Performance of Pradhan Mantri National Dialysis Program (PM – NDP) in Kashmir.

Submitted to

Ministry of Health and Family welfare

Government of India

New Delhi -10001

Jaweed Ahmad

Population Research CentreDepartment of EconomicsUniversity of Kashmir

Srinagar-190006

January-2022

CONTENTS

List of Tables

PREFACE

Although free dialysis services were already running in about 30 states in 2016 in the country, in J&K, after a year delay, the process was set rolling in June 2017. National Health Mission office floated tenders on June 28, 2017, to hire services for "operationalization of Dialysis Service at 10 Identified District Hospitals in Jammu and Kashmir under (Pradhan Mantri National Dialysis Services Programme) through Public Private Partnership Mode". At that time 10 districts were selected for setting up dialysis centers where the service would be provided free of cost to patients requiring this life-saving procedure. Out of the 10 selected districts, five were from the Jammu division, four from the Kashmir division, and one from Ladakh.

In Kashmir, the dialysis centers were established in DH Anantnag, DH Pulwama, DH Baramulla, and DH Kupwara. In Jammu, district hospitals of Kathua, Udhampur, Kishtawar, Doda, and in Ladakh, DH Leh was given this facility for free dialysis. At that time patients in Kashmir have just 10 government sector dialysis units available, two at SMHS Hospital and eight at SKIMS Soura.

Now in J&K after a 4-year delay in materializing the 'National Dialysis Programme (NDP)' in the rest 11 districts dialysis centers were also established. Under this program free of cost dialysis sessions are conducted for patients from below the poverty line (BPL) economic group and for non-BPL patients, the benefit of accessing the services close to the community at the district hospitals at subsidized rates are being provided.

NHM under this program is committed to providing quality services at the doorsteps of the patients as most patients have very high out-of-pocket expenditure. It has proved to be a very useful intervention to support the State in improving health care by addressing the key issues of accessibility, availability, financial viability, and accessibility of services.

While approving the Annual Work Plan of the PRC during 2021-22, Ministry of Health and Family Welfare desired to assess the performance of Pradhan Mantri National Dialysis Program (PM – NDP) in Kashmir. PRC undertook this study in four districts of Kashmir Valley. The study was completed due to the efforts, involvement, cooperation, support, and guidance of several officials and individuals at different levels. We wish to express our thanks to the Ministry of Health and Family Welfare, Government of India for allowing us to be part of this exercise of National importance.

I thank Mr. Bashir Ahmad Bhat, Associate Professor of the PRC for his immense support and guidance during the completion of this study. I also thank the Medical Superintendents of all the selected District Hospitals and other staff working in the Dialysis Centres for their support in data collection. I also thank all the Kidney patients who shared their personal experiences about their utilization of Dialysis services. It is hoped that the findings of this study will be helpful to both the Union Ministry of Health and Family Welfare and the State Government in making necessary changes.

Jaweed Ahmad Mir

(Research Assistant)

1.Background

The burden of chronic kidney disease (CKD) is increasing in alarming proportions all over the world. In India lack of financial resources, lack of trained manpower & infrastructure leads to severe strain on existing health policies in the light of the increasing burden of CKD. Kidneys are probably the only vital organs that can be realistically replaced by artificial means. The kidneys have an important role in maintaining health. When the person is healthy, the kidneys maintain the body's internal equilibrium of water and minerals (sodium, potassium, chloride, calcium, phosphorus, magnesium, sulphate). The acidic metabolism end-products that the body cannot get rid of via respiration are also excreted through the kidneys. The kidneys also function as a part of the endocrine system, Erythropoietin is involved in the production of red blood cells and calcitriol plays a role in bone formation. Haemodialysis is currently the most common alternative treatment in patients with renal failure in the world.

Large inequities exist in access to dialysis. Two-thirds of the population of India lives in rural areas where the availability of HD is limited. According to one study, almost 60% of dialysis patients had to travel more than 50 km to access HD. The burden of travel increases costs and exacerbates the loss of wages. Further, women are under-represented, and there are few paediatric dialysis services. Shared decision-making is practiced infrequently and access to conservative care is virtually non-existent. There is variability in frequency, session length, and HD prescription. The globally accepted standard of thrice-a-week dialysis delivery is restricted to affluent patients getting dialysis in corporate hospitals. Twice-a-week HD is the most common practice, delivered in the majority of centers. 7,8 About one-quarter of patients receive once a week or “as-needed” dialysis for financial feasibility. Dialysis sessions are usually 3-4 hours long. The adequacy is not uniformly reported.

In 1913, Leonard Rowntree and John Abel of Johns Hopkins Hospital developed the first dialysis system which they successfully tested in animals. A Dutch doctor, Willem Johan Kolff, constructed the first working dialyzer in 1943 during the Nazi occupation of the Netherlands. 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. Gordon Murray of the University of Toronto independently developed a dialysis machine in 1945. Nils Alwall of Lund University in Sweden modified a similar construction to the Kolff dialysis machine by

enclosing it inside a stainless-steel canister. This allowed the removal of fluids, by applying negative pressure to the outside canister, thus making it the first truly practical device for hemodialysis. Always treated his first patient in acute kidney failure on 3 September 1946

1.2What is dialysis

A healthy person's kidneys filter around 120 to 150 quarts of blood each day. If the kidneys are not working correctly, waste builds up in the blood. Eventually, this can lead to coma and death. The cause might be a chronic, or long-term condition, or an acute problem, such as an injury or a short-term illness that affects the kidneys. Dialysis prevents the waste products in the blood from reaching hazardous levels. It can also remove toxins or drugs from the blood in an emergency setting.

1.3 Principle of Dialysis:

Dialysis works on the principles of the diffusion of solutes and ultra filtration of fluid across a semi-permeable membrane. Diffusion is a property of substances in water; substances in water tend to move from an area of high concentration to an area of low concentration. Blood flows by one side of a semi-permeable membrane, and a dialysate, or special dialysis fluid, flows by the opposite side. A semipermeable membrane is a thin layer of material that contains holes of various sizes, or pores. Smaller solutes and fluid pass through the membrane, but the membrane blocks the passage of larger substances (for example, red blood cells and large proteins). This replicates the filtering process that takes place in the kidneys when the blood enters the kidney and the larger substances are separated from the smaller ones in the glomerulus.

1.4 Osmosis diffusion ultra filtration and dialysis

The two main types of dialysis, haemodialysis and peritoneal dialysis, remove wastes and excess water from the blood in different ways. Haemodialysis removes wastes and water by circulating blood outside the body through an external filter, called a dialyzer, that contains a semipermeable membrane. The blood flows in one direction and the dialysate flows in the opposite. The counter-current flow of the blood and dialysate maximizes the concentration gradient of solutes between the blood and dialysate, which helps to remove more urea and creatinine from the blood. The concentration of solutes normally found in the urine (for example potassium, phosphorus, and urea) is undesirably high in the blood, but low or absent in the dialysis solution, and constant replacement of the dialysate ensures that the

concentration of undesired solutes is kept low on this side of the membrane. The dialysis solution has levels of minerals like potassium and calcium that are similar to their natural concentration in healthy blood. For another solute, bicarbonate, dialysis solution level is set at a slightly higher level than in normal blood, to encourage the diffusion of bicarbonate into the blood, to act as a pH buffer to neutralize the metabolic acidosis that is often present in these patients. The levels of the components of dialysate are typically prescribed by a nephrologists according to the needs of the individual patient. In peritoneal dialysis, wastes and water are removed from the blood inside the body using the peritoneum as a natural semipermeable membrane. Wastes and excess water move from the blood, across the peritoneal membrane, and into a special dialysis solution, called dialysate, in the abdominal cavity.

1.5 Types of dialysis:

People with failed or damaged kidneys may have difficulty eliminating waste and unwanted water from the blood. Dialysis is an artificial way of carrying out this process. Dialysis substitutes the natural work of the kidneys, so it is also known as renal replacement therapy (RRT). Healthy kidneys regulate the body's level of water and minerals and remove waste. The kidneys also secrete certain products that are important in metabolism, but dialysis cannot do this. A person who has lost 85 to 90 percent of their kidney function will be likely a candidate for dialysis.

There are three types of dialysis.

1.Intermittent haemodialysis (IHD)

2.Peritoneal dialysis (PD)

3.Continuous renal replacement therapies (CRRT)

The choice will depend on factors such as the patient's situation, availability, and cost.

1.6 Intermittent haemodialysis:

Th**e** kidneys are crucial for eliminating waste, and other functions. In haemodialysis Trusted Source, the blood circulates outside the body. It goes through a machine with special filters. The blood comes out of the patient through a flexible tube known as a catheter. The tube is inserted into the vein. Like the kidneys, the filters remove the waste products from the blood. The filtered blood then returns to the patient through another catheter. The system works like an artificial kidney. Those who are going to have haemodialysis need surgery to enlarge a blood vessel, usually in the arm. Enlarging the vein makes it possible to insert the catheters.

Haemodialysis is usually done twice a week, for 3 to 4 hours a day, depending on how well the kidneys work, and how much fluid weight they have gained between treatments. Haemodialysis can be done in a special dialysis centre in a hospital or at home. People who have dialysis at home, their caregiver, must know exactly what to do. If a person does not feel confident doing dialysis at home, they should attend sessions at the hospital. Home haemodialysis is suitable for people who have been in a stable condition while on dialysis and do not have other diseases that would make home haemodialysis unsafe for them. The home environment must also be suitable for taking haemodialysis equipment. This type is most common in India and in Jammu & Kashmir also.

1.7 Peritoneal Dialysis:

While haemodialysis removes impurities by filtering the blood, peritoneal dialysis works through diffusion. In peritoneal dialysis, a sterile dialysate solution, rich in minerals and glucose, is run through a tube into the peritoneal cavity, the abdominal body cavity that surrounds the intestine. It has a semi-permeable membrane, the peritoneal membrane. Peritoneal dialysis uses the natural filtering ability of the peritoneum, the internal lining of the abdomen, to filter waste products from the blood. The dialysate is left in the peritoneal cavity for some time, so that it can absorb waste products. Then it is drained out through a tube and discarded. This exchange, or cycle, is normally repeated several times during the day, and it can be done overnight with an automated system. The elimination of unwanted water, or ultrafiltration, occurs through osmosis. The dialysis solution has a high concentration of glucose, and this causes osmotic pressure. The pressure causes the fluid to move from the blood into the dialysate. As a result, more fluid is drained than is introduced. Peritoneal dialysis is less efficient than haemodialysis. It takes longer periods, and it removes around the same amount of total waste product, salt, and water as haemodialysis. However, peritoneal dialysis gives patients more freedom and independence, because it can be done at home instead of going to the clinic several times each week. It can also be done while travelling with a minimum of specialized equipment. Before starting peritoneal dialysis, the patient needs a small surgical procedure to insert a catheter into the abdomen. This is kept closed off, except when being used for dialysis. This is not appreciated in Jammu & Kashmir.

1.8 Dialysis outcomes (Mortality)

Mortality is very high among patients on dialysis, especially in the first 3 months following initiation of haemodialysis treatment. Approximately one-quarter of patients on haemodialysis die within a year of initiating therapy in high income countries and this proportion is even higher in Low Income Countries. Over the past two decades, reductions in the relative and absolute risk of mortality have seemingly been achieved for patients on haemodialysis. Data suggests that relative gains in survival may be greater for younger than for older individuals; however, absolute gains seem to be similar across age groups35. Although controversial, improvements in mortality risk seem to have been more rapid among patients on dialysis than for the general population, suggesting that better care of patients receiving dialysis treatments rather than overall health gains might be at least partially responsible for these secular trends. The factors responsible for these apparent trends have not been confirmed, but could include better management of co morbidities, improvements in the prevention or treatment of dialysis-related complications such as infection, and/or better care prior to the initiation of dialysis. Although short-term mortality was lower for patients treated with PD than for those treated with hemodialysis, the long-term mortality risk is higher with Peritoneal Dialysis.

1.9 Dialysis Scenario in India

Hemodialysis (HD) is the most common KRT modality in India. 3 The first HD was performed at Christian Medical College, Vellore, Tamil Nadu in 1961 on an erstwhile Maharaja under the supervision of Dr Satoru Nakamoto, who had flown in from Seattle, WA.13 Until 1970, only patients with acute kidney injury were dialyzed at 4 centers across the country, and maintenance HD was available at 6 centres in India till 1978.13 Growth in the following years was slow and HD was largely restricted to a few public and private hospitals in large cities until the 1990s. The number and distribution of HD units has increased over the last 20 years, and dialysis is available now in all 28 states and 8 union territories.3 The number of HD stations in India was estimated at 12,881 in 2018.3The 2016 National Dialysis Program envisages setting up an 8-station dialysis facility in all 688 districts of the country to provide HD to poor patients. If patients were dialyzing twice-a-week (commonly done in India), just about 50,000 new patients (representing about one third of the current requirement) would be accommodated under this program, even without future growth.14 Like much of secondary and tertiary level health-care services, dialysis service in

India is predominantly private sector driven, reflecting low public spending on healthcare. Public sector hospitals largely manage critically sick patients and those with acute kidney injury, leaving limited capacity for accommodating patients on maintenance dialysis. Large inequities exist in access to dialysis. Two-thirds of the population of India lives in rural areas where the availability of HD is limited. According to one study,2 almost 60% of dialysis patients had to travel more than 50 km to access HD, and nearly a quarter lived more than 100 km away from the facility. The burden of travel increases costs and exacerbates loss of wages. Further, women are under-represented,15 and there are few pediatric dialysis services. Shared decision making is practiced infrequently and access to conservative care is virtually nonexistent. There is variability in frequency, session length and HD prescription. The globally accepted standard of thrice-a-week dialysis delivery is restricted to affluent patients getting dialysis in corporate hospitals. Twice-a-week HD is the most common practice, delivered in majority of centers. 7,8 About one-quarter patients receive once a week or "as-needed" dialysis for financial feasibility. Dialysis sessions are usually 3-4 hour long. The adequacy is not uniformly reported.

Every year about 2.2 Lakh new patients of End Stage Renal Disease (ESRD) get added in India resulting in additional demand for 3.4 crore dialysis every year. With approximately 4950 dialysis centers, largely in the private sector in India, the demand is less than half met with existing infrastructure. Since every Dialysis has an additional expenditure tag of about Rs.2000, it results in a monthly expenditure for patients to the tune of Rs.3-4 Lakhs annually. This therefore leads to financial catastrophe for practically all families with such patients. It has been felt that both in terms of provision of this important lifesaving procedure and also for reducing impoverishment on account of out-of-pocket expenditure for patients, a Dialysis program is required. Accordingly, MoHFW with support from the National Health Systems Resource Centre (NHSRC) studied relevant models on dialysis services being practiced under PPP mode. Further, a consultation with experts in this field as well as private service providers was held in the Ministry of Health & Family Welfare to discuss Public Private Partnership (PPP) for the envisaged program.

1.10 Dialysis Patients in Jammu and Kashmir

Like other parts of India, Jammu and Kashmir is also showing an increasing trend in the dialysis patients. It has increased from 563 in 2020-21 patients to 952 in 2021-22 out of these 583 are registered at public facilities and more than 13382 sessions have been conducted.

Among these dialysis centers DH Anantnag is with highest registration of 88 patients and has conducted 3114 sessions till date and Reasi is with the lowest registration of one patient.

Much to the relief of kidney patients requiring dialysis in Union Territory of J&K, Health & Medical Education Department has made dialysis centres operational in all the 20 Districts of J&K. All these centres have been established under Prime Minister's National Dialysis Program (PMNDP) under the umbrella of National Health Mission in the District Hospitals namely Govt. Hospital Gandhi Nagar Jammu, DH Poonch, DH Udhampur, DH Kishtwar, DH Ramban, DH Reasi, DH Samba in Jammu Division and DH Budgam, DH Pulwama, DH Ganderbal, DH Shopian, DH Kulgam, DH Bandipora, JLNM Hospital Srinagar & SDH Kupwara from Kashmir Division and Associated Hospitals of New Govt. Medical Colleges at Baramulla, Anantnag, Doda, Rajouri & Kathua. Under This programme free of cost dialysis sessions are conducted for patients from below poverty line (BPL) economic group and for non-BPL patients the benefit of accessing the services close to the community at the district hospitals at subsidized rates of Rs 950 per session is being provided.NHM under this programme is committed to provide quality services at the doorsteps of the patients as most patients had to undertake frequent trips and often over long distances to access dialysis services incurring travel cost and loss of wages for the patients and family members leading to financial catastrophe for practically all families with such patients. In absence of a government-run facility, the patients were forced to seek treatment at the privately operated centers involving very high out of pocket expenditure by the patients. It has given a relief to such patients who are undergoing dialysis in private sector.

Table No: 1 Dialysis services in Jammu & Kashmir as on September 2021.

S.No:	Name of Districts	No. of functional Dialysis Machines	No. of Patients registered	No. of Dialysis sessions held	Cumulative No. of Patients registered	Cumulative No. of Dialysis sessions held
1	DH Anantnag	10	88	543	96	3114
2	DH Gandhi Nagar	8	0	0	31	131
3	DH Baramulla	8	64	401	92	2054
4	JLNM Srinagar	8	16	109	16	222
5	DH Kathua	8	18	158	24	696
6	DH Bandipora	5	15	102	15	645
7	DH Udhampur	6	10	57	15	392
8	DH Rajouri	6	21	106	31	583

9	DH Doda	6	37	218	50	1141
10	DH Pulwama	6	18	132	26	789
11	DH Kulgam	6	41	335	49	1527
12	DH Poonch	6	21	114	34	727
13	SDH Kupwara	6	25	187	58	856
14	DH Kishtwar	5	5	35	9	179
15	DH Shopian	5	2	18	2	31
16	DH Ganderbal	5	11	78	17	197
17	DH Budgam	5	4	18	8	24
18	DH Ramban	5	6	28	7	47
19	DH Samba	5	2	16	3	33
20	DH Reasi	6	0	0	1	1
Total No.	20	125	404	2655	583	13382

In Jammu and Kashmir under this program, 5 to 10 dialysis machines as per workload have been installed in each of the dialysis centers and a total of 123 machines stand installed to date in the UT of J&K of which 62 dialysis machines were provided by the Ministry of Health & Family Welfare, GoI, 40 by World Bank and rest 22 procured under National Health Mission in the UT. To date, more than 35,000 dialysis sessions have been conducted in these centers and registered over 952 chronic patients suffering from renal diseases in J&K.

1.11 Public Private Partnership for Hemodialysis services

Although access to dialysis, particularly hemodialysis (HD), has increased in recent years, only a minority of patients can continue long-term HD, mostly because of the high OOPEs. Making dialysis available to all who can benefit from the therapy will create additional demand for 34 million dialysis sessions in India. Taking into account the financial pressures on the affected households, the government of India recently announced a National Dialysis Service Programme (now referred to as the Pradhan Mantri National Dialysis Programme) to provide free dialysis services to the poor in public sector hospitals in its Union Budget 2016–17. Implementation of this ambitious program will involve the major augmentation of existing service delivery infrastructure. Alternatively, the government may consider purchasing dialysis services from the private sector. Presently, the National Dialysis Programme is in its nascent stages in India. The proposed program aims to deliver dialysis services to the poor through a public-private partnership model. In this program, the private

partner provides for medical human resources, dialysis machines, water treatment infrastructure, dialyzer, and consumables Based on consultation with experts and discussion with some of the states implementing the Dialysis program in the PPP mode, the J&K government has decided that all the private dialysis centers will provide services in PPP mode and the patients will be benefited financially through health schemes such as Rashtriya Swasthya Bima Yojana (RSBY) funded by Govt. of India which covers hemodialysis procedure commonly known as Golden Card. But unfortunately, out of four visited private dialysis centers, only two were covered under this scheme, and the rest two were trying for its registration but it is a burden on patients OOPE they are less interested in getting the formalities done so that these suffering people will feel a ray of relief.

1.12 Financing the program

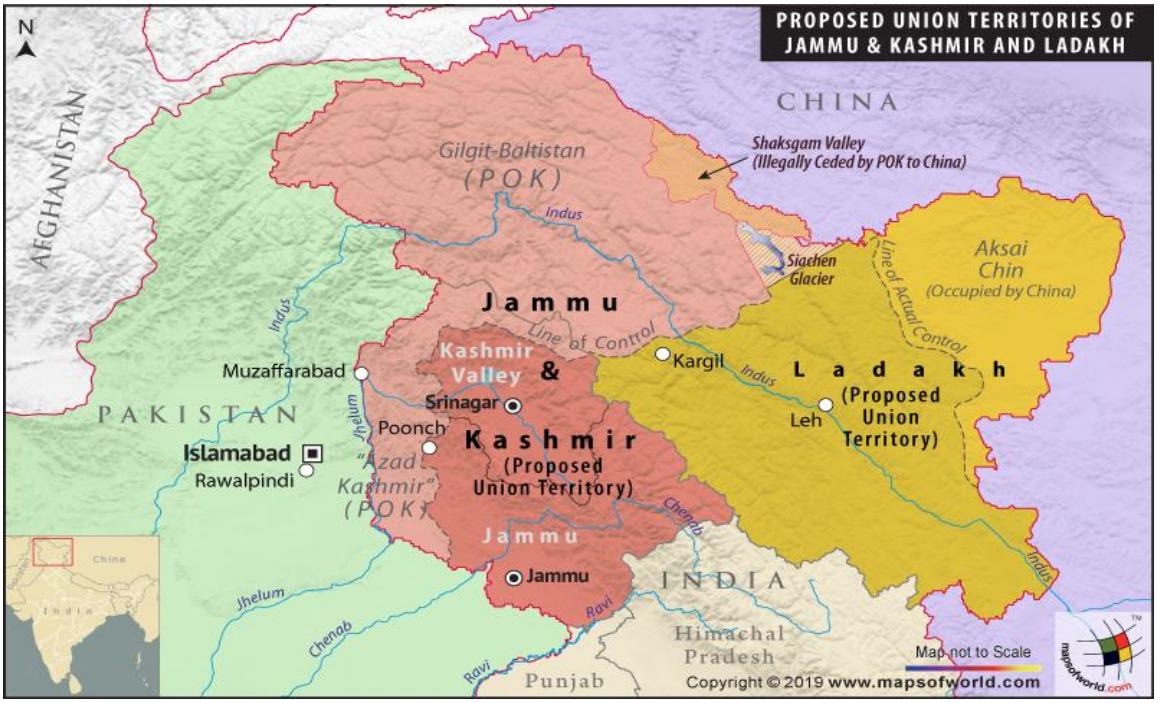
Currently, under NHM 100 % of the service procedure fees for patients from below the poverty line (BPL) economic group is proposed to be covered. However, non-BPL patients would have the benefit of accessing the services close to the community at the district hospitals at the same rates as paid by the Government for the BPL patient. While there are health schemes such as Rashtriya Swasthya Bima Yojana (RSBY) funded by Govt. of India which cover hemodialysis procedures, it is evident that due to the high cost and recurring sessions required over the lifetime, the total cost for providing dialysis cannot be adequately covered. However, for BPL families registered under RSBY, the cost of dialysis care shall be catered through RSBY funding up to its maximum coverage. The additional resources required would be provided to the state under the National Health Mission.

1.13 PRIME MINISTER'S NATIONAL DIALYSIS PROGRAMME (PM-NDP)

The burden of end-stage renal disease (ESRD) is rising dramatically in India, with the proportion of deaths due to kidney failure increasing from 2.1% in 2001–3 to 2.9% in 2010–13. The age-adjusted incidence of ESRD in India is 226 per million population [2]. It is estimated that 220 000 new ESRD patients are added to the pool every year. Dialysis is a life-sustaining treatment modality for these patients. The shortage of nephrologists, late referral of patients, inadequate health awareness about preventive measures, and a lack of more cost-effective alternatives like renal transplantation or peritoneal dialysis (PD) are important issues in the provision of care to ESRD patients. Unequal distribution of nephrologists, with a concentration in large cities and the private sector, are major barriers to equitable provision of

dialysis to all sections of society. Inadequate insurance coverage further aggravates the situation. Furthermore, 70% of those who start dialysis in India eventually give up dialysis due to financial constraints or death. Thus only 10–20% of dialysis patients in India continue long-term treatment. This high need for care is particularly relevant given the way health care is financed in India. Most of the health expenditures in India are borne by households as direct out-of-pocket expenditures (OOPEs). This poses significant barriers to accessing services. About 60 million households are pushed below the poverty line every year in India as a result of OOPEs. Although access to dialysis, particularly hemodialysis (HD), has increased in recent years, only a minority of patients can continue long-term HD, mostly because of the high OOPEs. Making dialysis available to all who can benefit from the therapy will create additional demand for 34 million dialysis sessions in India. Taking into account the financial pressures on the affected households, the government of India recently announced a National Dialysis Service Programme (now referred to as the Pradhan Mantri National Dialysis Programme) to provide free dialysis services to the poor in public sector hospitals in its Union Budget 2016–17. Implementation of this ambitious program will involve the major augmentation of existing service delivery infrastructure. Alternatively, the government may consider purchasing dialysis services from the private sector. Presently the National Dialysis Programme is in its nascent stages in India. The proposed program aims to deliver dialysis services to the poor through a public-private partnership model. In this program, the private partner provides for medical human resources, dialysis machines, water treatment infrastructure, dialyzer, and consumables. The state government provides space, power, and water within district hospitals to provide dialysis care. It is important to note that dialysis is not the final curative treatment for those with ESRD. The management of ESRD needs to be considered on a holistic basis, which implies adequate attention on the prevention of ESRD through better primary and secondary prevention strategies. There is also a need to develop capacity and infrastructure for the provision of renal transplantation. PD, found to be cost-containing in the long term, should be strongly considered in the low- and middle-income country.

Fig: 01. Demographic and socio-economic features of Jammu and Kashmir.



The total population of the country is 1210 million which Jammu and Kashmir comprise 12 million accounting

roughly one percent of the total population of the country. The decadal growth rate of the population is 31 percent substantially higher than the national decadal growth rate of 21 percent.

The population grew by 70 percent during 1991-2011, with a much higher rate than in 1981-91. The crude birth rate and crude death rate of the State are lower than the national average (Table 1). Infant and child mortality rates are good indicators of socio-economic development and the status of health and population programs. The infant mortality rate has come down from 50 in 2001 to 26 in 2017 which is lower than the national average of 34. The total fertility rate of the State is 1.9 which is lower than the national average of 2.4. The sex ratio, which has alarmingly come down from 933 in census 2001 to 883 in census 2011 is lower than the national sex ratio (940 females per thousand males). The scheduled caste population of the State is only 8 percent against 16 percent in the country. However, the scheduled tribes of the State are higher (11 percent) than the national average (8.6 percent). The literacy rate in the State has improved by more than 14 percentage points from 54 percent in 2001 to 68.7 percent in 2011. The literacy rate for the population of seven years and above is 78 percent for males and 58 percent for females and 69 percent for the total population, although it is lower than the national average. The detailed figures of major health and demographic indicators are mentioned in Table 2.

Table 2: Demographic Characteristics of Jammu and Kashmir and India		
Indicator	J&K	India
Total Population (Crores)	12.54	1210.19
Decadal Growth (percent)	31.42	21.54
Crude Birth Rate (SRS 2017)	15.7	20.4
Crude Death Rate (SRS 2017)	5.2	6.9
Natural Growth Rate (SRS 2017)	10.8	14.0
Infant Mortality Rate (SRS 2017)	24	34
Maternal mortality Rate (SRS 2011)	NA	254
Total Fertility Rate (SRS 2014)	1.9	2.4
Sex Ratio (Census 2011)	883	940
Child Sex Ratio (Census 2011)	859	914
Schedule Caste Population (percent) (Census 2011)	8.0	16.6
Schedule Tribe Population (percent) (Census 2011)	11.0	8.6
Total Literacy rate (percent) (Census 2011)	68.74	74.04
Male Literacy Rate (percent) (Census 2011)	78.26	82.14
Female Literacy Rate (percent) (Census 2011)	58.01	65.46

Source: Census 2011 and (SRS 2017) Government of India.

2. Introduction:

Kidney disease is an increasingly important public health concern because of the large numbers of patients affected, the low levels of awareness, interaction with other diseases, the associated diagnostic and management challenges, and the high cost of care.2 These challenges are particularly concerning in low-resource settings, where decision-makers must make difficult choices about how to ensure equitable access to treatments despite scarce resources and many competing priorities.3 Recent estimates suggest that around 850 million people worldwide have some form of kidney disease.4 Kidney diseases can be acute or chronic. Acute kidney injury (AKI) may occur following a range of insults, including but not limited to infections, use of nephrotoxic medicines (often available over the counter) and traditional remedies, complications of pregnancy such as preeclampsia, environmental hazards, or trauma. In addition to its short-term consequences, AKI is an important risk factor for chronic kidney disease (CKD). CKD has many causes, both inherited and acquired. Some

causes and risk factors for CKD, particularly diabetes, hypertension, and glomerulonephritis, are well known. Others, such as preeclampsia, infections, use of traditional remedies, and environmental causes, have been recognized recently.6-8 Congenital anomalies of the kidney and urinary tract, hereditary nephropathies, and glomerulonephritis are important causes of CKD in children.

This program was launched on World health day, April 7, 2016, in India and the same year in Jammu and Kashmir. End-Stage Renal Disease continues to be a result of the existing and emerging burden of non-communicable disease. Providing renal transplant facilities for ESRD patients depends upon the availability of infrastructure and robust organ donation system coupled with adequate availability of trained qualified manpower. Within the limited choices, dialysis practically remains the first and in a majority of cases, the only choice for ESRD patients. Every year about 2.2 Lakh new patients of End-Stage Renal Disease (ESRD) get added in India resulting in additional demand for 3.4 Crore dialysis every year. With approximately 4950dialysis centers, largely in the private sector in India, the demand is less than half met with existing infrastructure. Since each Dialysis has an additional expenditure tag of about Rs.2000, it results from the expenditure for patient's minimum of Rs. 1 lakh annually. Besides, most families have to undertake frequent trips, and often over long distances to access dialysis services incurring heavy travel costs and loss of wages for the patient and family members accompanying the patient. All District Hospitals (DHs) of Jammu and Kashmir have functional Dialysis Centre with almost all the required facilities available. The major constraints in receiving appropriate treatment include the high cost in private sectors, Centers located in Metro cities & Medical colleges with a limited number of Nephrologists, etc. Keeping this in mind, strengthening District Hospitals by providing affordable multispecialty care including dialysis services in district hospitals is an important step in this direction.

To gain from the available capacity of the private sector existing in the dialysis care segment and their capability to install and operate dialysis care systems in quick time and compliment the emerging strengths of the public sector such as availability of drugs and diagnostics, the Dialysis program has been undertaken in Public-Private Partnership in some districts. Thus, this study is initiated to analyze these clinics to know the outcome of this program in J&K.

2.1 Objectives

1. Object of this study is to assess the availability of infrastructure, human resources, and availability of other logistics available at Dialysis Centers in the public sector and private sector hospital.

2. The study also examines the performance of the dialysis Centers and suggests various measures to improve the services provided at dialysis clinics.

2.2 Methodology

J&K has a total of 20 districts. The present study will be conducted in the Kashmir division which has a total of 10 districts and out of which four districts will be selected namely Anantnag, Baramulla, Kulgam, and Ganderbal. In each district, two dialysis centers, one public, and one private is selected. These dialysis centers were assessed physically and one questionnaire was for each selected facility to know the staff strength, equipment, and outcome of the services. At each selected facility in the district at least (20-25) patients depending on the availability of beds have been included in the survey by interviewing through a questionnaire designed as per guidelines of the program. Further to observe the grass-root level implementation of the Programme in each district data was also collected by directly questioning the State Nodal Coordinator and in charge Medical Officers using a pre-designed questionnaire on the functionality of dialysis clinics. utilized for the HD unit were determined from stock registers, supplemented by direct observation. Assumptions regarding the life of the equipment were made after discussion with experts. Prices for equipment, consumables, and medicines were obtained from department records or the hospital procurement section.

2.3 Infrastructure

The study is a district-level public sector and equally private sector dialysis centers study in the Kashmir division. The study has an exclusive 8-station HD unit that operates one to three shifts, with each HD session lasting 3.30 to 4 h. More details on infrastructure are provided in the supplementary material. An independent water treatment plant provides high-quality water for this HD unit. The Availability of ins fracture and bed capacity is given in Table No:03

Table No: 03Availability of infrastructure and Bed Capacity of Dialysis centres in Kashmir.

S.No.	Name of Districts	Total No. of Dialysis Machines	No. of functional Dialysis Machines	No. of non functional Dialysis Machines	No. of Monitors available?	No. of non-functional monitors	No. of non-functional monitors	No. of dialysis machines for Hip -B positive unit
1	DH Anantnag	10	8	2	6	0	6	2
2	DH Kulgam	6	6	0	5	0	5	1
3	DH Ganderbal	5	5	0	5	0	5	0
4	DH Baramulla	8	8	0	7	0	7	1
5	IFDC Anantnag	5	5	0	5	0	5	0
6	Lords Kulgam	5	5	0	5	0	5	0
7	AL Noor Ganderbal	10	8	2	8	0	8	2
8	Gooru Hospital	8	8	0	7	0	7	1
9	Total	**57**	**53**	**4**	**48**	**0**	**48**	**7**

In visited facilities as per guidelines set by MoHFW GoI for dialysis centers for a single functional bed must have a space of 12x10 (120) sq ft. or 10x10 (100) sq. ft but it was found that none of the facility has required space for beds. No required space for the waiting hall or for the attends is available in any visited health dialysis center. The minimum space of the dialysis center as per MoHFW guidelines is shown below in the table No:4

Table N0: 04 Recommended Minimum space for haemodialysis centre shall be as follows:		
S.No:	**Area**	**Minimum requirement**
1	**Reception Area**	**30 sq mtrs**
2	Waiting Area Public Utilities	
Treatment Room		
3	**Bed Space**	**80 sq mtrs**
4	**Procudure Room**	
5	**Staffchanging Room**	

6	**Dirty Utility**	
7	**Clean Utility Store**	
8	**Dialyzer Cleaning Area**	
9	**Toilet**	
10	**Store Room**	
11	**CAPD Training Area**	
12	**Store & Pharmacy**	**20 Sq mts**
Administrative Department		
13	**Accounts office**	**20 Sq mts**
14	**Medical Records**	
Water Treatment Area		
15	**RO Plant**	**20 Sq mts**
16	**Water Pump**	
Generator		
17	**Generator**	**5 Sq mts**

It was observed that all the dialysis centers in the public or private sector have inadequate space. In the case of the public sector, all the dialysis centers have been adjusted in the DH already constructed but no center was designed in these buildings resulting in insufficient space forwards and waiting area. When we analyze the bed capacity of these dialysis centers out of 8 dialysis centers 3 out of 4 public and 3 out of 4 private facilities have 6 to 8 beds while only two dialysis centers one each from public and private dialysis centers have only 10 beds available but out of only one ten bedded public dialysis center DH Anantnag 2 beds are still un- installed because of non-availability of RO.

Table No:05 Beds Availability in Dialysis Centres

S.No	**Beds**	**Public**	**Private**	**Total facilities**
1	<5	0	o	0
2	6 to 8	3	3	6
3	9 to 10	1	1	2
	Total	4	4	8

Intradialytic monitoring of hemodynamic parameters is an active area of research; future developments in this field will decrease intradialytic morbidity and the mortality of end-stage renal disease patients treated by hemodialysis. Recent investigations have been assisted by the development of devices that can continuously and noninvasively measure hematocrit and plasma protein concentration during the treatment. Intradialytic morbidity, fluid overload, and hypertension in chronic hemodialysis patients have been shown to be associated with either large or small intradialytic decreases in blood or plasma volume that can be routinely measured by these devices. The use of intradialytic changes in blood volume as a feedback control parameter to vary the ultrafiltration rate and dialysate sodium concentration, so called profiling, is now possible, but further research in this area is necessary to show how to optimize the control algorithms. Other, more preliminary studies suggest that monitoring of central blood volume, extracellular volume, and cardiac output during hemodialysis may permit improved hemodynamic stability during treatment and better control of blood pressure. Although optimal application of these techniques and devices remains to be shown, their routine use during maintenance hemodialysis therapy will likely be the standard of care in the near future.

While we analyse the availability of monitors in the dialysis centers only two public facilities have 1 to 4 monitors and in private dialysis centers only 3 have 1 to 4 monitors. While 5 to 8 monitors are in two public facilities and in one private facility. while the staff in the public facilities is of the opinion that each dialysis machine must have a monitor to facilitate the patient in case of any emergency as was observed during our visit in DH Baramulla, they had to shift patient from non-monitored bed to monitor fitted bed. The details of monitors are in table :06

Table No:06 Availability of Monitors in Dialysis Centres

S.No	Monitors Available	Public Facility	Private Facility	Total Facilities
1	1 to 4	2	3	5
2	5 to 8	2	1	3
	Total	4	4	8

2.4Availability of beds for Hepatitis B and C Patients

As Hepatitis virus infections continue to be a major concern in the dialysis setting. We studied levels of hepatitis B surface antigen (HBsAg) and hepatitis C virus (HCV) RNA

contamination in dialysis units to better define the role of the dialysis environment and machines in the nosocomial transmission of hepatitis viruses. Possible contamination by hepatitis B virus (HBV) and HCV was studied by collecting environmental samples in 3 dialysis units located in Rome, Italy. Samples and controls were tested for HBsAg by a microparticle enzyme. Conversely, the finding of HCV RNA contamination on a dialysis machine not dedicated to HCV-positive patients suggests that isolation of HCV-infected dialysis patients and the use of dedicated machines are unjustified. Major attention should be given to strict adherence to infection control measures in the dialysis setting. Although many viruses and diseases can affect your health, the most important ones that you should be aware of while on hemodialysis are Hepatitis B, Hepatitis Cand HIV/AIDS. The distribution of beds availability for non-infectious or Hepatitis B, Hepatitis Cand HIV/AIDS negative patients out of 53 functional beds only 4 are available in the public sector and 3 are available in private dialysis centers. The distribution is given in Table No. 08 below.

Table No:08 Availability of beds for non-Hep B patients in Kashmir.

S.No:	Dialysis Machines Available for	Beds In Public Facility	Beds In Private Facility	No. of Public Facility	No. of Private Facility	Total Beds
1	Negative unit	23	23	4	4	46
2.	Positive unit	4	3	3	3	07

There is no bed available in DH Ganderbal and Lords hospital Kulgam for Hepatitis B and Hepatitis C and positive patients.

3. Human Resource

India has one of the lowest densities of nephrology workforce worldwide. There are only about 2,600 nephrologists (1.9 per million population), and there is a chronic shortage of dialysis nurses and technicians. There are about 72 nephrology training programs with an intake of approximately 150 trainees every year who go through a 3-year course. Similar statistics for other personnel are not available. Nurses are required to receive 6 months of practical training in the dialysis unit in addition to basic nursing training, and dialysis technicians undergo a certificate course in dialysis technology. Some stand-alone dialysis centers are run by dialysis technicians and not regularly supervised by nephrologists. Other

multipurpose workers provide sanitation, machine cleaning, and dialyzer reprocessing services. Very few centers have access to renal dieticians.

The dialysis center is led by a medical director specializing in nephrology, and a nursing supervisor, responsible for the management of the medical and nursing staff respectively. Each treatment shift is supervised by a physician (except in the case of a Limited Care Unit (LCU)) and a renal nurse is assigned to realize the dialysis treatment of up to 4-6 patients, depending on the level of assistance required by local regulations. The renal nurses are assisted by dialysis technicians, depending on the sanctioned strength. Depending on their size and location, the dialysis center may have additional administrative and technical support staff. As per the (Guidelines for Dialysis Centre Page 6 6.2.) of Ministry of Health GoI, a dialysis center must have a qualified Nephrologist, having DM or DNB in nephrology or its equivalent degree shall be the head of the center. In areas where there is no qualified Nephrologist, a certified trained dialysis physician (as per local law and regulation) shall be the head of the center. The center shall have qualified or trained medical staff, dialysis technicians, Staff nurses, and other support staff as per the scope of service provided and the medical care shall be provided as per the requirements of professional and regulatory bodies. Periodic skill refresher training shall be provided for all categories of the staff as relevant to their job profile, as prescribed by professional resource persons of the field so that the staff can get knowledge of every new technique and method and will enhance their skill potential.

Like other dialysis centers of India Jammu and Kashmir is also facing an acute shortage of staff in dialysis cents the public sector dialysis centers are mostly run by the internal arrangement of the staff they have trained some paramedical staff with a short period of training and are running these dialysis centers the earlier established dialysis centers have been given two technicians and 4 FMPHW for these dialysis centers but the newly established 10 districts are running on purely internal arrangement. There is no qualified Nephrologist, having DM or DNB in nephrology in position in any of the visited dialysis public dialysis centers. The availability of staff in public dialysis centers is given below in Table No; 9

Table No: 9 Man Power Regular/ NHM in visited public Dialysis institutions.									
	Staff details at Dialysis Centre	**GMC Anantnag**		**DH Kulgam**		**DH Ganderbal**		**GMC Baramulla**	
S.No:	Staff details	**Sanction**	**In Position**	**Sanction**	**In Position**	**Sanction**	**In Position**	**Sanction**	**In Position**
1	Nephrology Senior consultant	1	0	0	0	0	0	0	0
2.	Dialysis Medical Officer	1	1	1	1	1	1	1	1
3.	Dialysis Technicians	2	2	**Internal arrangement**	3	**Internal arrangement**	**2**	**Internal arrangement**	**2**
4.	Technical Assistants	**Internal arrangement**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
5.	Lab. Technicians	0	0	0	0	0	0	0	0
6.	Nurses From NHM	4	4	4	4	4	4	**Internal arrangement**	1
7.	Staff Nurses	**Internal arrangement**	2	**Internal arrangement**	5	**Internal arrangement**	1	**Internal arrangement**	3
8.	Housekeeping staff	0	0	0	0	0	0	0	0
9.	Patient: Housekeeping	0	0	0	0	0	0	0	0
10.	Nursing orderly	**Internal arrangement**	2	**Internal arrangement**	1	0	0	0	0
11.	Sweepers	**Internal arrangement**	1	**Internal arrangement**	1	**Internal arrangement**	1	**Internal arrangement**	1
12.	Receptionist	0	0	0	0	0	0	0	0
13.	Medical transcriptionist	0	0	0	0	0	0	0	0

In private institutions the position it not better than the public sector dialysis centers.There is no proper documentation and distribution in case of staff strength in these dialysis centers because these private dialysis centers are providing multi-speciality health related activities and thus, they shift their staff from one place to other. In our visited dialysis centers only one dialysis centre in Anantnag namely Interferon Kidney Care Diabetes & Dialysis Centre have a nephrologist in position basically he is the owner of this dialysis centre. Theavailability of staff invisited private dialysis centers is given below in Table No :10

Table No: 10 Man Power Available at Private visited Dialysis enters.					
	Facility and Services	**IFKCDC**	**Lords Hospital**	**Al Noor DHC**	**Gooru Hospital**
S.No:	Staff at Dialysis Centre	In Position	In Position	In Position	In Position
1	Nephrology Senior consultant	1	0	0	Once in a week
2.	Dialysis Medical Officer	0	0	0	0
3.	Dialysis Technicians	2	1	1	1
4.	Technical Assistants	1	1	2	3
5.	Lab. Technicians	1	0	0	0
6.	Nurses	3	5	2	1
7.	Staff Nurses	1	0	1	0
8.	Housekeeping staff	0	0	0	0
9.	Patient: Housekeeping	1	1	0	1
10.	Nursing orderly	1	0	0	1
11.	Sweepers	1	1	1	1
12.	Receptionist	0	0	0	0
13.	Medical transcriptionist	0	0	0	0

3.1 Patient Staff Ratio

Kidney disease is an increasingly important public health concern because of the large numbers of patients affected, the low levels of awareness, interaction with other diseases, the associated diagnostic and management challenges, and the high cost of care. These challenges are particularly concerning in low-resource settings, where decision-makers must make difficult choices about how to ensure equitable access to treatments despite scarce resources and many competing priorities. Recent estimates suggest that around 925 people in J&K have some form of kidney disease. Kidney diseases can be acute or chronic. Acute kidney injury (AKI) may occur following a range of insults, including but not limited to infections, use of nephrotoxic medicines (often available over the counter) and traditional remedies, complications of pregnancy such as preeclampsia, environmental hazards, or trauma. In addition to its short-term consequences, AKI is an important risk factor for chronic kidney disease (CKD). CKD has many causes, both inherited and acquired. Some causes and

risk factors for CKD, particularly diabetes, hypertension, and glomerulonephritis, are well known. Others, such as preeclampsia, infections, use of traditional remedies, and environmental causes, have been recognized recently.6-8 Congenital anomalies of the kidney and urinary tract, hereditary nephropathies, and glomerulonephritis are important causes of CKD in children. The services of dialysis are being provided through 20 public facilities and an almost equal number of private dialysis centers. In the public sector, we have 125 beds available to provide services to 583 patients while 342 patients are receiving dialysis services through private dialysis centers in J&K. in many districts the services were started in June 2021 and these centers have a shortage of manpower and have accommodated fewer patients one patient in DH Reasi and 5 in DH Ganderbal. Anantnag is the highest in accommodating 86 patients and has provided 3114 sessions till September 2021. Dialysis centers functioning in DH Gandhi Nagar, DH Samba, DH Reasi, and DH Ramban have started only one session due to a lack of trained staff. During the same period, 13382 sessions have been conducted successfully with a duration of about 3.50 hrs per session. In visited facilities, we have Anantnag with the highest patient registration and highest sessions provided to the patients at the same time this facility is also having a long list of 91 patients waiting for the turn in a public facility but in our visited facilities DH Ganderbal was the lowest in registration with 5 and sessions 15 per week. In the visited facilities there are only 53 beds functional while in DH and Al Noor 2 beds each were non-functional due to the non-availability of RO capacity and space in the designated dialysis ward Improving the quality of care delivered to patients receiving in-center dialysis treatment remains a perpetual concern with stakeholders. Quality indicators traditionally have focused on such items as the adequacy of dialysis, anemia management, patient survival, and, most recently, the percentage using arteriovenous fistulas. Largely overlooked in the quest for improvement has been adequate consideration of dialysis clinic staffing levels. Staffing is important because it has been identified as a structural measure of quality. The distribution is shown in Table No: 11.

Table No: 11Service provided Of the Dialysis Centre During last Three Months

District	Facility Type	Total number of Beds available	Total number of patients per week	Month wise Total Sessions held during last	No. of patients sessions cancelled	No of patients waiting for dialysis as on date	Patient: Technician ratio	Patient: Nurses ratio .
DH Anantnag	**Public**	8	72	864	8	91	24;1	8.01
DH Kulgam		5	45	910	0	0	15.04	15.02
DH Ganderbal		6	5	75	8	7	6.01	2.01
DH Baramulla		5	35	150	0	0	15.02	15.06
IFDC Anantnag	**Private**	5	15	910	8	0	15.04	8.01
Lords Kulgam		8	45	910	0	0	3.01	3.01
AL Noor Ganderbal		8	72	1066	8	0	15.04	8.01
Gooru Hospital		8	35	420	0	0	15.04	8.01

Focusing on nephrologists, nurses, patient care technicians, dietitians, and social workers, this article suggests areas of needed research. As we know that the dialysis program has been launched in a phased manner early it was launched in 10 districts in 2017 and 2021 in other remaining districts. But this program has faced many challenges and the biggest challenge to provide space to established the dialysis centers as all the centers were not pre-planned and the space provided as per the requirement is not sufficient another challenge was staff this is the reason that in public facilities no required staff was provided at the time of when the dialysis centers were established by an internal arrangement was made to make these public facilities functional. This gap concerning the technicians is highest in Anantnag as there are only two technicians and the ratio is one technician for 24 patients and best technician ratio in public dialysis centers is in DH Kulgam where this ratio is one technician for 3 patients. in case of private dialysis centers the staff, the position was not clear and as per their record shows one technician for three patients which is not possible as the bed capacity was not more than 6 beds in these centers and no clear record was maintained for the staff of dialysis centers.

3.3 Administrative area

The facility administrator (FA) at a dialysis center is the person who manages the entire center. The FA is responsible for all aspects of a center's operation and is a problem solver for any issues that may arise. Most facility administrators are dialysis nurses, although some are social workers, dietitians, or have a background in business. Before someone becomes a patient, they may meet with an FA. The FA welcomes prospective and new patients by giving

tours of the dialysis center, explaining the process, and answering initial questions. When patients first begin dialysis, the FA will make sure they fill out all the necessary paperwork. Because success at a dialysis center is measured by how well patients respond to their dialysis treatments, the FA will monitor each patient's clinical outcomes with the center's nurses. To provide service excellence to all patients, a Quality Index (QI) is established. The QI is a score that measures how well each clinic is doing by looking at several factors regarding patient outcomes. The FA monitors the QI score for their center, starting administrative, management, and leadership skills, they were promoted to FAs. These qis are based on many indicators and services available in the dialysis center. In visited many indicators are disappointing and directly affect the patient care.

In table the indicators are given which affect the patient services and all visited centers lack these facilities which are there is no separate office, Transcriptionist area, Conference room, separate male and female beds, Isolation room, dialyzer reprocessing room, station, and change room along with anesthesia trolley for making AV fistula and Recovery room available with 5 recliner beds. These facilities were not present in both public and private dialysis centers. Table No:11 explains administrative requirements as under.

Table No :11 Availability of Administrative Requirements.

Facility Type	Anantnag	Kulgam	Ganderbal	Baramulla	Anantnag	Kulgam	Ganderbal	Baramulla
	Public				Private			
Administrative area								
Do you have a separate office available for dialysis unit?	No	No	No	No	No	No	No	No
Is Transcriptionist area along with pantry for the doctors, staff and patients available?	No	No	No	No	No	No	No	No
Is Conference room Available:	No	No	No	No	No	No	No	No
Is Haemodialysis area for Positive patients available?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is No. of beds for Male and Female	No	No	No	No	No	No	No	No
Is Isolation room Available,	No	No	No	No	No	No	No	No
Is Dialyzer reprocessing room available?	No	No	No	No	No	No	No	No

Is Dialyzer storage room Common for positive and negative patients available?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is station and change room along with anaesthesia trolley for making AV fistula available?	No	No	No	No	No	No	No	No
Is Recovery room available with 5 recliner beds?	No	No	No	No	No	No	No	No
Is Doctors duty room available?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The facilities which were present are dialysis storage and the doctors' room was available in all centers. A fire extinguisher and some LCDs were installed for recreation. Toilet facilities in all the visited centers are common for staff, patients, and attendants. even in DH Baramulla toilets were used as stores as both the washroom were leaking and at other centers, this facility was not satisfactory. The canteen facility is not available at any public facility while it is available at two private dialysis centers only.

4. Key conclusion and findings

4.1 Main Findings

a) Nephrologists are not available in any of the Dialysis Units and all the Units are looked after by General physicians. The two sanctioned positions of Dialysis technicians under NHM are vacant in all the public Dialysis Centre. However, all sanctioned positions of FMPHWs are in place.

b) The space for the Dialysis Centre as per the guidelines of the Directorate General of Health Services is not available in any of the dialysis centers visited by us.

c) Facilities for non-invasive blood pressure monitoring and ECG monitoring of patients are not available for all patients in the visited centers.

d) Adequate toilets for consultants, technicians, patients & patients' relatives are not available in any of the Dialysis Units.

e) Thirty percent of the dialysis machine is not fitted with monitors. Private Hospitals have few monitors available.

f) Areas for dialyzing patients having viral diseases (HBV/HCV) should be separated from those patients not having any viral infections. These facilities are available only in Public facilities but not in any visited Private facility.

g) Separate Laboratory service is not available in any visited Dialysis center.

h) Free dialysis services are not provided by two of the visited private DCs as they have not been impaneled under PMJAY.

i) All the Government facilities have a long list of patients waiting for dialysis services

j) Out of pocket expenditure for one dialysis session in private DC is about Rs1650/= except for tests and medicines. While it is free in public dialysis centers.

k) Government dialysis Centre located in DH Anantnag and Baramulla provides services to almost 24 to 70 patients per week and private Units on average provide to 15-30 patients.

Record keeping is very poor particularly at private health care units and special attention needs to be taken on recording and reporting of the services.

l) There is a need to increase the number of Dialysis machines in public health families to minimize the waiting list.

m) No separate toilets are available for patients, attendants, and staff in any visited center.

n) No dialysis centers maintain records properly. Though public centers maintain registers private centers have no records and data available.

4.3 Recommendations

Based on the findings of the present study, Populations Research Centre, University of Kashmir, recommends the following measures for improving the quality services of these dialysis centers. Dialysis is growing rapidly in India, but there is room to improve access and quality of service. With commitment from the union and state governments and the entry of new service providers, scaling up of service delivery seems a realistic goal. While HD is the dominant modality, wider adoption of PD might allow more rapid and equitable expansion, including to remote rural areas.

The development of a registry would allow ongoing monitoring of quality-of-service delivery, provide iterative feedback for service improvement and allow international

comparisons. For maximum impact, dialysis services should develop as a component of an integrated kidney replacement therapy program that includes kidney transplantation for suitable subjects and conservative care for those deemed to be unsuitable for dialysis. Finally, the health systems should be reoriented to increase focus on primary care that priorities early detection and prevention of progression of kidney disease.

1. All Dialysis centers shall be provided with a Nephrologist, having DM or DNB in nephrology in every dialysis center. And the doctor should have around during each session to interact with the patients and ensure patient care in the center.

2. Dialysis technicians (two for each Dialysis center) and 4 FMPHW/Nurses shell be appointed to optimize the service delivery in the centers so that all patients can be benefited.

3. Infrastructure must be provided as many facilities have 0nly 5 or 6-bed capacity and a smaller number of monitors both bed strength must be strengthened by providing, Dialysis Machines, Monitors and dialyzers.

4. Laboratory services shell be provided separately to these dialysis Centers.

5. All centers shall provide at least three session dialysis services per day to coop -up the waiting patients.

6. The roaster of the patients should be prepared in such a manner so the patients living in far-flung areas can get a session at the time which is convent to them to reach home well in time.

7. Patients on dialysis shall be given medicine free of cost or on the Golden Card as they have to purchase it OPE which is a burden for them in the situation.

8. Necessary steps should be taken so that the Golden card should cover the purchase of drugs, Lab expenditure of patients to reduce their OPE.

9. Behavior of staff must be kind enough towards the patients so that they feel relaxed.

10. Training must be provided to the staff especially Technicians and nursing staff to tackle any emergency during the dialysis session.

11. There is a great scope to improve the recording and reporting of the data. The data must be analyzed by the In charge of the center.

12. Feedback mechanism should be strengthened to improve the services.

13. RO must be safeguarded from the cold and heating arrangement must be provided to these centers.

14. Waiting area needs to be provided to all dialysis centers so the attendants can rest.

15. Separate toilets must be provided in every dialysis center.

16. The requirement of improving the nursing services Irregular visits by patients and lack of effective communication between the patients and the physicians.

5. References

1. Xie Y, Bow B, Mokdad AH, et al. Analysis of the Global Burden of Disease study highlights the global, regional, and national trends of chronic kidney disease epidemiology from 1990 to 2016. Kidney Int. 2018; 94: 567–581.

2. Dare AJ, Fu SH, Patra J, et al. Renal failure deaths and their risk factors in India 2001-13: nationally representative estimates from the Million Death Study. Lancet Glob Health. 2017;5(1) :e89- e95.

3. Jha V, Ur-Rashid H, Agarwal SK, et al. The state of nephrology in South Asia. Kidney Int. 019;95:31-37.

4. Liyanage T, Ninomiya N, Jha V, et al. Worldwide access to treatment for end-stage kidney disease: a systematic review. Lancet. 2015;385(9981):1975-82z.

5. Rajapurkar MM, John GT, Kirpalani AL, et al. What do we know about chronic kidney disease in India: the first report of the Indian CKD registry. BMC Nephrol 2012;13:10.

6. Anupama YJ, Sankarasubbaiyan S, Taduri G. Chronic kidney disease of unknown etiology: case definition for India- A perspective. Indian J Nephrol [Epub ahead of print] [cited 2020 Jun 19]. Available from: http://www.indianjnephrol.org/preprintarticle.asp?id=266081.

7. Lakshminarayana GR, Sheetal LG, Mathew A, Rajesh R, Kurian G, Unni VN. Hemodialysis outcomes and practice patterns in end-stage renal disease: Experience from a Tertiary Care Hospital in Kerala. Indian J Nephrol 2017; 27: 51-7.

8. Kulkarni MJ, Jamale T, Hase NK, Jagdish PK, Keskar V, Patil H, Shete A, Patil C. A cross-sectional study of dialysis practice patterns in patients with chronic kidney disease on maintenance hemodialysis. Saudi J Kidney Dis Transpl 2015; 26: 1050-6.

9. Vijaya KL, Aruna M, Narayan Rao S, Mohan PR. Dietary counseling by renal dieticians improves the nutritional status of hemodialysis patients. Indian J Nephrol 2019; 29:179-85.

10. Chandrashekhar A, Ramakrishnan S, Rangarajan D. Survival analysis of patients on maintenance hemodialysis. Indian J Nephrol. 2014;24(4):206-213

11. Devraj A, Siva Tez Pinnamaneni V, Biswal M, Ramachandran R, Jha V. Extra nasal Staphylococcus aureus colonization predisposes to bloodstream infections in patients on

hemodialysis with non cuffed internal jugular vein catheters. Hemodial Int. 2017;21(1):35-40.

12. Jha V, Chugh S, Chugh KS. Infections in dialysis and transplant patients in tropical countries. Kidney Int. 2000;57(74): S-85-S-93.

13. Chugh KS. Five Decades of Indian Nephrology: A Personal Journey. Am J Kidney Dis. 2009 Oct;54(4):753-63.

14. Jha V. Providing Dialysis in India: Many pieces in the puzzle. Natl Med J India [Epub ahead of print] [cited 2020 Jul 25]. Available from: http://www.nmji.in/preprintarticle.asp?id=279969

15. Shaikh M, Woodward M, John O, et al. Utilization, costs, and outcomes for patients receiving publicly funded hemodialysis in India. Kidney Int. 2018;94(3):440-445. oi:10.1016/j.kint.2018.03.028

16. Rao M, Juneja R, Shirly RB, Jacob CK. Haemodialysis for end-stage renal disease in Southern India – A perspective from a tertiary referral care center. Nephrol Dial Transplant. 1998;13:2494–500

17. Chauhan R, Mendonca S. Adequacy of twice-weekly hemodialysis in end-stage renal disease patients at a tertiary care dialysis center. Indian J Nephrol. 2015;25(6):329- 333. doi:10.4103/0971-4065.151762.

18. Obi Y, Streja E, Rhee CM, et al. Incremental Hemodialysis, Residual Kidney Function, and Mortality Risk in Incident Dialysis Patients: A Cohort Study. Am J Kidney Dis. 2016;68(2):256-265. doi:10.1053/j.ajkd.2016.01.008.

19. Bansal D, Kher V, Gupta KL, Banerjee D, Jha V. Haemodialysis vascular access: current practices amongst Indian nephrologists. J Vasc Access. 2018;19(2):172-176. doi:10.5301/jva.5000817

20. Indian Society of Nephrology Guidelines for Hemodialysis Units. Indian J Nephrol

Supplement. 2012;22.

Photo Gallery


DIALYZER
CLEANING
AREA
QUALITY POLICY