However, many hemodialysis patients lack adequate knowledge about fistula care. Educational interventions like Information, Education, and Communication (IEC) packages can play a key role in improving patient knowledge and self-care practices.

Aim of the Study: To evaluate the effectiveness of an IEC package on knowledge regarding home care of Cimino-Brescia fistula among hemodialysis patients in selected hospitals of a metropolitan city.

Methodology: A quantitative, pre- experimental one-group pre-test post-test design was adopted. The study included 65 hemodialysis patients selected through non-probability purposive sampling. Data were collected using a self-structured questionnaire covering demographic details and knowledge on fistula care. After the pre-test, participants received an IEC package comprising structured teaching, pamphlets, and exercise demonstration videos. Post-test was conducted on the fifth day. Data were analyzed using descriptive statistics, paired t-test, and Fisher's Exact Test.

Results: The mean pre-test knowledge score was 9.3 (SD = 2.3), which increased to 16.3 (SD = 3.2) in the post-test. The calculated t-value was 24.8 ($p < 0.05$), indicating a highly significant improvement in knowledge after the intervention. Significant associations were found between pre-test knowledge and demographic variables such as age ($p = 0.008$) and education ($p = 0.014$).

Conclusion: The study concluded that the IEC package was highly effective in enhancing patients' knowledge regarding home care of the Cimino-Brescia fistula. Regular educational interventions can empower patients, prevent complications, and improve treatment outcomes and quality of life.

INTRODUCTION

The kidneys are vital, bean-shaped organs located in the posterior abdominal cavity, with the left kidney positioned slightly higher than the right. They perform essential functions, including filtering metabolic wastes like urea and ammonium, regulating fluid and electrolyte balance, maintaining acid-base equilibrium, and producing hormones such as erythropoietin and calcitriol. Additionally, kidneys help regulate blood pressure and reabsorb nutrients like glucose and amino acids.

Renal failure, or kidney insufficiency, occurs when the kidneys cannot adequately filter blood or maintain fluid balance. Major causes include diabetes mellitus and hypertension, while other risk factors include age, smoking, and obesity. Renal failure can be acute or chronic. Acute renal failure (ARF) is sudden and potentially reversible, characterized by reduced urine output, electrolyte imbalances, fatigue, edema, and other symptoms. Untreated ARF may lead to complications like uremia, hyperkalemia, or fluid overload. In contrast, chronic kidney disease (CKD) is progressive and irreversible, often resulting from



diabetes, hypertension, nephritic syndrome, or polycystic kidney disease. CKD increases the risk of cardiovascular disease, anemia, bone disorders, and metabolic complications.

Globally, CKD affects millions of people and has emerged as a major cause of morbidity and mortality. Treatment options focus on managing symptoms, slowing disease progression, and improving quality of life. Dialysis, including hemodialysis and peritoneal dialysis, is a key intervention, with arteriovenous fistula (AVF) considered the gold standard vascular access due to its durability and lower complication rates. Proper care and maintenance of AVF, including hand-arm exercises, hygiene, and monitoring for complications, are essential for successful hemodialysis outcomes.

Assessing patient awareness of AVF care is critical, as inadequate knowledge can lead to complications, hospitalization, and reduced quality of life. Therefore, interventions such as structured Information, Education, and Communication (IEC) packages are vital to enhance patients' understanding and self-management of AVF, ensuring optimal dialysis outcomes and improving overall well-being.

NEED OF THE STUDY

Chronic Kidney Disease (CKD) is a progressive kidney disorder that, if left untreated, can lead to renal failure. In India, over 10% of the population is affected, with more than 100,000 new patients developing kidney failure each year. CKD affects not only adults but also children under five years of age. Globally, kidney diseases contribute significantly to mortality, with an estimated 5–11 million deaths annually. Acute kidney injury (AKI) adds another 1.7 million deaths each year. CKD also reduces patients' quality of life, especially those on dialysis, who often experience fatigue, muscle weakness, and other physical limitations.

Hemodialysis is the primary treatment for patients with advanced CKD and end-stage renal disease (ESRD). It maintains life by filtering blood but does not restore full kidney function or endocrine activity. In India, dialysis demand is rising rapidly, with millions of sessions performed annually and around 220,000 new ESRD patients added each year. Patients on hemodialysis must follow strict schedules, medication routines, diet control, fluid restriction, and exercise to prevent complications such as hypotension, fluid overload, muscle cramps, or vascular access problems.

Arteriovenous fistula (AVF) is the preferred form of vascular access for hemodialysis. However, 20–50% of AVFs fail to mature or develop complications due to thrombosis, stenosis, or improper care. Exercise, hygiene, and regular monitoring are essential to prevent AVF failure and improve patient outcomes. Previous studies have shown that many patients have inadequate knowledge and practice regarding AVF self-care, highlighting a gap in patient education.

Therefore, there is a pressing need to improve awareness and knowledge of post-dialysis home care among CKD patients. Using structured interventions such as Information, Education, and Communication (IEC) packages can strengthen patients' understanding of AVF care, enhance adherence to treatment protocols, and reduce complications. This study aims to assess the knowledge of patients undergoing hemodialysis and implement an IEC package to improve post-dialysis home care, ultimately improving patient safety, treatment outcomes, and quality of life.

AIMS OF STUDY: The aim of present was Study to evaluate the effectiveness of IEC package on knowledge regarding home care of Cimino-Brescia fistula (CBF) undergoing hemodialysis patients of selected hospitals in metropolitan city.

METHODOLOGY

A quantitative research approach was adopted to assess the effectiveness of an Information, Education, and Communication (IEC) package on knowledge regarding home care of Cimino- Brescia fistula among hemodialysis patients in selected metropolitan hospitals. A pre- experimental one-group pre-test post-test design was used, where participants' knowledge was assessed before and after the intervention to determine its effectiveness. The study population comprised hemodialysis patients with Cimino-Brescia fistula attending selected hospitals. A total of 65 patients fulfilling the inclusion criteria were selected using non-probability purposive sampling. Inclusion criteria were patients with AV fistula, present during data collection, and able to read English, Marathi, or Hindi, while patients unwilling to participate or with AV fistula complications such as aneurysm, thrombosis, or stenosis were excluded.

A self-structured questionnaire was developed based on literature review and expert guidance to collect data. The tool consisted of three sections: demographic information, a knowledge questionnaire covering



kidney anatomy, dialysis, AV fistula, home care, diet, fluid management, and exercise, and the IEC package intervention, which included structured teaching, pamphlets, and exercise demonstration videos. Content validity was established through review by nursing experts, nephrologists, a dietician, a physiotherapist, language experts, and a statistician. Reliability was assessed using the test-retest method with seven participants, yielding a Pearson correlation coefficient of 0.98, indicating high reliability.

Data collection involved obtaining administrative permission and informed consent, administering the pre-test, providing the IEC package on the same day, and conducting the post-test after five days. Data were analyzed using descriptive statistics for demographic variables and paired t-test to assess the effectiveness of the IEC package. Associations between demographic variables and knowledge were examined using Fisher's exact test. The entire process ensured ethical considerations, feasibility, and accuracy of results, providing a systematic evaluation of the IEC package's impact on patient knowledge regarding home care of Cimino-Brescia fistula.

RESULT

Section A: Demographic Characteristics of Haemodialysis Patients

The present study comprised 65 haemodialysis patients from selected hospitals in a metropolitan city. Analysis of demographic variables revealed that the majority of patients (33.8%) were between 51–60 years of age, followed by 32.3% above 60 years. Most of the patients were male (61.5%).

Regarding education, the majority (50.8%) had secondary education, while 27.7% had higher secondary education. With respect to occupation, the largest proportion (40%) were unemployed or housewives, followed by 27.7% who were private employees.

In terms of residence, two-thirds (66.2%) of the patients resided in urban areas, while 20% were from rural regions. The majority (84.6%) received information about home care of Cimino-Brescia fistula from healthcare professionals, indicating a key role of health staff in patient education.

Most patients (67.7%) had no family history of kidney disease, and 43.1% had been undergoing haemodialysis for 1–3 years. Furthermore, 60% of patients received

haemodialysis three times per week. Hypertension was found to be the most common co-morbid chronic illness (53.8%) among the study participants.

SECTION B: Analysis of Knowledge Regarding Home Care of Cimino-Brescia Fistula

Part I: Pre-test Level of Knowledge

Table No. 1: Pretest level of knowledge regarding home care of Cimino Brescia fistula undergoing Haemodialysis patients of selected hospitals in metropolitan city

N=65

Knowledge	Pretest	
	Frequency	%
Poor	5	7.7%
Average	40	61.5%
Fair	20	30.8%
Good	0	0.0%
Excellent	0	0.0%

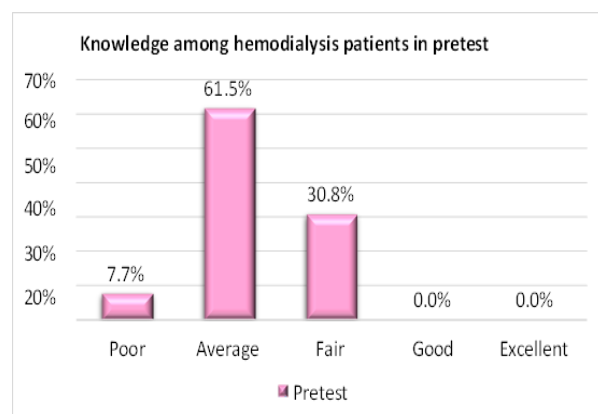


Figure No. 1: Distribution of knowledge among hemodialysis patients in pre-test

Before the intervention, the results showed that 7.7% of the patients had poor knowledge, 61.5% had average knowledge, and 30.8% had fair knowledge regarding home care of the Cimino-Brescia fistula. None of the participants had good or excellent knowledge levels. This indicates that baseline knowledge among haemodialysis patients was inadequate.



Part II: Post-test Level of Knowledge

Table No. 2: Post-test level of knowledge regarding home care of Cimino Brescia fistula undergoing haemodialysis patients

N=65

Knowledge	Posttest	
	Frequency	%
Poor	0	0.0%
Average	2	3.1%
Fair	23	35.4%
Good	36	55.4%
Excellent	4	6.2%

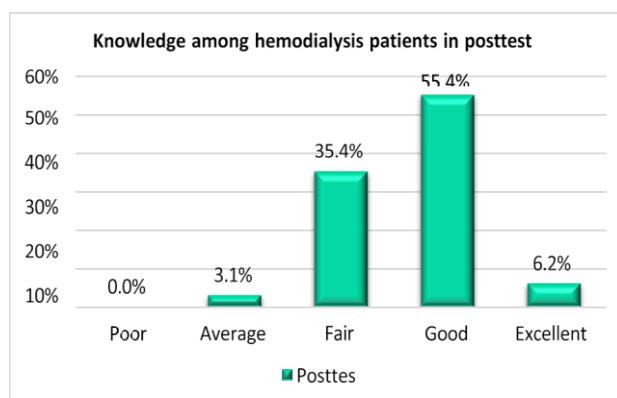


Figure No. 2: Distribution of knowledge among hemodialysis patients in post-test

After administration of the IEC (Information, Education, and Communication) package, the post-test results demonstrated remarkable improvement. 3.1% had average knowledge, 35.4% had fair knowledge, 55.4% had good knowledge, and 6.2% achieved excellent knowledge. This reveals a significant gain in knowledge following the educational intervention.

Part III: Comparison of Pre-test and Post-test Knowledge

The comparison between pre-test and post-test scores showed a marked improvement. In the pre-test, none of the patients scored in the good or excellent category, whereas in the post-test, 61.6% (good + excellent) achieved higher knowledge levels. This demonstrates a positive impact of the IEC package on the patients' understanding of home care for the fistula.

Part IV: Effectiveness of the IEC Package

A paired t-test was applied to assess the effectiveness of the IEC package. The mean pre-test score was 9.3 (SD = 2.3), which increased to 16.3 (SD = 3.2) in the post-test. The calculated t-value was 24.8 with 64 degrees of freedom and a p-value < 0.05, indicating a highly significant improvement in knowledge after the intervention.

SECTION B – IV: Association of Pre-test Knowledge with Demographic Variables

The association between pre-test knowledge and demographic variables was analyzed using Fisher's Exact Test. The results revealed a significant association between knowledge and two demographic variables: age ($p = 0.008$) and education ($p = 0.014$).

No significant association was found between knowledge and gender, occupation, residence, source of information, family history, duration of haemodialysis, frequency of haemodialysis per week, or presence of co-morbid chronic illness.

DISCUSSION

The present study was undertaken to assess the effectiveness of an Information, Education, and Communication (IEC) package on knowledge regarding home care of Cimino-Brescia fistula among hemodialysis patients in selected hospitals of a metropolitan city. Chronic kidney disease (CKD) is a progressive and irreversible condition, and hemodialysis remains a life-sustaining therapy for patients in advanced stages. Proper care and maintenance of the arteriovenous (AV) fistula, also known as the Cimino-Brescia fistula, are crucial to ensure effective dialysis and prevent complications.

The study followed a pre-experimental one-group pre-test post-test design, including 65 hemodialysis patients selected through non-probability purposive sampling. Data were collected using a self-structured knowledge questionnaire. Findings of the study revealed that the mean pre-test knowledge score was 9.3 (SD = 2.3), which significantly increased to 16.3 (SD = 3.2) in the post-test. The obtained p-value was less than 0.05, indicating a statistically significant improvement in knowledge following the administration of the IEC package. Therefore, the null hypothesis (H_0) was rejected, and the research hypothesis (H_1) was accepted. The findings clearly demonstrate that the IEC package was effective in enhancing patients'



knowledge regarding home care of the Cimino-Brescia fistula.

These findings are supported by Khumukcham Monali Devi et al. (2022), who conducted a study to assess the effect of a self-instructional module on knowledge regarding the care of AV fistula among hemodialysis patients in Guwahati, Assam. Their results indicated that the mean post-test knowledge score (12) was significantly higher than the pre-test (7.32), with $t = 5.65$ and $p = 0.0001$, confirming the effectiveness of educational interventions in improving patient knowledge.

Similarly, Mrs. Sonia Abraham and Ms. Anju Baby et al. (2019) carried out a study in Ernakulam district, Kerala, to assess AV fistula care practices among hemodialysis patients. The results showed that 59.4% had very good AV fistula care practices, and 40.6% had good practices, with a mean score of 30.22 (SD = 3.23). No significant association was found between AV fistula care practices and selected demographic variables.

The consistency of these findings across studies emphasizes that structured educational approaches—such as IEC packages and self-instructional modules—play a vital role in improving patients' knowledge and practices. Enhanced awareness and adherence to AV fistula care guidelines help prevent complications, improve treatment efficiency, and ultimately enhance the quality of life among hemodialysis patients.

CONCLUSION

The present study concluded that the implementation of an Information, Education, and Communication (IEC) package is a highly effective strategy for enhancing knowledge regarding the home care of the Cimino-Brescia fistula among hemodialysis patients. The study findings revealed that prior to the intervention, a substantial proportion of patients demonstrated inadequate understanding of fistula care practices, highlighting the need for structured educational initiatives. Following the administration of the IEC package, a significant improvement in post-test knowledge scores was observed, establishing the effectiveness of the educational intervention.

Participants exhibited considerable enthusiasm and active engagement during the learning process, reflecting a genuine interest in acquiring comprehensive knowledge about fistula care. The marked increase in post-test knowledge scores, as compared to pre-test

results, underscores the positive influence of the IEC package in improving patients' awareness and self-care capabilities.

These findings affirm that educational strategies such as IEC packages not only enhance patients' understanding of fistula management but also empower them to participate actively in their own treatment process. By fostering awareness and promoting correct home care practices, such interventions can minimize complications, prolong the functionality of the fistula, and improve overall treatment outcomes.

Hence, the study concludes that structured educational interventions should be integrated into routine patient care for individuals undergoing hemodialysis. Continuous patient education through IEC materials is essential for promoting self-efficacy, ensuring fistula longevity, and ultimately contributing to the overall well-being and quality of life of patients with chronic kidney disease.

Conflict of Interest

The authors certify that they are not involved in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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