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Facts and Factors Affecting Quality of Life of Patients Undergoing Haemodialysis: A Review

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Abstract

In India, diabetes and hypertension contribute to 40-60% of chronic kidney disease (CKD) cases. According to the Indian Council of Medical Research (ICMR), the prevalence of diabetes among adults has reached 7.1%, ranging from 5.8% in Jharkhand to 13.5% in Chandigarh. Among urban populations over 40 years, this prevalence can rise to 28%. Hypertension affects about 17% of adults, with rural prevalence at 14.8% and urban at 21.4%. A 17.4% prevalence among adults aged 20-59 in a Delhi slum-resettlement colony has been reported. The increasing burden of these comorbidities makes individuals with CKD a priority for targeted interventions. CKD affects around two million people in India, many of whom require dialysis or kidney transplantation. However, only 10-12% receive dialysis, mainly due to financial barriers or limited access. Even among urban patients with access, frequent dialysis remains unaffordable. The Bangalore Kidney Foundation (BKF) addresses this gap by offering free or subsidized dialysis services, along with medicines, nutrition, and diagnostics, enabling patients to receive regular care. For those ineligible for transplantation, this support allows for a more stable, functional life. The World Health Organization (WHO) defines quality of life (QOL) as an individual's perception of their position in life, shaped by cultural context and value systems. QOL encompasses various domains, including health, employment, environment, education, relationships, spirituality, and personal safety-making it an essential consideration in chronic illness management, especially for patients undergoing lifelong dialysis.

Keywords: Structured Teaching Program, Elderly, Management, Osteoarthritis, Cataract, Hearing loss

Introduction

Despite available resources, kidney failure deaths remain higher in India than in other low- and middle-income nations with similar sociodemographic profiles. However, mortality rates can still be reduced.

The number of deaths from chronic kidney disease (CKD) in India increased from 0.59 million in 1990 to 1.18 million in 2016.[1] Due to the lack of renal failure registries, the incidence of kidney failure continues to be based on estimates. According to the Million Death Study, renal disease claimed the lives of 136,000 people in 2015.[2] According to a 2018 study, there are around 175,000 chronic dialysis users in India, which translates to a prevalence rate of 129 per million people. According to a comprehensive research, over two-thirds of people with renal failure in 2010 passed away without

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undergoing dialysis.[3]

Currently, 40-60% of CKD cases in India are caused by diabetes and hypertension.[3] According to recent data from the Indian Council of Medical Research (ICMR), the prevalence of diabetes among adults in India has risen to 7.1%, ranging from 5.8% in Jharkhand to 13.5% in Chandigarh. Among urban populations over the age of 40, the prevalence is significantly higher, at 28%. Similarly, an estimated 17% of adults in India have hypertension with a prevalence of 14.8% in rural areas and 21.4% in urban areas.[4,5] Panesar *et al*. observed a prevalence of 17.4% among individuals aged 20-59 years in a slum-resettlement colony in Delhi. The primary focus is undoubtedly to treat individuals with CKD since the frequency of these diseases is expected to rise in India.[6,7]

With 19.3 million cases of diabetes in 1995 and an estimated 57.2 million by 2025, and 118.2 million individuals suffering from hypertension in 2000, the number of individuals in India needing dialysis is predicted to skyrocket.[1] The cost of dialysis treatments can range between Rs. 10,000 and Rs. 20,000 per month, making them unaffordable for individuals from lower socioeconomic groups. To address this issue, the Karnataka government decided to establish dialysis clinics in every district of the state. In Karnataka, dialysis facilities are available in 16 district hospitals and two taluk hospitals. In the first phase (2008-09), dialysis facilities were established in the district hospitals of Chamarajanagar, Bagalkote, Bidar, Gulbarga, Karwar, Bijapura, Chitradurga, and Chikmagalur. The dialysis facility at the KC General Hospital in Bangalore was also established. In the second phase, dialysis facilities were established in the General hospital, Jayanagar, Bangalore, along with other district hospitals in Ramanagaram, Kolar, Gadag, Tumkur, Chikballapur, Madikeri, and Dharwad.[3]

Chronic kidney disease affects around two million patients, necessitating either dialysis or a kidney transplant. Only 10-12% of patients undergo dialysis due to financial constraints, or a lack of access to facilities. Despite having access, frequent dialysis is not an option for the urban poor due to financial constraints. By offering dialysis at affordable rates, or free/subsidized dialysis, the Bangalore Kidney Foundation (BKF) ensures that patients receive regular treatment. In addition to dialysis, BKF also provides nutritive meals, medicines, and diagnostic testing.[4] For patients without access to kidney transplantation, regular dialysis offers a viable means to lead a meaningful life.

Fewer than 1 in 10 individuals with chronic kidney disease (CKD) require dialysis (artificial kidney therapy) or a transplant of the kidney. People with CKD are at a higher risk of stroke or heart attack, particularly if they are obese or smokers. Regular monitoring of renal function and blood pressure is recommended, and patients should receive appropriate treatment if their blood pressure rises.[6]

Need for Hemodialysis

The main function of the kidneys is to filter the blood, eliminating waste materials and excessive water that the body does not need. These waste products are expelled from the body in the form of urine. When the kidneys don't function properly, waste rapidly accumulates in the body, leading to illness. Renal failure occurs when the kidneys cannot effectively remove excess water and waste from the blood. At this stage, the individual requires dialysis because their kidneys can no longer cleanse the blood on their own.[7]

Hemodialysis helps patients maintain appropriate levels of sodium and potassium in the body, thereby controlling the blood pressure. It is usually initiated when the kidneys have completely failed, causing life-threatening complications.[7]

Hemodialysis Procedure

Hemodialysis is a medical procedure that removes surplus water and waste from the blood using a device with a specific filter. It is a therapy for advanced renal disease that enables to maintain a normal quality of life (QoL) despite the condition of kidneys. With this therapy, blood pressure can be managed and the body's vitamin and mineral levels can be adjusted. End-stage renal failure is the most advanced state of chronic kidney disease, and is treated by hemodialysis. Additionally, it is also used in the treatment of acute renal damage.

Common causes of kidney failure include:[8]

- Diabetes
- High blood pressure
- Kidney inflammation
- Kidney cysts
- Inherited kidney diseases

Dialysis is a critical therapy option for serious kidney failure, such as renal failure or end-stage kidney disease. When the kidneys are not functioning properly, waste materials and excess fluid accumulates in the blood. Dialysis helps by removing some of these waste products and fluids, partially replacing the kidneys' function.[8]

Before starting dialysis, a vascular access point is created to allow blood flow from the body to the dialyzer. This minor surgical procedure is usually performed on the arm. Before each dialysis session, the patient's weight, blood pressure, pulse, and temperature are checked and the skin around the access site is thoroughly cleaned.

During the procedure, a needle and tubing are attached to the catheter, fistula, or graft to draw blood from the bloodstream. A dialyzer, also referred as an 'artificial kidney', filters the blood. One portion of the dialyzer is for blood, while the other is for dialysate, a cleansing solution, with a small membrane present between the two parts. Blood cells and proteins, which are significant components of the blood cannot pass through the barrier due to their large size. Some amounts of waste and excess water are removed through the membrane. The filtered blood is returned to the body through a second tube.[7,8]

Figure 1: Hemodialysis

Post the dialysis procedure, needles are removed, and a pressure dressing is applied to control the bleeding. Rechecking of patient's weight is essential. Blood tests may be frequently required to precisely monitor the effect of medications. Any unusual or serious side effects must be immediately reported to the docter.

Risks of Hemodialysis

- Infection: Pathogens can enter the body through the vascular access site, potentially leading to an infection.
- Low blood pressure
- Itching
- Anemia
- Pericarditis

Activities for Patients After Hemodialysis

For patients undergoing regular dialysis, it is necessary to maintain good health. Patients equipped with knowledge of self-care can effectively avoid health-related issues. The following activities should be observed after the dialysis treatment.

- **Right foods**

  Patients should follow a healthy diet, including the recommended daily intake of water, salt, vitamins, and minerals. Excess potassium can affect the heartbeat and needs to be managed properly. It is essential to work out a diet plan with a doctor and follow it carefully after hemodialysis.

- **Medicines**

  Patients should adhere to the prescribed medications.

- **Hemodialysis benefits**

  The nephrology team monitors each patient's treatment to ensure that they are receiving adequate hemodialysis, facilitating removal of toxins from blood.

Hemodialysis Monitoring

Blood testing

Blood tests are used to monitor patients undergoing hemodialysis, either at home or in a facility, to ensure that the frequency and treatment regimen (referred to as dialysis prescription) are appropriate. According to studies, the correct dialysis prescription enhances health, avoids complications, and increases survival time. Blood testing is done at a minimum interval of one month and depending on the results, the dialysis prescription may need alterations.

Body weight monitoring

Dialysis must perform the function of fluid removal because failing kidneys can no longer adequately eliminate excess fluid from the body. Between hemodialysis sessions, fluid retention can lead to

serious complications. Most patients have their weight monitored before and after dialysis session and are instructed to check their weight daily at home.[9]

Caring for the Access

Proper care of the vascular access site is essential to prevent complications. Although issues may still arise, the risk is considerably reduced when patients follow a few precautions:

- Each time before dialysis, the access site must be washed with soap and warm water. Scraping off scabs or scratching the area must be avoided.
- The access area must be monitored for warmth and redness everyday, as it could indicate an infection.
- It is important to check the blood flow in the access every day. A vibration, known as a thrill, should be felt over the access. Occasionally, ultrasonography can be used to assess the flow (sound waves). During dialysis, a flow monitoring system measures the rate of blood flow.
- Avoid carrying heavy objects, sleeping on the arm, and wearing tight clothing or jewelry to prevent stressing the arm. Blood pressure measurements and blood sample collection should be avoided on the arm with access.
- Needle placements in the access must be changed. After the needle is removed, light pressure is applied to halt any bleeding. If bleeding develops later, gentle pressure is applied to control the bleeding and if bleeding does not cease within 30 minutes or becomes excessive, a healthcare provider must be contacted. [8,9]

Quality of life

The World Health Organization defined quality of life (QOL) as a person's view of their place in life in relation to their objectives, expectations, standards, and concerns in the context of the culture and value systems in which they live.[10]

Employment, wealth, environment, mental as well as physical health, leisure time activities, education, social connections, religious beliefs, safety, security, and freedom are all typical measures of quality of life. QOL can be associated with a variety of situations, such as those related to politics, the economy, medical issues, and international developments. Health-related QOL is a measure of quality of life as it relates to health (HRQOL).[10,11]

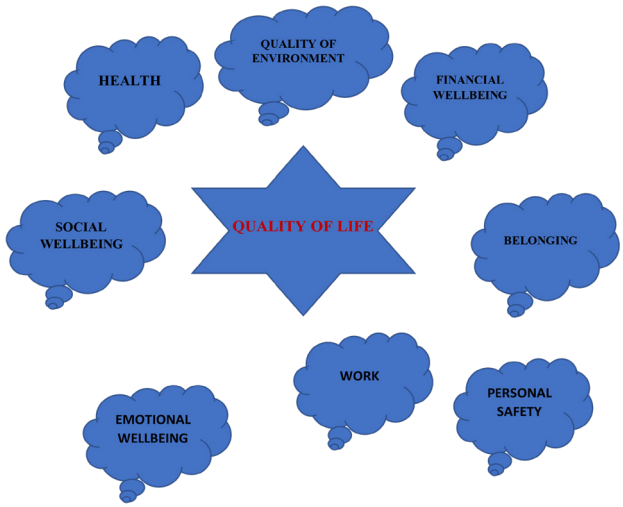

Figure 2: Measures of quality of life

The degree to which a person is in good health, enjoys their surroundings, and is able to participate in or enjoy life's experiences is referred to as quality of life (QoL). The term ‘quality of life’ is inherently ambiguous, as it can reflect both an individual’s perspective of their own life as well as the circumstances of their habitation. Because of this, assessing quality of life may be difficult. Some define it in terms of wealth or overall satisfaction with life, while others explain it in terms of quality (e.g., the ability to have a healthy, happy life in terms of one's overall happiness). A disabled person may claim that their QoL is excellent, whereas a healthy person who lost their job would claim the opposite. The phrase "quality of life" in the context of health care refers to a comprehensive concept that encompasses social, emotional, physical, and material well-being.[10,11]

Historical Background

Academic interest in quality of life increased after World War II, as socioeconomic disparities were becoming more generally acknowledged. This acted as the impetus for research on social indicators, which in turn sparked investigations into subjective well-being and quality of life. Medical consultations have always taken into account the patient's opinion of their health, but it wasn't until the 1960s that researchers began methodically gathering and disseminating this information in the medical literature.[9,10]

Quality-of-Life Measures

There are various types of quality-of-life measures. These include generic measures, which are meant to assess health-related quality of life in any group of patients (in fact, in any population sample); disease-specific measures, such as those meant to assess health-

related quality of life in specific illness groups; and individualized measures, which allow the inclusion of aspects of life that are important to specific patients. Quality-of-life measures include the 36-item Short Form Health Survey (SF-36), the Sickness Impact Profile (SIP), and the Beck Depression Inventory (BDI). These indicators cover a wide range of aspects of life that may be adversely affected by sickness, such as mental and physical health, as well as the ability to participate in social and professional activities. A number of disease-specific assessments, including the Arthritis Impact Measurement Scales (AIMS), the 39-item Parkinson's Disease Questionnaire (PDQ-39), the Endometriosis Health Profile (EHP), the 40-item Amyotrophic Lateral Sclerosis Scale (ALSS), and the Arthritis Assessment Questionnaire (ALSAQ-40), are designed to be used with particular patient groups. Like generic measurements, they consider aspects like mental and physical functioning. They also address issues that patients with certain diseases may have in common (e.g., perceptions of social stigma and emotions of loss of control).

Subjective versus Outsider Perspectives

Aspects of health that are not typically assessed using conventional techniques, like blood tests, clinical judgment, and X-rays, include quality of life. Due in part to their perception as being more objective, the latter have a tendency to dominate the fields of medicine and health care. Because it directly considers the patient's subjective opinions, QoL measurement may provide healthcare practitioners with information that may complement or sometimes contradict standard evaluations. There is evidence, for instance, that those from the outside, such as doctors and family members, have a more negative perception of a patient's quality of life than the patient does.

In other cases, clinical evaluations are steady over time, but patients nonetheless experience a decline in their health. Such differences between both the opinions of people in a specific state of health and those of outside observers serve as a warning of the limitations of basing judgments only on observers' evaluations. The improvement of the patient's well-being is the major goal of the healthcare system. Only by including patient perspectives in treatment evaluations-ensuring that medical as well as health care is completely evidence-based-can this be accomplished.[9]

In the context of health care, QoL is commonly evaluated in terms of how a particular condition impacts the patient personally. This may include an aging person's natural decline in health, a chronic or end-stage disease process, the unexpected mental or physical deterioration of a loved one, a painful but not life-threatening condition, a potentially fatal but not terminal illness, or any combination of these scenarios. The Quality of Life Research Unit at the University of Toronto defines the quality of existence as "the extent to which a person appreciates the significant possibilities of his or her life". Their QoL model is built on the concepts of "being," "belonging," and "becoming," which refer to one's identity, relationship to one's surroundings, and fulfillment of one's ambitions.

Studies using experience samples reveal significant inter-individual variation in the relationship between somatic symptoms and quality of life. Since quality of life is closely linked to well-being, including freedom from illness and access to treatment, Hecht and Shiel define QoL as "the patient's ability to enjoy typical daily activities".[12]

Patients' estimated glomerular filtration rate (eGFR) level can be used to calculate estimated kidney function by using the results of a routine blood test called serum creatinine. Kidney function or GFR decreases as the blood creatinine level rises. When kidney function is about 20% normal, it is typically possible to be added to the waiting list for a kidney transplant. Although this varies, many patients will require to begin dialysis when their functioning of the kidney is between 6 and 10 percent. At this low level of kidney function, most patients will experience some symptoms, which often alleviate after starting dialysis. There is no set level of kidney function at which dialysis must begin in the absence of symptoms. However, some nephrologists (kidney specialists) recommend initiating dialysis once the eGFR level drops below approximately 10 mL/min/1.73 m2, even in the absence of symptoms. While urine production may remain normal in patients with chronic renal disease and in some patients with acute kidney injury, urine does not sufficiently remove waste products from the body.[12]

The increase in survival rates among patients with chronic renal failure as a result of replacement therapy has prompted greater attention to QoL, a crucial metric for assessing the effectiveness of chronic disease

management. A comprehensive meta-analysis was conducted to determine whether peritoneal dialysis or hemodialysis results in better improvement of QoL. They analyzed studies published between 2011 to June 2016, from databases such as Medline, Cinahl, Scopus, PubMed, and ProQuest. They selected studies that compared the QoL of patients receiving hemodialysis and peritoneal dialysis, utilizing the KDQOL-SF 1.3 or 36 questionnaires. The data were recorded using Microsoft Excel, and a t-test for independent samples was conducted. Among the seven studies reviewed, only a few reported substantial variations between the two therapies. Some studies found that patietns undergoing hemodialysis reported a higher quality of life, particularly in terms of physical health and aspects related to care.[13]

As patients age, their priorities and perceptions of QoL change. A qualitative study was conducted to explore the themes important to elderly dialysis patients and to assess how well these themes are reflected in the QoL measures currently in use. Twelve individuals aged 75, receiving hemodialysis participated in semi-structured interviews to share what matters most to them in life. The interview transcripts were analyzed using the framework analysis methodology (coding, mapping, and charting,). Key themes were identified and compared based on the participant's frailty status. The study examined how well the Kidney Disease Quality of Life (KDQOL-36) and World Health Organization Quality of Life for Older Adults (WHOQOL-OLD) questionnaires represented the subthemes of the study. The average age of the 12 participants was 81 (4.2) years, seven of them were African-American, six were female, and six matched the weakness criteria. The two primary quality of life themes identified were: being in good health (subthemes: the capacity to do things independently, keeping physical health, the ability to handle symptoms and to be alive) and receiving support from social networks (subthemes: socialization, emotional social support, and to have social support in real life). Views on the subthemes often varied according to one's state of weakness. For example, among frail individuals, the dominating themes were social support and physical well-being, as acknowledged by older dialysis patients, and are likely to need the use of novel tools.[14]

To investigate the standard of living among hemodialysis patients, 320 patients receiving hemodialysis at one-day dialysis centers were interviewed. The Missoula-VITAS Quality of Life Index (MVQOLI), a scale for evaluating QoL, as well as sociodemographic and clinical characteristics, were incorporated in the custom-constructed questionnaire used to gather data. It was observed that worse quality of life was associated with longer hemodialysis sessions (P <0.001).[15]

Both general and kidney-specific components of QoL can be investigated in patients undergoing hemodialysis. A research was conducted in Oman to assess the QoL of patients while receiving hemodialysis, and to identify the features that may impact it. The physical (45.7) and emotional (53.3) QoL scores of dialysis patients were found to be approxiamtely half those of the average person. Dialysis patients, according to other studies, have a low QoL, highlighting the need for renal rehabilitation programs to improve their quality of life.[16]

CKD is a progressive, irreversible condition that leads to various biochemical, clinical, and metabolic complications. These are directly or indirectly associated to high rates of hospitalization, morbidity, and death. Beyond the physical and psychological distress experienced on diagnosis and during treatment, individuals also experience further losses in their professional, social, sexual, and psychological contexts. The term QOL refers to a broad range of factors across environmental, social, psychological, and physical domains. In addition to determining whether a person is disease-free, a QOL assessment also considers physical, mental, and social well-being. Hospitalizations negatively affect physical and emotional scores, while absences are inversely correlated with social support and age. The study's data analysis highlighted the need to improve aspects of patients' lives that require both adaptation and asstimulation, aiming to create better balance in an individuals life.[1,11,13]

Conflicts of Interest

Nil

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