A STUDY ON DETERMINATION OF FACTORS INFLUENCING THE OVERALL QUALITY OF LIFE IN LONG-TERM HEMODIALYSIS PATIENTS

A PROJECT REPORT

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Submitted to the Department of Nutrition and Food Engineering in the partial fulfillment of B.Sc. in Nutrition and Food Engineering
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APPROVAL

This Project titled "**A study on determination of factors Influencing the Overall Quality of Life in Long-Term Hemodialysis Patients**," submitted by **Afsana Akter Mira** to the Department of Nutrition and Food Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Nutrition and Food Engineering and approved as to its style and contents.

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DECLARATION

We hereby declare that this project has been done by us under the supervision of **Ms. Tasmia Tasnim, Assistant Professor,** Department of Nutrition and Food Engineering**,** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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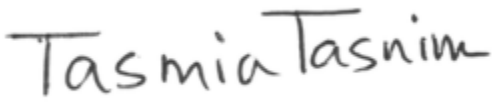

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ABSTRACT

Nutritional status concerns are prevalent among hemodialysis patients and have a significant influence on health-related quality of life (HRQoL). This research aims to use hemodialysis patients from the Kidney Foundation Bangladesh to look at how the Mini Nutritional Assessment (MNA) relates to health-related quality of life (HRQoL). The study used a cross-sectional approach and included 200 patients. Data was collected via in-person interviews using the SF-36 Health Survey and the MNA. For the statistical assessment, which comprised HRQoL measurements, MNA scores, and sociodemographic knowledge about SPSS Statistics software was used. Participants' socioeconomic status and level of education varied, and 52% were female and 48% were male. Based on clinical parameters, the average Body Mass Index (BMI) was 22.09 ± 6.60, accounting for 20.5% underweight, 22% overweight, and 8% obese. Nutritional status was determined to be normal for 32% of participants, at risk for malnutrition for 56%, and malnourished for 12%, according to MNA evaluations. Surprisingly, those in the starving group reported higher physical functioning than those in the at-risk or normal-nutrition groups ($p = 0.008$). HRQoL ratings varied across dimensions. Other HRQoL measures, such as role emotions, physical pain, social function, energy/fatigue, and overall health, did not show any significant variations.The results emphasize both undernutrition and overnutrition among patients, illuminating the complicated link between nutrition and HRQoL. The surprisingly elevated physical functioning ratings observed in malnourished people raise the possibility of sampling bias or compensating mechanisms. In order to improve HRQoL in hemodialysis patients, this emphasizes the need for focused nutritional therapies and additional study into the interactions between nutritional status, mental health, and social support.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Hemodialysis is a medical procedure that involves removing a patient's blood from their body and then returning it after correcting problems such as azotemia, fluid imbalances, electrolyte disturbances, and acid-base abnormalities often associated with uremic syndrome. Its main purpose is to oversee the treatment of both acute and chronic renal failure that does not show improvement with conventional therapies. Additionally, it may be used in the treatment of certain poisonings, such as ethylene glycol poisoning, as well as in the preparation of patients for kidney transplants. This intricate process requires sophisticated technology and highly trained personnel to guarantee its proper and safe implementation, particularly in patients who are severely sick. Advancements in neonatal dialysis technology have made it a viable, efficient, and secure alternative for addressing profound renal failure in domestic animals such as canines and felines. The increasing acknowledgement and need for this treatment suggest a bright future for hemodialysis as a crucial method of replacing renal function (Elliott, 2000).

More than 300,000 people in the United States who have end-stage renal disease depend on hemodialysis as a vital therapy to prolong their lives. The pioneering contributions of early innovators such as Kolff, Merrill, Scribner, and Schreiner have led to the widespread adoption of dialysis as a routine medical procedure. Since 1973, Medicare has provided universal access to dialysis for all qualified patients, irrespective of their financial situation or other personal circumstances. The number of hemodialysis patients is increasing, and this is accompanied by a rise in both the average age and the prevalence of numerous health disorders. Although the rates of hospitalization have been stable, there has been a small improvement in the risk-adjusted mortality rate. There is a continuous discussion on the optimal methods for transferring patients from chronic renal disease to dialysis, which includes determining the appropriate time for nephrology referrals and the initiation of therapy. Uremic syndrome, caused by kidney failure, leads to malfunction in several organ systems owing to the accumulation of waste products that are typically eliminated by healthy kidneys. While hemodialysis effectively addresses some of these problems, it may also worsen existing disorders or give rise to new concerns. For example, the use of heparin during dialysis might elevate the likelihood of gastrointestinal hemorrhage, while the presence of amino acid depletion in dialysate can lead to the development of uremic malnutrition. In addition, addressing a specific uremic condition, such as secondary hyperparathyroidism, might potentially result in the development of additional complications, such as adynamic bone disease. It is crucial for nephrologists who are responsible for treating hemodialysis patients to have a thorough awareness of the complex relationship between uremic syndrome, concomitant diseases, and the impact of renal replacement treatment. Nephrologists essentially

practice internal medicine in a simulated environment that replicates the symptoms of total renal failure (Himmelfarb, 2005).

1.2 Background

1.2.1 Hemodialysis and Its impact in life

It is well acknowledged that individuals suffering from end-stage renal illness encounter several difficulties, including both physical and psychological concerns that might have a negative impact on their overall prognosis. Anxiety and sadness are the most common psychological diseases linked to renal failure. Levin was the first to use the phrase "psych nephrology" to emphasize that persons who receive renal replacement treatment often experience several stresses, which may result in serious mental disorders (Vasilopoulou, 2016).

Currently, there are more than 400,000 patients in the United States who are receiving maintenance hemodialysis. Despite the progress in dialysis technology, these patients continue to face frequent hospitalizations, reduced quality of life, and increased death rates. The yearly death rate for all causes in this group is about 20%, which is tenfold greater than that of the overall population. The five-year survival rate is around 40%, which is lower than that of many other kinds of cancer. Cardiovascular problems account for 40% of all deaths in this group, mostly caused by heart failure, acute myocardial infarction, and life-threatening arrhythmias (Chirakarnjanakorn, 2017).

Malnutrition is a prevalent problem in patients with end-stage renal disease who are receiving hemodialysis (HD), with rates of occurrence ranging from 18% to 75%. The risk of malnutrition in HD patients is caused by several variables, such as the catabolic effects of the dialysis procedure, decreased appetite owing to the uremic environment and dietary limitations, nutrient loss via the dialysis membrane, inflammation, and metabolic acidosis. These elements are contributing factors to the development of a disorder called protein-energy wasting (PEW) syndrome. PEW, an acronym coined by the International Society of Renal Nutrition and Metabolism (ISRNM), refers to the collective impact of cachexia, malnutrition, and inflammation in individuals with chronic kidney disease (CKD). It is associated with higher rates of illness and death. Malnutrition not only increases the likelihood of illness but also reduces physical ability and results in more frequent and longer hospital stays, which have a detrimental impact on overall health-related quality of life (QOL). Research suggests that those who are malnourished often have a worse quality of life, underscoring the need of timely identification and treatment. Although the influence of nutritional status on the quality of life (QOL) for individuals with HD is recognized, there is a lack of substantial data to substantiate this correlation. The Pharmacy and Nutrition and Nephrology Departments at our hospital created and implemented a nutritional care model in 2017. The objective of this approach is to detect nutritional hazards at an early stage, enable frequent nutritional evaluations and monitoring, and establish a nutritional intervention program (NIP) to avoid the progression of malnutrition and the subsequent deterioration of quality of life (QOL) (Garrido Pérez, 2016).

1.2.2 Factors associated with quality of life

Hemodialysis patients often encounter acute difficulties such as low blood pressure and involuntary muscular contractions, in addition to chronic conditions including low red blood cell count and infections caused by hepatitis B and C viruses. In addition, these people may encounter a dearth of autonomy, reliance on family members, disturbances in their personal and social spheres, and financial burden. The strenuous and time-consuming nature of hemodialysis may lead to symptoms such as tiredness, lethargy, impairment, reduced sexual desire, and even severe depression. These symptoms severely impact the overall feeling of well-being and quality of life of those undergoing hemodialysis. These problems may result in modifications to one's lifestyle, changes in health condition, and adjustments in personal responsibilities. Patients experience many physical, mental, and social stresses that impact their quality of life. This includes factors like financial stability, employment, relationships, religious views, as well as physical, mental, and social health. Cultural environments, value systems, personal objectives, and expectations shape their experience of life. Research indicates that the quality of life for those undergoing hemodialysis is significantly worse when compared to the overall healthy population (Naderifar, 2018).

1.3 Objectives

- ✓ To assess the demographic characteristics, including age, gender, location, marital status, education, income, and employment, of individuals living with hemodialysis.
- ✓ To assess MNA and understanding health condition among hemodialysis patients.
- ✓ To evaluate the quality of life (QOL) of individuals with hemodialysis using the SF-36 questionnaire across various dimensions, including physical functioning, emotional well-being, social functioning, pain, role functioning (both physical and emotional), general health, energy/fatigue, and health change.

CHAPTER 2

LITERATURE REVIEW

2.1 SF-36 Questionnaire

The task of defining and quantifying the quality of life (QoL) is difficult since it encompasses a wide range of aspects and is complex in nature. They contend that sickness and its therapies have an effect on several facets of an individual's well-being, including psychological, social, economic, and biological dimensions. An all-encompassing definition of sickness should include all these aspects and enable the assessment of individual elements. This technique enables the comprehension of how various illnesses or therapies impact the overall quality of life or particular facets thereof (Fallowfield, 2009).

The SF-36 is used as an instrument to assess many aspects of both physical and mental well-being, including eight categories. The factors included in this list are vitality, bodily discomfort, general health perceptions, mental health, physical functioning, physical role constraints, emotional role limitations, and social role restrictions. The SF-36 instruments used in this investigation are derived from lengthier versions used in the Medical Outcomes investigation (MOS), which is an observational study aimed at investigating differences in physician practices and patient outcomes across various healthcare systems (Hays, 1993).

In addition, the SF-36 incorporates a solitary metric that accurately captures changes in total well-being. The questionnaire consists of 36 items and is derived from the MOS SF-36. Up to this point, the SF-36 has been shown in more than a thousand publications. Detailed information on the SF-36's history, development, psychometric qualities, reliability, validity, and normative data may be found in the original volume of the SF-36 user's manuals. Frequently researched medical disorders, such as arthritis, back pain, depression, diabetes, and hypertension, have been extensively examined in over 20 studies using the SF-36. In addition, there are 148 studies that specifically examine the translation of the SF-36 questionnaire. Furthermore, numerous articles provide comparisons between the findings of the SF-36 questionnaire and 225 other evaluation methods, both general and disease-specific (Ware Jr, 2000).

Additionally, the SF-12 Health Survey, a condensed version of the SF-36, has 12 questions and evaluates the quality of life connected to health (Windsor, 2006).

An in-depth and unbiased evaluation of the evolution of the SF-36, including a meticulous analysis of its origins and practical uses. The SF-36 Web page (http://www.rand.org) provides a comprehensive list of associated books for more information and extra resources. The SF-36 has been extensively studied and shown to be very useful in assessing the impact of various illnesses and medical conditions. Research has been conducted on more than 130 different diseases and medical conditions (McDowell, 2006).

2.2 Relevant studies

Hemodialysis patients often have reduced functional capacities in comparison to persons in good health, leading to a detrimental impact on their overall quality of life. This research investigated the correlation between regular physical exercise and the overall well-being of 93 people with HD (Huntington's disease) and 140 individuals who are in good health. The assessment of quality of life was conducted using the 36-item SF-36 questionnaire, whereas the measurement of habitual physical activity was done using the Human Activity Profile (HAP). The regression study revealed that adjusted activity scores (AAS) obtained from HAP, in addition to variables such as age, gender, fat tissue index (FTI), lean tissue index (LTI), and comorbidity scores, were shown to be significant predictors of the Physical Component Summary (PCS) of the SF-36. Among patients with HD, AAS explained 32% of the variability in PCS scores. Specifically, for every one-point rise in AAS, there was a corresponding improvement of 0.431 points in PCS. In contrast, among healthy controls, AAS accounted for just 14.9% of the variance in PCS, with a lower effect size (B = 0.359). The results emphasize that physical exercise has a stronger effect on the quality of life in HD patients than in healthy persons. This underscores the importance of regular physical activity programs and the role of the nephrology community in supporting these efforts (Filipčič, 2021).

Compliance with treatment is crucial for improving the quality of life in hemodialysis patients, with a considerable effect on their general health and well-being. This research investigated the correlation between treatment adherence and quality of life in hemodialysis patients at Shahid Beheshti University of Medical Sciences in Tehran, Iran. The study, which spanned from October 2016 to May 2017 and used a correlational descriptive-analytic approach, included a sample of 200 patients from five hospitals. The data collection process included the use of a demographic questionnaire, the KDQOL-SF, and the ESRD-AQ. Sampling was done based on availability, and the analysis was performed using SPSS version 18. The research sample included 50% men, of whom 23% were aged between 51 and 60. The results showed that the average quality of life score was 50.42±22.81 and the average treatment adherence score was 901.13±85.30. A strong positive association was seen between adherence to therapy and quality of life ($r=0.218$, $P<0.01$). These findings emphasize the need of focused educational and intervention initiatives to increase adherence to therapy, therefore enhancing the quality of life for patients undergoing hemodialysis (Naderifar M. T., 2018).

This cross-sectional research was done from January to April 2019 at the hemodialysis unit of Lahore General Hospital. The objective of the study was to assess patient satisfaction and quality of life in 141 individuals with End-Stage Kidney Disease (ESKD) who were receiving hemodialysis. By utilizing a questionnaire that was created specifically for this study and ensuring that participants were fully informed and gave their consent, the research discovered that 82.56% of patients expressed contentment with the quality of care they received at the dialysis center. However, 36.9% of patients expressed dissatisfaction with the cannulation technique, and a portion of them also expressed discontent with the amount of time spent with

doctors. Although patients expressed a high level of satisfaction (89.9%) with the self-care instruction they received, they faced considerable difficulties in the financial and emotional elements of their life. The main financial concerns were centered on transportation expenses, as dialysis treatments and erythropoietin were given without any cost. Nevertheless, a significant proportion of patients (54.1%) saw a decrease in their earnings as a result of their medical condition, and a substantial majority (80%) of working patients had to take leave from work to undergo dialysis treatment. While financial hardship did not directly cause marital breakup, it did exacerbate domestic disputes. Out of the unmarried patients, 40% expressed hesitancy in pursuing partnerships, while another 40% encountered challenges in finding suitable companions. However, a significant majority of 97.9% reported satisfaction with the assistance provided by their families. In general, while the majority of patients expressed contentment with their decision to undergo hemodialysis and the level of treatment they got, their quality of life was considerably affected by financial limitations and psychological pressures. Individuals who are employed, married, and have consistent earnings reported a higher quality of life. The research identified deficiencies in the dialysis unit's surroundings and health education, emphasizing the need for continuous enhancements in hemodialysis procedures to improve patient outcomes (Iqbal, 2021).

The research included 395 individuals undergoing hemodialysis and employed a customized survey to collect information, encompassing socio-demographic and clinical data, the Hospital Anxiety and Depression Scale (HADS) to measure anxiety and depression, and the Missoula-VITAS Quality of Life Index (MVQOLI) to assess quality of life. The results indicated that 47.8% of the individuals reported experiencing significant levels of anxiety, while 38.2% reported high levels of sadness. The average quality of life score was 17.14. The statistical analysis revealed significant associations between quality-of-life scores and various factors, including family status ($p=0.007$), education level ($p<0.001$), number of children ($p=0.001$), adherence to medical advice ($p=0.003$), diet compliance ($p=0.002$), and relationships with healthcare professionals and peers ($p<0.001$). The results of the multiple linear regression analysis revealed a substantial association between the overall quality of life and depression levels, even after controlling for confounding factors. Patients with moderate and high levels of depression had quality of life ratings that were 2.5 and 4.4 points poorer, respectively, compared to those with low levels of depression ($p<0.001$). These findings highlight the significance of include evaluations of anxiety and depression in the care of hemodialysis patients in order to improve their overall quality of life (Vasilopoulou C. B., 2016).

This research, carried out from March 1, 2007, to February 28, 2008, in western Turkey, aims to investigate the frequency of depression in hemodialysis patients and its influence on their quality of life (QoL). The study examined data from 294 patients using the Beck Depression Inventory (BDI) and the Medical Outcomes Study Short Form-36 (SF-36). The findings revealed that 27.9% of the participants were experiencing depression. The prevalence of depression was higher among women, older individuals, those with lower education levels,

and the unemployed. This difference was statistically significant ($p < 0.05$). Patients with depression had substantially lower scores in all SF-36 areas ($p < 0.001$), and higher BDI scores were linked to lower SF-36 scores ($p < 0.001$). These results emphasize the negative impact of depression on the quality of life in hemodialysis patients, emphasizing the need of regularly screening for depression to improve patient treatment and outcomes (Kizilcik, 2012).

Fatigue is a common and severe symptom in patients with chronic renal disease who are getting regular hemodialysis treatment. However, the causes and effects of fatigue on survival are not well known. This research examined the factors associated with tiredness and the resulting consequences in a group of 1,798 individuals undergoing hemodialysis. The SF-36 vitality scale was used to evaluate fatigue levels. The study found that higher scores on the index of coexistent illnesses (ICED), diabetes, non-African-American ethnicity, lower levels of serum albumin, usage of sleep drugs, and poor sleep quality were all substantially linked to greater levels of exhaustion at the beginning of the study. Analyzed longitudinally, the study found that older age, longer duration of dialysis, higher ICED scores, and usage of sleep medicine were associated with an increase in tiredness. Conversely, higher levels of serum albumin were connected with a decrease in fatigue. In addition, there was a direct correlation between a 10-point increase in vitality score and a 10% increase in average survival rate ($p < 0.0001$). The results indicate that demographic and clinical variables have a considerable impact on tiredness, which subsequently influences mortality. This emphasizes the need to treat fatigue in order to enhance patient well-being and increase survival rates in end-stage renal illness (Jhamb, 2011).

Malnutrition is a common issue among hemodialysis (HD) patients and can significantly affect their quality of life (QOL). This study explores the effectiveness of the Malnutrition-Inflammation Score (MIS) in identifying nutritional risk (NR) and examines the relationship between nutritional status and QOL in patients undergoing a nutritional intervention program (NIP). The cross-sectional study included 120 patients, utilizing the MIS to detect NR and the Kidney Disease Quality of Life (KDQOL-SF) instrument version 1.2 to evaluate QOL. The results revealed that 62% of patients were at risk of malnutrition ($MIS > 5$). Nutritional status was significantly correlated with all QOL sub-scales. Multiple linear regression analysis demonstrated that malnutrition accounted for 28.9% of the variance in the Kidney Disease Summary Component, 33% in the Physical Component Summary, and 21.5% in the Mental Component Summary. Thus, malnutrition emerged as a critical predictor of lower KDQOL-SF scores. These findings underscore the importance of using the MIS for early detection of NR and highlight the potential of NIPs to enhance QOL in HD patients by addressing malnutrition (Visiedo, 2022).

2.3 Factors Influencing Quality of Life in Hemodialysis Patients

Quality of life (QoL) in hemodialysis (HD) patients is profoundly impacted by a range of factors, with the SF-36 scale frequently used to predict mortality and hospitalization risk in this population. Studies have shown that the Physical Component Summary (PCS) score of the

SF-36 is a strong predictor of mortality, often surpassing serum albumin levels in its prognostic value, with a one-point increase in PCS correlating with a 2% reduction in mortality risk, independent of other variables. Similarly, the Mental Component Summary (MCS) score is closely linked to depression, with scores under 43 indicating high sensitivity and specificity for depressive symptoms. In Romania and other Central and Eastern European countries, recent advancements in dialysis care, including the employment of psychology specialists and the establishment of national psychonephrology summits, have aimed to enhance QoL among end-stage renal disease (ESRD) patients. A comprehensive study involving 709 prevalent HD patients across 12 Romanian dialysis centers explored how various demographic and clinical factors, such as age, gender, dialysis vintage, educational and socio-economic levels, living status, serum hemoglobin, Kt/V, diabetes, and heart failure, affect QoL. This study marks a significant effort in understanding QoL determinants in the Romanian dialysis population and aligns with broader European research to better tailor interventions and support for improving patient outcomes (Gonyea, 2020).

2.4 Research gaps

The current research aims to address some of these gaps by exploring various factors that can impact the quality of life in this population, including physical, psychological, and emotional factors. Here are some specific gaps identified:

2.4.1 Psychological and Emotional Factors in Quality of Life

Psychological and emotional factors are integral to the quality of life (QoL) for patients undergoing hemodialysis, profoundly impacting their overall well-being. Evidence reveals that depression and anxiety are common among these individuals, often intensified by the chronic nature of their condition and the rigorous demands of their treatment (Weisbord et al., 2004). These mental health issues can detrimentally affect various dimensions of QoL, including social relationships, daily activities, and general life satisfaction. Moreover, emotional elements like stress and the ability to manage it play a significant role in QoL outcomes, with effective psychological support and counseling proving beneficial for improving patient satisfaction and emotional resilience. Implementing focused interventions and support strategies to address these psychological and emotional challenges is crucial for enhancing QoL in hemodialysis patients (Cruice, 2003).

2.4.2 Longitudinal Studies

Longitudinal studies play a crucial role in understanding the quality of life (QoL) among hemodialysis patients by tracking changes and identifying factors that influence QoL over time. These studies follow patients across extended periods, offering insights into how elements like clinical conditions, treatment adherence, and psychosocial factors impact QoL as it evolves. For example, research indicates that a decline in functional status or the emergence of additional health issues can lead to a reduction in QoL over time. Additionally, longitudinal studies assess the effects of various interventions such as modifications in dialysis

methods or the introduction of supportive care programs on QoL improvements. By capturing these ongoing changes and evaluating intervention effectiveness, longitudinal studies provide essential data for crafting strategies to enhance QoL and achieve better long-term outcomes for hemodialysis patients (Bouchet, 1996).

2.4.3 Comparative Analysis

Comparative analysis in evaluating the quality of life (QoL) for hemodialysis patients involves examining and contrasting various factors, treatments, or patient groups to determine what most significantly affects QoL. This approach often includes comparing different dialysis methods, such as hemodialysis versus peritoneal dialysis, or analyzing differences among patient demographics like age or ethnicity. Such studies can uncover variations in QoL tied to treatment types, healthcare access, and psychosocial support. For example, research has indicated that patients on home-based dialysis frequently report a higher QoL compared to those receiving in-center hemodialysis, likely due to greater flexibility and autonomy. Additionally, comparative studies evaluate the impact of specific interventions, such as psychological support or nutritional programs, on QoL across different patient populations. Through these comparisons, researchers can identify effective practices and customize interventions to enhance QoL for hemodialysis patients (Zhao, 2021).

2.4.4 Intervention Studies

Intervention studies focus on evaluating the impact of targeted treatments or programs designed to improve the quality of life (QoL) for hemodialysis patients. These investigations often assess how various interventions, such as psychological therapy, dietary adjustments, or physical activity programs, influence patient outcomes. For instance, research has demonstrated that cognitive-behavioral therapy and counseling can notably enhance QoL by alleviating symptoms of depression and anxiety in hemodialysis patients. Additionally, customized nutritional programs have been effective in improving dietary intake and reducing malnutrition, thereby boosting overall QoL. Exercise interventions, including structured fitness regimens, have also been shown to improve physical health and overall well-being, positively impacting QoL. By identifying which interventions are most beneficial, these studies offer crucial guidance for refining clinical practices and enhancing patient care strategies (Lii, 2007).

2.4.5 Cultural and Sociodemographic Variations

Cultural and sociodemographic factors profoundly shape the quality of life (QoL) for hemodialysis patients, influencing their illness perceptions and treatment experiences. Research indicates that cultural norms and values can affect how patients handle their chronic conditions. For example, cultures emphasizing family support and community care often see better QoL outcomes due to enhanced emotional and social backing. Conversely, in cultures where chronic illness is stigmatized or poorly understood, patients may suffer from heightened psychological distress and diminished QoL. Sociodemographic variables such as age, gender, educational attainment, and socioeconomic status also significantly impact QoL. Evidence

suggests that younger patients, those with higher education levels, and individuals with better financial stability generally report superior QoL. Gender can further influence QoL, with some studies finding that women may experience more emotional challenges than men. Recognizing these cultural and sociodemographic differences is crucial for creating personalized interventions that cater to the unique needs of various patient groups, thereby enhancing the effectiveness of QoL improvement efforts for hemodialysis patients (Guerra-Guerrero, 2012).

2.4.6 Patient-Reported Outcomes and Preferences

Patient-reported outcomes (PROs) and preferences are essential for evaluating and enhancing the quality of life (QoL) in hemodialysis patients. PROs offer direct feedback on how patients view their health, symptoms, and the effects of their treatment on daily living (Cella et al., 2007). These outcomes typically encompass aspects such as physical health, emotional well-being, and overall satisfaction with care, capturing the patient's personal experiences and viewpoints. Preferences reflect patients' values and choices about treatment options and QoL enhancements. In the context of hemodialysis, PROs can identify difficulties patients face, such as fatigue, pain, or restrictions in their daily lives, allowing healthcare providers to customize interventions more effectively. Additionally, understanding patient preferences is crucial for collaborative decision-making, ensuring that treatment strategies align with patients' values and goals. Integrating PROs and preferences into care approaches fosters patient-centered care, leading to more tailored and satisfactory treatment experiences, and ultimately enhancing the QoL for those undergoing hemodialysis (Janssen, 2015).

CHAPTER 3

METHODOLOGY

3.1 Study design

The research was designed as a cross-sectional study and focused on patients admitted to the Kidney Foundation Bangladesh. The investigation took place at the Kidney Foundation Bangladesh, located in Section-2, Mirpur, Dhaka-1216.

3.2 Study setting

This cross-sectional study was carried out at the Kidney Foundation Bangladesh, located in Section-2, Mirpur, Dhaka-1216.

3.3 Study Population

I gathered data from 200 individuals undergoing hemodialysis. The sample size was determined using the formula n= {Z2 *P(1-P)}/E2

3.4 Research Instrument

Data collection was performed using a validated questionnaire and a standardized instrument.

3.5 Socio-demographic characteristics

Participants provided details about their age, gender, educational background, residential location, income level, and employment status.

3.6 Step of data collection

I gathered information on demographics, MNA data, and SF-36 data through face-to-face interviews with patients lasting 15-20 minutes, using a pre-designed questionnaire with the patients' consent.

3.7 Statistical Analysis

Data analysis was conducted with SPSS Statistics software (Version 25.0, IBM, Armonk, NY, USA). Descriptive statistics included frequency distributions, percentages, means, and standard deviations. To explore relationships between variables, a Chi-square test was applied for inferential analysis.

3.8 SF 36 Scoring

Scoring the SF-36 Health Survey involves a two-phase procedure. The initial phase requires converting pre-coded numeric values according to the scoring key provided in Table 3.1. It's important to ensure that all responses are coded so that higher scores indicate better health outcomes. Each item is scored on a scale from 0 to 100, where 0 represents the poorest and 100 represents the best possible health state, with scores reflecting the percentage of the maximum possible score attained.

In the second phase, responses to items within each scale are averaged to produce the eight distinct scale scores. Table 3.2 details which items are combined to form each of these scales. Missing responses are excluded from the calculations, so each scale score is the average of only the answered items within that scale.

Table 1: Recoding items (step 1)

Item numbers	Change original response category*	To recoded value of:
1, 2, 20, 22, 34, 36	1 →	100
	2 →	75
	3 →	50
	4 →	25
	5 →	0
3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1 → 2 →	0 50
	3 →	100
13, 14, 15, 16, 17, 18, 19	1 → 2 →	100 0
21, 23, 26, 27, 30	1 →	100
	2 →	80
	3 →	60
	4 →	40
	5 →	20
	6 →	0
24, 25, 28, 29, 31	1 →	0
	2 →	20
	3 →	40
	4 →	60
	5 →	80
	6 →	100
32, 33, 35	1 →	0
	2 →	25
	3 →	50
	4 →	75
	5 →	100

* Pre-coded response choices as printed in the questionnaire.

Table 2: Averaging items to form scales (Step 2)

Scale	Number of items	After recoding per Table 3.1, average the following items
Physical functioning	10	3 4 5 6 7 8 9 10 11 12
Role limitations due to physical health	4	13 14 15 16
Role limitations due to emotional problems	3	17 18 19
Energy/fatigue	4	23 27 29 31
Emotional well-being	5	24 25 26 28 30
Social functioning	2	20 32
Pain	2	21 22
General health	5	1 33 34 35 36

Table 3: Reliability, central tendency and variability of scales in the medical outcomes

Scale	Items	Alpha	Mean	SD
Physical functioning	10	0.93	70.61	27.42
Role functioning/physical	4	0.84	52.97	40.78
Role functioning/emotional	3	0.83	65.78	40.71
Energy/fatigue	4	0.86	52.15	22.39
Emotional well-being	5	0.90	70.38	21.97
Social functioning	2	0.85	78.77	25.43
Pain	2	0.78	70.77	25.46
General health	5	0.78	56.99	21.11
Health change	1	—	59.14	23.12

Note: Data is from baseline of the Medical Outcomes Study (N=2471), except for "Health change," which was obtained one year later (health-care, 2024).

3.9 Methodology

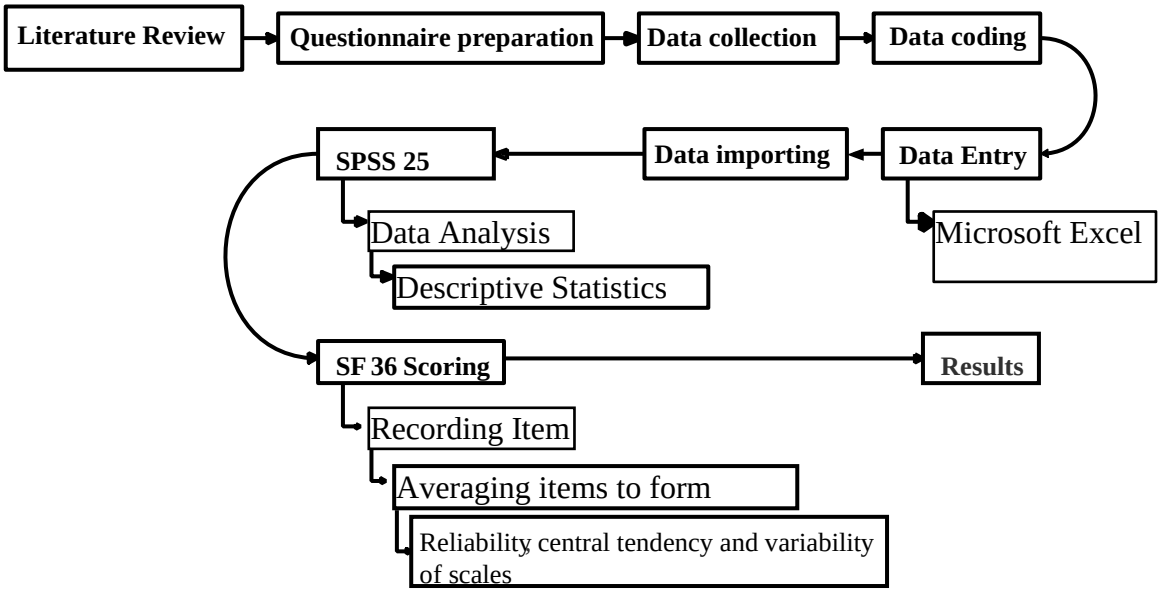

Figure 1: Flowchart of methodology

3.10 Contemplating principles

Before providing their written consent to participate, each participant was informed about the study's objectives and its scope.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Results

4.1.1 Socioeconomic traits

Table 4: Socioeconomic Characteristics

Variables	Category	Frequency (n)	Percentage (n%)
Sex	Male	96	48
	Female	104	52
Education	Illiterate	19	9.5
	Primary	74	37
	Secondary	56	28
	Graduate	33	16.5
	Post Graduate or Upper	18	9
Resident Status	Rural	28	14
	Urban	172	86
Marital Status	Single	10	5
	Married	190	95
Income	Very poor (<10,000)	12	6
	Poor (10,000-20,000)	89	44.5
	Moderate (20,000-30,000)	49	24.5
	Rich	50	25
Employment Status	Unemployed	29	14.5
	Service Holder	9	4.5
	Housewife	95	47.5
	Farmer or Labor	5	2.5
	Others	62	31

The 200 participants in the study show a gender distribution that is balanced, with slightly more women than men (52% versus 48%, respectively). There is a large range in educational achievement, from 9.5% of the population living in poverty to 9% with doctorate degrees, indicating a potential impact on socioeconomic mobility. Greater access to urban resources and opportunities is indicated by the overwhelming 86% of residents who live in urban areas as opposed to 14% in rural areas. The majority of people (95%) are married, which suggests that conventional family structures are strong. With 6% of the population classed as extremely poor, 44.5% as poor, 24.5% as moderate, and 25% as rich, income levels show significant economic difference and highlight both the nation's affluence and economic concerns. With

47.5% of women being housewives, 14.5% being unemployed, and only 4.5% in formal employment, the employment status is varied but dominated by non-formal sectors. This suggests strong gender roles and economic dependency, particularly among women. The diverse life experiences and economic circumstances among the populace are highlighted by this complex socioeconomic environment.

4.1.2 Clinical characteristics

Table 5: Clinical characteristics

Variables	Categories	Frequency	Percentage	Mean ± SD
Body Mass Index (BMI)	Underweight	41	20.5	22.0938 ±6.59553
	Normal	99	49.5	
	Overweight	44	22	
	Obese	16	8	

Body Mass Index (BMI) data, which show the clinical characteristics of the study population, show a wide range of weight categories with a mean BMI of 22.09 ± 6.60. Nearly half of the participants had a generally healthy weight status, as indicated by the majority (49.5%) who fall within the normal weight range. Nonetheless, 20.5% are considered underweight, suggesting that a sizeable fraction may be suffering from dietary inadequacies or other health issues. Furthermore, 22% of the individuals are overweight, and 8% are obese, indicating that the community is at risk for weight-related health issues like diabetes and cardiovascular disease. The different health profiles and potential clinical difficulties that may need to be addressed are highlighted by this distribution.

4.1.3 MNA in 3 groups

Table 6: MNA in 3 groups.

Variables	Category	Frequency (n)	Percentage (n %)
MNA in 3 groups	Malnourished (0-7)	64	32
	At risk of malnutrition (8-11)	112	56
	Normal (12-14)	24	12

Using the Mini Nutritional evaluation (MNA) scale, the research population's nutritional evaluation reveals alarmingly high levels of malnutrition. According to the MNA, 32% of the participants are considered malnourished, meaning they scored 0–7, indicating a sizeable segment of the population with poor nutritional status and potentially harmful health implications. Furthermore, 56% of the population is at danger of malnutrition, with MNA scores ranging from 8 to 11. This means that more than half of the population is at risk of nutritional decline and may need interventions to stop things from getting worse. Merely 12% of the participants meet the recommended nutritional range, with scores ranging from 12 to 14, indicating that just a handful have appropriate nutrition. These results highlight the urgent need for focused nutritional interventions to address and lessen malnutrition in the population.

4.1.4 Quality of life scores

Table 7: SF-36 Scoring results reliability, central tendency, and variability of scales

Scale	Items	Alpha	Mean	SD
Physical Functioning	10	.809	60.7250	19.86384
Role functioning/physical	4	.833	30.7500	37.48618
Role functioning/emotional	3	-.379	42.0000	23.44910
Energy/fatigue	4	.038	43.3000	14.72051
Emotional well-being	5	-.452	54.4000	13.71058
Social functioning	2	.711	52.3125	13.38439
Pain	2	1.00	49.1625	26.01854
General health	5	.132	47.8750	12.45244
Health change	1	--	49.7500	31.80006

Quality of Life (QOL) scores bivariate analysis shows strong correlations between different aspects of well-being. With a mean score of 60.73 and good reliability (α =.809), social functioning and physical functioning show a positive correlation (mean = 52.31, α =.711), indicating that enhanced social engagement is linked to better physical health. On the other hand, inconsistent assessments or fluctuating emotional states could be the cause of the low dependability of role functioning/emotional (α = -.379) and emotional well-being (α = -.452), suggesting intricate relationships between physical and emotional health. Scores for energy and exhaustion (mean = 43.30, α =.038) appear to have little to no correlation with other dimensions, which may be because the scale is not very reliable. A potential negative association between pain and general health (mean = 47.88, α =.132) can be seen, indicating that higher levels of pain may be linked to worse evaluations of general health. Pain has perfect reliability (α = 1.00) with a mean score of 49.16. One measure, health change (mean = 49.75), can be used to assess general perceptions of gains or losses in health. It can also be used to examine how one's health changes dynamically in relation to other QOL aspects. The bivariate connections highlight the interdependence of the physical, emotional, and social dimensions

of health, underscoring the necessity of all-encompassing methods for enhancing standard of living.

4.1.5 QOL score ANOVA analysis

Table 8: HRQoL Dimension Score in different MNA Categories

HRQoL Dimensions	MNA Categories	N	Mean	Std. Deviation	P Values
Role Emotional	Malnourished	26	39.7436	29.84289 ±5.85267	.828
	At risk of malnutrition	42	41.2698	25.29985± 3.90385	
	Normal Nutritional Status	132	42.6768	21.52553± 1.87356	
Body Pain	Malnourished	26	40.6731	19.65398± 3.85446	.150
	At risk of malnutrition	42	47.6786	26.97895± 4.16294	
	Normal Nutritional Status	132	51.3068	26.59325± 2.31465	
Social Function	Malnourished	26	51.9231	14.00549± 2.7467	.937
	At risk of malnutrition	42	51.7857	15.01306± 2.31657	
	Normal Nutritional Status	132	52.5568	12.80530± 1.11456	
Energy/ Fatigue	Malnourished	26	42.6923	17.15988± 3.36533	.971
	At risk of malnutrition	42	43.2143	16.11019± 2.48586	
	Normal Nutritional Status	132	43.4470	13.84390± 1.20496	
General Health	Malnourished	26	44.0385	12.33039± 2.41819	.243
	At risk of malnutrition	42	49.1667	10.75881± 1.66012	
	Normal Nutritional Status	132	48.2197	13.49488± 1.17458	
Physical Functioning	Malnourished	26	71.3462	22.38561± 4.39018	.008

	At risk of malnutrition	42	61.7857	19.87220± 3.06635	
	Normal Nutritional Status	132	58.2955	18.74731± 1.63174	
Role Physical	Malnourished	26	32.6923	34.47407± 6.76092	.930
	At risk of malnutrition	42	29.1667	38.22138± 5.89769	
	Normal Nutritional Status	132	30.8712	38.06632± 3.31325	
Emotional Well Being	Malnourished	26	54.6154	15.42745± 3.02557	.995
	At risk of malnutrition	42	54.2857	15.85650± 2.44671	
	Normal Nutritional Status	132	54.3939	12.70557± 1.10588	
Physical Composition	Malnourished	26	49.8798	13.17789± 2.5844	.911
	At risk of malnutrition	42	50.2827	16.86636± 2.60254	
	Normal Nutritional Status	132	50.3172	14.55209± 1.2666	
Mental Composition	Malnourished	26	47.2436	13.45114± 2.63799	.838
	At risk of malnutrition	42	47.6389	9.79021± 1.51066	
	Normal Nutritional Status	132	48.2686	7.89849± 0.68748	

The Mini Nutritional Assessment (MNA) categories of malnourished, at risk of malnutrition, and normal nutritional status provide unique insights into how different aspects of quality of life are impacted by nutritional status. These insights are revealed by comparing the health-related quality of life (HRQoL) dimensions across these categories. Out of all the HRQoL characteristics, physical functioning is the one where dietary status has the biggest impact. In contrast to those who were at risk of malnutrition (61.79) and those who had a normal nutritional status (58.30), the malnourished group unexpectedly reported the highest mean score (71.35). With a p-value of.008, this finding indicates a statistically significant difference and could indicate a nuanced link between physical functioning and malnutrition. This surprising result could have as its explanation that malnourished people, aware of their physical limitations, may take up compensatory behaviors or activities that temporarily improve their

physical functioning. An alternate explanation for this could be that the study's malnourished subjects were those who continued to lead reasonably busy lives despite their dietary inadequacies.

However, there were no statistically significant variations seen in other HRQoL characteristics such as role emotions, bodily pain, social function, and general health across the nutritional groups. With the malnourished group scoring 39.74, the at-risk group scoring 41.27, and the group with normal nutritional condition scoring 42.68, for instance, the role emotional ratings were relatively similar across the groups, yielding a p-value of.828. The lack of a substantial difference implies that emotional roles might not be particularly sensitive to changes in nutritional status. This could be because psychological and social factors have a greater influence on emotional well-being than does physical health alone. Similarly, a p-value of.150 was obtained for bodily pain scores, which were lower in the malnourished group (40.67) than in the group with appropriate nutritional status (51.31). This may suggest that, although malnutrition may be a component in physical discomfort, other variables, such as aging or chronic illnesses, may have a greater influence on pain perception, therefore lessening the apparent influence of nutritional status.

Another crucial HRQoL dimension, social function, demonstrated negligible variations throughout the groups, with the malnourished group scoring 51.92, those at risk 51.79, and those with normal nutritional condition 52.56. Regardless of nutritional health, social involvement and interaction may be maintained, as indicated by the p-value of.937, which indicates no significant difference. This may be because social networks and community involvement act as buffers against the negative impacts of diet, preserving social functioning even when there are nutritional difficulties. Likewise, there were no notable variations observed between the groups in energy/fatigue, a dimension that is closely associated with vitality (p-value of.971). The group with normal nutritional status scored 43.45, those at risk scored 43.21, and the malnourished group scored 42.69. This suggests that factors other than diet, like underlying medical disorders, mental health issues, and sleep quality, may have a greater influence on an individual's energy levels.

There were no appreciable variations in general health, which is a broad measure of overall wellbeing, between the nutritional groups. The group with normal nutritional status scored 48.22, the malnourished group 44.04, and the at-risk group 49.17, with a p-value of.243. This implies that a variety of factors, such as psychological resilience, access to healthcare, and pre-existing medical issues, likely have an impact on people's assessments of their overall health rather than just their nutritional status.

The role physical component, which measures how physical health affects day-to-day activities, also revealed no significant differences, with p-values of.930 for the malnourished, at-risk, and normal groups, respectively, being 32.69, 29.17, and 30.87. This suggests that while maintaining physical health is crucial, additional adaptive techniques or support networks may be used by people to lessen the direct impact of their health on their daily tasks.

With scores of 54.62 for the malnourished group, 54.29 for those at risk, and 54.39 for those with normal nutritional status, emotional well-being—a dimension strongly associated with mental health—did not show significant differences across the nutritional categories either, yielding a p-value of.995. This shows that emotional stability is likely to be maintained throughout a range of nutritional statuses, potentially because of innate traits including personality, coping strategies, and social support that enable people to remain emotionally stable even in the face of nutritional difficulties. Scores for physical composition were likewise close, with no discernible variations. A p-value of.911 was obtained by dividing the scores of the malnourished group (49.88), the at-risk group (50.28), and the normal nutritional status group (50.32). This suggests that people's judgments of their physical health are not greatly influenced by their nutritional status, maybe because the body can adjust over time to different nutritional consumption levels.

Finally, there was no significant variance in the mental composition scores either. The group that was malnourished scored 47.24, the group that was at risk scored 47.64, and the group with normal nutritional condition scored 48.27, yielding a p-value of.838. The absence of a statistically significant difference implies that mental health outcomes, as indicated by mental composition, might be more resistant to variations in nutritional status. This is probably because non-nutritional factors like social support, psychological resilience, and availability of mental health services have an impact.

4.2 Discussion

4.2.1 Socioeconomic Characteristics and HRQoL

The demographic data indicates unequal access to resources, with a slight majority of women and a diverse educational attainment. Although 86% of participants reside in cities, 44.5% of them are still considered to be poor, indicating that living in an urban area does not always translate into improved financial standing or a higher standard of living. Economic dependency is highlighted by the large percentage of housewives (47.5%) and unemployed people (14.5%), which is a reflection of conventional gender norms that restrict access to formal employment, particularly among women. Strong family structures are also suggested by the fact that 95% of participants were married, which can both increase financial strain and offer support.

4.2.2 Clinical Characteristics and Nutritional Status

The clinical data, in particular the BMI, show that participants' health profiles vary. Nearly half of the participants have a BMI within the normal range, indicating good overall health, with a mean of 22.09 ± 6.60. But 20.5% of them are underweight, which raises questions about dietary inadequacies and increases susceptibility to conditions like impaired immunity and chronic illnesses. Furthermore, 22% of the population is overweight, and 8% of the population is obese, indicating a rising worry for non-communicable diseases like diabetes and cardiovascular disorders. This suggests that there is a dual burden of malnutrition, with serious health problems resulting from both undernutrition and overnutrition.

4.2.3 Nutritional Status and HRQoL

The results of the Mini Nutritional Assessment (MNA) draw attention to a crucial problem: a sizeable section of the populace is either undernourished (32%) or at danger of becoming undernourished (56%). The fact that just 12% of the participants meet the recommended nutritional standards highlights how urgent it is to address nutritional deficits. Given that poorer HRQoL outcomes are closely associated with both at-risk populations and the high prevalence of malnutrition, these factors have substantial consequences for public health.

4.2.4 HRQoL Dimensions Across MNA Categories

The study found that the malnourished group had surprisingly good physical functioning scores; this finding may have been caused by compensatory activities or sampling bias, as these people continue to be active despite nutritional difficulties. The lack of substantial changes between MNA categories was observed in other HRQoL dimensions, such as role emotions, body pain, social function, and overall health. This suggests that these elements are more influenced by psychological, social, or chronic health problems and less susceptible to nutritional status. Overall well-being is significantly influenced by elements other than nutrition, such as mental health and social support, as seen by the consistency of energy/fatigue levels and general health across groups.

4.2.5 Implications and Future Research

The results of this study demonstrate the critical need for focused public health initiatives to treat malnutrition, especially for underweight and socioeconomically disadvantaged populations. Research into compensatory behaviors is necessary in light of the unexpectedly good physical functioning in malnourished persons. This research could lead to the development of more potent health therapies. The study also highlights how critical it is to evaluate HRQoL in light of the larger social and psychological context. To further understand and resolve HRQoL differences across time, future research should examine the complex interactions among psychological well-being, social support, and nutritional status.

CHAPTER 5

CONCLUSION

5. Conclusion

The results of this study shed significant insight on how participants' health-related quality of life (HRQoL) and nutritional status relate to one another. Even if the BMI profile is generally healthy, the high frequency of undernutrition and overnutrition highlights the dual burden of malnutrition, which carries significant risks for long-term health issues and chronic diseases. The surprising finding that those with lower physical functioning scores were also those who were starved raises the possibility of compensatory behavior or sample error. Furthermore, the little difference in other HRQoL variables between dietary categories—like pain, social functioning, and emotional well-being—highlights the impact of social and psychological aspects in addition to nutritional status.These findings highlight the necessity of focused public health initiatives that reduce nutritional deficiencies and enhance general health, particularly for underweight and economically deprived populations. Future studies ought to examine the intricate relationships that exist between social support, psychological strength, and nutritional status. Comprehending these dynamics is crucial in order to devise efficacious therapies that augment physical health and HRQoL, consequently augmenting quality of life throughout heterogeneous populations.

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APPENDICES

Appendix 1: Questionnaire Determination of Quality of Life for Hemodialysis Patients.

QUESTIONNAIRE:

Name of data collector:	**Area Name:**	**Hospital Name:**

Questionnaire Consent Form

Data Collector:

Greetings and salutations, allow me to introduce myself. My name is [.....]. The purpose of our visit is to collect information from Daffodil International University. The purpose of this questionnaire is to collect data from you. A few moments may pass before the meeting is over. Your identity and the information you provide will be kept strictly secret and will only be used for research purposes. Your participation would be much appreciated. Could you please confirm that you are willing to provide the research any information or data that they may need, both now and in the future?

1 means positive (Initiate data collection if yes)

2= Negative (if it's negative, go on to the next person)

If the informant gives their approval, the data collector may proceed with the question-and-answer session, rescheduling for a more convenient time if additional time is needed.

I, _____, Following is the agreement regarding the exchange of data.

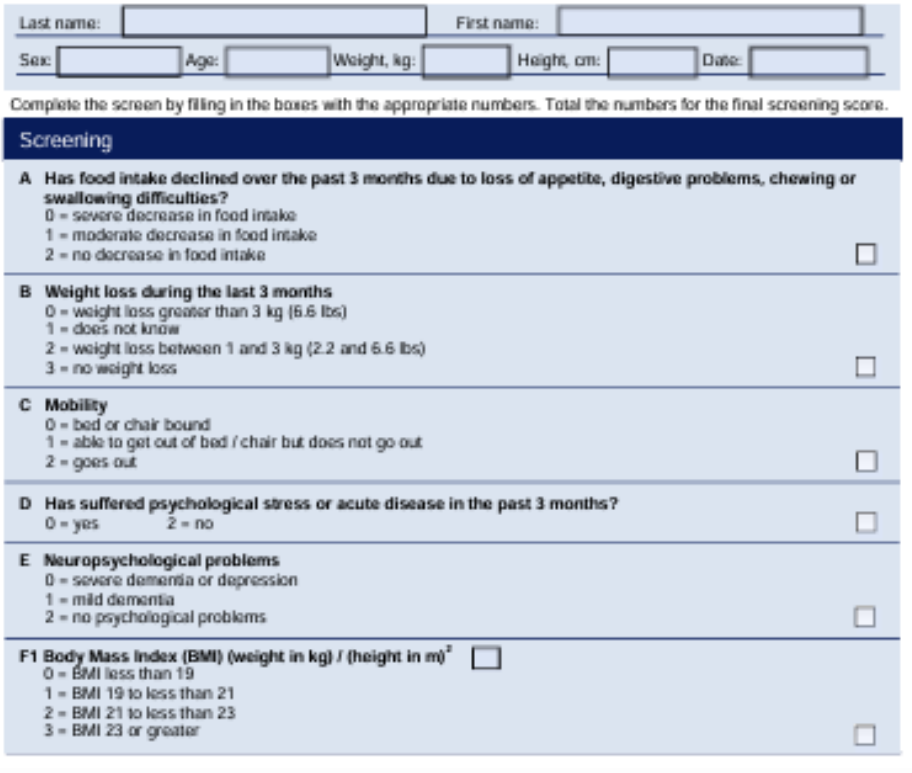
Date: ___/___/_____

Socio-demographic characteristics

Age	
Gender	1. Male 2. Female
Education	1. Illiterate 2. Primary 3. Secondary 4. Tertiary
Residency	1. Rural

	2. Urban
Marital status	1. Single 2. Married 3. Divorced or widowed
Income group	1. Very Poor (Monthly Income less than 10,000) 2. Poor (Income range 10K to 20K) 3. Moderate (20K–30K) 4. Rich (Income more than 30K)
Employment	1. Unemployed 2. Service Holder 3. Housewife 4. Farmer/labor 5. Other
BMI	

Appendix 2: Mini Nutritional Assessment



Last name: First name:

Sex: Age: Weight, kg: Height, cm: Date:

Complete the screen by filling in the boxes with the appropriate numbers. Total the numbers for the final screening score.

Screening

A Has food intake declined over the past 3 months due to loss of appetite, digestive problems, chewing or swallowing difficulties?
0 = severe decrease in food intake
1 = moderate decrease in food intake
2 = no decrease in food intake

B Weight loss during the last 3 months
0 = weight loss greater than 3 kg (6.6 lbs)
1 = does not know
2 = weight loss between 1 and 3 kg (2.2 and 6.6 lbs)
3 = no weight loss

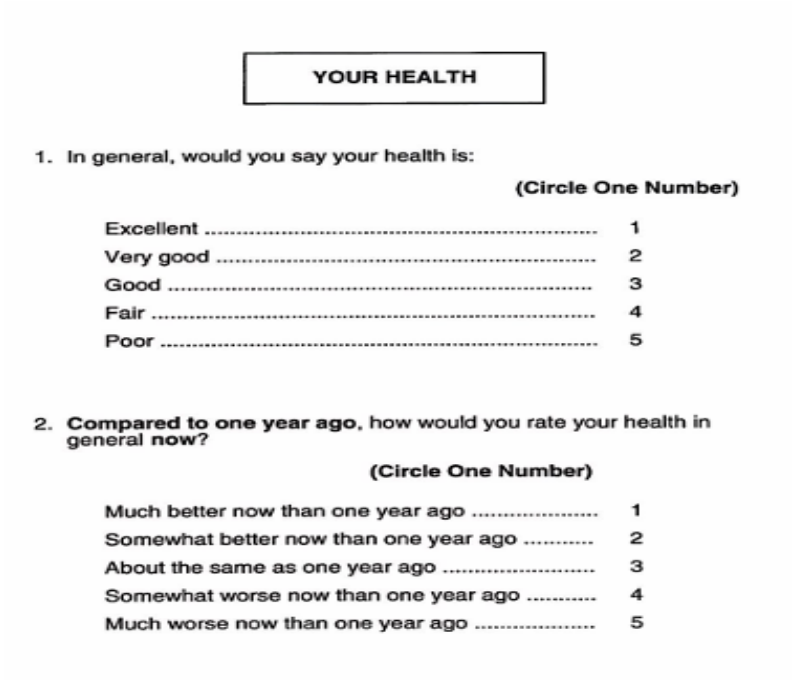
C Mobility
0 = bed or chair bound
1 = able to get out of bed / chair but does not go out
2 = goes out

D Has suffered psychological stress or acute disease in the past 3 months?
0 = yes 2 = no

E Neuropsychological problems
0 = severe dementia or depression
1 = mild dementia
2 = no psychological problems

F1 Body Mass Index (BMI) (weight in kg) / (height in m)^2
0 = BMI less than 19
1 = BMI 19 to less than 21
2 = BMI 21 to less than 23
3 = BMI 23 or greater

Appendix 3: SF 36 Questionnaire



YOUR HEALTH

1. In general, would you say your health is:

(Circle One Number)

Excellent	1
Very good	2
Good	3
Fair	4
Poor	5

2. **Compared to one year ago**, how would you rate your health in general **now?**

(Circle One Number)

Much better now than one year ago	1
Somewhat better now than one year ago	2
About the same as one year ago	3
Somewhat worse now than one year ago	4
Much worse now than one year ago	5

4. During the **past 4 weeks,** have you had any of the following problems with your work or other regular activities **as a result of your physical health?**

(Circle One Number on Each Line)

	Yes	No
a. Cut down the **amount of time** you spent on work or other activities?	1	2
b. **Accomplished less** than you would have liked?	1	2
c. Were limited in the **kind** of work or other activities?	1	2
d. Had **difficulty** performing the work or other activities (for example, it took extra effort)?	1	2

5. During the **past 4 weeks,** have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

(Circle One Number on Each Line)

	Yes	No
a. Cut down the **amount of time** you spent on work or other activities?	1	2
b. **Accomplished less** than you would like?	1	2
c. Didn't do work or other activities **as carefully as usual?**	1	2

3. The following items are about activities you might do during a typical day. **Does your health now limit** you in these activities? If so, how much?

(Circle One Number on Each Line)

	Yes, Limited a Lot	Yes, Limited a Little	No, Not Limited at All
a. **Vigorous activities**, such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. **Moderate activities**, such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing **several** flights of stairs	1	2	3
e. Climbing **one** flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3
g. Walking **more than a mile**	1	2	3
h. Walking **several blocks**	1	2	3
i. Walking **one block**	1	2	3
j. Bathing or dressing yourself	1	2	3

6. During the **past 4 weeks**, to what **extent** have your **physical health or emotional problems** interfered with your normal social activities with family, friends, neighbors, or groups?

(Circle One Number)

Not at all	1
Slightly	2
Moderately	3
Quite a bit	4
Extremely	5

7. How much **bodily** pain have you had during the **past 4 weeks?**

(Circle One Number)

None	1
Very mild	2
Mild	3
Moderate	4
Severe	5
Very severe	6

8. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

(Circle One Number)

Not at all	1
A little bit	2
Moderately	3
Quite a bit	4

9. These questions are about how you feel and how things have been with you **during the past 4 weeks.** For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks** . . .

	(Circle One Number on Each Line)					
	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
a. Did you feel full of pep?	1	2	3	4	5	6
b. Have you been a very nervous person?	1	2	3	4	5	6
c. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
d. Have you felt calm and peaceful?	1	2	3	4	5	6
e. Did you have a lot of energy?	1	2	3	4	5	6
f. Have you felt downhearted and blue?	1	2	3	4	5	6
g. Did you feel worn out?	1	2	3	4	5	6
h. Have you been a happy person?	1	2	3	4	5	6
i. Did you feel tired?	1	2	3	4	5	6

10. During the **past 4 weeks,** how much of the **time** have your **physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

(Circle One Number)

All of the time	1
Most of the time	2
Some of the time	3
A little of the time	4
None of the time	5

11. Please choose the answer that best describes how **TRUE** or **FALSE** each of the following statements is for you.

	(Circle One Number on Each Line)				
	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people	1	2	3	4	5
b. I am as healthy as anybody I know	1	2	3	4	5
c. I expect my health to get worse	1	2	3	4	5
d. My health is excellent	1	2	3	4	5

YOUR KIDNEY DISEASE

12. How **TRUE** or **FALSE** is each of the following statements for you?

(Circle One Number on Each Line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. My kidney disease interferes too much with my life	1	2	3	4	5
b. Too much of my time is spent dealing with my kidney disease	1	2	3	4	5
c. I feel frustrated dealing with my kidney disease	1	2	3	4	5
d. I feel like a burden on my family	1	2	3	4	5

13. These questions are about how you feel and how things have been going during the **past 4 weeks.** For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks** . . .

(Circle One Number on Each Line)

	None of the Time	A Little of the Time	Some of the Time	A Good bit of the Time	Most of the Time	All of the Time
a. Did you isolate yourself from people around you?	1	2	3	4	5	6
b. Did you react slowly to things that were said or done?	1	2	3	4	5	6
c. Did you act irritable toward those around you?	1	2	3	4	5	6
d. Did you have difficulty concentrating or thinking?	1	2	3	4	5	6
e. Did you get along well with other people?	1	2	3	4	5	6
f. Did you become confused?	1	2	3	4	5	6

14. During the **past 4 weeks,** to what extent were you bothered by each of the following?

(Circle One Number on Each Line)

	Not at All bothered	Somewhat bothered	Moderately bothered	Very Much bothered	Extremely bothered
a. Soreness in your muscles?	1	2	3	4	5
b. Chest pain?	1	2	3	4	5
c. Cramps?	1	2	3	4	5
d. Itchy skin?	1	2	3	4	5
e. Dry skin?	1	2	3	4	5
f. Shortness of breath?	1	2	3	4	5
g. Faintness or dizziness?	1	2	3	4	5
h. Lack of appetite?	1	2	3	4	5
i. Washed out or drained?	1	2	3	4	5
j. Numbness in hands or feet?	1	2	3	4	5
k. Nausea or upset stomach?	1	2	3	4	5

14. (Continued) During the **past 4 weeks,** to what extent were you bothered by each of the following?

(Circle One Number on Each Line)

	Not at All bothered	Somewhat bothered	Moderately bothered	Very Much bothered	Extremely bothered
Hemodialysis Patient only					
l. Problems with your access site?	1	2	3	4	5
Peritoneal Dialysis Patient only					
m. Problems with your catheter site?	1	2	3	4	5

EFFECTS OF KIDNEY DISEASE ON YOUR DAILY LIFE

15. Some people are bothered by the effects of kidney disease on their daily life, while others are not. How much does kidney disease **bother** you in each of the following areas?

(Circle One Number on Each Line)

	Not at All bothered	Somewhat bothered	Moderately bothered	Very Much bothered	Extremely bothered
a. Fluid restriction?	1	2	3	4	5
b. Dietary restriction?	1	2	3	4	5
c. Your ability to work around the house?	1	2	3	4	5
d. Your ability to travel?	1	2	3	4	5
e. Being dependent on doctors and other medical staff?	1	2	3	4	5
f. Stress or worries caused by kidney disease?.....	1	2	3	4	5
g. Your sex life?.....	1	2	3	4	5
h. Your personal appearance?	1	2	3	4	5

The next three questions are personal and relate to your sexual activity, but your answers are important in understanding how kidney disease impacts on people's lives.

16. Have you had any sexual activity in the **past 4 weeks?**

(Circle One Number)

No ..... 1 ---> Please skip to Question 17

Yes 2

How much of a problem was each of the following in the **past 4 weeks?**

(Circle One Number on Each Line)

	Not a Problem	A Little Problem	Somewhat of a Problem	Very Much a Problem	Severe Problem
a. Enjoying sex?	1	2	3	4	5
b. Becoming sexually aroused?	1	2	3	4	5

For the following question, please rate your sleep using a scale ranging from 0 representing "very bad" to 10 representing "very good."

If you think your sleep is half-way between "very bad" and "very good," please circle 5. If you think your sleep is one level better than 5, circle 6. If you think your sleep is one level worse than 5, circle 4 (and so on).

17. On a scale from **0** to **10**, how would you rate your sleep overall?

(Circle One Number)

0 1 2 3 4 5 6 7 8 9 10

Very Bad — Very Good

18. How often during the **past 4 weeks** did you...

(Circle One Number on Each Line)

	None of the Time	A Little of the Time	Some of the Time	A Good bit of the Time	Most of the Time	All of the Time
a. Awaken during the night and have trouble falling asleep again?	1	2	3	4	5	6
b. Get the amount of sleep you need?	1	2	3	4	5	6
c. Have trouble staying awake during the day?	1	2	3	4	5	6

19. Concerning your **family and friends,** how satisfied are you with ...

(Circle One Number on Each Line)

	Very Dissatisfied	Somewhat Dissatisfied	Somewhat Satisfied	Very Satisfied
a. The amount of time you are able to spend with your family and friends?.....	1	2	3	4
b. The support you receive from your family and friends?.....	1	2	3	4

20. During the **past 4 weeks,** did you work at a paying job?

(Circle One Number)

Yes 1
No 2

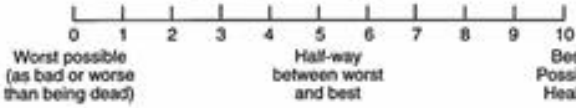
21. Does your health keep you from working at a paying job?

(Circle One Number)

Yes 1
No 2

22. Overall, how would you rate your health?

(Circle One Number)



SATISFACTION WITH CARE

23. Think about the care you receive for kidney dialysis. In terms of your satisfaction, how would you rate the friendliness and interest shown in you as a person?

(Circle One Number)

Very Poor	1
Poor	2
Fair	3
Good	4
Very Good	5
Excellent	6
The Best	7

24. How **TRUE** or **FALSE** is each of the following statements?

(Circle One Number on Each Line)

	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. Dialysis staff encourage me to be as independent as possible	1	2	3	4	5
b. Dialysis staff support me in coping with my kidney disease	1	2	3	4	5

BACKGROUND INFORMATION

25. Do you currently take prescription medications regularly (4 or more days a week) that are prescribed by your doctor for a medical condition? Please don't count over the counter medications like antacids or aspirin.

(Circle One Number)

No ..... 1 ---> Please skip to Question 26

Yes 2

⬇

25a. How many different prescription medications do you currently take?

Number of Medications: _____

26. How many days total in the **last 6 months** did you stay in any hospital overnight or longer? **(If none, please write in 0)**

Number of Days: _____

27. How many days total in the **last 6 months** did you receive care at a hospital, but came home the same day? **(If none, please write in 0)**

Number of Days: _____

28. What caused your kidney disease?

(Circle All That Apply)

Don't know	1
Hypertension (High Blood Pressure)	2
Diabetes	3
Polycystic Kidney Disease	4
Chronic Glomerulonephritis	5
Chronic Pyelonephritis	6
Other (please specify): _____	7

29. When were you born?

Month / Day / Year

30. What is the highest level of school you have completed?

(Circle One Number)

8th grade or less	1
Some high school or less	2
High school diploma or GED	3
Vocational school or some college	4
College degree	5
Professional or graduate degree	6

31. What is your gender?

(Circle One Number)

Male	1
Female	2

32. How do you describe yourself?

(Circle One Number)

African American or Black	1
Hispanic or Latino	2
Native American or American Indian	3
Asian or Pacific Islander	4
White	5
Other (please specify): _____	6

33. Are you currently married?

(Circle One Number)

No	1
Yes	2

34. During the **last 30 days**, were you:

(Circle One Number)

Working full-time	1
Working part-time	2
Unemployed, laid off, or looking for work	3
Retired	4
Disabled	5
In school	6
Keeping house	7
None of the above	8

35. What kind of health insurance do you have?

(Circle One Number)

None, I have no health insurance	1
Medicare only	2
Medicare and any other insurance	3
Medicaid or Medi-Cal only	4
Private, fee-for-service health insurance (e.g., Prudential, Aetna, etc.)	5
HMO, PPO, IPA or other prepaid plan (e.g., Kaiser, Cigna, FHP, etc.)	6
Other (please specify) _____ _____	7

36. What was your total household income (from all sources) before taxes in the **LAST CALENDAR YEAR**, including yourself, your partner, and others you regard as family who live in your household? (Please remember your answers are confidential.)

(Circle One Number)

Less than $5,000	1
$5,001-$10,000	2
$10,001-$20,000	3
$20,001-$40,000	4
$40,001-$75,000	5
More than $75,000	6
Don't know	7

37. Did someone help you fill out this survey?

(Circle One Number)

Yes, a physician or other health care provider	1
Yes, a family member or friend	2
Yes, someone else	3
No	4

38. What is today's date?

☐☐ / ☐☐ / ☐☐
Month / Day / Year

DETERMINATION OF QUALITY OF LIFE FOR HEMODIALYSIS PATIENTS

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