CLINICAL AUDIT OF DIALYSIS UNIT IN ALLIED AND DHQ HOSPITAL, DISTRICT FAISALABAD, PAKISTAN.

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SUPERVISOR CERTIFICATE

It is certified that this report titled "Clinical Audit of Dialysis Unit in the Allied and DHQ Hospitals, District Faisalabad, Pakistan"submitted by the students of 4th year MBBS to the Department of Community Medicine, Faisalabad Medical University, (PMC) Faisalabad is their original work. They carried out this research under my supervision. It is certified further, that to the best of my knowledge, the work reported herein does not form part of any other report.

Signature of supervisor: _____

Date of Approval: _____

DEDICATION

To

Allah Almighty

the most Merciful and the most Benevolent,

Holy Prophet (P.B.U.H)

the source of blessing for whole mankind

And

To all the humans

who are in pursuit of a healthy living.

ACKNOWLEDGMENT

First and foremost, after **Allah Almighty**, we are thankful to our supervisor **Dr**. **Muhammad Hamid** for his continuous valuable contribution and guidance without which it was not possible for us to accomplish our aims of the study. We are also indebted to the **patients** who co-operated with us. Last but not the least, we specially thank our parents and family members for their help and support during the whole study

TABLE OF CONTENTS

List of Tables

List of Graphs

List of Abbreviations

IP: Index of positivity

PPE: Personal Protective Equipment

AHF: Allied Hospital Faisalabad

DHQ: District Headquarters

CKD: Chronic Kidney Disease

ABSTRACT

Introduction: Kidney disease is a significant worldwide public health problem. Acute kidney injury and chronic kidney disease are linked to high healthcare costs, low quality of life, and serious adverse health outcomes. Clinical audit is a part of the continuous quality improvement process. It consists in measuring a clinical outcome or a process against well-defined standards, established using the principles of evidence-based medicine. The comparison between clinical practice and standards leads to the improvement of daily care quality.

Objectives: To study healthcare facilities available in the dialysis unit of Allied and District headquarter. To compare these facilities to those of international standards of WHO. To identify the shortcomings for the betterment of flaws and furtherance of health.

Methods: A descriptive cross-sectional study was conducted to analyse the clinical audit of the dialysis unit in Allied and DHQ hospital, Faisalabad. The source of the study population was the patients admitted to the dialysis unit, Allied Hospital, and DHQ hospital, Faisalabad. The study included patients with loss of kidney function admitted to the nephrology Ward and excluded the patients not requiring dialysis and patients not admitted to the nephrology Ward. A structured questionnaire with close-ended questions was used to collect the required quantitative information. Eleven data collectors and one supervisor were recruited to conduct the study. SPSS computer software Version 26 was used for the entry, compilation, and analysis of the data.

Results: In the Allied hospital, according to the census, infrastructure was found to be at 33.3%, access to dialysis fluid at 28.5%, patient care standards 100%, sterilization standards at 85.7%, water treatment standards 100%, staff and paramedics 100%, ambiance 50%, privacy 50%, power supply 100%, safety protocols 100%. In the DHQ hospital, the infrastructure of the dialysis unit was found to be at 66.6%, access to the dialysis unit at 71.4%, patient care standards 100%, sterilization standards at 57.1%, water treatment standards 100%, staff and paramedics 100%, ambiance 100%, privacy 100%, power supply 100%, safety protocols 33.3%.

Conclusion and Recommendations: The overall average availability of dialysis facilities in the Allied hospital is 74.5%, which is borderline and the overall average availability of dialysis facilities in the DHQ hospital is 82.8%, which is acceptable. Assessment of facilities in the dialysis units of both hospitals must take place autonomously

Keywords: Clinical audit, Dialysis Unit, Nephrology Ward, Allied, and DHQ hospital, Faisalabad.

INTRODUCTION

Kidney disease is a significant worldwide public health problem. Acute kidney injury and chronic kidney disease are linked to high healthcare costs, low quality of life, and serious adverse health outcomes. Despite this burden, kidney disease is rarely included in major chronic disease control strategies, presenting an obstacle when calling for governments to address kidney diseases [1]. The audit is a systematic and critical examination to examine or verify [2] Clinical audits are a part of the continuous quality improvement process. It consists in measuring a clinical outcome or a process against well-defined standards, established using the principles of evidence-based medicine. The comparison between clinical practice and standards leads to the formulation of strategies to improve daily care quality [3].

In medicine, dialysis is the process of removing excess water, solutes, and toxins from the blood in people whose kidneys can no longer perform these functions naturally. While renal replacement therapy has improved many patients' care, questions remain, regarding the quality of care provided to patients by dialysis facilities [4] Dialysis may need to be initiated when there is a sudden rapid loss of kidney function, known as acute kidney injury (previously called acute renal failure), or when a gradual decline in kidney function, chronic kidney disease, reaches stage 5 and 85 to 90% of their function is lost, hence the dialysis becomes essential. In the recent decennary, many proceedings have been done in the remedial treatment with dialysis along with the implementation of international guidelines to make sure the delivery of optimal and appropriate care to dialysis patients.

The first successful dialysis was performed in 1943 A Dutch doctor, Willem Johan Kolff, constructed the first working dialyzer in 1943 during the Nazi occupation of the Netherlands. Due to the scarcity of available resources, Kolff had to improvise and build the initial machine sausage casings, beverage cans, a washing machine, and various other items that were available at the time. Over the following two years (1944–1945), Kolff used his machine to treat 16 patients suffering from acute kidney failure, but the results were unsuccessful. Then, in 1945, a 67-year-old comatose woman regained consciousness following 11 hours of hemodialysis with the dialyzer and lived for another seven years before dying from an unrelated condition. She was the first-ever patient successfully treated with dialysis [5]. The dialysis Market size was valued at USD 82 bill. Dialysis 020 is projected to grow at over 4.5% CAGR from 2021 to 2027. The rising burden of renal diseases in the development.

The rising developing countries are a factor driving the market grow A rapidly growing elderly population base prone A rapid kidney diseases and end-stage renal disease will augment the demand for dialysis therapy over kidney replacement. Between 5.3 and 10.5 million people over the Globe require dialysis or transplantation, although many do not receive these treatments due to a lack of resources or financial barriers [6] Accora ding to the Global Burden of Disease Study 2017, the number of Chronic Kidney Disease deaths increased by 42% worldwide between 1990 and 2017. In South Asia, 9,459,473 disability-adjusted life years—26% of all disability-adjusted life years worldwide—were attributable to CKD 2017 [7] The prevalence of chronic kidney disease in South Asia ranged from 5.01% to 13.24%. Long-term hemodialysis and long-term peritoneal dialysis are available in all countries, but Afghanistan lacks peritoneal dialysis services [8]. Addressing the growing disease burden in the South Asia region is complicated by weak and unorganized health systems, inadequate preparedness and response capabilities, deficient quality of care, and poor data systems. Primary health systems focus mainly on managing infections and providing maternal and newborn care. In recent years, some countries have announced policies to address NCDs, but have failed to include CKD.

A major reason for this is the lack of data. Unlike other parts of the world, there are no national registries for kidney diseases in the region [9]. Dialysis costs about $150 per session, and for patients with kidney failure, this is a cost that they need to bear for an l, lifetime. A normal dialysis patient needs 12 to 14 sessions of dialysis each month. This could easily add up to over $2,000 monthly, which is quite a costly procedure to afford leading to people's misery. There are now more than 7,500 dialysis clinics in the United States. Fresenius Medical Center North America had over 208 thousand dialysis patients, of any dialysis provider in the United States. DaVita Kidney Care followed with 204 thousand of patients on dialysis. The United States has 2093 dialysis patients per million, Switzerland had 127, the UK has 53, Sweden 65, and France, the nation with the highest per million and prevalence rate in Europe, was dialyzing only 133 patients per million [10]

Pakistan is a developing country, and, according to the human development index of the United Nations, it stands in the 150th position out of 189 countries and territories [11]. The health system in Pakistan is below international standards [12]. Intermittent hemodialysis in Pakistan began in 1970. A dialysis registry in Pakistan has not still been established to approach dialysis. In Pakistan, nephrology services are not up to the mark due to

limited numbers of nephrologists (eighty for a population of 163million [13] and only 40 percent of patients have hemodialysis access. At present, there are 72 public and private dialysis centers, largely in urban areas. Provisions in rural areas are nonexistent. That's why most of the patients from these areas are referred late, mainly in emergency units at the nearby tertiary care centers. According to the last published data by The Kidney Foundation of Pakistan in 2014, there were 5,935 patients on hemodialysis with 891 machines in the country. The incidence of end-stage renal disease is between 100-150 new cases per million per year, with a disease burden of 27000 new cases.

The treatment of the first choice for these patients is renal transplantation, which is available to only 5% of patients, the rest have no other option except to resort to dialysis to sustain their life [14]. These patients are also under-dialyzed due to a lack of facilities which affects their survival as well as QOL, but this data is quite limited with large dialysis facilities not contributing their data to the foundation. Therefore, considering the prevalence reported above, the annual cost of hemodialysis for 22,000 new patients every year will be around Rs12-15 billion, which certainly the government cannot afford, at least in the recent years to come [15] However, these facilities are gradually improving with philanthropic support. Recently the government has initiated sponsoring a program to provide free dialysis. This has increased the number of patients on dialysis along with some Major improvements in the dialysis facilities. At present, almost 2000 patients are being dialyzed under this program.Faisalabad is a large, densely populated, industrial city in Pakistan with current treatment options for patients suffering from ESKD are mainly palliative care and hemodialysis.

According to the Dialysis Registry of Pakistan 2014, there are a total of 3 dialysis centers in Faisalabad with 42 machines and 447 patients with the majority of the patients undergoing dialysis falling under the age group of 51 to 70 years. Scarce and poorly targeted scrutiny by survey agencies allows the substandard qualities of care problems to go undetected and uncorrected. Even when deficiencies are recognized little incentive exists especially in developing countries' dialysis units where proposed targets are not reached due to financial barriers.

In general, survival rates for patients on dialysis are poor**.** Based on the United States Renal Data System (USRDS) report (HD) is 57% at 3 years after the onset of ESKD as compared to 68% for patients receiving peritoneal dialysis (PD). The **5-**year survival for patients receiving HD and PD is 42% and 52%, respectively. Overall mortality is 10-20 times

higher than the general population for patients receiving dialysis. The risk is greatest during the first 3 months after starting dialysis. Annual mortality is around 9% per year with 40-50%. 5 - year survival [16] mortality of hemodialysis patients is between 25 and 30% per year [17] Malnutrition and inadequate dialysis appear to be the major factors causing such high mortality rate [18] a report issued by the United States General Accounting Office, 16% of dialysis patients didn't have an adequate amount of toxins removed from their blood, 24% had anemia that was not brought under control and 19% of patients were dialyzing for extended periods using catheters [19] The American Association of Medical Instrumentations (AAMI) had issued guidelines of dialysis water treatment and quality of product water to ensure patients' safety [20]. To prevent transmission of infections in dialysis units, the Centers for Disease Control and Prevention set out guidelines to protect against the spread of infections especially hepatitis B and C[21]

This audit aims to highlight the discrepancies between actual practice and standards to the changes needed to improve the quality of care [22] at District Head Quarter and Allied Hospital Faisalabad-Pakistan.

LITERATURE REVIEW

Chronic hemodialysis is the most common treatment for end-stage renal disease. Technological developments in dialyzer membranes, dialysis machines, and vascular access have made haemodialysis routine, but the procedure remains potentially hazardous because of mechanical impairment and human inaccuracy . Serious adverse reactions have resulted, particularly from microbiological or chemical contamination of hemodialyzers and dialysate solutions [25]

Even though hemodialysis treatment is successful to improve many of the clinical outcomes of end stage renal disease and to delay otherwise impending death, hemodialysis patients still have higher mortality and hospitalization as well as lower quality of life in comparison to the general population. The concept of quality, adequacy, or suitability of hemodialysis, which were introduced in the 1970s, implies dialysis which enables patients to have a normal quality of life as well as solid clinical tolerance during the dialysis [26]

Regarding this, research and audit programs were carried out in various institutes describing different interventions performed in clinical practice of a dialysis unit. In April 1991, a research regarding the audit on the degree of application of universal precautions in hemodialysis unit was performed in which ,a total of 364 opportunities to wear gloves and to wash hands thereafter and 273 opportunities to wash hands before a patient-oriented activity were observed. The proportion of occasions when gloves were actually used was 18.7%. Hand washing after a patientoriented activity was performed only on 32.4% of occasions. Finally, only on 3% of such occasions was hand washing before the activity.The degree of compliance with standard precautions by health care personnel is unsatisfactory and this favours nosocomial transmission in haemodialysis units [27]

Concerning the hygiene and sterilization practices , a multicentric survey of the in haemodialysis units was conducted in june 2005 in Nephrology Dialysis Transplantation in Spain, gloves were actually used on 92.9% of these occasions. Hands were washed only 35.6% of the time after patient contact, and only 13.8% of the time before patient contact. Poor adherence to hand washing was associated with the number of shifts per hemodialysis unit per day and with higher patient-to-nurse ratios. In the acute hemodialysis units, there was greater adherence to standard precautions than in the chronic units .The personnel's knowledge of patients' infectious status did not modify their adherence to hand hygiene practices. A higher patient-to-nurse ratio independently influenced hand washing both before and after patient contact [28]

In 2008, study regardimg the determination regarding roles of environmental contamination and non complaince with standard precautions in the risk of hepatitis virus c transmission in a hemodialysis unit was done according to which two patients experienced seroconversion to HCV during the study period. Phylogenetic analyses showed that

of these patients was infected with the same strain as that affecting a chronically infected patient also treated in the unit. Of 740 environmental surface samples, 82 (11%) contained hemoglobin; 6 (7%) of those contained HCV RNA. The rate of compliance with hand hygiene was 37% (95% confidence interval, 35%-39%), and gloves were immediately removed after patient care in 33% (95% confidence interval, 29%-37%) of cases. A low ratio of nurses to patients and poor hand hygiene were independent predictors of the presence of hemoglobin on environmental surfaces [29] In 2011, a KAP study was conducted among nurses in the dialysis unit in a University Hospital in Alexandria, Egypt.82.4% of them were bachelor degree nurses and 17.6% were secondary diploma nurses. Their mean years of experience was 5.7±5.74 years. None of the nurses received training in infection control.

None of the nurses (0%) washed hands before and after the different procedures that required hand washing or used plastic aprons or face protection. In contrast, all of them (100%) wore nonsterile gloves before or after the different activities that required wearing of gloves . In 3.7% of opportunities that required the use of hand washing or alcohol rub after removing gloves , nurses used alcohol rub in correct steps after removal of gloves, whereas in 6.3% they used alcohol rub but by following incorrect steps.With regard to the availability of cleaning facilities, it was observed during the study period that the sinks were inconveniently located outside the dialysis rooms. Alcohol rub was available in a dispenser at the bedside in the dialysis rooms [30]

In July 2011, a study on the Evaluation of Quality of Care in a large Saudi hemodialysis center regarding adherence to Quality of Dialysis Water Standards was conducted. Product water chemical testing, both biochemically and bacteriologically, is compliant with association for advancement of medical instrumentation guidelines that advise to perform an annual biochemical analysis of product water and to perform microbial cultures monthly. Corrective measures are routinely undertaken if the colony count exceeds the allowable limit (50 CFU).7 Testing for endotoxin has not yet been included in the monthly microbial testing. Compliance with the US centre of disease Guidelines for Infection Control in a hemodialysis unit, adherence to infection control guidelines is closely met in daily practice. Wearing gloves and hand washing are among the practices that are well adhered to by all nurses on all occasions. The practice of hand washing before and after patient contact is a role while nurses care for patients and touch patients' equipment at the dialysis station.

Regarding infectious control ,dialysis stations (chairs, beds, tables, and machines) are disinfected and cleaned between patients. All cases are tested for hepatitis B and C infection using the hepatitis B surface antigen (HBsAg) test and anti-HCV antibodies and PCR for HCV RNA. Follow-up testing is performed every 6 months for anti-HCV antibodies and PCR for HCV RNA for HCV negative patients and seroconverted patients after treatment and every year for HCV-positive patients without treatment. With regard to hepatitis B, follow-up testing is performed every 3 months only for susceptible patients. Screening for anti-HBs antibody is tested every year for all vaccinated patients and all newly admitted patients. Hepatitis

B vaccination is routine practice for both dialysis patients (except HBsAg-positive patients) and the healthcare personnel.A booster dose was given to all patients with low anti-HBs antibody titer <10 IU/mL.All patients were negative for HIV serology test while the prevalence of hepatitis C virus (HCV)-positive and hepatitis B virus (HBV) positive patients was 24.7% and 4.1%, respectively. HBsAg positive patients and also HCV-infected patients were dialyzed on separate machines in an isolation room and had dedicated nurses. All negative patients for HBV and HCV were dialyzed on separate machines in separate rooms (male and female rooms) [31]

In 2016, a research was held in central Iran regarding the evaluation of bacteriological and chemical quality of dialysis water and fluid in which concentration of the determined chemicals (copper, zinc, sulfate, fluoride, chloramines and free chlorine) did not exceed the recommended concentration by the Association for the Advancement of Medical Instrumentation (AAMI) exclude lead, nitrate, aluminum and calcium. Furthermore, the magnesium; cadmium and chromium concentration exceeded the maximum level in some centers. No contamination with heterotrophic bacteria was observed in all samples, while the AMMI standard for endotoxin level in dialysis fluid (< 2 EU/ml) was achieved in 95% of samples.Dialysis water and fluid failed to meet the all chemical and bacteriological requirements for hemodialysis. To minimize the risk of contaminants for hemodialysis patients therefore, a water quality management program including monitoring, maintenance and development of water treatment system in hemodialysis centers is extremely important. In addition, an appropriate disinfection program is needed to guarantee better [32]

Another research was held in 2016, regarding the impact of multidisciplinary rehabilitation on the quality of life of hemodialysis patients in Iran, according to which the mean age of patients was 55.8 ± 14.3 years, 60% were male, and 93.3% were married. The average duration of hemodialysis was 3 ± 2.4 years. The quality of life score of all patients before the intervention was between 10 and 19 (moderate level), which after intervention, improved to a good level in half of the patients ($p < 0.001$). Rehabilitation programs improve the quality of life of hemodialysis patients. By this finding, implementation of rehabilitation programs is recommended in hemodialysis centers with participation of experts from different fields including nurses, physiotherapists, and clinical psychologists [33]

In 2016, a cross sectional study was held regarding knowledge ,attitude and practice of nurses about the standard precautions for the hospital aquired infection in teaching hospital affiliated to Zobol university of medical sciences.According to which the practice score showed unsatisfactory practice among HCP. Regarding their opinion, the majority of HCP disagreed to follow the five moments and reported that the WHO technique of hand hygiene is so sophisticated and timeconsuming; they disagreed with changing gloves between patients and considering gloves as a substitute to hand hygiene. The majority recap the needle by two hand techniques disagreed with following respiratory hygiene, and color-coding was accepted only from nurses. Also, it was found that there was a positive correlation between years

of experience, infection control training programs, and the level of SPs practice score. The results show that 43% of the participants in this study had poor knowledge, 42% had average

practice, and 37% had a moderate attitude about hospital infection. There was a significant relationship between knowledge and gender (r= 00.8 p= 0.02). However, the variables of age, marital status, employment, work experience, education, and place of work did not establish a significant relationship with the independent variables (p> 0.05) [34]

In 2019, a research regarding health care personnel opinion and the implementation obstacles regarding the standard precautions in hemodialysis unit was done according to which 53% of the participants were from governmental hospitals and 57.1% were females. The age median of them was 30 years (IQR = 28–32). The majority of the participants were medical/surgical RNs (33.1%) while only 8.3% of them were from the pediatric/gynecology departments. The overall knowledge score was 16.27 (SD = 3.15), and the total compliance score was 49.15 (SD = 12.36). Besides, the study showed a moderate positive correlation between the level of knowledge, experience in years, and the standard precautions compliance (r = 0.387, p = 0.01), (r = 0.341, p = 0.01), respectively [35]

OBJECTIVES

1. To study healthcare facilities available in the dialysis unit of Allied and District headquarter.
2. To compare these facilities to those of international standards of who.
3. To identify the shortcomings for the betterment of flaws and furtherance of health.

METHODOLOGY:

STUDY DESIGN:

The study design applied was a descriptive cross-sectional study.

STUDY POPULATION:

The source population was the patients admitted to the dialysis unit, Allied Hospital, and DHQ Hospital Faisalabad.

SAMPLE UNIT:

Patients admitted to the nephrology ward of Allied Hospital and DHQ Hospital Faisalabad

STUDY SETTING:

The study was conducted in the nephrology ward, at Allied and DHQ Hospital Faisalabad. It is a public sector and tertiary care hospital in Faisalabad, with a bed capacity of 1500. Allied Hospital Faisalabad contains several [23] doctors and teaching staff. It provides all facilities to its patients, has treatment available for many diseases, and has a burn center. There is also an emergency ward open 24 hours.

STUDY DURATION:

The tentative duration for this study was 6 months.

SAMPLING TECHNIQUE:

A convenient sampling technique was used.

SAMPLE SIZE:

The study included 60 patients in the nephrology ward, at Allied and DHQ Hospital Faisalabad.

INCLUSION CRITERIA:

The study included patients with loss of kidney function admitted to the nephrology ward, at Allied and DHQ Hospital, Faisalabad.

EXCLUSION CRITERIA:

The study did not include healthy individuals, patients not requiring dialysis, and patients not admitted to the nephrology Ward.

DATA COLLECTION PROCEDURE:

Questionnaires were distributed among the patients, staff, and faculty members of the dialysis center and questions will also be explained to them.

DATA COLLECTION TOOL:

A Structured questionnaire with close-ended questions was used to collect the required quantitative information.

DATA ANALYSIS:

SPSS computer software Version 26 was used for the entry, compilation, and analysis of the data.

Gantt Chart

	June				July				August				September				October				Nov
Research Activities	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1	W 2	W 3	W 4	W 1
Topic Planning & Submission																					
Approval of Topic																					
Proposal Development																					
Proposal Submission																					
HOD Approval																					
Ethical Approval																					
Data Collection																					
Data Analysis																					
Report Writing & Review																					
Research Submission																					

ETHICAL CONSIDERATIONS

- Consideration of ethical pillars of beneficence and non-maleficence.
- Written Consent from hospital management will be taken.
- Confidentiality will be assured.

OPERATIONAL DEFINITIONS

DIALYSIS:

The process of removing waste products and excess fluid from the body is necessary when kidneys are not able to adequately filter the blood.

HEMODIALYSIS:

A medical procedure to remove the fluid and waste products from the blood and to correct the electrolyte imbalance. This is done using a machine and dialyzer also referred to as an artificial kidney.

PERITONEAL DIALYSIS;

A dialysis technique that uses the patient's body tissues inside the abdominal cavity as a filter. A plastic tube called a dialysis catheter is surgically placed through the abdominal wall into the abdominal cavity. By using different types of solutions waste products and excess water can be removed from the body.

CHRONIC KIDNEY DISEASE:

It is defined as kidney damage or glomerular filtration rate less than 60ml/min/1.73^2 for 3 months or more irrespective of the cause.

END-STAGE RENAL DISEASE:

It is the final permanent stage of chronic kidney disease where kidney function has declined to a point that kidneys can no longer function on their own.

INDEX OF POSITIVITY:(IOP)

It is an arbitrary unit for assessment. 100% positivity indicates total affirmation of the checklist items and so on. The criteria adopted for analysis of the checklist data will be the classification indices suggested by Carter apud Saupe and Horr.

RESULTS

The study was conducted for the availability of dialysis facilities in Allied and DHQ hospitals.

The facilities include infrastructure (entrance, treatment rooms, storage area), access to dialysis unit (by car, separate walking and ambulance patient arrival, access to food, clean linen, pharmacy, waiting area, isolation room to outdoor space, toilet), patient care standard (monitoring for hemolytic or unusual reactions, record of physical examination, vitals, water balance per shift), sterilization standards (insurance of infectious control, facilities of PPE, sterilization of machines, absence of chronic toxins from drinking water, catheters for clotted blood etc.), water treatment standards, staff and paramedics (qualification, equipment of technicians for maintenance of dialysis unit), ambience of dialysis unit (access to natural light, appropriate windows and doors for visual and acoustic privacy, isolation of noisy areas, adequate sanitary facilities), privacy in dialysis unit (confidentiality, sufficient space to permit curtains to be drawn), power supply and safety protocols.

In the Allied hospital, according to the census, infrastructure was found to be at 33.3%, access to dialysis fluid 28.5%, patient care standards 100%, sterilization standards 85.7%, water treatment standards 100%, staff and paramedics 100%, ambiance 50%, privacy 50%, power supply 100%, safety protocols 100%.

The overall average availability of dialysis facilities in the Allied hospital is 74.5%, which is borderline.

In the DHQ hospital, the infrastructure of the dialysis unit was found to be at 66.6%, access to the dialysis unit at 71.4%, patient care standards 100%, sterilization standards at 57.1%, water treatment standards 100%, staff and paramedics 100%, ambiance 100%, privacy 100%, power supply 100%, safety protocols 33.3%.

The overall average availability of dialysis facilities in the DHQ hospital is 82.8%, which is acceptable.

TABULAR REPRESENTATION OF RESULTS

TABLE NO. 1

SCALE OF INDEX OF POSITIVITY

Index of Positivity (%)	Classification of Facilities
100	Substantial
90-99	Appropriate
80-89	Acceptable
70-79	Borderline
<70	Poor

TABLE NO. 2

SECTION-WISE RESULTS

Dialysis Unit Facilities	Index of Positivity (%)		Classification of Facilities	
	Allied Hospital	**DHQ Hospital**	**Allied Hospital**	**DHQ Hospital**
The infrastructure of the Dialysis Unit	33.3	66.6	Poor	Poor
Access to Dialysis Unit	28.5	71.4	Poor	Borderline
Patient Care Standards	100	100	Substantial	Substantial
Sterilization Standards	85.7	57.1	Acceptable	Poor
Water Treatment Standards	100	100	Substantial	Substantial
Staff and Paramedics	100	100	Substantial	Substantial
Ambiance	50	100	Poor	Substantial
Privacy	50	100	Poor	Substantial
Power Supply	100	100	Substantial	Substantial
Safety Protocols	100	33.3	Substantial	Poor
Overall Average	**74.5**	**82.8**	**Borderline**	**Acceptable**

TABLE NO. 3

FACILITIES IN DIALYSIS UNIT

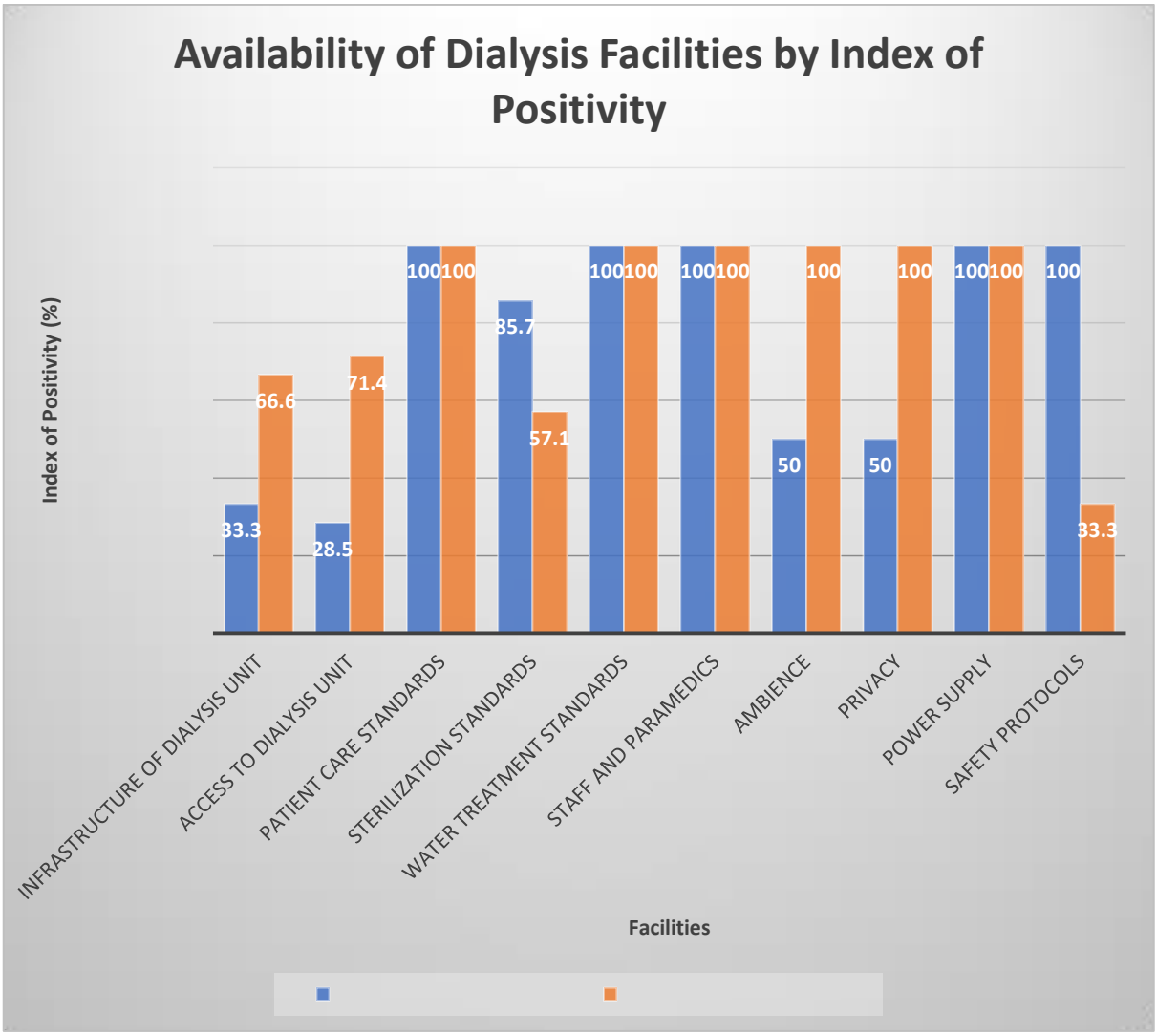
DIALYSIS UNIT FACILITIES	
SECTIONS	**SUB-ITEMS**
A. Infrastructure	Entrance or reception area
	Treatment rooms
	Clinical and non-clinical storage area
B. Access to Dialysis Unit	Access to dialysis unit by car
	Separate walking and ambulance patient arrival at the unit
	Access to food, clean linen, pharmacy
	Access from the waiting area to the treatment area
	Access of isolation room to outdoor space
	Access to parking for debilitated patients
	Access of patients to the toilet
C. Patient Care Standards	Monitoring of patients for hemolytic and unusual reactions
	Position of bedridden patients
	Record of physical examination per shift
	Record of vitals and water balance per shift
D. Sterilization Standards	Insurance of infectious control
	Facilities of PPE
	Sterilization of machines
	Verification of absence of chronic toxins from feed water
	Checking of sensitivity methods for bacterial growth in both water and dialysis fluid

	Checking of central venous catheters for clotted blood
	Checking for dried oxygen masks and nebulizers after use
E. Water Treatment Standards	Checking for adequate water treatment services
	Insurance of adequate water distribution loop
	Inclusion of backflow prevention, temperature controller, depth filter
	Ease of delivery of dialysate regularly
F. Staff and Paramedics	Qualification of paramedics according to WHO criteria
	Equipment of technicians for maintenance of the dialysis unit
G. Ambience of Dialysis Unit	Access to the natural light
	Appropriate windows and doors for visual and acoustic privacy
	Ensuring isolation of noisy areas from clinical areas
	Providing adequate sanitary facilities
H. Privacy in Dialysis Unit	Ensuring the confidentiality of medical records and personal discussions
	Providing sufficient space to permit curtains to be drawn when required
I. Power Supply	Providing 24 hours standby power supply
J. Safety Protocols	Ensuring WHO's five movements of hand hygiene followed by paramedics
	Following Covid-19 protocols
	Screening patients for hepatitis B, C, and HIV

GRAPHICAL REPRESENTATION OF RESULTS

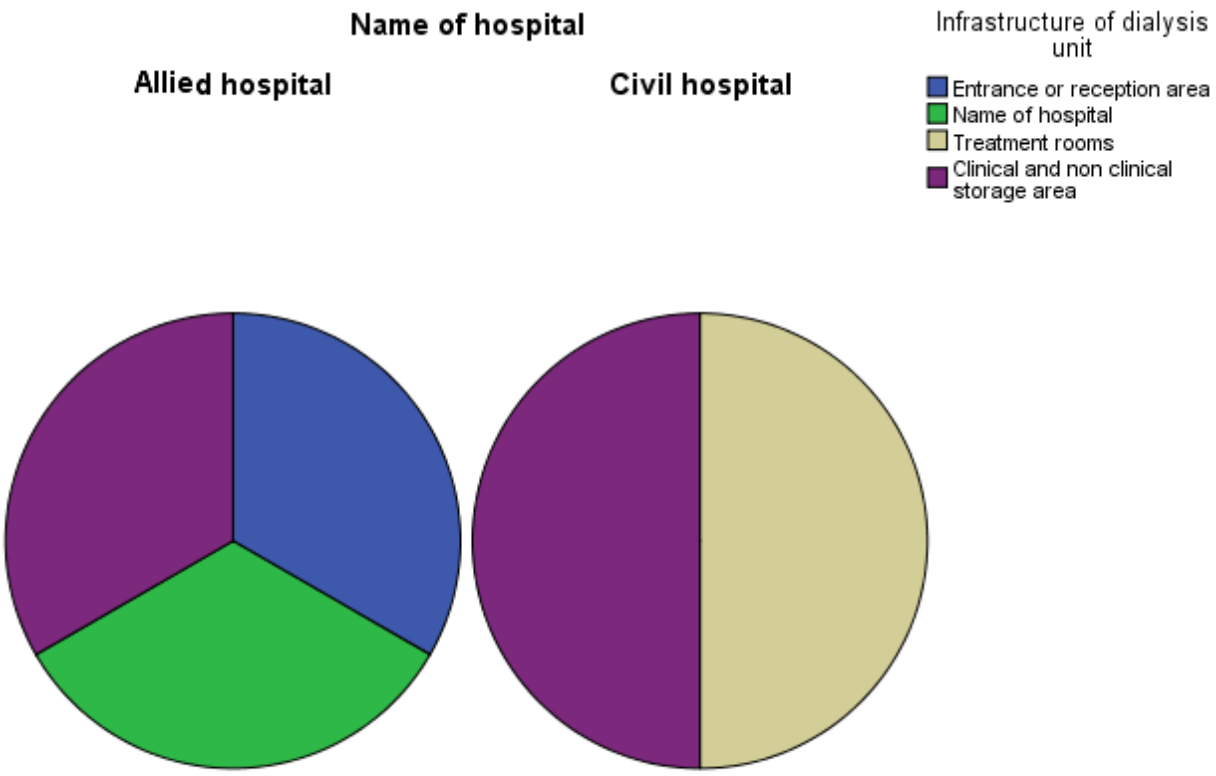
GRAPH NO. 1

Availability of Dialysis Facilities by Index of Positivity.



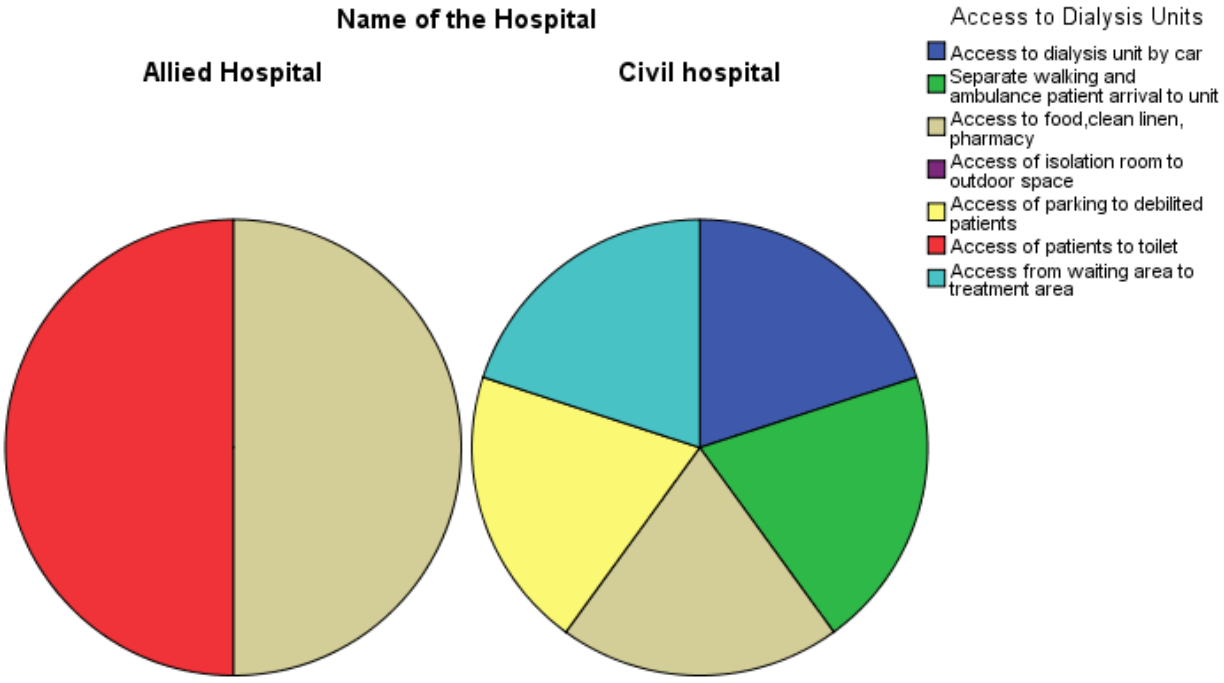
GRAPH NO. 2

Pie Chart regarding Infrastructure of Dialysis Unit in Allied Hospital and DHQ, FSD.



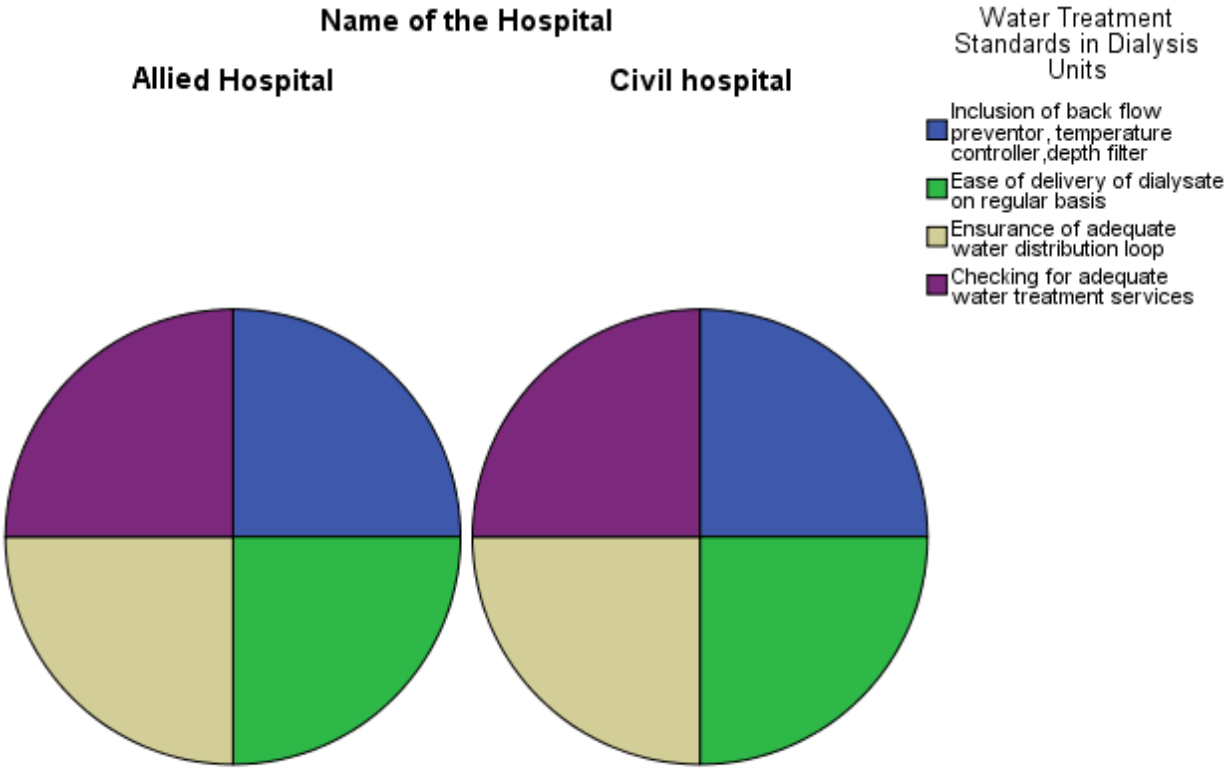
GRAPH NO. 3

Pie Chart regarding Access to different Basic Facilities in Dialysis Unit in Allied Hospital and DHQ, FSD.



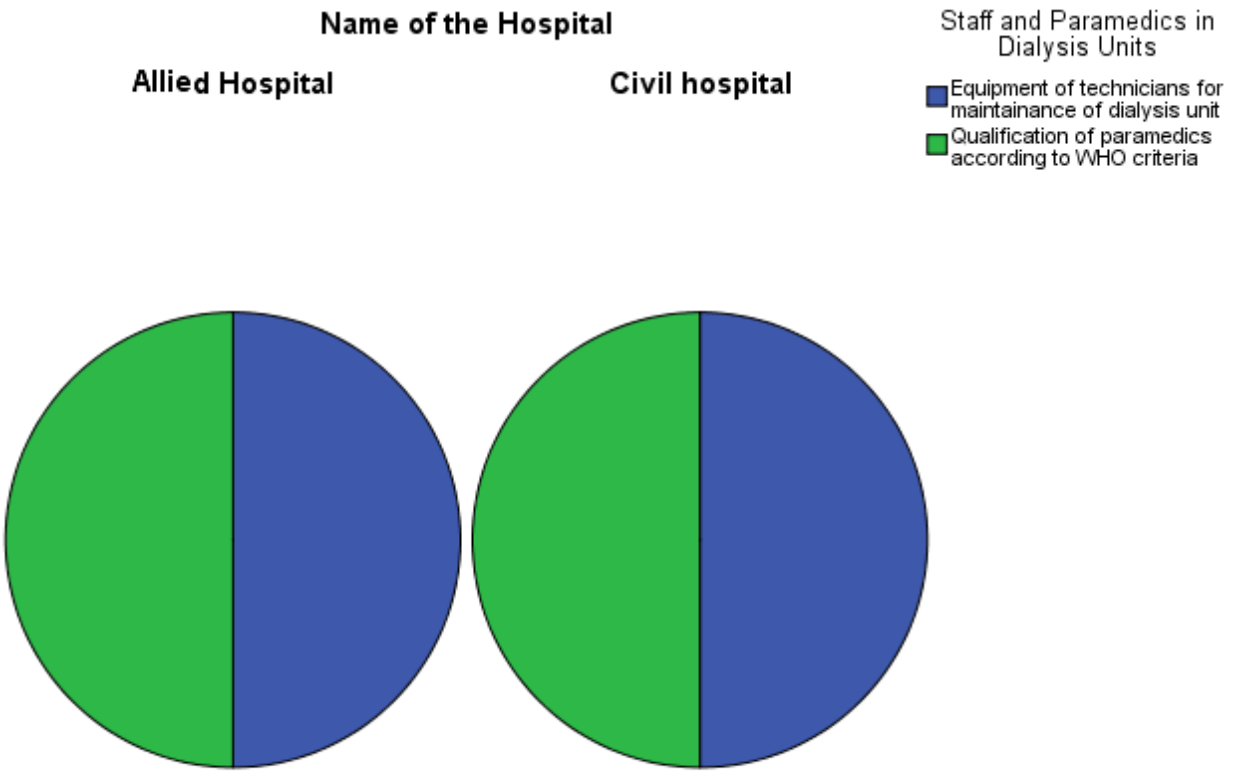
GRAPH NO. 4

Pie Chart regarding Water Treatment Standards in Dialysis Unit in Allied Hospital and DHQ, FSD.



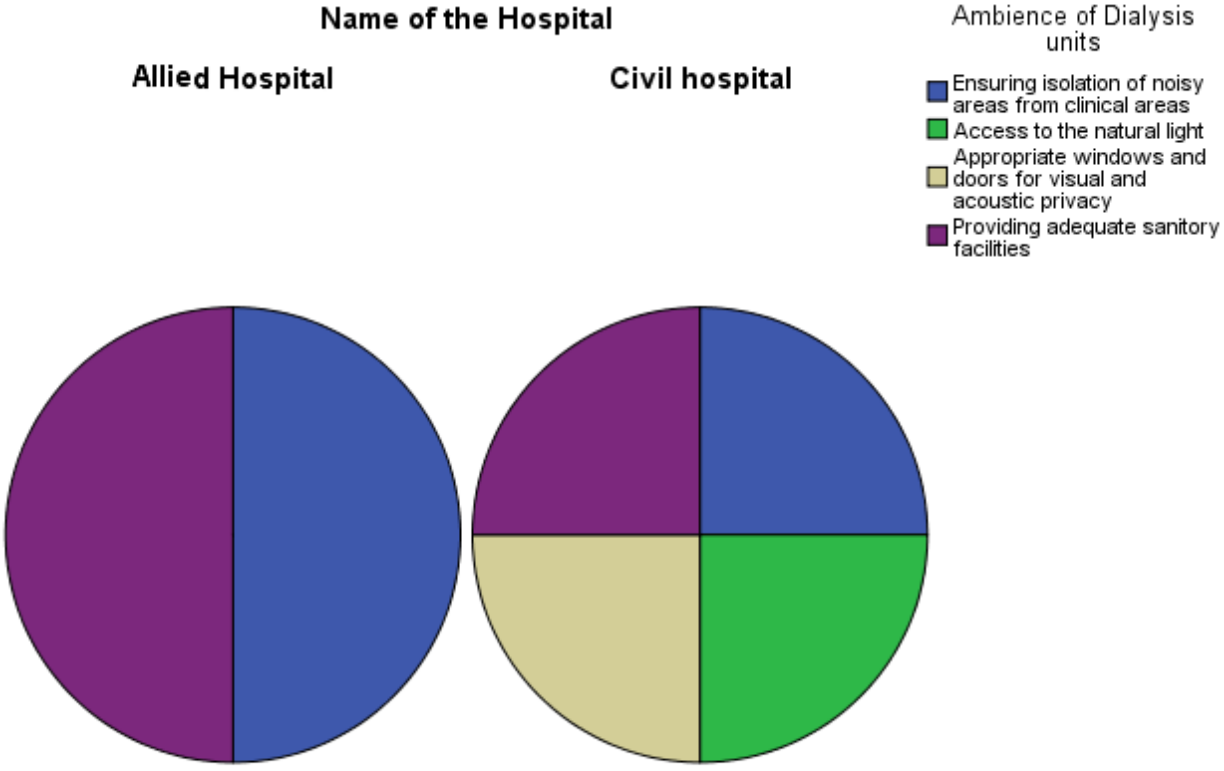
GRAPH NO. 5

Pie Chart regarding Basic Information of Staff and Paramedics in the Dialysis Unit in Allied Hospital and DHQ, FSD.



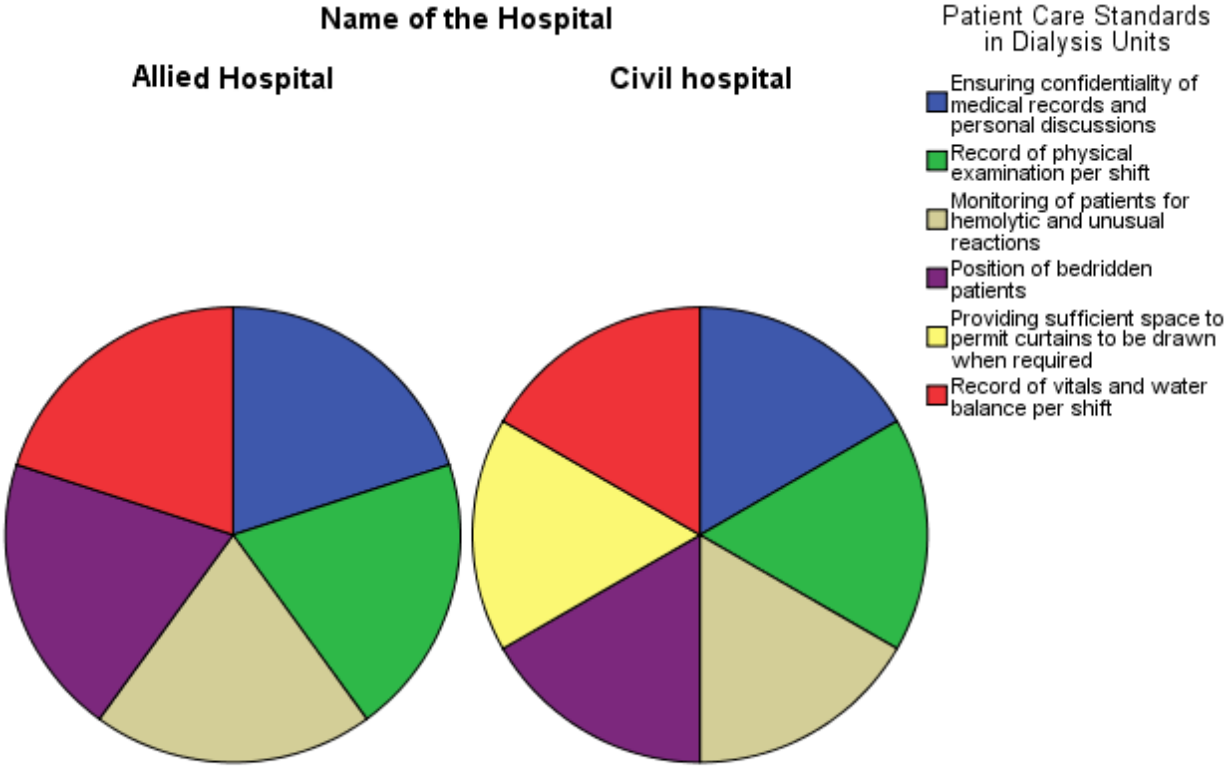
GRAPH NO. 6

Pie Chart regarding Ambience of Dialysis Unit in Allied Hospital and DHQ, FSD.



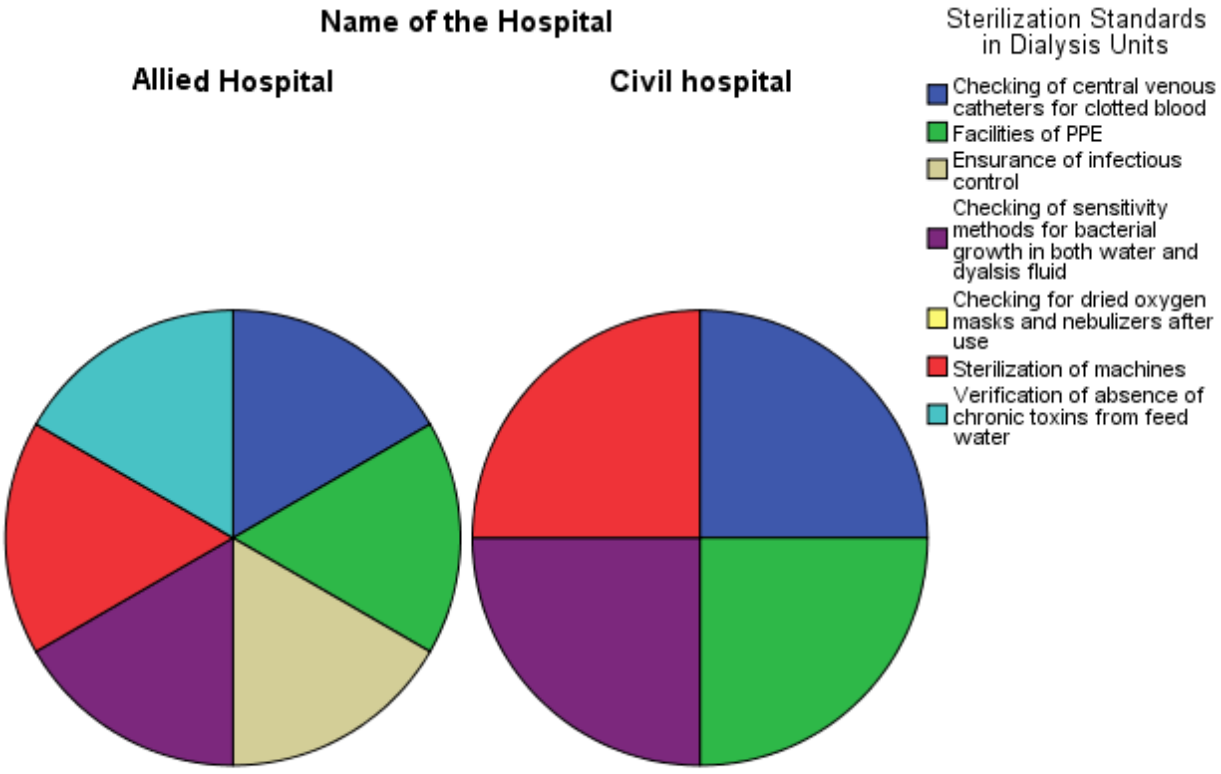
GRAPH NO. 7

Pie Chart regarding Patient Care Standards in Dialysis Unit in Allied Hospital and DHQ, FSD.



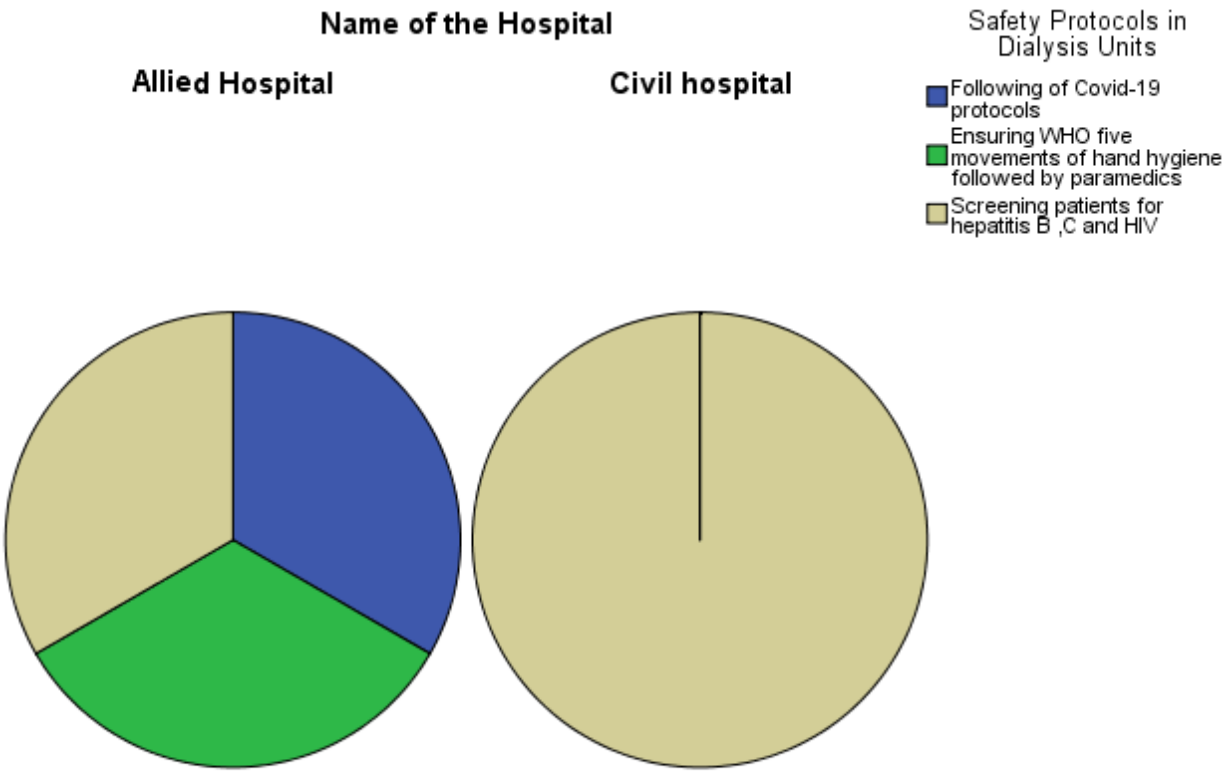
GRAPH NO. 8

Pie Chart regarding Sterilization Standards in Dialysis Unit in Allied Hospital and DHQ, FSD.



GRAPH NO. 9

Pie Chart regarding Safety Protocols in Dialysis Unit in Allied Hospital and DHQ, FSD.



DISCUSSION

Evaluation of dialysis facilities in developing countries for the improvement of health care is an important part of international health programs. In order to prevent imminent death and disability amelioration of mechanical facilities in dialysis is required. A cross-sectional descriptive study was conducted in Allied Hospital and District Headquarters Hospital Faisalabad for the clinical audit and analysis of dialysis facilities in the dialysis unit of these hospitals. It shows a comparison between dialysis facilities in these local teaching hospitals and WHO standards for these facilities.

The facilities in the dialysis unit in Allied hospital Faisalabad is 74.5% met and the facilities of the dialysis unit in District health quarters hospital Faisalabad is 82.8% met according to WHO standards. Early deaths occur due to shortcomings in dialysis facilities and patient care standards in developing countries. This study helps us to evaluate the degree of gaps in the hemodialysis unit and patient care practices.

The study shows that the infrastructure facilities are 33.3% and 66.6% in compliance with WHO standards in Allied and District Health Quater Hospital Faisalabad respectively. The patient care standards in both Hospitals are 100% in compliance with international standards for most of the patients. For sterilization standards, 85.7% in Allied hospital and 57.1% in District Health Quater are met.

The additional finding shows that accessibility to the dialysis center is 28.5% in Allied Hospital and 71.4% in District Health Quarter Hospital. The compliance of privacy is 50% and 100% in Allied and District Health Quater Hospitals respectively. Safety proticols are 100% followed in Allied Hospitals and 33.3% followed in District Health Quarter according to WHO standards.

A similar case study or hemodialysis audit has recently been developed in Egypt. The study shows compliance with guidelines in 16 government hospitals of Cairo and Giza governorates. The mean percentage compliance with hemodialysis guidelines in these 16 study hospitals was 59.3%. Within 5 separate domains compliance were 68.5% for patient care practices,61.3% for infection, prevention, and control, 51.5% for the facility, and 56.5%for records. Overall compliance with WHO guidelines is lacking in many aspects. In the

hospitals under study, facilities are somewhat better if we measure compliance with patient care standards, sterilization standards, and safety protocols.

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This type of study with consideration of infrastructure, patient care standards,sterilization and water treatment standards and infections prevention protocols has not been developed in South Asian countries.

It is emphasised that future studies should be more oriented towards recent advancements that need to be practiced in routine in dialysis units.

CONCLUSION

The study was conducted for the availability of dialysis facilities in Allied and DHQ hospitals. The study showed the comparison of the standard facilities recommended by WHO with the facilities in the dialysis units in the respective hospitals. The index of positivity was determined. According to that, the overall average availability of dialysis facilities in the Allied hospital is 74.5%, which is borderline and the overall average availability of dialysis facilities in the DHQ hospital is 82.8%, which is acceptable.

RECOMMENDATIONS

- Assessment of facilities in the dialysis units of both hospitals must take place autonomously. So that a system of self-serving feedback is maintained to ensure quality assurance inside the units. Periodic assessment of quality such as this study should take place after every year or so.
- At present there are no set standards or criteria for proper facilities relevant to dialysis units. In light of international standards to provide proper facilities, a concerted standard of facilities for dialysis units must be devised nationally. It can serve as a national tool for quality standards.
- At present, there is no quality assurance body for dialysis unit facilities. Healthcare policymakers should form a national body for the provision of these facilities to ensure that standards are being met. Such an institute can work to further improve the quality through research and development.
- Measures should be taken to make patients aware of the facilities they are entitled to.

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RESEARCH QUESTIONNAIRE FOR THE CLINICAL AUDIT OF THE DIALYSIS UNIT IN, ALLIED AND DHQ HOSPITAL, FAISALABAD

Name:

Age:

Sex:

Residence:

Name of Hospital:

Infrastructure

1) Does the dialysis unit has the main entrance or reception area?

Yes. No

2) Does the dialysis unit has treatment rooms?

Yes. No

3) Does the dialysis unit has a separate clinical and nonclinical storage area?

Yes. No

Access

4) Is it easy to access the dialysis unit where the majority of patients arrive by car on daily basis?

Yes. No

5)Does the dialysis unit has separate walking and stretcher/ambulance patient arrival?

Yes. No

6) Does the dialysis unit have safe access for the delivery of food, clean linen, pharmacy, consumables, disposable items, and related removal of waste?

Yes. No

7) Does the dialysis unit has easy access from the waiting area to the patient treatment area?

Yes. No

8)Does it has a functional relationship of training and isolation rooms to the entry of the unit with access to outdoor space?

Yes. No

9) Is it easy to access public Parking for patients who are often debilitated and may need a visit on regular basis?

Yes. No

10) Does the waiting room has direct access to the toilet?

Yes. No

Patient care standards

11) Are patients monitored for an unexplained cluster of hemolytic pyrogenic and other unusual reactions?

Yes. No

12) Are bedridden patients in the correct position?

Yes. No

13) Is a record of physical examination per shift maintained?

Yes. No

14) Is the record of vitals and water balance per shift maintained?

Yes. No

Sterilization standards

15) Does the dialysis unit take into consideration the need to ensure a high level of infection control in all aspects of clinical and non-clinical practice?

Yes No

16) Does the staff have proper hand washing facilities and provision of PPE equipment, liquid soap, and paper towels?

Yes. No

17) Are machines properly sterilized in the dialysis unit?

Yes. No

18) Is the absence of chronic toxins from feed water verified on regular basis?

Yes. No

19) Are high-sensitivity methods for both water and dialysis fluid checked for bacterial growth?

Yes. No

20)Are central venous catheter clean with no externally clotted blood?

Yes. No

21) Are oxygen masks and nebulizers dried and protected after use?

Yes. No

Water treatment standards

22) Does the dialysis unit provide adequate water treatment services?

Yes. No

23) Does the dialysis unit ensure an adequate water distribution loop?

Yes. No

24) Does the dialysis unit include a backflow preventer, Feed water temperature controller, and multimedia depth filter?

Yes. No

25) Does the dialysis unit has ease of delivery of a large amount of dialysate on palettes to the unit on regular basis? Yes. No

Staff and Paramedics

26) Are paramedics qualified according to WHO criteria to perform their duty at the dialysis unit?

Yes. No

27) Are the technicians of the dialysis unit well-equipped and well-skilled for 24/7 maintenance of the dialysis unit?

Yes. No

Ambiance

28) Does the dialysis unit and especially the treatment area has access to natural light?

Yes. No

29) Does the dialysis unit has appropriately located windows and doors to enhance visual and acoustic privacy?

Yes. No

30) Does the dialysis unit ensures the isolation of noisy areas such as waiting rooms from clinical areas?

Yes No

31) Does the dialysis unit provide adequate sanitary facilities?

Yes. No

Privacy

32) Does the dialysis unit ensure the confidentiality of personal discussions and medical records?

Yes. No

33) Does the dialysis unit provide sufficient space within each treatment room to permit curtains to be easily drawn whenever required?

Yes. No

Power supply

34) Does the dialysis unit provide 24 hours stand-by power supply requirements?

Yes. No

Safety Protocols

35) Are WHO's five movements of hand hygiene followed by paramedics during patient dealing?

Yes. No

36) Are COVID-19 protocols followed in the dialysis unit?

Yes. No

37) Are patients screened for Hepatitis B, C, HIV, and others beforehand?

Yes. No