

DIALYSIS TREATMENT LANDSCAPE IN JAPAN AND INDIA:

A COMPARATIVE STUDY

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

(2021- 2023)

by

Dr. Aarohi Kalyankar

Under the Supervision and Guidance of

Dr. Dhirendra Kumar

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled **Dialysis treatment landscape in Japan and India: A comparative study** is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.



(Signature)
Name of Student
Date



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Q1, B1, B2, B3, 6th Floor, Cyber Towers, Hitec City, Madhapur, Hyderabad – 500 081. CIN: U72200TG2006PTC049670
Tel: +91 - 040 - 2311 4722, Fax: +91 - 040 - 2311 4723, info@orbees.com | www.orbees.com | www.orbeesmedical.com

22nd May 2023
Hyderabad

To

Ms. Aaroohi Kalyankar
11, Regency Priyadarshini, Khajrana ring road square,
Indore, Madhya Pradesh - 452 016.

Dear **Ms. Kalyankar**

Internship Experience Letter

This letter also certifies that **Ms. Aaroohi Kalyankar** is doing internship with Orbees Business Solutions Pvt Ltd from **21st February 2023 to till date** and her role is Intern – Analyst

We wish her all the best for her future endeavors.

For **Orbees Business Solutions Pvt. Ltd**

Rakesh Valluru
Sr. Manager - Operations



CERTIFICATE

This is to certify that dissertation titled **Dialysis treatment landscape in Japan and India: A comparative study** is a record of the research work undertaken by Dr. AaroHi Kalyankar in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide
IIHMR University, Jaipur
Date:

School Dean
IIHMR University, Jaipur
Date:

ABSTRACT

A study was conducted to compare and contrast the dialysis treatment environments in Japan and India. The three main factors examined were accessibility to dialysis treatment, cost of dialysis treatment, and quality of dialysis treatment. Japan has a universal health system, while India has a worse state of health. Self-pay expenses in Japan are limited, and insurance pays for the remainder. India is working to achieve health equity for all of its citizens, but the quality of dialysis care is much better in Japan, which has an impact on success rates and average life expectancy.

The findings reveal a sizable variation in the cost of dialysis treatment. In Japan, only 6% of treatment costs are covered by the patient out of pocket, and the majority of costs are reimbursed by the government, compared to about 50% of treatment costs in India. Although nephrologists in Japan and India receive similar education and training, the standard of care in each nation differs greatly. The study acknowledges the significant distinctions between the two nations, including socioeconomic status and population. The study also includes a number of government initiatives to enhance the healthcare system from both the Indian and Japanese governments.

India's healthcare system is still in its infancy, compared to Japan's universal healthcare system. India has introduced programs such as Ayushman Bharat and Pradhan Mantri Jan Arogya Yojana to help the poor and disadvantaged sectors of society. Japan has more hospital beds per person and more sophisticated medical technology, while India is catching up with telemedicine and e-health initiatives. Both nations' healthcare systems have advantages and disadvantages, but India is working to enhance its healthcare system through government initiatives and technological advancements.

Keywords

Dialysis, renal diseases, nephrologist, healthcare, insurance, reimbursement, hemodialysis.

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CONTENTS

ACKNOWLEDGEMENTS

TABLE OF FIGURES

TABLE OF ABBREVIATIONS

ABSTRACT

1. INTRODUCTION	11
1.1. Background	11
1.2. Healthcare system of Japan	12
1.3. Healthcare system of India	13
1.4. Difference between in India and Japan	13
1.5. Purpose of study	14
2. REVIEW OF LITERATURE	15
3. METHODOLOGY	23
3.1. Objective	23
3.2. Research Methodology	23
3.3. Research Questions	23
3.4. Study Type	23
3.5. Study Tool	23
4. REVIEW FINDINGS	24
4.1. Dialysis patient journey in India	25
4.1.1. Unmet needs	27
4.2. Dialysis patient journey in Japan	28
4.2.1. Unmet needs	30
4.3. Comparison of cost	30
4.3.1. Cost of dialysis in India	30
4.3.2. Cost of dialysis in Japan	32
4.4. Quality of care	34
4.4.1. Dialysis care quality in Japan	34
4.4.2. Dialysis care quality in India	36
4.5. Accessibility of care	38
4.5.1. Accessibility in India	38
4.5.2. Accessibility in Japan	38
5. CONCLUSION	40
6. RECOMMENDATIONS	41
7. BIBLIOGRAPHY	42

LIST OF FIGURES

FIGURE 1: Patient care pathway for dialysis patients in India.....	25
FIGURE 2: Patient care pathway for dialysis patients in Japan.....	28
FIGURE 3: Patient dialysis funding in India.....	30
FIGURE 4: Patient dialysis funding in Japan.....	32
FIGURE 5: Differences between India and Japan.....	34
FIGURE 6: Physician training and education differences between India and Japan.....	36
FIGURE 7: Duration of patient access to dialysis care post diagnosis in Japan and India...	38

ABBREVIATIONS

HD	Hemodialysis
ESRD	End Stage Renal Disease
JRDR	Japanese Renal Data Registry
JSDT	Japanese Society for Dialysis Therapy
CKD	Chronic Kidney Diseases
LTCI	Long Term Care Insurance
RRT	Renal Replacement Therapy
AVF	Arteriovenous Fistula
AV	Arteriovenous

Dialysis treatment landscape in Japan and India: A comparative study

1. INTRODUCTION:

1.1. Background:

Dialysis is a life-saving treatment for people with end-stage renal disease (ESRD). When kidneys are affected by ESRD, they can no longer function effectively and must be replaced. To eliminate waste from the blood and preserve fluid balance, dialysis can be employed. Hemodialysis and peritoneal dialysis are the two basic forms of dialysis. In hemodialysis, waste materials are removed from the blood by filtering it via a machine. A particular fluid is passed through the peritoneum, the lining of the belly, during a peritoneal dialysis operation. The fluid drains from the body after absorbing waste from the blood. Dialysis is a permanent condition that can be exceedingly expensive to cure. The type of dialysis, the location of the procedure, and the patient's insurance coverage all affect the price of the procedure. A patient's quality of life can be significantly impacted by dialysis as well. Dialysis patients frequently experience exhaustion, nauseousness, and vomiting. Additionally, they could have trouble focusing and falling asleep. Infections and heart disease risk can both be raised by dialysis. Dialysis is a widespread issue. Around the world, 4.4 million people were reportedly receiving dialysis in 2017. Dialysis is thought to cost more than \$200 billion annually globally. In the upcoming years, it is anticipated that the illness burden from dialysis will increase further. As the population ages, more people are anticipated to have ESRD. As the price of medical treatment continues to climb, so too is it anticipated that the cost of dialysis would rise.

1.1. Healthcare system of Japan:

Japan is an island country in East Asia, with a population of ~120 Million. The country has one of the best healthcare systems in the world; dialysis treatment in Japan is reportedly the best. The Japanese healthcare system is a universal healthcare system. All the Japanese citizens and residents are covered under the system; the government grants and individual premiums are used to finance the system. The healthcare system comprises of two major sectors: the public and private sector. Basic healthcare services like doctor visits, hospital

stays, and prescription medications are provided by the public sector. Long-term care, dental treatment, vision care, and other healthcare services are offered by the private sector. Public health insurance is mandated for all citizens and permanent residents of Japan. There are two different categories of public health insurance, the first one is National Health Insurance (NHI) and the second is Employees' Health Insurance (EHI). The NHI plan is for people who are unemployed or self-employed. While the EHI is available for the people who work at an organization that provides health insurance benefits. Public health insurance plan premiums are determined by a family's size and income. For low-income households, the government subsidizes the premiums. Private health insurance can be used to pay for the costs of treatments like dental care, vision care, and long-term care that are not covered by public health insurance. Most people agree that the Japanese healthcare system is quite effective and efficient. The system has a high level of patient satisfaction and minimal administrative costs. The Japanese healthcare system faces significant difficulties notwithstanding its efficacy and efficiency. Starting with the demography of the nation, it has a rapidly ageing population and very low birth rates. The 2022 White Paper on Health, Labor, and Welfare estimates that just 9.74 million medical and welfare workers will be available in 2040, despite the fact that 10.7 million of these people are expected to be required. Japan will face a shortfall of 960,000 medical and welfare service professionals.

1.2. Healthcare system of India:

India is a country in South Asia, with a population of 1,428 Million. The healthcare system in India is convoluted and fragmented with a mixture of public and private providers. Through a network of primary health centers (PHCs) and sub-centers, the public sector provides primary care, while the commercial sector offers a larger variety of services, including specialized treatment. The Indian healthcare system offers a wide range of care, and the public health sector is considered to be of a lower quality than the private healthcare. However, since public healthcare is affordable, it is frequently the only choice for those who are residing in rural areas. In India, some of the most well-known public health insurance programs are: Bharat Ayushman Pradhan Mantri The Jan Arogya Yojana (PM-JAY) is the

largest health insurance program in the world, covering secondary and tertiary care hospitalization costs for families up to Rs. 5 lakhs annually. Rashtriya Swasthya Bima Yojana (RSBY) offers a hospitalization benefit of Rs. 30,000 per family each year. Employees in the organized sector are covered by health insurance under the Employees' State Insurance Scheme (ESI). CGHS, the Central Government Health Scheme provides central government employees with health insurance.

1.3. Difference between in India and Japan:

With highly distinct healthcare systems, India and Japan are two very different nations. India is the second-most populous nation in the world with a population of more than 1.4 billion. Japan ranks as the tenth most populated nation in the world with a population of slightly over 125 million. Public and private healthcare providers are combined in India's healthcare system. While the middle class and the wealthy receive healthcare services from the commercial sector, the impoverished and elderly receive it through the public sector. Depending on the supplier, the quality of healthcare varies widely in India. Private hospitals typically have greater facilities and staffing levels than public hospitals, which are frequently overcrowded and understaffed. The healthcare system in Japan is a universal healthcare system, which implies that all people of Japan are eligible for medical care. Through a combination of taxes and premiums, the government provides healthcare coverage. Japanese doctors have advanced training, and Japanese hospitals are well staffed. Even though it would appear to be simple to adapt, India is unable to adopt Japan's healthcare system structure due to a number of factors. First off, there are significant population variations between the two nations, which makes it challenging for India to offer universal healthcare.

Additionally, unemployment and poverty are other issues affecting India that limit people's ability to pay for healthcare. The same scarcity of healthcare workers that exists in Japan is also present in India.

1.4. Purpose of the study:

The purpose of this study is to compare the dialysis treatment landscape in Japan and India; and to unearth insights from which India can learn from Japan to improve the treatment and reduce disease burden in India. The following variables can be used for the comparison:

- i. Quality: Japanese healthcare system is strict and mandates accreditation. Dialysis facilities in India may not be essentially accredited. Therefore, standards of quality can be compared between the two.
- ii. Cost: Out of pocket payment in Japan is minimal due to the Co-payment system. Whereas, in India, out of pocket cost is higher.
- iii. Access: The universal healthcare system aids accessibility of treatment for the people of Japan. On the contrary, Indian healthcare insurance system does not cover dialysis treatment, affecting accessibility for the patients.

2. REVIEW OF LITERATURE

S. No.	Specialization	Author (Year)	Salient features
1.	Global Dialysis Perspective- India	Joyita Bharati and Vivekanand Jha (2020)	The article examines the current condition of dialysis treatment in India. They have concentrated on data such as the number of patients in India, the number of deaths in India, and so on. The article also discusses affordability as a problem for Indian patients, stating that the average number of dialysis sessions per week is also affected by affordability; wealthy patients can access up to three sessions per week, whereas lower middle class and middle-class people who do not qualify for the government's insurance schemes are burdened by the cost of treatment and cannot access it properly. It emphasizes the growing need for dialysis therapy in India. The number of patients is growing, yet treatment options are limited. The article also highlights the difficulties of giving dialysis treatment in India, such as the high cost of treatment and a shortage of skilled experts. The paper finishes by urging a coordinated effort to enhance access to dialysis treatment in India.

2.	Cost of hemodialysis in a public sector tertiary hospital of India	Gunjeet Kaur, Shankar Prinja, Raja Ramachandran, Pankaj Malhotra, Krishan Lal Gupta, Vivekanand Jha (2018)	The article evaluates the total cost of hemodialysis (HD) in an Indian tertiary care hospital. From April 2015 to March 2016, the authors employed bottom-up costing approaches to identify, measure, and value all capital and recurring resources used for service delivery. After accounting for usable life and discounting at 3% for future years, capital costs were annualized. To analyse the impact of changes in resource utilisation and costs, sensitivity analyses were performed. The authors discovered that the average annual cost of HD per patient was \$1,140 (INR 85,000). Consumables accounted for the majority of the cost (44%), followed by employee pay (29%), and infrastructure (18%). The authors also discovered that HD patients' out-of-pocket expenses (OOPEs) were significant, with the typical patient spending \$2,280 (INR 1,60,000) each year. Many households faced substantial financial hardship as a result of the OOPEs, with 40% of patients experiencing trouble paying for HD. According to the authors, the cost of HD in India is expensive, and OOPEs are a significant financial burden for many households. They urge that the Indian government consider offering financial aid to ESRD sufferers in order to help them afford HD
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3.	Decision-making around Commencing Dialysis	Indu Ramachandra Rao, Nandini Vallath, YJ Anupama, Krishan Lal Gupta, Krithika S. Rao (2021)	The article addresses the decision-making process for individuals with end-stage renal disease (ESRD) who are starting dialysis. The authors suggest that starting dialysis is a complicated decision that should involve the patient, their family, and their healthcare team. The writers explain the elements that should be examined when deciding whether to begin dialysis, such as the patient's age, overall health, quality of life, and wishes. They also examine the dangers and benefits of dialysis, as well as dialysis alternatives. The authors conclude that starting dialysis is a personal decision that should be taken by the patient and their family in cooperation with their healthcare team. Palliative care should be a vital element of the care of individuals with ESRD, whether or not they begin dialysis.
4.	Chronic Kidney Diseases in India: A clarion for change	Santosh Varughese and Georgi Abraham (2018)	The article takes an in-depth look at the prevalence of chronic kidney disease (CKD) in India. The authors begin by analyzing the epidemiology of CKD in India, noting that the disease's prevalence has been quickly growing in recent years. They next go over the risk factors for CKD in India, such as diabetes, hypertension, and obesity. The authors also discuss the clinical course of CKD, noting that the condition is linked to an increased risk of death, cardiovascular disease, and other comorbidities. They point out that the Indian government lacks the resources to give comprehensive

			kidney treatment to all those in need. The authors end by advocating for a variety of strategies to address the CKD burden in India. They suggest that the Indian government invest in programs to enhance access to renal care, test for CKD risk factors, and educate the people about the importance of kidney health. They also advocate for more CKD research in India.
5.	Access to CKD Care in Rural Communities of India: a qualitative study exploring the barriers and potential facilitators	Jafar et al. (2020)	The paper investigates the barriers to and potential facilitators of access to chronic kidney disease (CKD) care in India's rural communities. The researchers conducted a qualitative study in which they interviewed 30 key informants, including CKD patients, carers, healthcare practitioners, and community leaders. The authors discovered that there are many barriers to access CKD care in rural India such as inadequate awareness, financial constraints, Lack of transportation, and scarce health care providers. The authors also discovered some possible facilitators of CKD care access in rural communities such as community-based programs, government initiatives, etc. The article provides a useful summary of the hurdles to and potential facilitators of access to CKD care in India's rural populations. The recommendations for interventions to alleviate the barriers to CKD care made by the authors are timely and significant.

6.	Dialysis Patients' Utilization of Health Care Services Covered by Long-Term Care Insurance in Japan	Utako Shimizu, Yuji Mitadera, Hagiko Aoki and Kouhei Akazawa (2015)	The study investigated at the way dialysis patients in Japan used health care services funded by long-term care insurance (LTCI). The study made use of a national database of dialysis patients in Japan. The research discovered that dialysis patients made extensive use of LTCI services. The average dialysis user used LTCI services for 1,139 days in 2015. Home care, day care, and nursing care were the most prevalent LTCI services used by dialysis patients. The study also discovered that dialysis patients' use of LTCI services varied by age, gender, and comorbidity. Older dialysis patients were more likely than younger dialysis patients to use LTCI services. Female dialysis patients were more likely than male dialysis patients to use LTCI services. Dialysis patients with greater comorbidities were more likely than dialysis patients with less comorbidities to use LTCI services. According to the study's findings, dialysis patients in Japan are heavy users of LTCI services. Dialysis patients' significant use of LTCI services is most likely owing to the high expense of dialysis therapy and the high risk of complications connected with dialysis treatment.
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7.	Global Dialysis Perspective: Japan	Norio Hanafusa and Masafumi Fukagawa (2020)	The article provides an exhaustive overview of Japan's dialysis system. The authors cover the incidence of renal disease in Japan, the various dialysis modes available, dialysis financing, and care quality. The authors remark that the frequency of kidney illness in Japan is rising, and the number of dialysis patients is projected to rise further in the coming years. Hemodialysis, which is administered in freestanding dialysis machines, is the most prevalent dialysis modality in Japan. Peritoneal dialysis is less common and is usually reserved for patients who cannot tolerate hemodialysis. They also highlight some of the system's problems, such as the growing number of dialysis patients and the rising cost of care. Another issue is the ageing population, which makes elderly patients more likely to acquire kidney disease.
8.	Current status of vascular access in Japan—from Dialysis Access Symposium 2017	Mizuya Fukasawa (2019)	The article addresses Japan's present state of vascular access. The author observes that the number of dialysis patients in Japan is growing, putting a pressure on the healthcare system. The high risk of problems related with vascular access is one of the major concerns confronting the Japanese healthcare system. The author addresses the many methods of vascular access available in Japan, as well as the benefits and drawbacks of each. The usage of temporary vascular access devices (VADs) in Japan is also discussed. VADs are utilized in individuals who do not

			have AVFs or who require urgent vascular access. VADs are put into veins and can be used for weeks or months. Finally, the author discusses the need for improved vascular access management in Japan. The author suggests that the Japanese government invest in innovative vascular access technology research and development. The author also suggests that the government increase funds for vascular access management training for healthcare practitioners.
9.	Tracing all patients who received insured dialysis treatment in Japan and the present situation of their number of deaths	Kubo, S., Noda, T., Myojin, T. (2022)	The study provides an excellent review of dialysis epidemiology in Japan. The authors monitor the number of patients who underwent insured dialysis therapy in Japan from 2005 to 2019 using data from the Japanese National Health Insurance Database and the Vital Statistics Database. They also utilize this information to compute the age-standardized mortality rate among insured dialysis patients. The number of patients receiving insured dialysis therapy in Japan grew from 287,000 in 2005 to 382,000 in 2019. In addition, the number of fatalities among these individuals climbed from 41,000 in 2005 to 56,000 in 2019. The authors conclude that the rise in the number of fatalities among insured dialysis patients in Japan was mostly related to population ageing and the rising incidence of diabetes mellitus.

10.	Japanese society for dialysis therapy renal data registry—a window through which we can view the details of Japanese dialysis population	Norio Hanafusa, Shigeru Nakai, Kunitoshi Iseki, Yoshiharu Tsubakihara (2015)	The article describes the Renal Data registration (JRDR) of the Japanese Society for Dialysis Therapy (JSDT), which is a countrywide registration of dialysis patients in Japan. Since 1966, the JRDR has been collecting data on dialysis patients and is the world's longest running and most comprehensive dialysis registry. The article starts with an overview of the JRDR. The authors describe the data gathered by the JRDR, the procedures used to obtain it, and the data quality. Following that, the writers go into the demographics of the Japanese dialysis community. The authors next go into how to use the JRDR data. They demonstrate how JRDR data has been utilized to enhance dialysis care quality in Japan. For example, JRDR data has been used to generate dialysis treatment guidelines, identify individuals at risk of problems, and assess the efficacy of novel therapies. The writers conclude by analyzing the JRDR's future. They contend that the JRDR is a vital resource for advancing dialysis patient care in Japan. They also contend that the JRDR might be utilized to enhance dialysis patient treatment in other nations.
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3. METHODOLOGY:

3.1. Objective: The primary objective of this study is to compare the Japanese and Indian dialysis treatment landscapes in order to analyze India's learning prospects from a nation with one of the finest dialysis treatment statuses.

The special objectives are:

- ✓ To determine and compare current trends of treatment between India and Japan.
- ✓ To assess the clinical landscape and headwinds in the system.
- ✓ To assess opportunities and learning outcomes for India from the Japanese health system.

3.2. Research Methodology: A comprehensive and in-depth literature study was undertaken for the Dialysis treatment landscape in Japan and India, adopting a selection criterion to choose only papers from the recent ten years. All necessary information was obtained from well-known publications, journals, databases, and papers. The paper "Global Dialysis Perspective: India" was thoroughly evaluated. This literature study contained a total of ten papers. The publications were sorted by publication year, relevance to the study aim, and geographical correctness. The articles were sourced from PubMed, Google Scholar, and Sage journals.

3.3. Research Questions:

3.3.1. What are the differences between the standard of dialysis care in India and Japan?

3.3.2. What are the contributing elements that affect how expensive, accessible, and how well dialysis works in Japan and India?

3.4. Study Type: Secondary study

3.5. Study Tool:

3.5.1. Pub Med, Research gate, Google Scholar, and Sage publications.

4. REVIEW FINDINGS:

Chronic kidney disease (CKD) is a degenerative disorder that causes kidney damage and, eventually, kidney failure. Kidney failure occurs when the kidneys' ability to eliminate waste materials and excess fluid from the circulation is compromised. When this occurs, dialysis or a kidney transplant are required to keep the individual alive.

A blood test called a creatinine test is used to detect CKD. Creatinine is a waste product generated by the muscles. Creatinine levels in the blood might rise when the kidneys are not operating correctly.

Other tests used to detect CKD include a blood urea nitrogen (BUN) test, urine analysis, and a kidney biopsy. Hypertension, Diabetes, Glomerulonephritis, Polycystic kidney disease, Obstructive uropathy, Kidney stones, Urinary tract infections, Drug-induced kidney damage, Environmental pollutants, Nutritional inadequacies, and Genetic diseases are all causes of CKD. CKD is a disease that goes unnoticed. Fatigue, weakness, loss of appetite, weight loss, edema, and elevated blood pressure may occur as the condition advances.

CKD is a severe disease. If left untreated, it might lead to renal failure. Kidney failure is a potentially fatal disorder.

Management in the early stages entails attempts to avoid illness development and optimize medical management with the goal of minimizing consequences and preserving the functions of the patient's various organ systems. In the fifth stage of the disease, some sort of renal replacement therapy (RRT), such as dialysis or kidney transplantation, may be necessary. The approach to RRT is determined not only by the patient's health status, social and financial resources, but also by the health care context in which they get care. Successful kidney transplantation improves physical and mental health, as well as functioning, including sexual function, in appropriate individuals.

Dialysis is a therapy that eliminates waste materials and excess fluid from the circulation when the kidneys are unable to do so. For patients who have a low chance of receiving a kidney transplant, hemodialysis and peritoneal dialysis are options. There is also a subset of patients who may benefit from conservative therapy alone.

The two forms of dialysis:

- Hemodialysis: This is a method in which blood is filtered outside of the body. Hemodialysis is typically performed three times a week for three to four hours each time.
- In peritoneal dialysis, the blood inside the body is filtered using a particular solution. Home peritoneal dialysis can be performed continuously or irregularly.

Although the treatment is difficult and stressful for the patients, it has a great potential to save lives. It can help people to lead a long and happy life with a better quality.

4.1. DIALYSIS PATIENT JOURNEY IN INDIA

The decision to begin dialysis is complicated. It is critical to understand that renal replacement treatment should not be considered the default therapy for all patients with severe renal insufficiency. The choice to begin dialysis and the mode of dialysis should be made individually in a shared decision-making process between the treating nephrologist and the patient. Patients should get pre-dialysis education early in the course of chronic renal disease to assist prepare them for this possibility. Withholding dialysis could be a viable choice in a subgroup of patients, particularly the elderly with many comorbid conditions. Comprehensive preserving care should be provided to all patients who have decided not to dialyze.

A nephrologist is referring to a patient who has been diagnosed with chronic kidney disease (CKD). The nephrologist will evaluate the patient's condition and go over potential therapies with him or her. If the patient's kidneys are unable to eliminate metabolic waste and excess fluid from the blood, dialysis may be required.

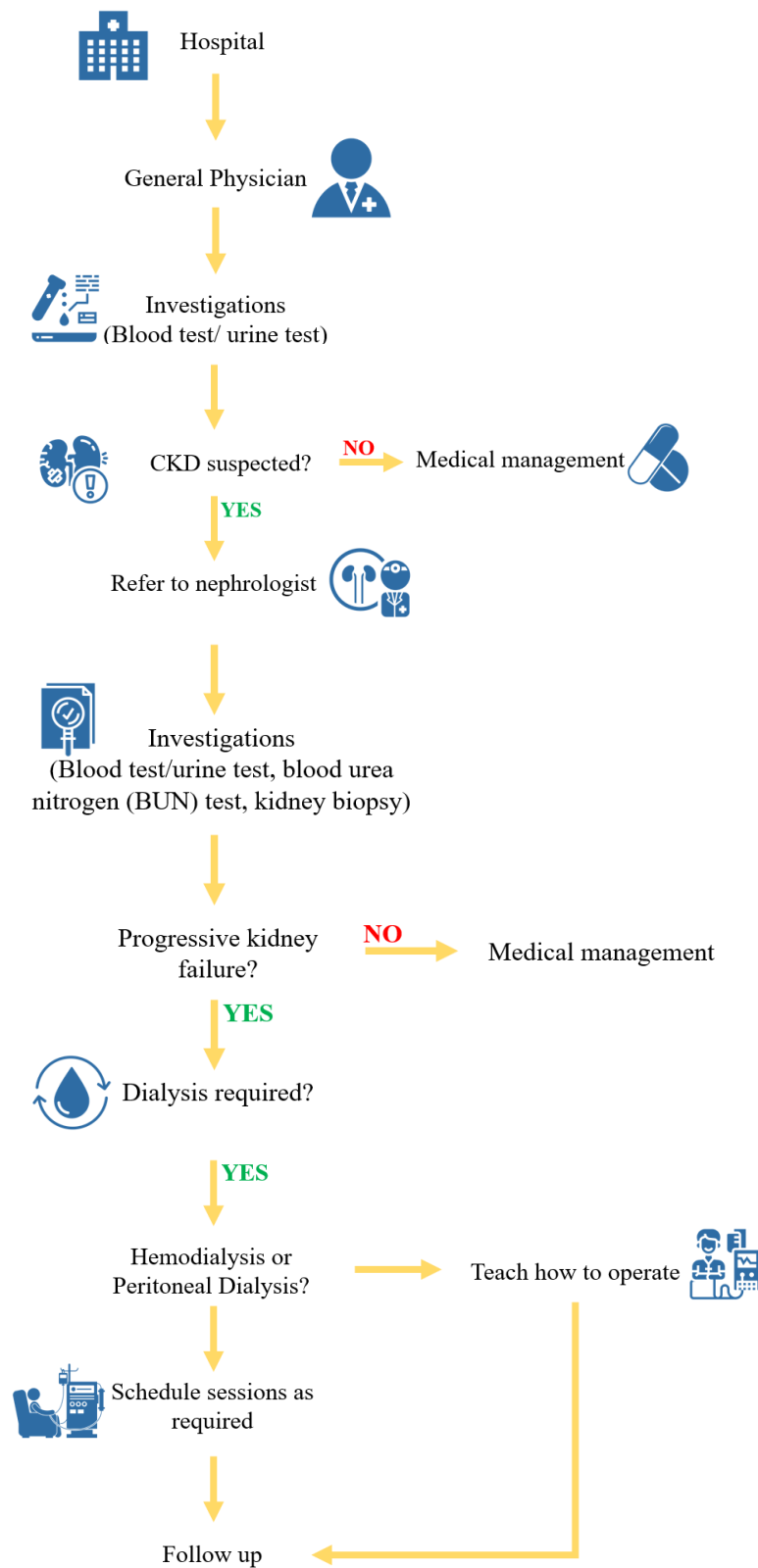


Fig. 1: Patient care pathway for dialysis patients in India

4.1.1. UNMET NEEDS:

Treatment-seeking behavior is intimately related to an individual's and a country's health state. Despite the government's efforts to improve India's health-care system, doctors face several challenges. At the doctor's end, there are some unfulfilled demands as well. There are several unmet clinical needs in the discipline of nephrology. To begin, a method to detect early development of chronic kidney disease in persons living in rural regions in order to initiate therapy and boost chances of cure. This would allow doctors to treat patients more effectively and efficiently, which would benefit patients as well. A more precise method of determining retention volumes of fluid in non-ambulatory chronic renal disease patients in order to do efficient dialysis; a safer method of performing hemodialysis in patients with disruptive bleeding indicators in order to avert uncontrolled bleeding and shock. A successful method for maintaining the patency of an AV fistula for dialysis in chronic renal disease patients in order to avoid thrombosis, stenosis, and AV fistula correction surgery. A safer method of doing hemodialysis in patients with end-stage renal disease who do not have a ready/mature AVF in order to avoid several interim accesses in the neck and femoral veins and the associated infections and vein thrombosis until the AVF develops.

In addition to the government strategies in place for patients, guidelines and more attention to biomedical innovation are required to assist clinicians in providing better care.

4.2. DIALYSIS PATIENT JOURNEY IN JAPAN

Dialysis patients in Japan go through four major stages: diagnosis, pre-dialysis, dialysis, and post-dialysis. The patient may have CKD symptoms such as tiredness, shortness of breath, and edema during the diagnostic stage. A nephrologist may be consulted to evaluate the patient. To diagnose CKD, the nephrologist will do a physical exam and request blood testing and other procedures. The nephrologist will discuss therapy options with the patient if CKD has been diagnosed. The patient may be sent to a dialysis center for examination during the pre-dialysis stage. The professionals at the dialysis center will evaluate the patient's needs and propose a kind of dialysis. The patient may need to make modifications to his or her lifestyle, such as following a certain diet and using drugs.

The patient may be required to learn how to do dialysis at home. The patient will begin dialysis treatment at the Dialysis stage. Dialysis is typically performed three times a week for four hours each time. Dialysis can be performed in a dialysis center or at home. Dialysis aids in the removal of waste materials and excess fluid from the blood. Dialysis can help patients improve their quality of life.

Finally, the patient will continue their lives with CKD and dialysis therapy throughout the Post-dialysis period. The patient must continue to adhere to a restricted diet and take drugs. The patient ought to visit the nephrologist on a frequent basis. Changes in lifestyle are of great importance. Activities such as regular exercise and stress management practices by breathing exercises and meditation may be of help. To learn how to perform dialysis at home, the patient needs training. Dialysis is a lifetime treatment for people with chronic kidney diseases. The patient's reaction to dialysis will help medical professionals to treat them effectively.

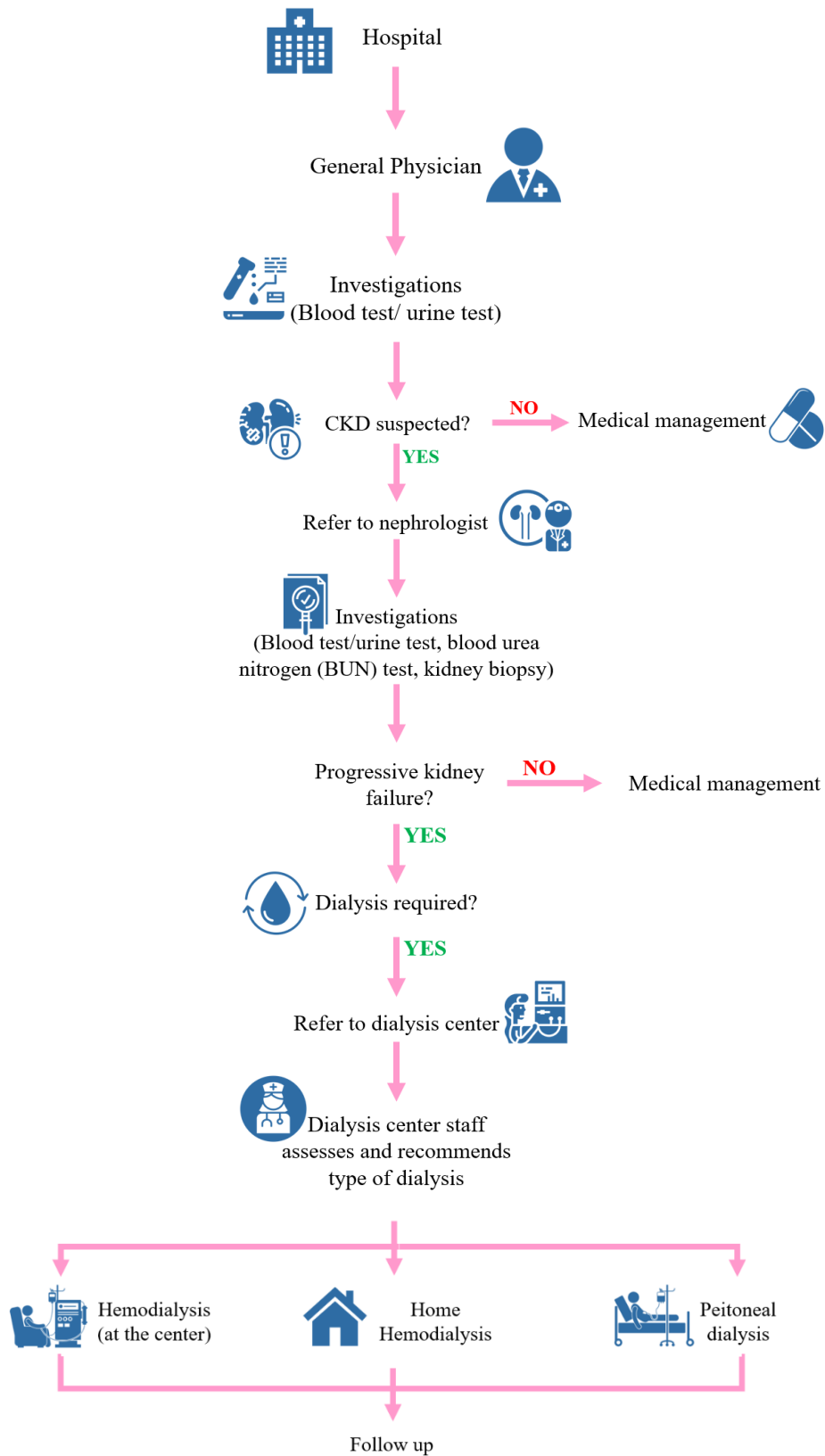


Fig. 2: Patient care pathway for dialysis patients in Japan

4.2.1. UNMET NEEDS:

Renal diseases are very common in Japan. The increase in ageing population and co-morbidities such as diabetic nephropathy are increasing the burden of disease in the country. Despite having a high quality and standard of care, the physicians in Japan suffer a great deal. The number of nephrologists is low in comparison to the population of the country. The academic and training programs for Nephrologists in Japan are relatively low, and it is less preferred by the young generation regardless of the increasing disease burden and opportunity. There is also a lack of awareness amongst people regarding renal diseases, this may lead to late detection and diagnosis. The delay in diagnosis and treatment may also be related to the cultural differences in rural and urban areas, and acceptance towards the treatment may be apprehended. The Japanese government may focus on improving the training landscape for nephrologists so that more people can receive the treatment.

4.3.COMPARISON OF COST

4.3.1. COST OF DIALYSIS IN INDIA:

Affordability of healthcare is a serious issue in India. Patients have to pay out of their pockets for accessing healthcare. Although the government provides financial aid and reimbursement to the underprivileged and other groups via many programs, it is difficult for the middle-income status people to afford healthcare. In addition to this, the cost of dialysis is not subsidized by the government, and it falls on the patient to bear all the cost. However, the National Dialysis Program provides aid to the patients that fall under the basic requirements to be enrolled into this program. Patients who are covered by government insurance programs such as the ESIC - Employee's State Insurance Corporation and PM JAY- Pradhan Mantri Jan Aushadhi Yojana, are eligible for a higher reimbursement. Patients with end-stage renal disease (ESRD) are eligible for a variety of supplementary benefits in addition to the yearly payment, including:

- Blood testing, medication and other diagnostic tests are provided at no cost.
- The government provides these benefits, which are managed by state and municipal governments.

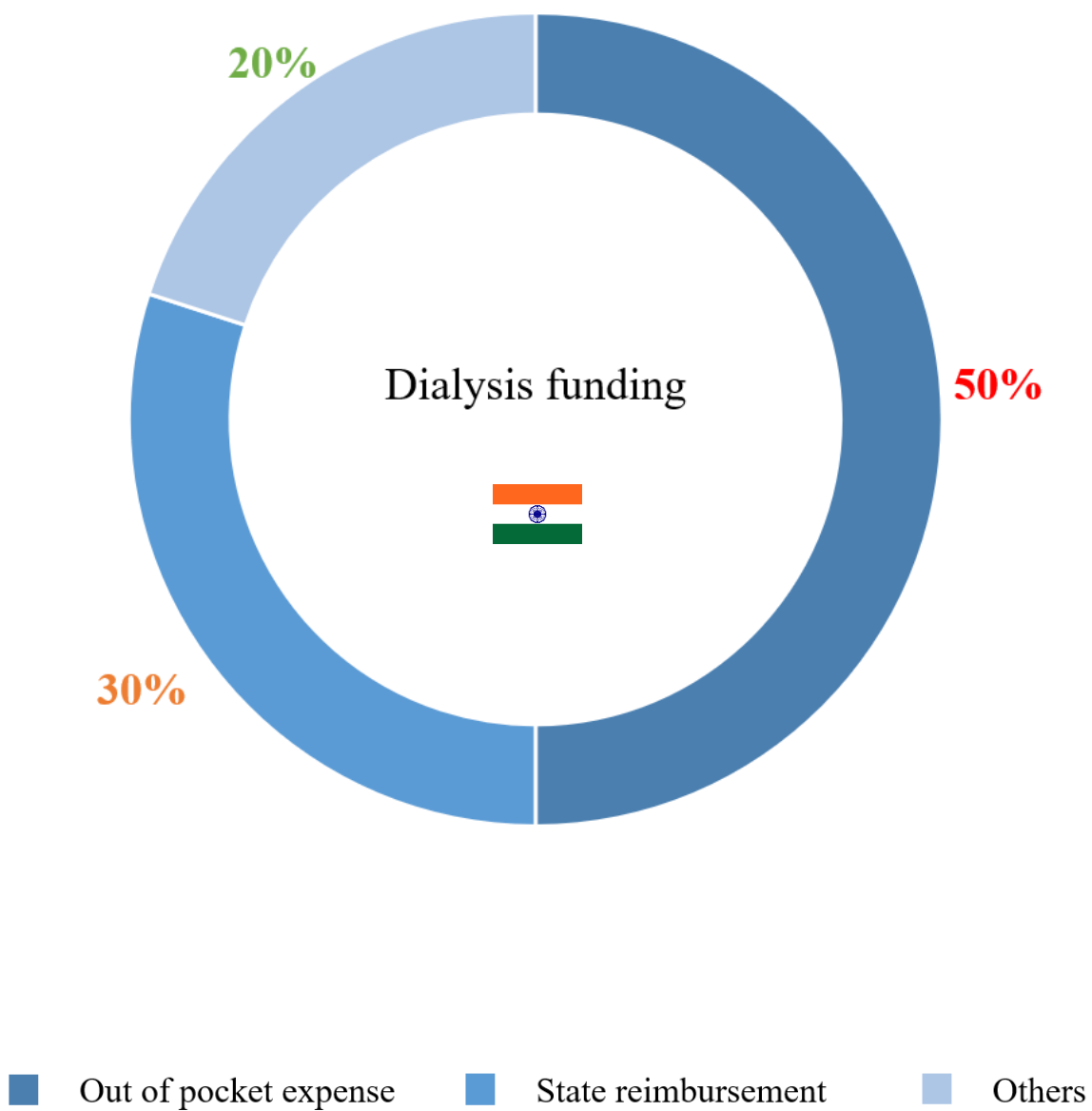


Fig. 3: Patient dialysis funding in India

4.3.2. COST OF DIALYSIS IN JAPAN:

In Japan, patients on ongoing dialysis do not bear a major amount of the dialysis treatment costs. The national health insurance system covers the vast bulk of the costs. customers must pay a monthly copayment of up to 20,000 Japanese Yen (about \$200), however this is waived for low-income customers.

A patient on maintenance dialysis will pay roughly 320,000 JPY (approximately \$3000) every month, excluding any additional costs or drugs. The cost of lab testing is 22,500 JPY per month, and the technical cost is 21,400 JPY- these fall under medical management charge.

Financial assistance is available in Japan through a number of public and private initiatives.:

- The national health insurance system pays for the majority of the cost of dialysis therapy.
- The Social Security Disability Insurance (SSDI) program helps people with disabilities who are unable to work financially.
- A federally funded health care program for low-income individuals and families is called Medicaid.
- Several non-profit groups provide financial aid to patients so they can cover the cost of their dialysis treatments.

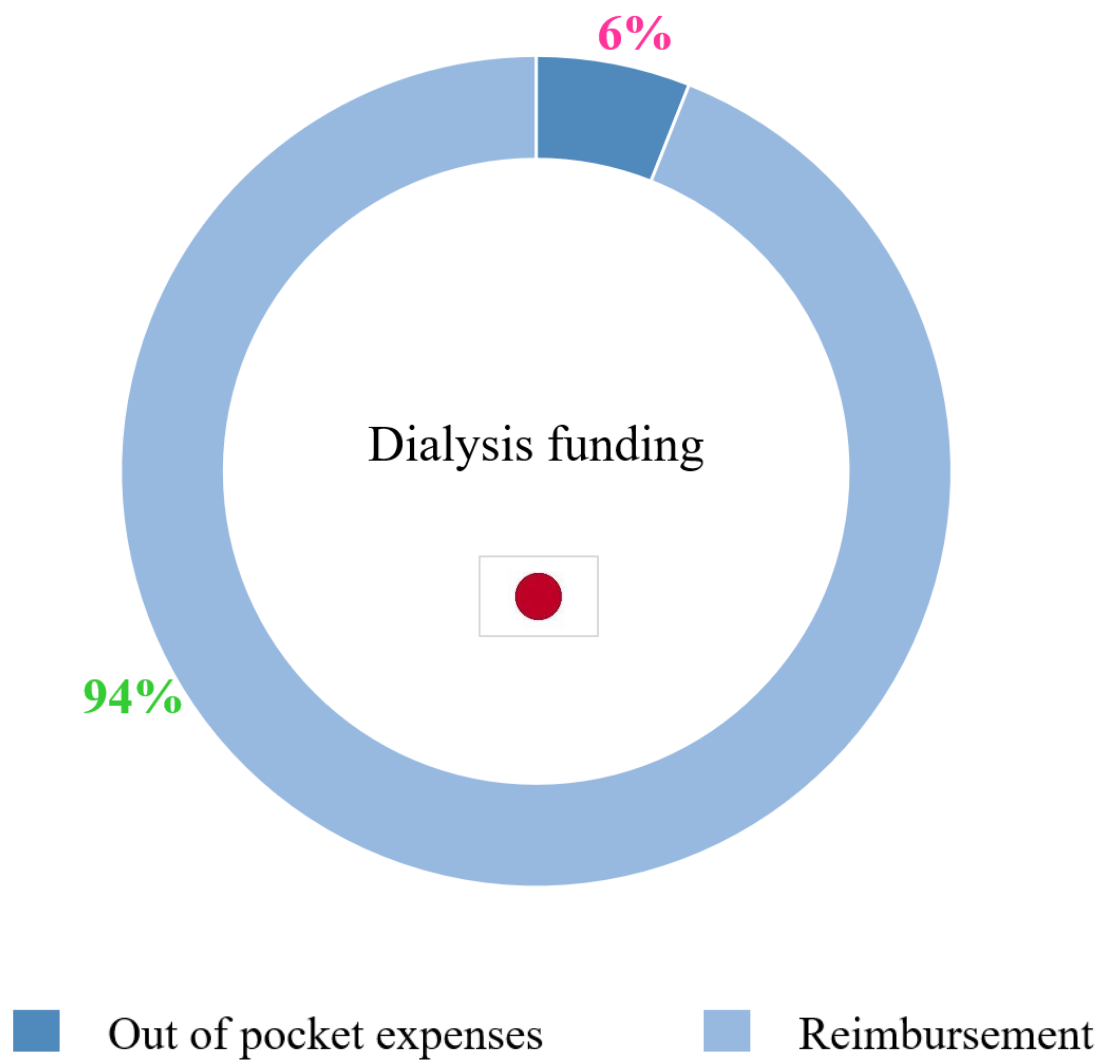


Fig. 4: Patient dialysis funding in Japan

4.4. QUALITY OF CARE

4.4.1. DIALYSIS CARE QUALITY IN JAPAN:

Mortality rate for dialysis is low in Japan when compared to other developed countries.

In 2019, there were 15.6 fatalities per 100 patient-years among dialysis patients in Japan.

The low mortality rate in Japan is a result of number of factors:

- Japanese patients receive dialysis within 6 months of diagnosis. Therefore, the patient outcomes are improved.
- The standard of care in Japan is set at a higher level. This is due to various factors such as advanced technology, trained staff, and adoption of evidence-based practices.
- Patient compliance in Japan is better and the patients follow treatment protocols and not miss sessions.
- Highly qualified and expert professionals. The dialysis specialists in Japan are highly skilled and trained. They also have a good team of multi-disciplinary sources.
- Evidence based practices are used in Japanese dialysis facilities and the procedures tend to improve patient outcomes and are based on well researched data.
- Support services are excellent in Japan. The patients have a heavy range of support services such as pick and drop, psychological support, and emotional support services.

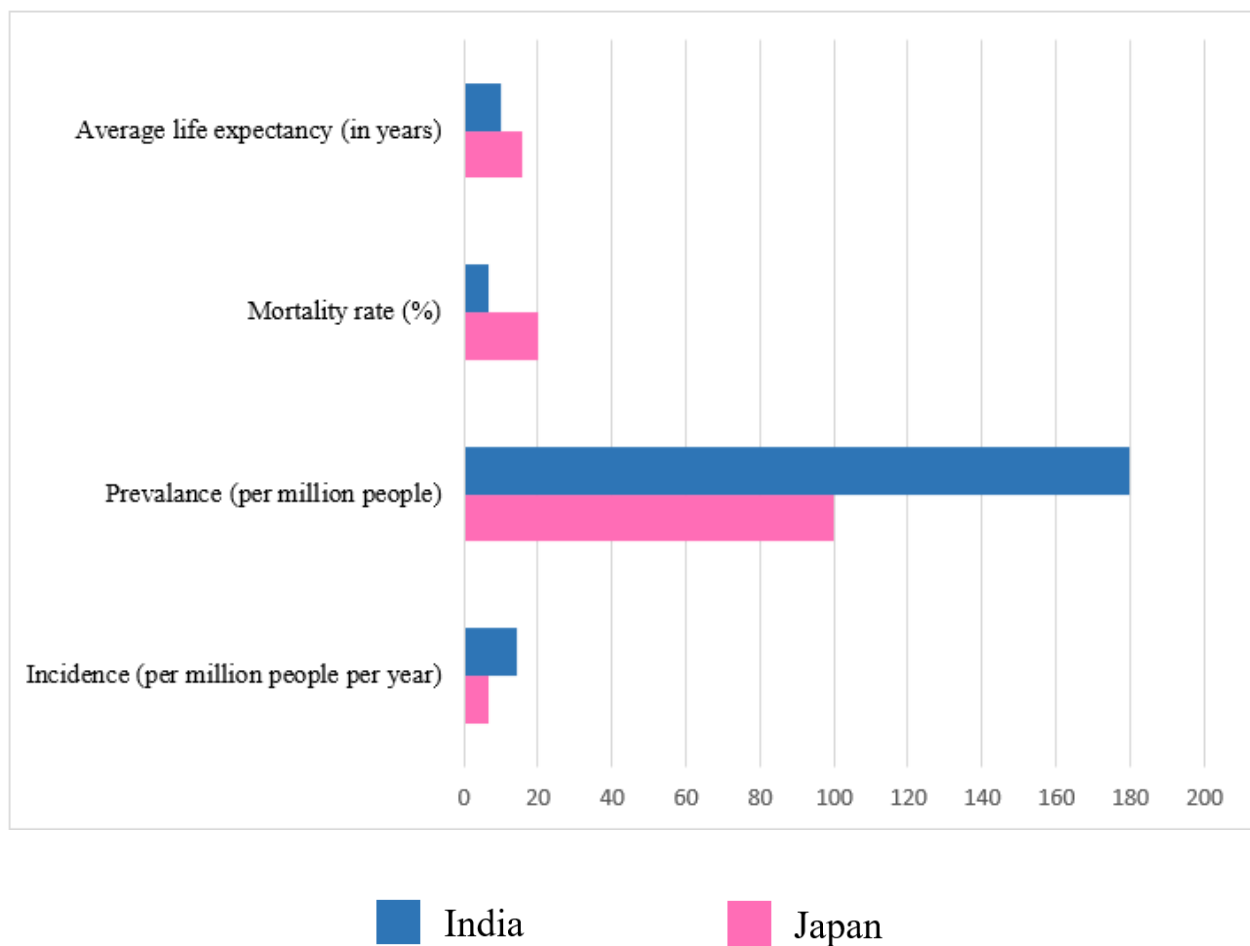


Fig. 5: Differences between India and Japan

4.4.2. DIALYSIS CARE QUALITY IN INDIA:

The mortality rate for patients receiving dialysis in India was 24.5 fatalities per 100 patient-years, according to the Global Dialysis Perspective: India study released in 2018.

Various factors contribute to the high death rate of dialysis patients in India. These elements are as follows:

- In India, on an average, patients receive dialysis after a year of diagnosis. Poor patient outcomes may be a cause of delay.
- Low quality of care in India is due to various factors including lack of trained staff, low quality apparatus, and not following evidence-based practices.
- Patient compliance is poor in India and patients express dissatisfaction with the treatment. Lack of awareness, lack of knowledge, lack of support services, and the high cost of dialysis are contributing factors.
- There is a severe healthcare professional shortage in India, especially qualified dialysis specialists. This could be due to low pay for the staff, low training programs, and high demand for the services.
- The equipment used are of low quality in many dialysis facilities in India. Proper sterilization and other health protocols are also not followed.
- The government lacks strictness in the regulations. Regulatory and certified government bodies especially for dialysis may be of use.

Characteristic	India	Japan
Minimum educational requirement	5-year MBBS degree	6-year MD degree
Length of residency	3 years	4 years
Length of fellowship	2 years	3 years
Content of training	Tropical nephrology	Dialysis and transplantation

Fig. 6: Physician training and education differences between India and Japan

4.5. ACCESSIBILITY OF CARE

4.5.1. ACCESSIBILITY IN INDIA:

Dialysis treatment in India is not easily accessible to its people. The cost of treatment is prohibitively expensive for many people. The lack of healthcare professionals to tend to the patients also draws back the accessibility in time for the people. It is affected by a number of factors including lack of funding for training programs, dearth of qualified professionals, lack of infrastructure and low reimbursement. Low numbers of dialysis centers, apparatus and technology for the treatment also affect accessibility to the treatment. The most crucial cause is that people from rural areas are unable to travel to dialysis centers in other areas and therefore there is a low consumption of the healthcare services. A large number of people even fail to undergo any kind of investigation for diagnosis, and in turn do not get diagnosed.

4.5.2. ACCESSIBILITY IN JAPAN:

Receiving dialysis therapy in Japan is relatively easier. The government is actively involved in the treatment of dialysis patients and is determined to provide the best healthcare to its people. The government offers a large amount of reimbursement that prevents the people from having to self-pay. The government also has a cap on the self-payment for the treatment at 20,000 JPY per month (for patients who are earning above the base salary). The government also provides funding and training to the dialysis centers; the dialysis centers also provide a pick and drop service for the patients who cannot travel to the center on their own. In addition to this, Japan provides a facility for tourists in order to get their dialysis session even when they are travelling. They arrange for the patient's transport, stay and sightseeing too. This is an exceptional service that only Japan provides.

Patient access to dialysis

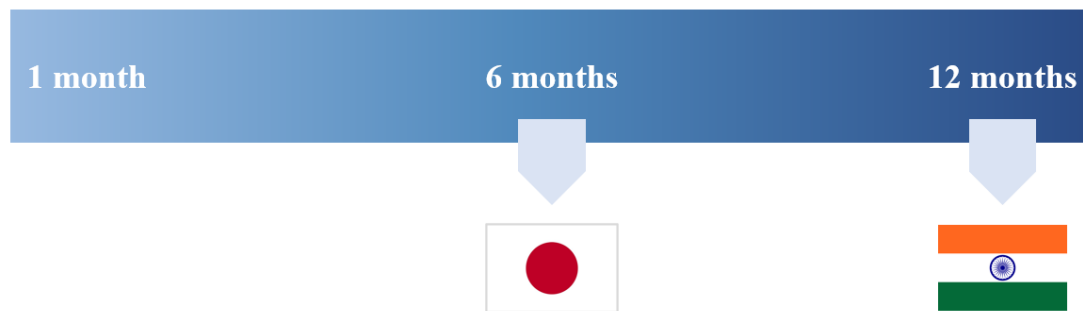


Fig. 7: Duration of patient access to dialysis care post diagnosis in Japan and India

5. CONCLUSION

The dialysis treatment landscape in India and Japan are extremely diverse. Japan has a universal healthcare system, where the government is actively involved in the provision of dialysis services. Therefore, Japan has an excellent quality of treatment while being affordable and accessible to the population. It does not come as a surprise that Japan is considered to have one of the best dialysis treatments globally.

The Indian government is trying hard to overcome the challenges that dialysis patients face in India. A number of programs have been introduced and implemented by the government in order to provide better treatment to the people. Although, the programs are not fulfilling the growing burden of the disease in India, they are definitely carving a way to grow. With an increase in the population, the number of dialysis patients are increasing and in turn a great opportunity lies in front of India to enhance their treatment.

RECOMMENDATIONS:

- Developing a Universal health system: Japan provides a universal healthcare system, that signifies that health insurance covers all Japanese people, including dialysis treatment. India could establish an equivalent system to ensure that all Indians, regardless of money or social class, have access to dialysis therapy.
- Promoting government participation: The Japanese government is heavily involved in providing dialysis therapy. The government subsidizes dialysis centers and establishes quality-of-care criteria. India should boost its engagement in dialysis treatment provision in order to improve care quality and make it more affordable.
- Investment in training and education: Japan spends extensively on healthcare professional training and education. This has contributed to Japan having a large pool of competent dialysis providers. To increase the quality of care, India may engage in comparable training and teaching programs.
- Financial aid: Aid is provided by the Japanese government to persons who require dialysis therapy. This makes dialysis more accessible for folks who are unable to pay for

themselves. India might provide its residents similar financial aid to make dialysis treatment more accessible.

In addition to these specific steps, India might benefit from Japan's comprehensive healthcare strategy. Japan places a high value on preventative care, which helps to limit the number of patients who require dialysis in the first place. To lessen the burden of renal disease and dialysis therapy, India might use a similar approach to preventative care. The ideas of universal access, fairness, and solidarity underpin the Japanese health-care system. This implies that all Japanese people, regardless of money or social class, are entitled to healthcare. The system is supported by a mix of taxes and premiums.

“For people, for life, for the future.”

-Japan's Ministry of Health, Labour and Welfare (MHLW).

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