

**ENHANCING INFECTION CONTROL PRACTICES IN THE DIALYSIS DAY-
CARE UNIT: A COMPREHENSIVE ASSESSMENT AT FORTIS ESCORTS
HOSPITAL, AMRITSAR**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

By

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Under the Supervision and Guidance of

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2024

26 June 2024

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Sucharita Mahajan** has completed her internship in the **Department of Medical Admin- Quality** from **26 March 2024 to 26 June 2024**.

She was found to be sincere, hardworking, dedicated and showed keen interest towards her assignment.

We wish her all the very best in her future pursuit for a prosperous career.

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled "**Enhancing Infection Control Practices in the Dialysis Day-care Unit: A Comprehensive Assessment at Fortis Escorts Hospital, Amritsar**" is the Bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Sucharita

Name of Student- Dr. Sucharita Mahajan

Date – 26/06/2024

CERTIFICATE

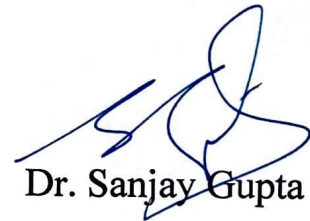
This is to certify that dissertation titled **“Enhancing Infection Control Practices in the Dialysis Day-care Unit: A Comprehensive Assessment at Fortis Escorts Hospital, Amritsar”** is a record of the research work undertaken by **Dr. Sucharita Mahajan** in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.



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ABSTRACT

An descriptive, cross- sectional study was conducted at a tertiary hospital to assess the compliance to infection control protocols and dialyzer reuse practices. Also, patient feedback was taken regarding the service delivery in the dialysis daycare department. Data was collected through direct observation for the infection control and dialyzer reuse practices for which a checklist was made prior to the commencement of study. A feedback form was also made which covered all the parameters regarding the service delivery. All of the data was assessed as per the hospital policy. MS- EXCEL was used to analyse it and present the findings in graphs and tables.

Infection control practices are a critical aspect of any healthcare system that is not only a regulatory requirement but more like an asset for healthcare organizations. Adherence to infection control protocols results in effective operations and better patient care as well as making hospitals safer.

Stringent infection control measures are among some of what makes up the image and trustworthiness of a health facility. By minimizing the risks for HAIs, a good number of facilities prioritize patient safety within their premises. It is possible therefore for medical centers to reduce hospital stays thereby lowering patients' financial costs as well as the burden on the entire health system.

The data was collected during April-May 2024. The research shows that there has been good compliance with major hygiene practices such as hand washing and equipment cleaning methods. However, several areas still need improvement such as missing hand hygiene after touching surfaces near patient's vicinity and uneven application of face mask use. Thus, regular audit should be done on this basis too.

Generally, satisfaction is still high, especially on the issues of cleanliness and staff behaviour, but the problem of operational delays must be improved in order to better the service delivery and satisfaction of patients.

ABBREVIATIONS
WHO – WORLD HEALTH ORGANISATION
HAI – HEALTHCARE ASSOCIATED INFECTIONS
HD - HEMODIALYSIS
PPE- PERSONAL PROTECTIVE EQUIPMENT
AV FISTULA- ARTERIOVENOUS FISTULA
DLC – DOUBLE LUMEN CATHETER
SOP – STANDARD OPERATING PROCEDURE
MS - MICROSOFT
IPD – IN PATIENT DEPARTMENT
ECHS - EX-SERVICEMEN CONTRIBUTORY HEALTH SCHEME
CGHS – CENTRAL GOVERNMENT HEALTH SCHEME

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CHAPTER 1: INTRODUCTION

Infection control is a cornerstone of patient safety and quality care in healthcare settings and a critical aspect of healthcare management, especially in specialized settings like dialysis units. Hemodialysis (HD) patients are particularly susceptible to a range of infections, such as bloodstream infections and localized infections at the vascular access sites like arteriovenous fistula (AV Fistula), double lumen catheter (DLC), and permanent catheter. Infections can be transmitted through contaminated water, equipment, environmental surfaces in the treatment area, or from patients with conditions that pose a risk to others in the dialysis unit. The high risk of healthcare-associated infections (HAIs) in HD patients stems from their immunocompromised status, proximity to other patients while receiving treatment, regular contacts with medical personnel who switch between patients and dialysing machine, and lapses in the adherence to recommended practices, such as hand washing and wearing personal protective equipment (PPE).

Given the vulnerability of dialysis patients to infections due to their compromised immune systems and the invasive nature of dialysis treatments, stringent infection control practices are paramount. It not only leads to increased morbidity and mortality but also contribute to prolonged hospital stays and higher healthcare costs.

The WHO has established the "5 Moments for Hand Hygiene" as a crucial guideline for preventing healthcare-associated infections (HAIs). These include : before touching a patient, before performing clean/aseptic procedures, after body fluid exposure/risk, after touching a patient, and after touching patient surroundings. This becomes of particular importance in a dialysis unit, where the risk of the transmission of infectious agents by simple contact is already high due to the frequent contact with patients and the utilization of shared equipment.

Your 5 Moments for Hand Hygiene

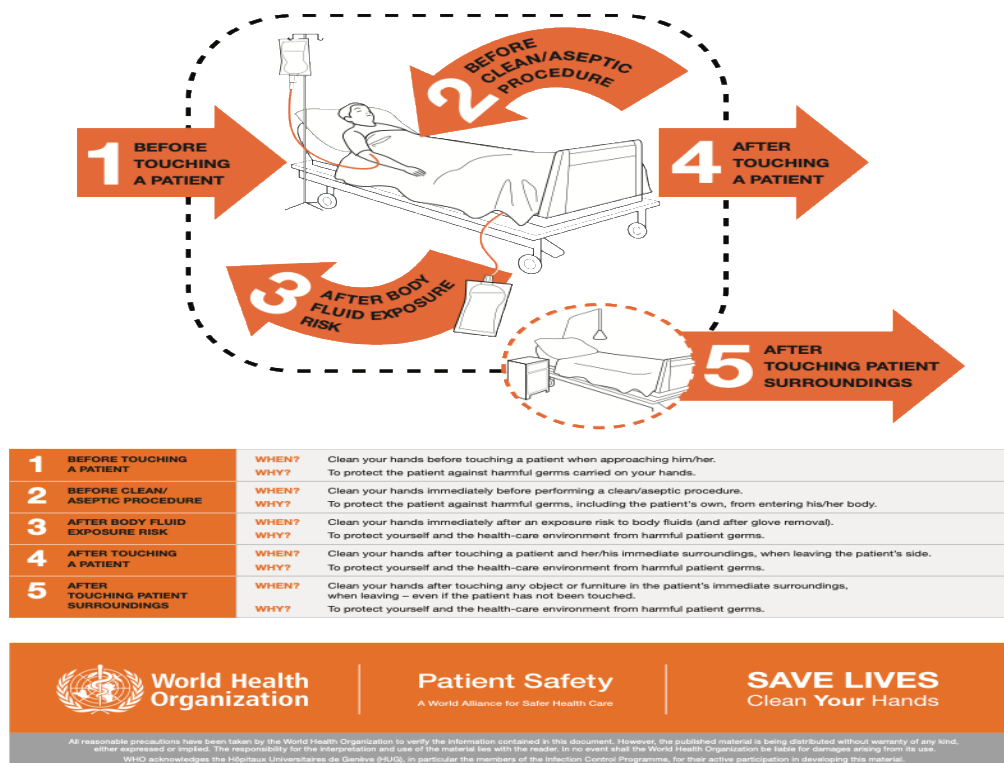


figure 1: WHO'S 5 hand hygiene moments

Bed cleanliness is another basic measure of infection control in a dialysis unit. A bed used for dialysis needs to be cleaned and disinfected after each session to eliminate any possible pathogens. This minimizes the risk of contamination by making sure the treatment areas, particularly the beds and surfaces surrounding them, are properly disinfected after each patient's session. In other words, this is rather significant in preventing cross-contamination and therefore providing a safe environment for the next patients.

Another very common practice seen in a dialysis unit is the reuse of dialyzers. This cost-effective practice is cleaning, disinfecting, and then reusing dialyzers for the same patient over several sessions. When done correctly, reuse of dialyzers is an intensive exercise of cleaning and testing to retain functionality and sterility so as to guarantee its safety for the patient.

Although this practice can immensely reduce the operational costs, it adds on to a different set of challenges related to infection control. Proper procedures need to be followed so that disinfection of the dialysers is done appropriately, and it is safe for re-use. This process needs strict adherence to the sterilization process to avoid infections.

However, one of the indicators of more general healthcare quality beyond technical measures is patient feedback on the quality of service in dialysis units. Patient experience and satisfaction levels can indicate a wide range of aspects, including perceived care quality, cleanliness, and infection control practices; hence, they should be rigorously surveyed. High patient satisfaction has often been related to better adherence to treatment, good health outcome, and general overview of the health institution.

It has several key areas like perceived Quality of Care, patients' perception of cleanliness; dialysis unit, waiting areas, treatment rooms, and equipment are very important and effective communication between health-care providers and patients is very essential. Patients appreciate clear explanations about treatment and any possible risks associated with certain procedures such as dialyzer reuse.

The gathering and analysis of patient feedback regarding infection control practices identify strengths and points of improvement within health care facilities, as well as the quality of overall services delivered. This is critical information in the design of relevant interventions for improving patient experience and outcomes.

This study shall, therefore, critically examine the infection control practices of the hospital dialysis unit with respect to observing WHO's hand hygiene guidelines, efficacy of bed carbolization, and safety of dialyzer reprocessing methods. Second, the study will review patients' opinion of the service quality in the dialysis department. These findings should be used to enhance infection control measures, promoting overall satisfaction among patients toward a better outcome for them and a safer healthcare environment by pointing out the strengths and areas of improvement in the current protocols.

SCOPE OF THE STUDY

This study was meant to evaluate the effectiveness of infection control practices within the dialysis department with the view of optimizing patient safety and satisfaction. The critical areas for evaluation were compliance with the WHO's 5 Moments for Hand Hygiene, dialyzer reuse practices, and general patient satisfaction. This research aimed to identify certain lapses in current practices and recommend strategies necessary for improvements. A checklist was used in observing and evaluating hand hygiene practices of healthcare professionals at key consecutive points in patient care. Patient satisfaction questionnaires were administered to the patients regarding the care received, in particular their perception regarding being clean and safe during their dialysis sessions. The results from this study should be used to underpin the optimization of infection control practices within the dialysis department by targeted interventions that have an enhanced implementation of already developed procedures, hereby enhancing patient safety and experience.

CHAPTER 1.1: OBJECTIVES OF THE STUDY:

- To assess the infection control measures to minimize the transmission of infections among the patients and healthcare workers in the dialysis department.
- To evaluate the compliance to established SOPs for the reuse of dialyzer in the dialysis department
- To assess the level of satisfaction among patients receiving care in the dialysis department and identify areas for improvement in service delivery and patient experience.

CHAPTER 2: REVIEW OF LITERATURE

S.No.	AUTHOR	YEAR	TITLE	FINDINGS
1.	Simone Scheithauer, Frank Eitner, Jennifer Mankartz et al	2011	Improving hand hygiene compliance rates in the haemodialysis setting: more than just more hand rubs	An interventional observational study in a prospective setting was conducted in three phases at the haemodialysis unit, RWTH Aachen University Hospital, with the aim of improving hand hygiene among the staff. The study involved 22 dialysis nurses and 3 doctors. Hand hygiene behaviour was observed using a modified WHO observation record. Two intervention phases were implemented to optimize standard operating procedures (SOPs) for dialysis procedures. The study found that optimizing SOPs significantly improved hand hygiene compliance. Hand hygiene compliance before aseptic tasks and patient contact saw the most significant improvements. The study highlights the importance of a multifaceted approach, including ongoing audits and feedback, to sustain long-term compliance. In other words, the researchers studied how improving procedures for connecting and disconnecting patients from dialysis machines could improve hand hygiene among nurses and doctors. They found that doing so led to a significant increase in handwashing, especially before touching patients and performing sterile tasks. The study suggests that improving procedures and providing feedback are

				important for long-term improvements in hand hygiene.
2.	Suetonia C Palmer, Giorgia de Berardis, Jonathan C Craig et al	2014	Patient satisfaction with in-centre haemodialysis care: an international survey	The research article examines patient experiences with various aspects of haemodialysis care across multiple countries. Study included a significant number of adult patients receiving treatment in haemodialysis clinics within a single provider in Europe and South America. The main outcome measured was patient satisfaction with overall care, while secondary outcomes focused on experiences with specific aspects of dialysis care. A substantial portion of patients responded to the questionnaire. However, less than half of the respondents rated their overall care as excellent. The aspects of care that received the highest ratings were staff attention to dialysis vascular access, the caring nature of nurses, staff responsiveness to pain or discomfort, the overall caring and helpfulness of dialysis staff, and the ease of reaching dialysis staff by telephone. Conversely, the lowest-rated aspects included the information provided when choosing a dialysis modality, the ease of seeing a social worker, the information given about dialysis, the accuracy of information from nephrologists regarding prognosis or kidney transplantation, and the accuracy of nephrologists' instructions.

3.	Ayman Karkar	2018	Infection control guidelines in hemodialysis facilities	Maintaining hand hygiene is paramount to prevent infections in hemodialysis units. Studies suggest that roughly 30 hand hygiene actions are necessary per patient during each dialysis session. However, several factors can impede this practice, including insufficient staffing, frequent staff turnover, inadequate training for staff and patients, a lack of supplies, and poorly designed dialysis units. Good hand hygiene practices and proper care of their vascular access should therefore be educated to the staff and patients. Coupled with these, regular awareness campaigns are further called for, with active participation by patients in the processes of their care.
4.	Mahim Mittal ¹ , Anoop K. Singh, Sudheer Yadav ¹ , Shilpa U. V.	2018	Safety and Efficacy of Dialyzer Reuse by Manual Reprocessing : An Observational Study	The study was conducted on 50 patients at Nehru Hospital, B.R.D. Medical College, Gorakhpur, India. Regarding the reprocessing agent administered to the patients, they were divided into two groups: either formaldehyde or peracetic acid. Both groups were dialyzed up to four sessions with the same dialyzer. The effectiveness of the dialyzer was measured by the urea reduction ratio in both groups. URR is a measure of the efficiency of dialysis in removing urea from the blood. The study found a statistically significant decrease in the URR after each successive dialyzer reuse by any reprocessing solution, proving a

				loss in effectiveness of the dialyzers to filter blood with repeated use. The URR was significantly better in patients with AV fistulas as compared to patients with other forms of access. In the serum albumin levels, there was a significant fall after the fourth dialysis, thus indicating decrease efficacy of the dialyzer because of blockage of membrane pores by albumin with reuse. F8 dialyzers with larger membrane area performed better as compared to F6.
5.	Isabella Carvalho Ribeiro, Noemí Angelica Vieira Roza et al	2019	Clinical and microbiological effects of dialyzers reuse in hemodialysis patients	A clinical crossover study was conducted to evaluate the safety and efficacy of reprocessing of dialyzers in hemodialysis patients. Ten patients underwent treatment with both single-use and reused dialyzers. Clinical data, lab results, and microbiological data were collected at various points during the study. The researchers found no significant differences in inflammatory markers (C-reactive protein) or endotoxin levels between patients using single-use and reused dialyzers. Additionally, bacterial cultures and endotoxin tests from the dialyzer inner chamber were negative. No significant clinical changes were observed in the patients. These findings suggest that reusing dialyzers up to 12 times might be safe from a clinical, microbiological, and inflammatory perspective, and may maintain adequate performance until the 12th reuse.

6.	Priscila Ferreira da Silva, Melanie D. Talson, et al	2021	Patient, Caregiver, and Provider Perspectives on Improving Information Delivery in Hemodialysis : A Qualitative Study	A multicentre qualitative study explored the challenges and potential improvements in information transfer for chronic disease management, focusing on hemodialysis care. Researchers conducted focus groups and interviews with 82 patients/caregivers and 31 healthcare providers at five Canadian hemodialysis centres. The study highlighted the importance of empowering patients through improved information sharing and the need for patient-centered approaches in managing chronic diseases
7.	Renoirte-López Karina, Abundis-Mora Gabriela Jiménez-Cornejo Mónica et al	2021	Automated Dialyzer's Reuse: A Safe and Cost-Effective Strategy	A multicentre, cross-sectional study was conducted involving 16 haemodialysis clinics. A study regarding the prevalence of anemia in patients with chronic renal failure on hemodialysis was done in Mexico. In this case-control study at 16 hemodialysis clinics in Mexico City, data obtained from more than 2,500 medical records were analyzed. Kt/V is a measure of dialysis adequacy. From these results, it might be concluded that anemia could be a common problem among Mexican hemodialysis patients. This further supports the need to provide adequate monitoring for proper dialysis. This study recorded demographic and dialysis prescription parameters with no significant difference in laboratory values or mortality for a comparison between a reuse group and a single-use group. Haemoglobin levels were higher in the

				reuse group, with lower weekly iron doses. Automated dialyzer reuse is safe and cost-effective in Mexico, with no significant clinical differences compared to single use
8.	Dr. K.V. Krishna Reddy, Dr. Syed Salman Ahmed et al	2022	A study to assess the infection control practices as a part of patient safety in a dialysis unit of a tertiary care teaching hospital	A study assessed adherence to infection control protocols in a hospital hemodialysis unit. Researchers observed staff practices related to hand hygiene, personal protective equipment (PPE), and waste disposal. Staff adhered well to some protocols, like using PPE and disposing of waste correctly. However, hand hygiene was a concern, with only 22% of staff washing hands before seeing patients. This highlights the importance of ongoing monitoring and improvement efforts to ensure consistent compliance with all safety protocols. There is variability in practices like handwashing before patient contact and consistent use of face masks and aprons.

9.	Noha H. Helmy, Amal Hussein, et al	2022	Hemodialysis patients' satisfaction with dialysis care: a cross-sectional prospective study conducted in a non-profitable care facility, Minia Egypt	A study in Egypt assessed patient satisfaction with hemodialysis care. Total 100 patients participated in the survey. Overall, patients were generally satisfied with their care, especially with nursing care. However, satisfaction with nutritional care and physician interaction was lower. Interestingly, despite reporting a lack of nephrologists, most patients were satisfied with the nurse-to-patient ratio. These findings suggest areas for improvement, such as communication with physicians and integration of nutritional counselling into hemodialysis care.
10.	M.G.D. Harun, M.M.U. Anwar, S.A. Sumon, et al	2023	Hand Hygiene Compliance and Associated Factors Among Healthcare Workers in Selected Tertiary-Care Hospitals in Bangladesh	A study in Bangladesh investigated hand hygiene practices in hemodialysis units across 10 hospitals. Total 14,668 HH opportunities were observed. The overall compliance rate was concerning, with only a quarter of staff (25.3%) following proper hand hygiene procedures. Nurses were the most compliant group, followed by doctors and cleaning staff. Interestingly, hand hygiene was most frequent after contact with patients or bodily fluids, but alarmingly low before touching patients. Public hospitals and surgical/medicine departments showed slightly better adherence compared to private hospitals and other departments. The study suggests a need to address challenges like limited supplies, skin

				irritation, workload, and inadequate facilities to improve hand hygiene compliance and reduce the risk of infections in hemodialysis units
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CHAPTER 3: METHODOLOGY

This Chapter provides the readers with a detailed explanation of how the data was collected and analyzed. It allows the readers to understand the research design, the population studied, the sampling methods used, and the data collection and analysis techniques employed.

3.1 RESEARCH QUESTION

What is the compliance to existing infection control practices and level of satisfaction among patients to the services in dialysis department at the Fortis Escorts Hospital, Amritsar and how can they be improved to minimize the risk of infection transmission among patients, healthcare workers

3.2 RESEARCH DESIGN

It involves the overall strategy applied and plan of action used to address the research question and objectives of the study.

3.2.1 STUDY SETTING

The study was conducted in the dialysis department at Fortis Escorts Hospital, Amritsar, a multi-specialty hospital with 173 beds and approximately 40 specialties. The dialysis daycare unit comprises a total of 11 beds, including 2 isolation beds designated for patients with HIV, Hepatitis. The staffing level in dialysis department typically included a multidisciplinary team of healthcare professionals which included consultant nephrologists (2), senior resident (1), medical officer (1), technicians (7), nurses (3) and head in charge nurse(1). The study was conducted under the guidance of Head, Quality department of the hospital and spanned from April to May, 2024.

3.2.2 RESEARCH APPROACHES

The study undertaken was a descriptive, cross-sectional study aiming to provide a snapshot of the current state of infection control measures and dialyzer reuse practices. The sample size of study is 60 patients who have undergone hemodialysis over and over again

during the month of April and May,2024. Total 374 opportunities have been observed for the infection control and hand hygiene measures.

3.2.3 DATA COLLECTION TOOLS AND TECHNIQUES -

The study involved a mixed method approach combining both qualitative and quantitative research methods to comprehensively assess the infection control measures and dialyzer reuse practice. Two separate checklists were developed for the infection control and dialyzer reprocessing based on the SOPs of the hospital and a patient feedback form was developed to evaluate the patient satisfaction towards the services in the dialysis department. The data was collected through open-ended and close-ended questions with a rating method (rating scale: 0 being worst and 5 being best) to know the patient satisfaction rate. Observational study was conducted to assess the current infection control measures including WHO'S 5 moments of hand hygiene, disinfection protocols and dialyzer reuse practices.

3.2.4 INCLUSION CRITERIA -

- Patients of all age and genders will be included.
- Patients undergoing any type of dialysis treatment including intermittent hemodialysis (IHD), Hemodiafiltration (HDF), Slow efficiency dialysis (SLED) will be eligible.
- All healthcare workers who are directly involved in providing dialysis care within the department. This includes consulting nephrologists, nurses and technicians.

3.2.5 EXCLUSION CRITERIA -

- The IPD patients
- All the patients who have been tested positive for hepatitis B, hepatitis C and HIV and are in isolation room for the dialysis in the dialysis daycare.
- Patients who are put on clinical research will be excluded

ETHICAL CONSIDERATIONS

All data acquired throughout the study were kept private and confidential. Any information acquired from participants, such as personal details or comments, was kept confidential and anonymous. Measures to ensure that the identity of the participants remained secured throughout the study. The investigation was carried out without any predetermined or biased influences that could skew the results in favour of a specific outcome

CHAPTER 4 : RESULTS

This section provides the reader with a concise and clear summary of the study with the analysis of the data collected, the interpretation of the data to answer the research question.

DEMOGRAPHIC DATA

The data collected was based on demographic details of the patients. The data was collected for the age group of 29- 81years of age where 128 were females and 246 were male patients. Most of the patients lie in the age group of 45-64 years of age.

Gender	Percentage of patients
Males	66%
Females	34%

Table1: Percentage of male and female

Age group	Percentage of patients
24-44	10%
45-64	60%
65 and above	30%

Table 2 : Percentage of age group

TOTAL OPPORTUNITIES OF INFECTION CONTROL OBSERVED

A total of 374 opportunities of infection control were observed during the period of month April,2024 to May, 2024. Out of these 267 were performed by the technicians, 69 were performed by nurses and 38 was done by the nurse in charge of the dialysis department.

PERSON PERFORMING THE TASK	NO. OF OPPORTUNITIES
TECHNICIANS	267
NURSES	69
NURSE IN CHARGE	38

Table 3 : No. of opportunities performed by various staff

COMPLIANCE TO WHO'S 5 HAND HYGIENE MOMENTS

The data on compliance with WHO's 5 Moments for Hand Hygiene in a dialysis department reveals varied adherence levels. Full compliance is highest before touching a patient and before clean/aseptic procedures (74.87%), moderate after body fluid exposure (65.78%), and notably low after touching patient surroundings (33.42%). After touching a patient, compliance is 56.15%.

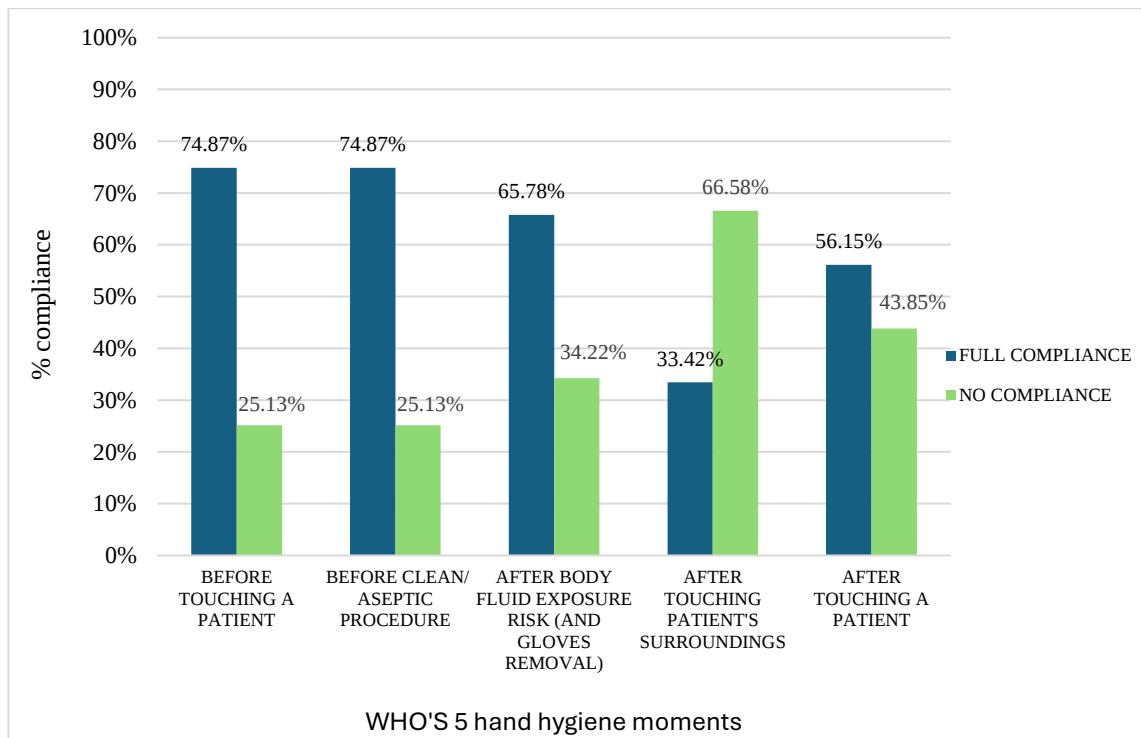


Figure 2: Compliance to WHO's 5 hand hygiene moments

COMPLIANCE TO DISINFECTING VASCULAR SITE ACCESS

100% compliance was observed in all the cases to disinfect the vascular site access (AV Fistula, DLC, permanent catheter) before initiating the dialysis session.

	Full compliance	No compliance
Patient vascular thoroughly washed with antiseptic solution before dialysis	100%	0%

Table 4: Percentage compliance to disinfecting vascular site

COMPLIANCE TO PERSONAL PROTECTIVE EQUIPMENTS

The pie chart illustrates the compliance levels of healthcare workers to face mask in a dialysis department. The chart shows that 66.58% fully comply, 24.06% of the staff demonstrate partial compliance, indicating that they follow the guidelines to some extent

but may not consistently adhere to all the required steps. Finally, a smaller portion, 9.36%, shows no compliance, highlighting a critical area for improvement.

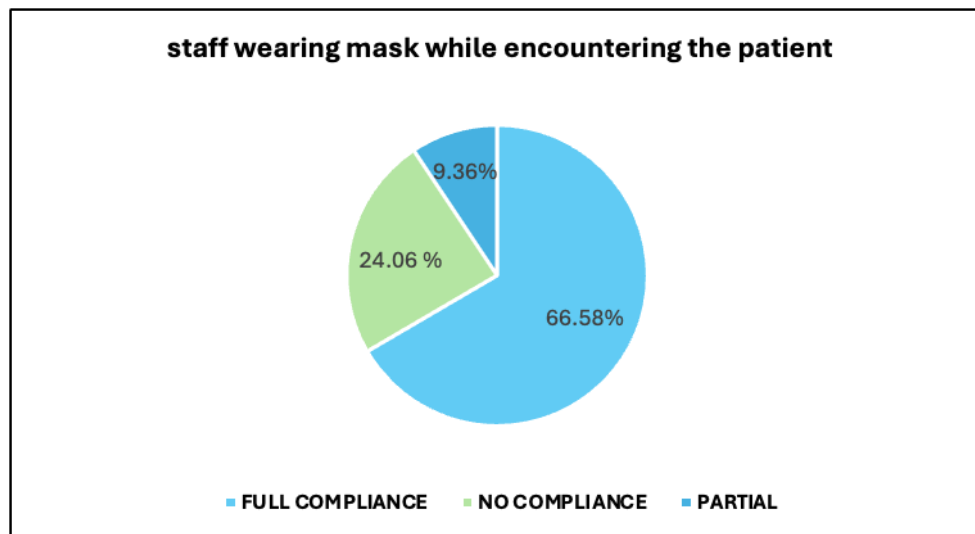


Figure 3 : Percentage compliance to face mask while encountering patient

The pie chart illustrates the compliance levels of healthcare workers to hand gloves in a dialysis department. The chart shows that 95% fully comply, whereas a smaller portion, 5%, shows no compliance to wearing of hand gloves while handling the patients.

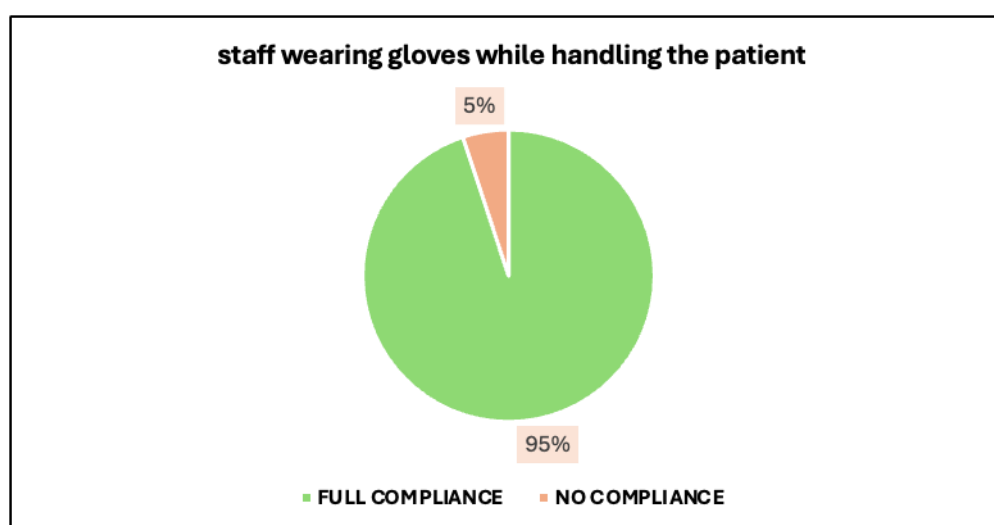


Figure 4 : Percentage compliance to wearing gloves while handling patients

REASONS FOR NOT WEARING GLOVES BEFORE ASEPTIC PROCEDURES

Out of 374 opportunities observed, in only 19 cases the healthcare workers were not wearing sterile gloves while inserting the needle (aseptic procedure). In most cases, difficulty in finding vein was the reason to not wear gloves, in 7 cases the patients switched to AV fistula for vascular access (earlier mode was either DLC or permanent catheter) hence, initially it posed problem to find vein. 3 cases were reported in which patients had swelling hence to have better access to veins for inserting needle, the healthcare workers opted not to wear gloves.

REASONS	NO. OF OPPORTUNITIES
NEW FISTULA	7
SWELLING	3
DIFFICULTY IN FINDING VEIN	9

Table 5 : No. of opportunities where no compliance to hand gloves was recorded

FACILITY CLEANING

Out of total 374 observations, the carbolization of bed and rinsing of dialysing machine was fully compliant in all the cases, therefore showing a 100% compliance.

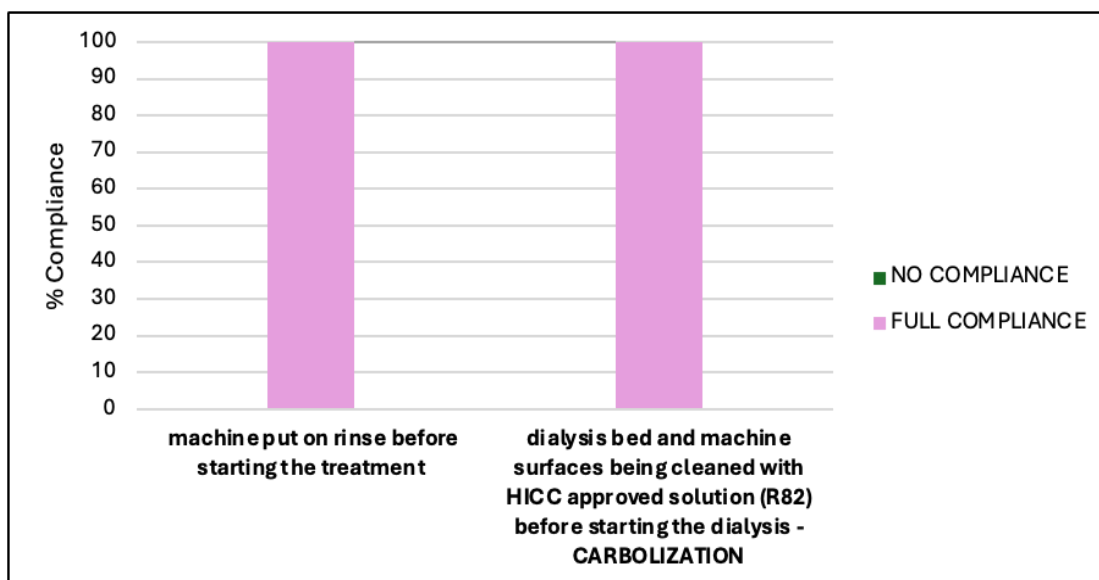


Figure 5: Percentage compliance to machine rinsing and carbolization

NO OF DIALYSER REUSE

Out of 374 opportunities observed, 238 patients used single use dialyzer; in 41 cases dialyzer was used for only once, in 36 cases was used up to 2nd use, in 35 cases was used up to 3rd use, in 19 cases was used up to 4th use and in 4 cases was used up to 5th use after getting passed on dialyzer reprocessor.

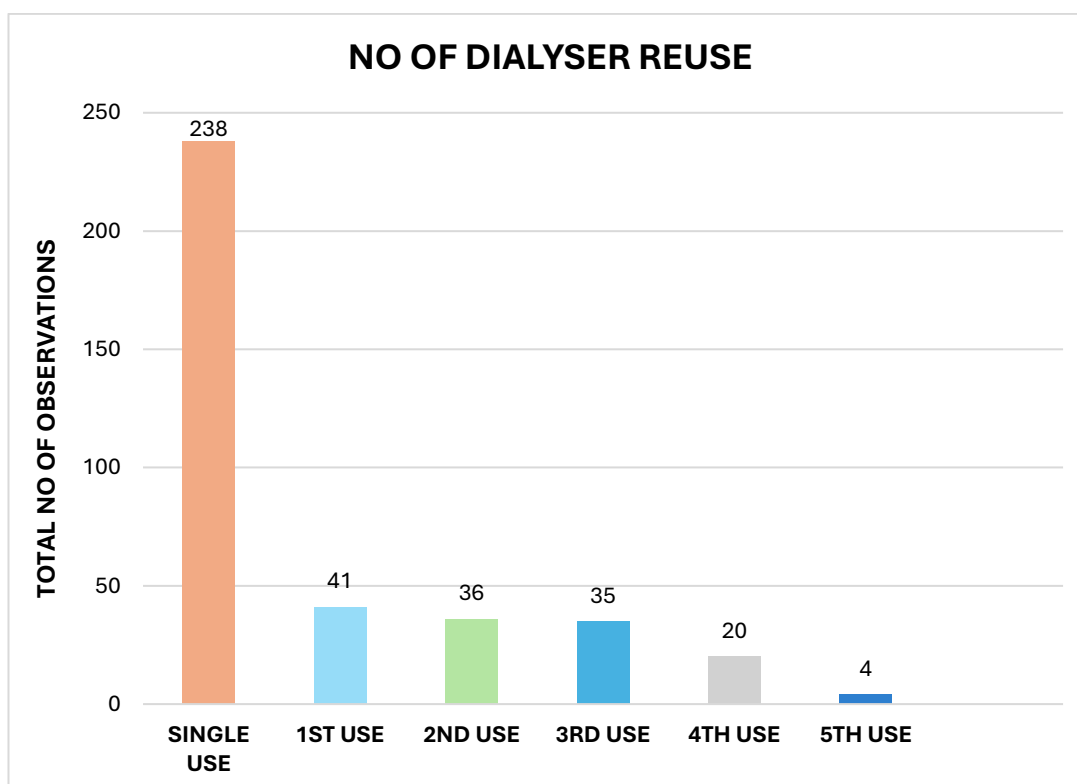


Figure 6: No. of dialyzer reuse

COMPLIANCE TO DIALYSER REUSE SOPs

Adherence to SOPs for dialyzer reuse is consistently 100% across all parameters.

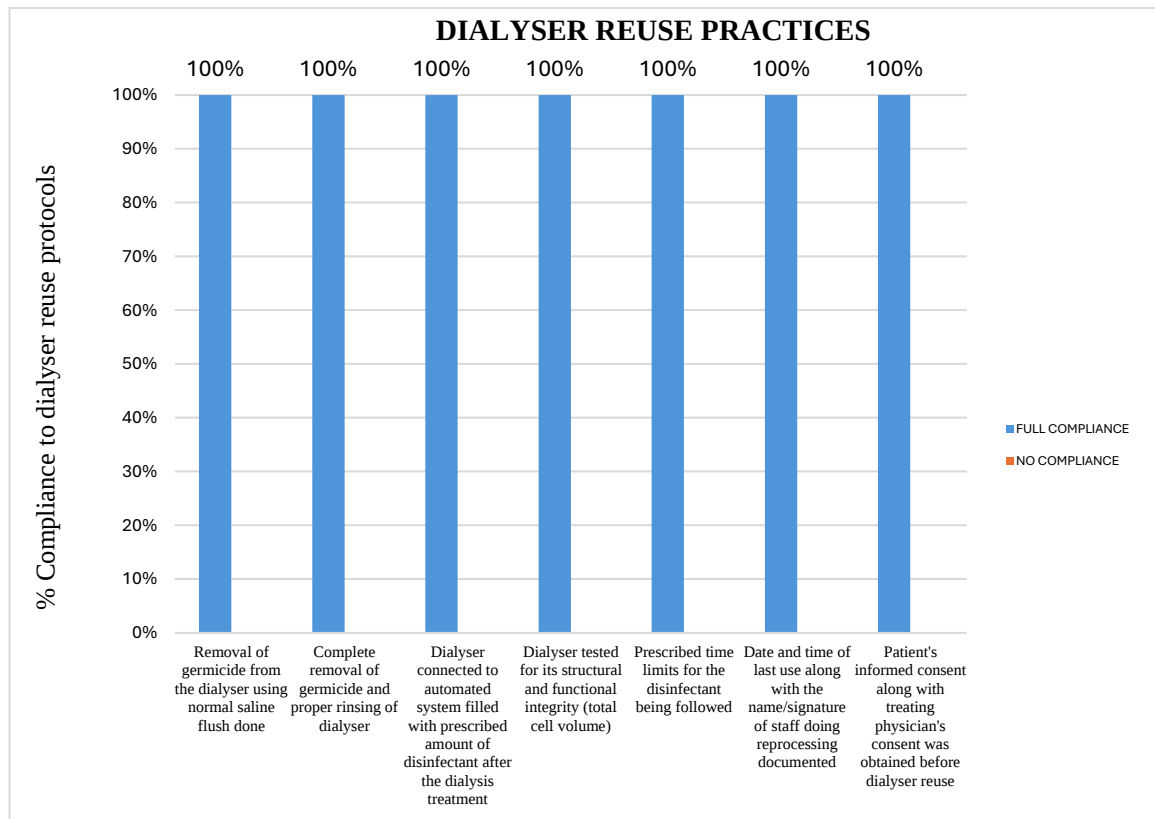


Figure 7: Percentage compliance to dialyzer reuse SOP's

COMPLIANCE TO PPE DURING DIALYZER REPROCESSING

The pie chart illustrates the compliance levels of healthcare workers to personal protective equipment (hand gloves and face mask) during the reprocessing of dialyzer in case of multiple uses. The chart shows that 52% fully comply (both face masks and hand gloves), 48% partially comply (only hand gloves but no face mask).

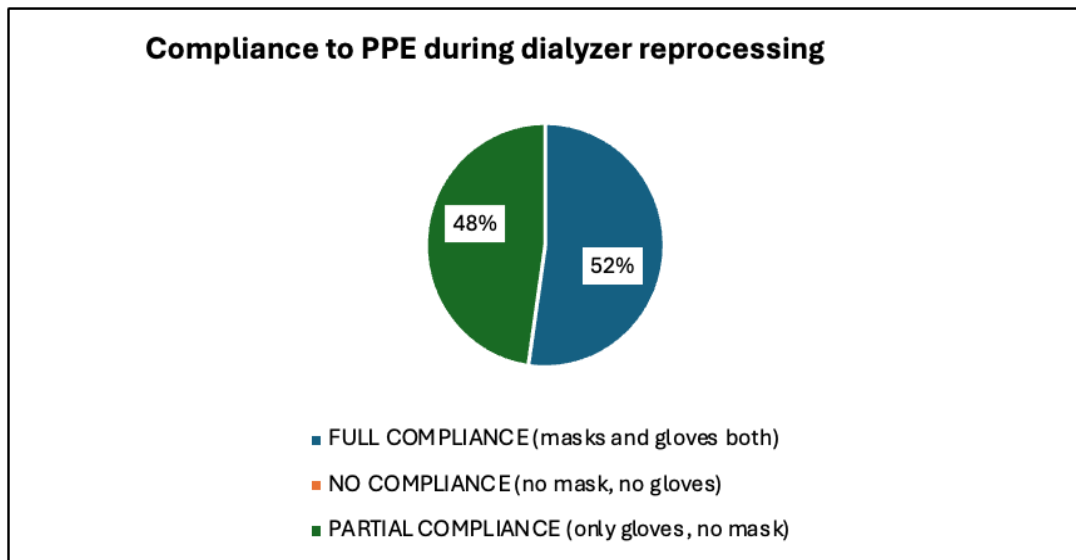


Figure 8: Percentage compliance to PPE while dialyzer reprocessing

PATIENT FEEDBACK FOR THE DIALYSIS

The bar graph shows the average rating (on a scale of 5) of patient regarding various parameters of the services in the dialysis department. The highest satisfaction is seen in the billing process followed by facility cleanliness and maintenance, staff behaviour and the check in process for the dialysis. The average rating of the overall experience of patients in the dialysis department is 4.6 out of 5.

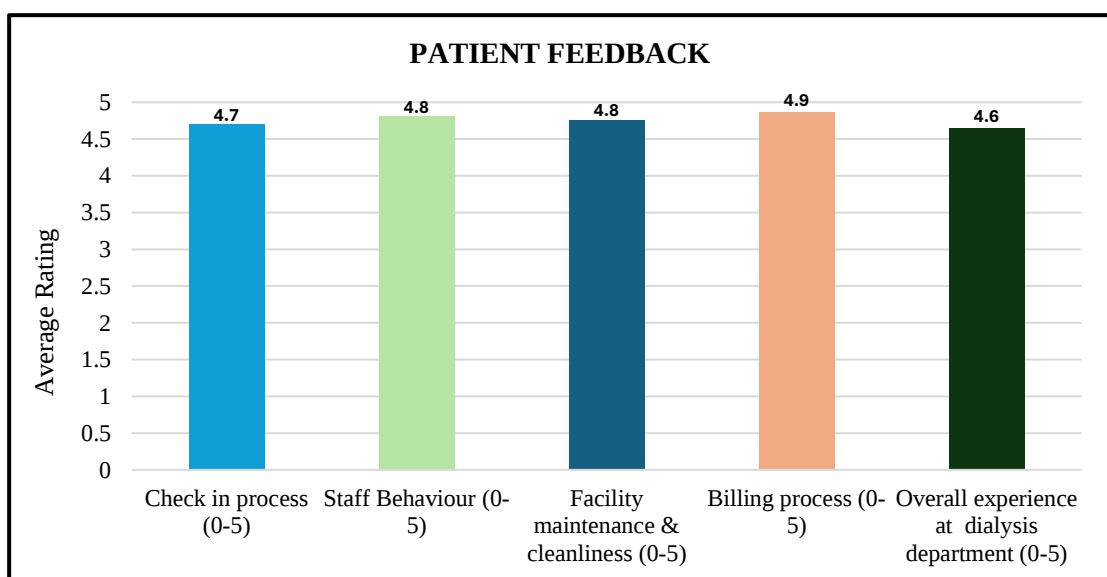


Figure 9: Average rating given by patients

PATIENT SATISFACTION WITH CHECK IN PROCESS DURING DIALYSIS

100% satisfaction was seen among the patients with the appointment scheduling and visits of doctor/staff. However, approximately (87%) of the patients got the bed on time whereas (13%) had to wait for longer to get the bed

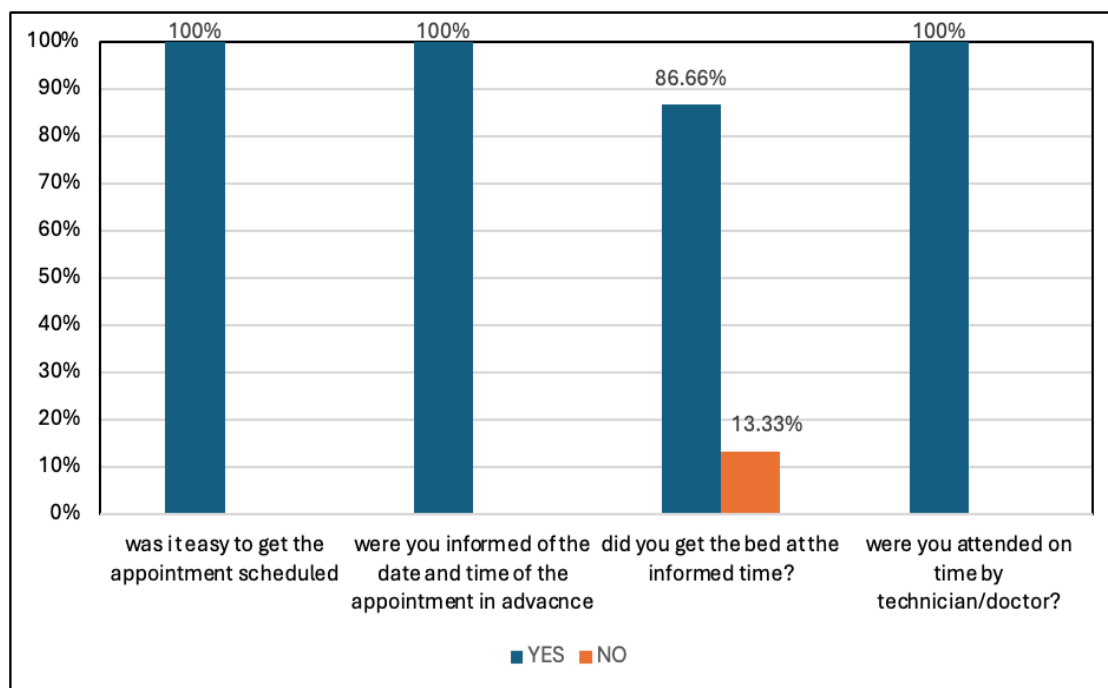


Figure 10: Patient satisfaction with check in process during dialysis

EXPLANATION OF CONSENT FORM TO PATIENTS

Almost 82% of the patients reported that the consent form was explained to them before the commencement of the dialysis whereas 18% reported of consent not being explained. Majority amongst these patients are old patients and are on regular dialysis.

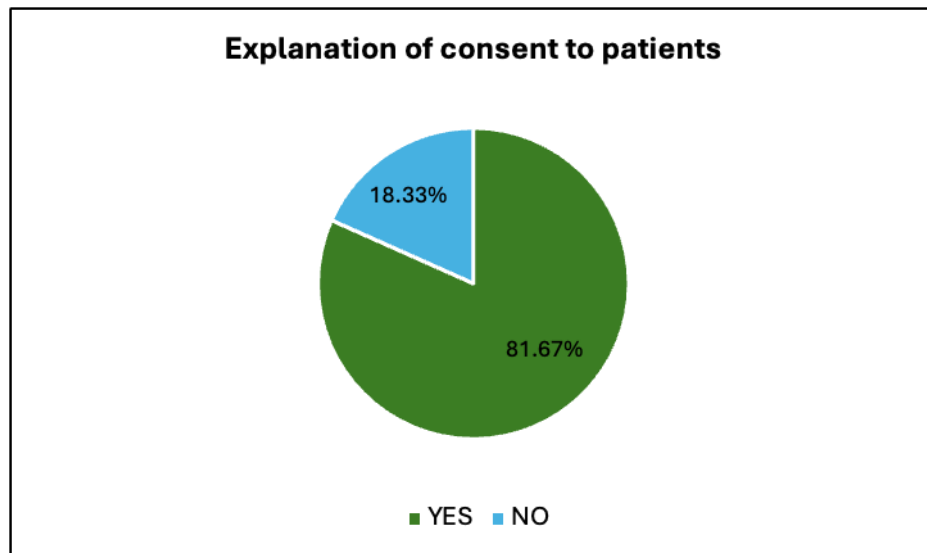


Figure 11: Percentage of patients reporting about the explanation of consent form

COMPLAINTS REPORTED BY PATIENTS

A total of 20 complaints were reported out of the sample size of 60 patients. The patients in dialysis unit presented with varied problems when asked about the feedback of facility. The maximum number of complaints(40%) constituted of longer waiting times to get a bed for their scheduled dialysis session and only (5%) of the total complaints accounted for not getting the preferred slots for the dialysis. Thirty percent complaints constituted for longer queue while the billing while 10% comprised of lack of enough visit by staff during the four-hour dialysis process. Only 15% complaints were regarding the hygiene and cleanliness in dialysis daycare unit.

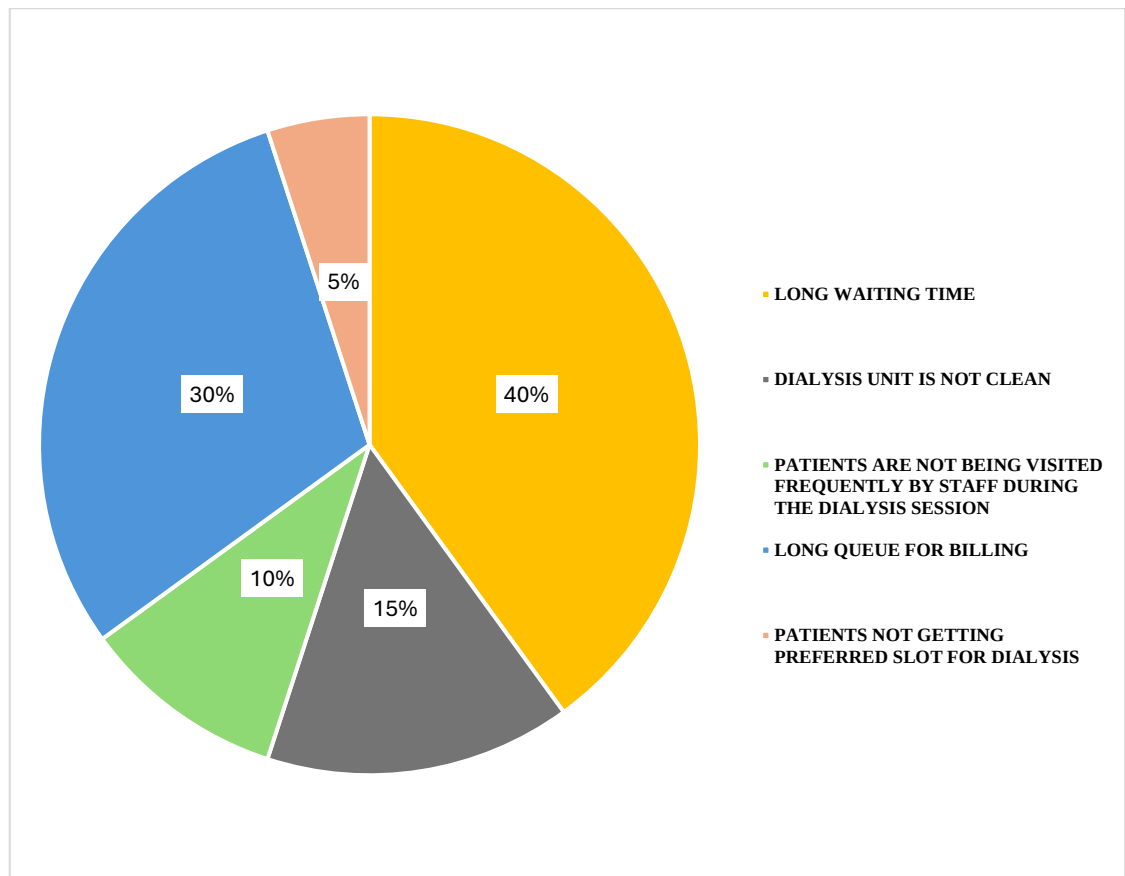


Figure 12: Percentage of complaints reported by the patients

CHAPTER 5: DISCUSSION

In the current study it has been found that gender distribution shows a higher number of male patients (246) compared to female patients (128), which could reflect the population demographics of the dialysis unit or broader trends in kidney disease prevalence. The majority of these procedures were performed by technicians (267), followed by nurses (69), and the nurse in charge (38). This distribution underscores the pivotal role of technicians in maintaining infection control standards, necessitating continuous training and monitoring to ensure adherence to protocols.

Adherence to WHO's 5 Moments for Hand Hygiene varied significantly. Full compliance was highest before patient contact and before aseptic procedures (74.87%), moderate after exposure to body fluids (65.78%). This suggests that healthcare workers are particularly diligent about hand hygiene when preparing to interact directly with patients or undertake procedures that require sterile conditions but significantly low after touching patient surroundings (33.42%). This indicates a significant area of concern, as failing to clean hands after touching potentially contaminated surfaces can lead to the spread of infections. Compliance after touching a patient was 56.15% suggesting that while there is awareness of the importance of hand hygiene after patient contact, adherence is not consistent across all staff.

The compliance levels of healthcare workers to face mask in a dialysis department shows that 66.58% fully comply, 24.06% of the staff demonstrate partial compliance, meaning the mask covers the mouth but not the nose indicating that they follow the guidelines to some extent but may not consistently adhere to all the required steps. Finally, a smaller portion, 9.36%, shows no compliance, highlighting a critical area for improvement. However, 95% of healthcare workers fully comply with wearing hand gloves while handling patients, whereas a smaller portion, 5%, do not comply, with the reasons for non-compliance being documented. The fact that the reasons for non-compliance have been documented suggests that there is an understanding of the underlying issues.

The study observed a 100% compliance rate in disinfecting vascular access sites before initiating dialysis, indicating robust practices in this critical area. Carbolization of beds and rinsing of dialysis machines also showed full compliance, reflecting strong procedural adherence in maintaining equipment and environment hygiene.

The study revealed significant insights into the practices surrounding dialyzer reuse. Out of 374 observations, 238 patients utilized single-use dialyzers. This indicates that most of the patients are preferring for single use dialyzer over the multi- use. Also, it was observed that the cash patients preferred single use dialyzer whereas various patients empanelled under government schemes like CGHS and ECHS used dialyzer multiple times. Cash patients, who are paying out-of-pocket, predominantly prefer single-use dialyzers. This choice suggests that these patients are willing to incur higher costs to ensure perceived better hygiene and safety whereas patients under government schemes (CGHS, ECHS) generally use dialyzers multiple times.

However, the usage varied with some dialyzers (4 out of 374 opportunities) being reused up to five times. The conformity to Standard Operating Procedures (SOPs) for dialyzer reuse showed full compliance in all the parameters. The staff strictly followed the SOPs for dialyzer reuse and the procedures were performed correctly and consistently, ensuring high quality and safety standards. However, the compliance levels for PPE usage during dialyzer reprocessing showed mixed results. Full compliance (both face masks and hand gloves) was observed in 52% of cases, while 48% partially complied by wearing only hand gloves. This partial compliance poses a risk of contamination and highlights the need for reinforcing the importance of comprehensive PPE use to all staff members.

Patient satisfaction was generally high, with an average overall experience rating of 4.6 out of 5. Satisfaction was particularly high regarding the facility cleanliness, staff behaviour. These high ratings suggest that the healthcare facility excels in providing a positive patient experience. These aspects are not only indicators of quality care but also contribute to patient loyalty, positive word-of-mouth recommendations, and potentially higher patient outcomes through improved patient satisfaction and engagement in their own healthcare. However, the most frequent complaints related to longer waiting times for bed availability and delays during the billing process. There were also few concerns about staff visitation frequency during dialysis.

LIMITATIONS

Direct observations have certain limitations: they are laborious and lack capacity for continuous monitoring. They can possibly provide information on a small percentage of all hand hygiene chances. If staff is aware about the study, it has the potential to influence health care professionals' behaviour. We attempted to mitigate these challenges by

engaging single observer. However, some possibilities may have been overlooked. During the study period, no one from the staff received performance feedback.

CHAPTER 6 : CONCLUSION

The analysis demonstrates excellent adherence to important hygiene measures such as hand hygiene before patient contact, aseptic procedures, and stringent equipment cleaning methods. However, there are noteworthy areas for improvement, such as occasional missing of hand hygiene after touching the patient's surroundings and varied compliance with face mask use. Patient satisfaction remains high overall, particularly in terms of cleanliness and staff behaviour; nevertheless, concerns concerning operational delays and infrastructural difficulties must be addressed in order to improve service efficiency and patient experience.

To summarise, while the dialysis unit adheres to many procedures and has high patient satisfaction, targeted improvements in procedural consistency, PPE compliance, and operational efficiency could improve service quality and patient outcomes even more.

Recommendations

Visual and Verbal Reminders: Display visual reminders with signage throughout the dialysis area, continually reiterating adherence to full PPE and infection control compliance.

Behavioural Nudges: Implement behavioural nudges, which include alerts in the form of reminders that are either audible or digital in nature, to remind healthcare workers to perform hand hygiene at appropriate steps.

Run regular, unannounced audits to monitor for compliance with infection control practices and policies. Provide feedback and action plans for correcting any deficiencies identified from audit results.

Optimize ward/bed allocation: Bed management systems shall be so streamlined that the waiting area of the patients is brought down by proper slotting of patients.

Enhanced Training and Supervision: Regular training sessions for all healthcare workers, with a focus on hand hygiene, PPE usage, and dialyzer reuse protocols. Enhanced supervision and real-time monitoring can ensure better compliance.

Regular Feedback Mechanisms: Establish regular feedback mechanisms, such as electronic surveys or suggestion boxes, to continuously gather patient input and address concerns promptly.

**ANNEXURE 1 : CHECKLIST TO CHECK COMPLIANCE WITH INFECTION
CONTROL PROTOCOLS IN DIALYSIS DAYCARE**

PATIENT NAME, AGE/SEX							
Checklist for Infection Control in Dialysis Unit		DATE	DATE	DATE	DATE	DATE	DATE
	WHO'S 5 HAND HYGIENE PRACTICES						
1	Before touching a patient						
2	Before a septic procedure						
3	After a procedure or body fluid exposure						
4	After touching a patient						
5	After touching a patient's surrounding						
STANDARD PRECAUTIONS							
1	Is the staff wearing masks while encountering the patient						
2	Is the staff wearing gloves while handling the patient						
3	Is the staff thoroughly washing the vascular access site with antiseptic solution before dialysis.						
FACILITY CLEANING							
1	Dialysis bed and machine surfaces being cleaned with HICC approved solution (R 82) after each session – CARBOLIZATION DONE						
2	Dialysing machine put on rinse before starting the treatment						

**ANNEXURE 2 : CHECKLIST TO CHECK COMPLIANCE WITH DIALYZER
REUSE PROTOCOLS IN DIALYSIS DAYCARE**

PARAMETERS	DATE	DATE	DATE	DATE	DATE	DATE
PATIENT NAME, AGE/SEX						
NO OF REUSE						
Removal of germicide from the dialyser using normal saline flush done						
Complete removal of germicide and proper rinsing of dialyser						
Dialyser connected to automated system filled with prescribed amount of disinfectant after the dialysis treatment						
Dialyser tested for its structural and functional integrity (total cell volume)						
Prescribed time limits for the disinfectant being followed						
Nurse/technician wearing gloves, face mask while dialyser reprocessing						
Date and time of last use along with the name/signature of staff doing reprocessing documented						
was patient's informed consent along with treating physician's consent was obtained before dialyser reuse						

**ANNEXURE 3 : CHECKLIST TO OBTAIN FEEDBACK OF PATIENTS
REGARDING THE SATISFACTION TOWARDS THE SERVICES IN
DIALYSIS DAYCARE**

PARAMETERS	DATE	DATE	DATE	DATE	DATE	DATE
PATIENT NAME						
AGE						
SEX						
Was it easy to get the appointment scheduled						
Were you informed of the date and time of the appointment in advance						
Did you get the bed at the informed time?						
Were you attended on time by technician/doctor?						
Rate your check in process						
On a scale of 1-5 how courteous, friendly and respectful were the staff members						
Were the staff members attentive to your needs during the treatment						
Was the consent form explained to you clearly						
How clean and well maintained was the facility?(1-5)						
How seamless was the billing process (1-5)						
How would you rate your overall experience at our dialysis department (1-5)						
Complaints (if any)						

ANNEXURE 4 : INFORMED CONSENT FOR THE PATIENTS FOR HAEMODIALYSIS



FORTIS ESCORTS HOSPITAL, AMRITSAR

Patient's Name: _____
 UID: _____ IPID: _____ Age: _____
 Gender (M/F): _____ D.O.A: _____ Unit: _____

INFORMED CONSENT FOR HAEMODIALYSIS

You will be asked to sign this form each time you come for Dialysis within this month, following which a fresh form shall be initiated every month.

I, _____, ☐ (the Patient) or ☐ representative of patient
 _____, have (please tick the correct option above and below)

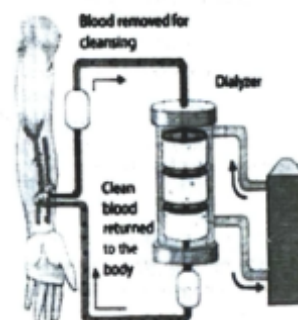
- ☐ read
- ☐ been explained this consent form in _____ (name of language) which I fully understand,

and understood the information provided about DIALYSIS in this consent form.

I am aware that Dialysis is a treatment procedure for kidney failure wherein blood is filtered through a dialysis membrane and reintroduced into the body. Per se, it is not a curative treatment.

I am now aware of the intended benefits, possible risks & complications, and available alternatives to Dialysis given below. I am also aware that results of Dialysis can vary from patient to patient; and I declare that no guarantees have been made to me regarding success of this procedure. I am aware that while majority of patients have an uneventful Haemodialysis session, some cases may sometimes develop complications.

Details of procedure: Haemodialysis (Intermittent), CRRT and SLED are similar procedures and use the same principle (membrane filtration). At the start of the session, needles are inserted into the AV fistula/graft and taped into place. In some patients, an existing vascular access port (e.g. Internal Jugular/Subclavian vein) may be used to connect the dialysis machine instead of an AV fistula/graft. Blood is slowly removed and transferred through a tube to a dialysis machine which is made up of a series of membranes. These membranes filter waste products from blood, which are passed into the dialysate fluid. The 'dirty' dialysate fluid is pumped out of the dialyser and the 'clean' blood is passed back into the body through the second needle. The needles are removed at the end of the session. A dialysis session takes around four hours to complete because blood needs to be removed, filtered and replaced slowly. In CAPD, tube is inserted into the abdominal cavity and the peritoneum is used as the filtering membrane.



Full Name of the procedure:

	Please tick as appropriate
INTERMITTENT HAEMODIALYSIS (IHD)	
CONTINUOUS RENAL REPLACEMENT THERAPY (CRRT)	
SLOW LOW EFFICIENCY DIALYSIS (SLEDD)	
CONTINUOUS AMBULATORY PERITONEAL DIALYSIS (CAPD)	

Intended benefits:

- o Provide an alternative for reduced kidney function
- o Removal of waste products from the blood
- o Removal of extra fluid from the body
- o Improving quality of life
- o _____
- o _____

Possible risks and complications:

- o Fluctuation in blood pressure (low BP i.e. Hypotension or high BP i.e. Hypertension) is a well-known side effect of Haemodialysis and may require discontinuation of the dialysis session. This can be corrected by placing the patient in a head-low position and adjusting the fluid intake.
- o Some patients may develop muscle cramps especially towards the end of the procedure. These can be overcome by massaging but may sometimes require treatment by fluids or medicines.
- o Irregularity of heart rhythm may occur in some patients and may require investigation (like blood tests) and treatment by medicines.
- o Some patients may develop fever (febrile reaction). This may be severe enough to require discontinuation of dialysis and treatment by medicines.
- o Development of symptoms like nausea, vomiting, restlessness and headache. These are usually self-limiting but may require modification of the dialysis procedure and treatment with medicines.
- o Some patients may develop an allergic reaction to the dialyser membrane, IV fluid, drugs and/or disinfectants. This may require discontinuation of the session and treatment by medicines.
- o Stroke, chest pain (angina), cardiac arrest and air embolism (presence of air bubble in the blood circulation) are uncommon complications of Haemodialysis, and may require hospitalization and/or admission to an Intensive Care Unit.
- o Some patients can develop internal clotting of blood in the dialysis circuit. Blood thinner (like Heparin) is administered to overcome this.
- o Some patients may develop breakdown of red blood cells (haemolysis). This may rarely be life threatening and require discontinuation of dialysis and treatment of symptoms.
- o Possibility of contracting infections like Hepatitis B, Hepatitis C, HIV etc. Risk of infection of abdominal cavity (peritonitis) is higher in patients on CAPD.
- o Any other/patient specific risk(s)
 - _____
 - _____

Possible alternatives :

- o Kidney transplant
- o Peritoneal dialysis
- o Any other _____

I am now aware of the common risks and complications associated with Dialysis and understand that it is not possible to list all possible risks and complications. I am also aware that I can withdraw my consent at any point of time at my own risk, by submitting the withdrawal in writing.

I also understand that sometimes a Dialysis session may need to be stopped and/or abandoned midway if the patient's clinical condition worsens. I understand that if medical exigencies demand, further or alternative treatment measures may need to be carried out. I am aware that I may require administration of blood and/or blood products during or after the Dialysis session if found necessary by the doctor. I am also aware that sometimes admission to an Intensive Care Unit and/or extension of duration of hospitalization may be required.

I am also aware that though Dialysis is carried out under instructions of and supervision of my treating doctor, the actual procedure is done by technicians and nursing staff and that my doctor may not be physically present at my bedside during entire duration and for each Dialysis session.

I have been explained about the use of Haemodialyser for each dialysis session. I have understood that while it is ideal to use a new Haemodialyser for each session the practice of reusing a Haemodialyser (specifically for the individual) is acceptable to make the process less expensive. I have also been explained that appropriate cleaning and disinfection of Haemodialyser is done before each reuse. I have also understood that reuse of Haemodialyser may be associated with chances of further complications like fall in BP and reaction to disinfectants used for cleaning.

I agree to the observing, photography (still/video) and televising of the procedure (including appropriate portions of my body) for academic/medical/medicolegal purposes, provided my identity is not revealed by such acts. I also agree to my clinical details being shared for scientific publications provided my identity is not disclosed.

I declare that I have received complete information and fully understood the same, that I have been given an opportunity to ask questions relating to my ailment, the Dialysis procedure being performed, its risks, alternatives, potential complications and expected benefits and recovery, and that all my questions have been answered to my satisfaction. I further declare that all fields requiring insertion or completion were filled in at the time of my signing this form.

By signing this form, I give my full, free, voluntary consent without any reservation to Dr. _____ (name of treating doctor) for performing _____ Dialysis (mention technique of Dialysis – IHD, CRT, SLEDD, CAPD) on myself or my patient _____ (name _____ of patient), being fully aware of the nature, potential risks and complications, intended benefits and possible alternatives. ☐ ☐

Signed on ____/____/____ at ____ AM/PM

	Signature / Thumb Impression	Name
Patient		
Surrogate/Guardian (if applicable)		(Write name & relationship with patient)
Reason for surrogate consent	Patient is unable to give consent because:	
Witness		
Interpreter (if applicable)		

#only if Patient is a minor or unable to give consent

I, the undersigned doctor, have explained the nature, potential risks and complications, expected benefits, expected course, and possible alternatives of Dialysis, to the patient/patient representative. I am confident that he / she has understood the information described in this document.

Consent obtained by*

Dr. _____ Designation & Dept. _____ Signature: _____

*(being person performing the procedure or member of his /her team)

Patient Name
IPID/UHID No.:

INTERMITTENT HAEMODIALYSIS CONSENT FOR THE MONTH OF _____

Date & Time	Obtained by (Name & Signature of Doctor/Technician)	Signature of Patient or Surrogate	Name of Surrogate (if applicable)	Relationship with Patient (if applicable)

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