NUTRITIONAL ASSESSMENT OF PATIENTS UNDERGOING HAEMODIALYSIS AT DIALYSIS CENTRE IN CENTRAL URBAN LUCKNOW

SUMMARY OF

THESIS

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Introduction

Nutrition is an integral aspect of human health and well-being, influencing the body's growth, development, and ability to combat diseases. Nutritional assessment plays a crucial role in evaluating an individual's nutritional status, aiding in the detection of nutritional deficiencies or excesses, and guiding the development of personalized dietary interventions. This essay explores the significance of nutritional assessment in various contexts, emphasizing its role in promoting better health outcomes, preventing diseases, and optimizing overall well-being. Nutritional assessment serves as a diagnostic tool to identify individuals suffering from malnutrition or undernutrition.

Nutritional assessment of patients is a vital process in healthcare that aims to evaluate their nutritional status, identify potential nutritional deficiencies or excesses, and design appropriate interventions to optimize their health and well-being. It serves as a fundamental cornerstone of holistic patient care, recognizing the profound impact of nutrition on overall health and disease management.

This explores the significance of nutritional assessment in clinical practice, highlighting its role in improving patient outcomes, preventing complications, and promoting a patient-centred approach to healthcare. Patients undergoing haemodialysis face unique nutritional challenges due to the increased nutrient losses during the dialysis process and the dietary restrictions necessary to manage their medical condition. Nutritional assessment in this patient population is crucial to identify malnutrition, assess dietary adequacy, and design personalized nutrition plans to optimize their overall health and well-being.

Patients on haemodialysis often have dietary restrictions, including limitations on potassium, phosphorus, sodium, and fluid intake. Nutritional assessment enables a comprehensive evaluation of their dietary intake to ensure compliance with these restrictions while meeting their essential nutrient needs.

Method of Nutritional Assessment of Patients

Nutritional assessment of patients involves a systematic approach to gather information about their dietary intake, nutritional status, and related factors. There are various methods and tools used in nutritional assessment, and healthcare professionals often employ a combination

of these methods to obtain a comprehensive understanding of the patient's nutritional status. Some common methods of nutritional assessment include:

(i) ***Anthropometric Measurements*****:** Anthropometric measurements involve assessing the patient's body size and composition. This includes measurements such as height, weight, body mass index (BMI), waist circumference, and skinfold thickness. These measurements provide valuable information about the patient's growth, nutritional status, and body fat distribution.

(ii) ***Dietary Assessment*****:** Dietary assessment involves gathering information about the patient's food intake and eating habits. There are several methods of dietary assessment, including:

- 24-Hour Dietary Recall: The patient is asked to recall all the foods and beverages consumed in the past 24 hours. This method provides a snapshot of the patient's recent dietary intake.
- Food Frequency Questionnaires (FFQ): FFQs ask the patient to indicate how often they consume specific foods or food groups over a designated period. This method provides insights into the patient's usual dietary habits.
- Food Records or Diaries: The patient maintains a detailed record of all foods and beverages consumed over a specific period, typically several days. Food records provide a more accurate picture of the patient's dietary intake over time.

(iii) ***Clinical Assessment*****:** Clinical assessment involves a thorough evaluation of the patient's medical history, physical examination, and clinical observations. This includes assessing signs of malnutrition, such as muscle wasting, dry skin, and oedema, as well as examining any medical conditions or symptoms that may impact the patient's nutritional status.

(iv) ***Biochemical Assessment*****:** Biochemical assessment involves analysing blood, urine, or other biological samples to measure specific biochemical markers related to nutritional status. Common markers include blood glucose, lipid profile, haemoglobin levels, serum albumin, and vitamin levels. These markers provide objective data about the patient's nutrient levels and potential deficiencies.

(v) ***Functional Assessment*****:** Functional assessment evaluates the patient's ability to perform activities of daily living and assesses any physical or cognitive limitations that might affect their nutritional intake or dietary management. This is particularly important for elderly or chronically ill patients.

(vi)*Nutritional Histo*ry: Taking a detailed nutritional history involves gathering information about the patient's past and current dietary practices, eating patterns, food preferences, and any recent changes in eating habits. This information provides valuable context to interpret other components of the nutritional assessment.

The study entitled **"Assessment of Nutritional status of patients undergoing Haemodialysis at Dialysis Centre in Central Urban Lucknow"** is quite interesting & relevant to the present-day society. The aim will be to do the assessment of nutritional status of haemodialysis patients and provide a dietary modification to them in Chandan Hospital, Lucknow, because in this study centre patients came from all over Uttar Pradesh, so maybe this study will be helpful in academics to know the prevalence of malnutrition, cause and factors effecting the nutritional status of dialysis patients and how nutritional status will improve. Researchers and healthcare professionals should pay close attention to kidney diseases that cause chronic renal failure (CRF) and, in many instances, progress to end-stage renal disease (ESRD). ESRD patients and their relatives may experience excruciating medical, social, and financial problems.

Objectives of the Study

1. To study the socio-demographic and socio-economic profile of the haemodialysis patients.
2. To study the different symptomatic factors arise during Haemodialysis.
3. To assess the level of malnutrition of haemodialysis patients using MIS tool.
4. To compare the effect of diet modification on Experimental and Control group of haemodialysis patients.
5. To study the effect of diet modification on Experimental and Control group of Haemodialysis patients based on biochemical parameters.
6. To provide nutritional awareness for improving the nutritional status to patient with Haemodialysis by providing booklet.

Hypothesis

$H_0$1: There is no significant difference between Hypertension Baseline and Hypertension Follow up of Experimental Group.

$H_0$2: There is no significant difference between Hypotension Baseline and Hypotension Follow up of Experimental Group.

$H_0$3: There is no significant difference between Nausea Baseline and Nausea Follow up of Experimental Group.

$H_0$4: There is no significant difference between Diarrhoea Baseline and Diarrhoea Follow up of Experimental Group.

$H_0$5: There is no significant difference between Constipation/Bloating Baseline and Constipation/Bloating Follow up of Experimental Group.

$H_0$6: There is no significant difference between Uraemia Baseline and Uraemia Follow up of Experimental Group.

$H_0$7: There is no significant difference between Hypertension Baseline and Hypertension Follow up of Control Group.

$H_0$8: There is no significant difference between Hypotension Baseline and Hypotension Follow up of Control Group.

$H_0$9: There is no significant difference between Nausea Baseline and Nausea Follow up of Control Group.

$H_0$10: There is no significant difference between Diarrhoea Baseline and Diarrhoea Follow up of Control Group.

$H_0$11: There is no significant difference between Constipation/Bloating Baseline and Constipation/Bloating Follow up of Control Group.

$H_0$12: There is no significant difference between Uraemia Baseline and Uraemia Follow up of Control Group.

$H_0$13: There is no significant difference between MIS Baseline and MIS Follow up of Experimental Group with diet modification.

$H_0$14: There is no significant difference between MIS Baseline and MIS Follow up of Control Group without diet modification.

$H_0$15: There is no significant difference between BMI Baseline and BMI Follow up of Experimental Group with diet modification.

$H_0$16: There is no significant difference between BMI Baseline and BMI Follow up of Control Group without diet modification.

$H_0$17: There is no significant difference between Energy (Baseline and Follow up) of Experimental Group with diet modification.

$H_0$18: There is no significant difference between Protein (Baseline and Follow up) of Experimental Group with diet modification.

$H_0$19: There is no significant difference between Energy (Baseline and Follow up) of Control Group without diet modification.

$H_0$20: There is no significant difference between Protein (Baseline and Follow up) of Control Group without diet modification.

$H_0$21: There is no significant Difference between Haemoglobin (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$22: There is no significant Difference between Creatinine (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$23: There is no significant Difference between Sodium (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$24: There is no significant Difference between Potassium (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$25: There is no significant Difference between Calcium (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$26: There is no significant Difference between Phosphorus (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$27: There is no significant Difference between Uric acid (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

$H_0$28: There is no significant Difference between Haemoglobin (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

$H_0$29: There is no significant Difference between Creatinine (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

$H_0$30: There is no significant Difference between Sodium (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

$H_0$31: There is no significant Difference between Potassium (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

$H_0$32: There is no significant Difference between Calcium (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

$H_0$33: There is no significant Difference between Phosphorus (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

$H_0$34: There is no significant Difference between Uric acid (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

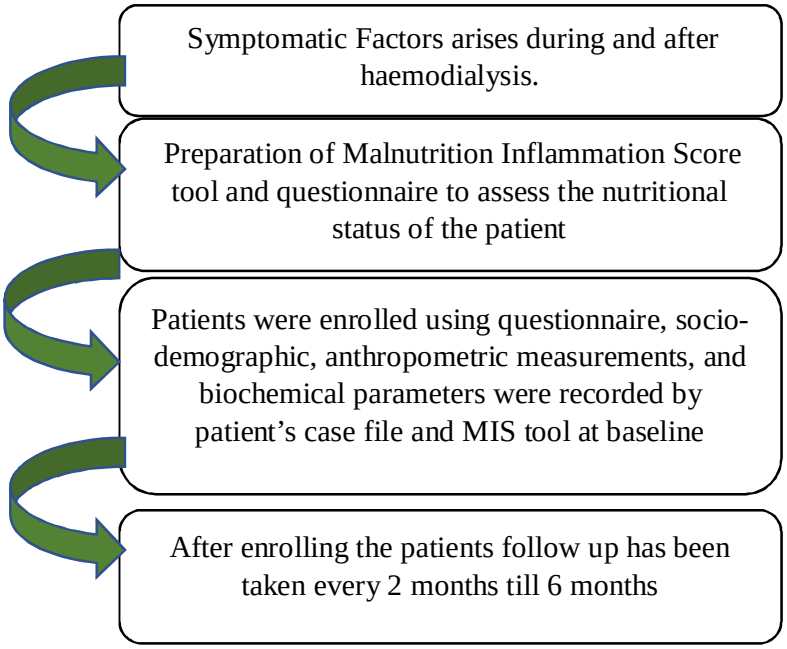
Methodology

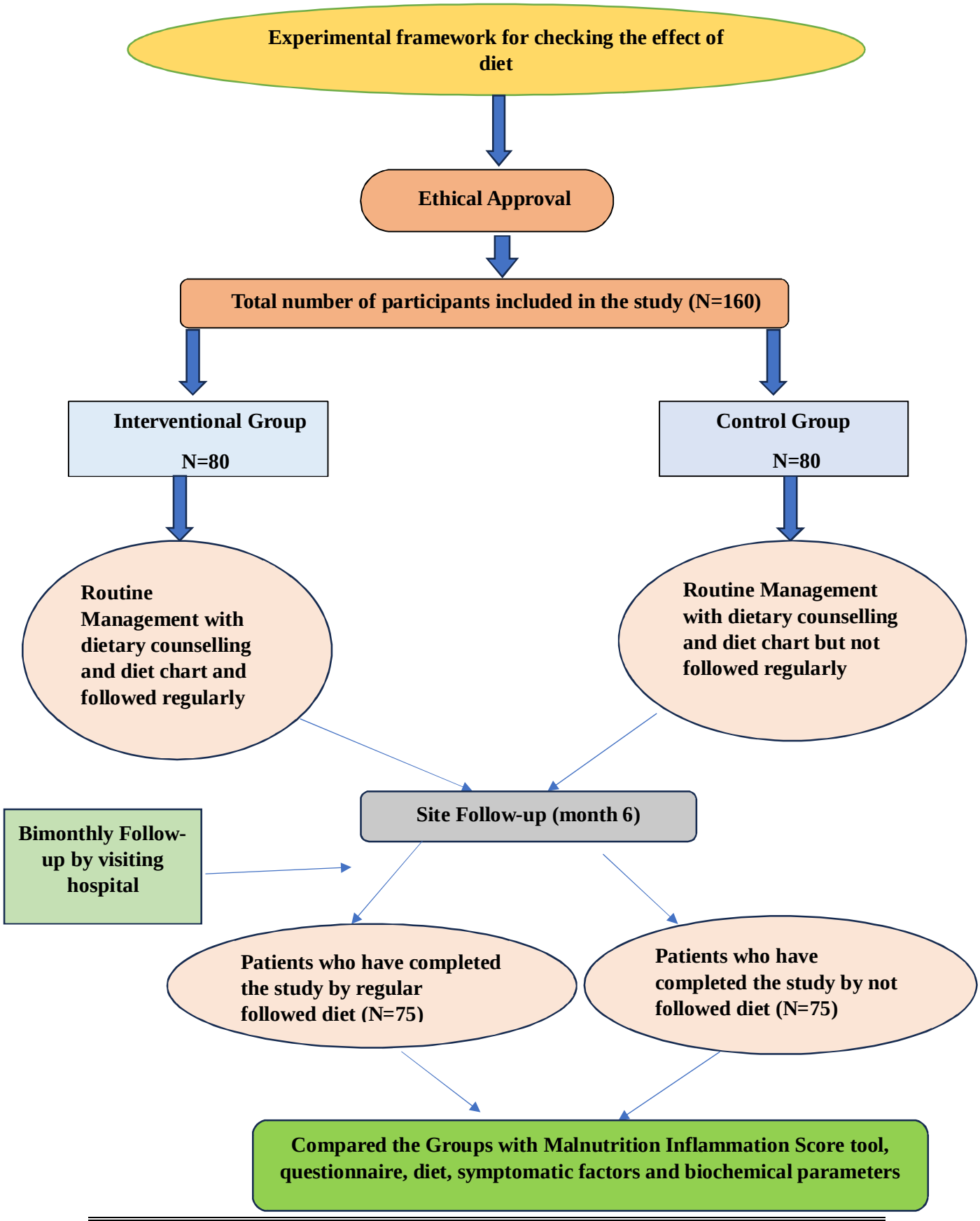
Research design: Research design is the research methods and techniques chosen by the researcher as a framework. Research was Interventional study.

Locale of the study: The examination was directed in Lucknow through Babasaheb Bhimrao Ambedkar University at Chandan Hospital, Lucknow, Uttar Pradesh, India.

Study period: The total period of research work was carried out from October 2018- 2023. The total sample of 150 patients was taken from 20th January 2022 to 30th January 2023 with regular follow up of 2-2 months of each patient till 6 months has been completed. The whole period was divided into three phases:

Plan of the study




Experimental framework for checking the effect of diet
Ethical Approval
Total number of participants included in the study (N=160)
Interventional Group N=80
Control Group N=80
Routine Management with dietary counselling and diet chart and followed regularly
Routine Management with dietary counselling and diet chart but not followed regularly
Site Follow-up (month 6)
Bimonthly Follow-up by visiting hospital
Patients who have completed the study by regular followed diet (N=75)
Patients who have completed the study by not followed diet (N=75)
Compared the Groups with Malnutrition Inflammation Score tool, questionnaire, diet, symptomatic factors and biochemical parameters

Statistical Analysis

Statistical analysis helps the researcher to make sense of quantitative information. Statistical procedure enables researchers to summarize, organize, evaluate, interpret, and communicate numeric information. The data collected had been entered on SPSS data sheet showing various items/variables in columns and subjects in rows. The analysis of data was also done using statistical software SPSS version 20.0. The items of demographic profile and personal characteristics were summarized using frequency tables, percentage, graphs and for continuous variables, mean and standard deviation (SD) were determined.

Variables:

Independent variables: An independent variable is the variable you manipulate or vary in an experimental study to explore its effects.

Age, Gender, Education level, Occupation, duration of dialysis, co-morbidities, and dietary intake.

Dependent Variables: A dependent variable is the variable being tested and measured in a scientific experiment.

Anthropometric measurements (BMI), Malnutrition Inflammation Score (MIS), biochemical parameters (haemoglobin, creatinine, sodium, potassium, calcium, phosphorus, and uric acid).

Variables were summarized by frequency and standard deviation. Significant tests were used, including Correlation and partial correlation tests were used for measuring association between different variables. Regression and paired t test have been used to analyse the data.

1. **Mean:** The individual observation is denoted by the sign X, number of observations denoted by n, and the mean by $\overline{X}$

$$\overline{X}=\frac{\sum X}{\text{No.of observation (n)}}$$

2. **Standard Deviation:** It is denoted by the Greek letter σ.

$$\sigma = \sqrt{\sum(X - X)}/n$$

where, σ = Standard deviation, Σ = summation

(x - x) = Square of deviation of each value from the arithmetic mean

f = frequency

n = total number of observations

3. **Factor Analysis:** The KMO and Bartlett test evaluate all available data together. A KMO value over 0.5 and a significance level for the Bartlett's test below 0.05 suggest there is substantial correlation in the data.

$$\chi^2 = \frac{(N-k)\ln(S_p^2) - \sum_{i=1}^{k}(n_i - 1)\ln(S_i^2)}{1 + \frac{1}{3(k-1)}\left(\sum_{i=1}^{k}\left(\frac{1}{n_i - 1}\right) - \frac{1}{N-k}\right)}$$

Where ,

$$N = \sum_{i=1}^{k} n_i$$;

$$S_p^2 = \frac{1}{N-k}\sum_{i}(n_i - 1)S_i^2$$

is the pooled estimate for the variance.

4. **Regression:** Regression analysis is a set of statistical processes for estimating the relationships between a dependent variable.

$$\mathbf{Y = a + bX + \in}$$

Where:

Y = is the dependent variable

X = is the independent (explanatory) variable

a =is the intercept

b = is the slope

∈ = and is the residual (error)

5. **Correlation:** A correlation coefficient is a number between -1 and 1 that tells you the strength and direction of a relationship between variables.

$$r = \frac{\sum (x-\bar{x})(y-\bar{y})}{\sqrt{\sum (x-\bar{x})^2 \sum (y-\bar{y})^2}}$$

Where, $\sum xy$ = Sum of products of deviations of x and y from their averages

$\sum x$ = Sum of the deviation of x from its average

$\sum y$ = Sum of the deviation of x from its average

$\sum x^2$ = Sum of the square deviation of the first series, x

$\sum y^2$ = Sum of the square of deviation of second series, y

n = Number of pairs of observations

6. **Paired t-test:** The paired t-test examines the mean difference between dependent observations.

Paired t test= mean of difference.

$$\mathbf{t = x_{diff} / (s_{diff}/\sqrt{n})}$$

where:

x_{diff}: sample mean of the differences

S: sample standard deviation of the differences

n: sample size (i.e., number of pairs)

7. **Level of significance:** "p" is level of significance

   $p > 0.05$ Not significant

   $p < 0.10$ Marginally significant

   $p < 0.05$ Significant

   $p < 0.01$ Highly significant

Results

5.1 Socio-demographic Profile of respondents of Experimental and Control group

There is total 150 respondents in the present study out of which 75(50%) were from experimental group and remaining 75(50%) were from control group. The results of their socio-demographic factors is as given below

- **Gender:** Male respondents in Experimental group were 48 (64%) and in control group were 42 (56%) which showed that respondents in both groups were mostly males.
- **Age:** In case of respondents of experimental group 25(33.33%) mostly belonged to the age group of 41-50 years, followed by 24(32%) who belonged to 30-40 years age group and then 23(30.67%) were in the age bracket of 51-60 years and very few 3(4%) belonged to 61-70 year. While the age of respondents in control group showed majority 30(40%) of them were under the age category of 51-60 years, followed by 19(25.34%) who were in the age group of 41-50 years, 16(21.33%) were 61-70 years old and just 10(13.33%) were 30-40 years old.
- **Marital Status:** Majority of respondents were married 53(70.7%) in experimental while in control group majority of the respondents were unmarried 45(60%).
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5.2 Socio-economic Profile of the respondents of experimental group and control group.

- **Educational qualification:** In experimental group most of the respondents 23(30.67%) were graduate while in control group there were equal number of respondents having graduate 17 (22.67%) and post graduate 17 (22.67%) degree.
- **Work Profile**: Majority of the respondents in Experimental Group 43 (57.3%) and 40 (53.3%) in control group were unemployed.
- **Income**: In experimental group, most 32 (42.7%) of the respondents were from medium income group, followed by 31 (41.3%) respondents who were in lower income group, 32 (42.7%) and only few 12 (16.0%) respondents were from higher income group. While in case of total respondents from Control Group, majority 30 (40.0%) respondents were from higher income group, followed by 23 (30.7%) respondents from lower income group and 22 (29.3%) respondents were from medium income group.

5.3 Information related to Personal Habits of the respondents of experimental group and control group.

- **Smoking**: Most of the respondents from Experimental Group 50 (66.7%) and Control Group 44 (58.7%) were non-smokers.
- **Drinking**: In experimental group, majority 53 (70.7%) of respondents said no to drinking. but in case of Control Group majority 43 (57.3%) of respondents said yes to drinking.

5.4 Information related to Basal Metabolic Index (BMI) of the respondents of experimental group and control group.

- In experimental group, majority 35 (46.7%) of respondents were normal followed by 25 (33.3%) respondents who were overweight15 (20.0%) respondents were underweight, While, 26 (34.7%) respondents were underweighted, 14 (18.7) % respondents were normal and 35 (46.7%) respondents were overweight from the total 75 respondents of Control Group out of total respondents.

5.5 Information regarding CKD (Duration of Illness, Duration of Dialysis & Co-morbidities) of the respondents of experimental group and control group.

- **Duration of Illness:** Majority 4(45.3%) of respondents in experimental group were ill for 3 years, followed by 20 (26.7%) respondents who were ill for 5 years, 11(14.7%) respondents were ill for more than 5 years and only 10(13.3%) respondents were ill for a year. But, most 34(45.3%) of the respondents were ill for 5 years in case of Control Group, followed by 19(25.3%) respondents who were ill for 3 years, 14(18.7%) respondents who were ill for more than 5 years and only 8 (10.7%) respondents were ill for a year,
- **Duration of Dialysis:** In case of experimental group, 33 (44.0%) respondents were on dialysis for 2 years, followed by 18 (24.0%) respondents were on dialysis for 1 year, 14 (18.7%) respondents were on dialysis for 6 months and only 10(13.3%) respondents were on dialysis for more than 2 years. In case of respondents of Control Group, majority 38 (50.7%) respondents were on dialysis for 6 months, followed by

31(41.3%) respondents who were on dialysis for 1 year whereas, only 5 (6.7%) respondents were on dialysis for more than 2 years and just 1 (1.3%) respondent were on dialysis for 2 years.

- **Co-morbidities:** The distribution of respondents according to the Comorbidity displayed that in case of Experimental Group, 21(28.0%) respondents were suffering from diabetes mellitus and hypertension both but in case of control group, majority 22(29.34%) respondents were suffering from diabetes mellitus alone and 19(25.33%) respondents were suffering from hypertension while 18(24.0%) respondents had no comorbidity and only 16(21.33%) respondents were suffering from diabetes mellitus and hypertension both.

5.6 Information related to Diet of the respondents of experimental group and control group.

- Majority 35(46.76%) of respondents from experimental group and majority 35(46.66%) respondents from control group were non-vegetarian.

5.7 Distribution of respondents according to the different symptomatic factors arise during haemodialysis in the baseline and follow-up of experimental and control group.

- **Hypertension:** In the case of respondents of experimental group, majority 33(44.0%) of respondents have Moderate level of hypertension in the baseline while in the follow-up, majority 55 (73.3%) respondents have Normal to Mild level of hypertension. While in case of respondents of control group, majority 50 (66.7%) of respondents have Normal to Mild level of hypertension and in the follow-up most 28 (37.3%) respondents have Moderate level of hypertension.
- **Hypotension:** In the baseline of respondents from experimental group**,** 48 (64.0%) have Normal to Mild level of hypotension while in follow-up most 62 (82.7%) of the respondents have Normal to Mild level of hypotension. While in the baseline of the respondents from the control group, 36 (48.0%) have Moderate level of hypotension and in follow-up majority 29 (38.7%) of respondents have Moderate level of hypotension.

- **Nausea:** In case of respondents of the Experimental group, majority 32 (42.7%) have Moderate Hypotension in the baseline while in the follow-up, 49 (65.3%) have Normal to Mild, level Nausea. However, in case of Nausea of all the respondents of the Control group, most of the respondents 30 (40.0%) have Normal to Mild, in the baseline and in the follow-up, majority 31 (41.3%) have Moderate level nausea.
- **Diarrhoea:** Most 29 (38.7%) respondents have Moderate level in the baseline and 59 (78.7%) respondents have Normal to Mild level of Diarrhoea in the follow-up of experimental group. While, in case of respondents of control group, majority 28 (37.3%) of respondents have Normal to Mild level of Diarrhoea in the baseline and in the follow-up, most 37 (49.3%) respondents have Normal to Mild level of Diarrhoea.
- **Constipation/Bloating:** In case of respondents of experimental group, majority 37 (49.3%) respondents have Severe Constipation/Bloating in the baseline while in the follow-up most 44 (58.7%) respondents have Normal to Mild level of Constipation/Bloating. While in case of respondents of the Control group, 36 (48.0%) have Normal to Mild in the baseline while in the follow-up, most 36 (48.0%) respondents have Moderate Constipation/Bloating.
- **Uraemia:** Majority 31 (41.3%) have Moderate Uraemia level in the baseline while in the follow-up, majority 57 (76.0%) have Normal to Mild Uraemia. In case of respondents of control group, most 31 (41.3%) respondents have Moderate level Uraemia in the baseline. While in the follow-up, 38 (50.7%) have Moderate Uraemia.

5.8 Difference between Symptomatic Factors of Haemodialysis patients in Baseline and Follow up in Experimental Group.

- **Hypertension:**

$H_0$1: There is no significant difference between Hypertension Baseline and Hypertension Follow up of Experimental Group.

Table 4.6.2, showed high significant ($p<0.001$) difference between Hypertension Baseline and Hypertension Follow up of Experimental Group, thus $H_0$1 was rejected and hence proven simultaneously.

- **Hypotension:**

$H_0$2: There is no significant difference between Hypotension Baseline and Hypotension Follow up of Experimental Group.

The difference between Hypotension Baseline and Hypotension Follow up of Experimental Group was also revealed from the table.4.6.2, which displayed that there is significant ($p<0.05$) difference between the two and resultantly $H_0$2 was rejected and hence simultaneously proven.

- **Nausea:**

$H_0$3: There is no significant difference between Nausea Baseline and Nausea Follow up of Experimental Group.

Table 4.6.2, showed that there was a high significant ($p<0.001$) difference between Nausea Baseline and Nausea Follow up of Experimental Group, therefore, giving the researcher the ground to reject $H_0$3 and prove it at the same time.

- **Diarrhoea:**

$H_0$4: There is no significant difference between Diarrhoea Baseline and Diarrhoea Follow up of Experimental Group.

Table 4.6.2, exhibits that there was high significant ($p<0.001$) difference between Diarrhoea Baseline and Diarrhoea Follow up of the experimental group with regard Diarrhoea. Thus, $H_0$4 was rejected and further it can be said that the null hypothesis is proved alongside.

- **Constipation/Bloating:**

$H_0$5: There is no significant difference between Constipation/Bloating Baseline and Constipation/Bloating Follow up of Experimental Group.

From the table 4.6.2, it was found that the Constipation/Bloating Baseline and Constipation/Bloating Follow up of Experimental Group have a high significant ($p<0.001$) for the haemodialysis patients in the experimental group. This further means that $H_0$5 was rejected and proved parallel.

- **Uraemia:**

$H_0$6: There is no significant difference between Uraemia Baseline and Uraemia Follow up of Experimental Group.

The Uraemia Baseline and Uraemia Follow up of respondents of Experimental Group, revealed from the table 4.6.2, that there is a high significant ($p<0.001$) difference between the two hence $H_0$6 was rejected and was proved along with.

5.9 Difference between Symptomatic Factors of Haemodialysis patients in Baseline and Follow up in Control Group.

- **Hypertension:**

$H_0$1: There is no significant difference between Hypertension Baseline and Hypertension Follow up of Control Group.

Table 4.6.3 showed that there was a significant ($p<0.05$) difference between Hypertension Baseline and Hypertension Follow up of Control Group therefore, $H_0$1 was rejected and proved together.

- **Hypotension:**

$H_0$2: There is no significant difference between Hypotension Baseline and Hypotension Follow up of Control Group.

The difference between Hypotension Baseline and Hypotension Follow up of Control Group was found to be significant ($p<0.05$) as witnessed from the table 4.6.3, thus, $H_0$2 was rejected and simultaneously proven.

- **Nausea:**

$H_0$3: There is no significant difference between Nausea Baseline and Nausea Follow up of Control Group.

Table 4.6.3, showed that Nausea Baseline and Nausea Follow up of Control Group have no significant difference as the p-value was .218. Therefore, $H_0$3 was accepted and could not be proved at the same time.

- **Diarrhoea:**

$H_0$4: There is no significant difference between Diarrhoea Baseline and Diarrhoea Follow up of Control Group.

The difference between Diarrhoea Baseline and Diarrhoea Follow up of for haemodialysis patients was found highly significant ($p<0.001$) as shown in the table 4.6.3, hence, $H_0$4 was rejected and proven together.

- **Constipation/Bloating:**

$H_0$5: There is no significant difference between Constipation/Bloating Baseline and Constipation/Bloating Follow up of Control Group.

About the difference between Constipation/Bloating Baseline and Constipation/Bloating Follow of Control group, the $H_0$5 was rejected as the table 4.6.3 revealed significant ($p<0.005$) difference between the two.

- **Uraemia:**

$H_0$6: There is no significant difference between Uraemia Baseline and Uraemia Follow up of Control Group.

No significant difference was found between Uraemia Baseline and Uraemia Follow up of Control Group as evident from the table 4.6.3. Since the p-value was found to be .104 therefore, the $H_0$6 was accepted and couldn't be proved parallel.

5.10 Most Important Symptomatic Factors in the Baseline of Haemodialysis patients in Experimental group.

Factor analysis was performed to explore the most Important Symptomatic Factors in the Baseline of Haemodialysis patients in Experimental group, the results showed that all the Symptomatic Factors in the Baseline of Haemodialysis patients were divided into two groups which have certain number of variables within it, the summary of which is provided below-

- **Factor 1:** includes following **3** variables Constipation/Bloating Baseline, Nausea Baseline, Diarrhoea Baseline
- **Factor 2:** includes following **3** variables Hypotension Baseline, Hypertension Baseline, Uraemia Baseline

5.11 Most Important Symptomatic Factors in the Baseline of Haemodialysis patients in Control group.

The most Important Symptomatic Factors in the Baseline of Haemodialysis patients in Control group were analysed using factor analysis, the results of which revealed that all the Symptomatic Factors in the Baseline of Haemodialysis patients were divided into three

groups which have certain number of variables within it, the summary of which is provided below-

- **Factor 1** includes following **3** variables Diarrhoea Baseline, Constipation/Bloating Baseline, Uraemia Baseline
- **Factor 2** includes following **2** variables Nausea Baseline, Hypotension Baseline
- **Factor 3** includes following **1** variable Hypertension Baseline.

5.12 Most Important Symptomatic Factors in the Follow-up phase of Haemodialysis patients in Experimental group.

The results of the factor analysis showed that in case of the Most Important Symptomatic Factors in the Follow-up phase of Haemodialysis patients in Experimental group, the total Symptomatic Factors were divided into three groups, the details of which are summarized below-

- **Factor 1** includes following **3** variables Constipation/Bloating Follow up, Hypotension Follow up, Hypertension Follow up
- **Factor 2** includes following **2** variables Uraemia Follow up, Diarrhoea Follow up
- **Factor 3** includes following **1** variable Nausea Follow up.

5.13 Most Important Symptomatic Factors in the Follow-up phase of Haemodialysis patients in Control group.

Most Important Symptomatic Factors in the Follow-up phase of Haemodialysis patients in Control group were evaluated with the use of factor analysis as a result of which three groups were made which had following number of variables within each group-.

- **Factor 1** includes following **2** variables Uraemia Follow up, Hypertension Follow up
- **Factor 2** includes following **2** variables Hypotension Follow up, Nausea Follow up
- **Factor 3** includes following **2** variables Constipation/Bloating Follow up, Diarrhoea Follow up.

5.14 Distribution of respondents according to MIS in the baseline and follow-up of experimental and control group

- **Experimental Group**: Out of total respondents, majority 39 (52%) respondents have Severe (20-30) MIS, followed by 28 (37.3%) respondents who had Moderate (10-20) MIS and just 8 (10.7%) respondents had Normal to mild (0-10) MIS in the baseline. In case of follow-up, majority 44 (58.7%) respondents had Moderate (10-20) MIS followed by 29 (38.7%) who were having Normal to mild (0-10) MIS increased from baseline to follow up to In addition, there was an increase in the number of in the follow-up at However, few 2 (2.7%) respondents reported Severe (20-30) MIS level.
- **Control Group**-In the baseline, majority 33 (44.0%) respondents had Moderate (10-20) MIS followed by 27 (36.0%) respondents who were having Severe (20-30) MIS and only 15 (20.0%) respondents had Normal to mild (0-10) MIS. In the follow-up, majority 34 (45.3%) respondents have Moderate (10-20) MIS followed by 21 (28.0%) respondents who had Normal to mild (0-10) MIS and 20 (26.7%) respondents were found to have Severe (20-30) MIS.

5.15 Difference between MIS Baseline and MIS Follow up of Haemodialysis Patients in Experimental Group

$H_0$1: There is no significant difference between MIS Baseline and MIS Follow up of Experimental Group.

High significant ($p<0.001$) difference in the Malnutrition Inflammation Score (MIS) of respondents in the baseline and follow-up was found from the table 4.8.2, thus, $H_0$1 was rejected and simultaneously proven.

5.16 Difference between MIS Baseline and MIS Follow up of Haemodialysis Patients in Control Group

H_0 1: There is no significant difference between MIS Baseline and MIS Follow-up of Control Group without diet modification.

Table 4.8.3 No significant difference between Malnutrition Inflammation Score (MIS) Baseline and Malnutrition Inflammation Score (MIS) Follow-up was found as the p-value comes out to be .134, thus H_0 1 was accepted that could not be proved together**.**

5.17 Distribution of respondents according to BMI in the baseline and follow-up of experimental and control group.

- **Experimental Group:** In the baseline, majority 35 (46.7%) were Normal followed by 25 (33.3%) respondents who were overweight and 15 (20.0%) were found underweight. In the follow-up, it was found that majority 42 (56.0%) respondents reported their BMI at Normal Level followed by 17 (22.7%) respondents having underweight BMI and 16 (21.3%) were found over-weight.
- **Control Group:** In the baseline majority 35 (46.7%) were overweight followed by 26 (34.7%) respondents who were underweight and only 14 (18.7%) respondents reported normal BMI. In the follow-up, majority 33 (44.0%) respondents had normal BMI followed by 25 (33.3%) respondents who were overweight and only 17 (22.7%) respondents were underweight.

5.18 Distribution of respondents according to Energy in the baseline and follow-up of experimental and control group

- **Experimental group:** In the baseline, equal number of respondents i.e., 32 (42.7%) were having sedentary level and moderate level while just 11 (14.7%) respondents were having heavy level of energy. In the follow-up, majority 33 (44.0%) respondents were having moderate level followed by 26 (34.7%) respondents who were having heavy level and just 16 (21.3%) were having sedentary level of Energy.
- **Control Group:** In the baseline, only 7 (9.3%) respondents were having sedentary level, 12 (16.0%) were moderate level and majority 56 (74.7%) were having heavy level of energy. In the follow-up, just few 5 (6.7%) respondents were having sedentary level, 13 (17.3%) were having moderate level and majority 57 (76.0%) were having heavy level.

5.19 Distribution of respondents according to Protein baseline and follow-up of experimental and control group

- **Experimental Group:** Majority 72 (96.0%) respondents were having low level of protein and only 3 (4.0%) were having high level in the baseline. In the follow-up, there were 13(17.3%) respondents having low level and majority 62 (82.7%) respondents having high level of protein.
- **Control group:** Majority 70 (93.3%) were having low level and just 5 (6.7%) were having high level of protein in the baseline. In the follow-up, majority 72 (96.0%) respondents had low level and 3 (4.0%) respondents had high level of protein.

5.20 Difference between BMI Baseline and BMI Follow up of Haemodialysis Patients in Experimental Group

H_0 1: There is no significant difference between BMI Baseline and BMI Follow up of Experimental Group with diet modification.

The difference between Basal Metabolic Index (BMI) Baseline and Basal Metabolic Index (BMI) Follow up of Experimental Group was found significant ($p<0.005$) as shown in the table 4.9.4, so the H_0 1 was rejected and it can be said that the null hypothesis was proved at the same time.

5.21 Difference between BMI Baseline and BMI Follow up of Haemodialysis Patients in Control Group

$H_0$1: There is no significant difference between BMI Baseline and BMI Follow up of Control Group without diet modification.

There was no significant difference between Basal Metabolic Index (BMI) Baseline and Basal Metabolic Index (BMI) Follow up as the p-value comes out to be .892 in the control group as evident from the table 4.9.5. Further, it denoted the acceptance of $H_0$1 that could not be proved concurrently.

5.22 Difference between Energy (Baseline and Follow up) & Protein (Baseline and Follow up) of Haemodialysis Patients in Experimental Group.

- **Energy:**

H_0 1: There is no significant difference between Energy (Baseline and Follow up) of Experimental Group with diet modification.

The Energy Baseline and Energy Follow up of haemodialysis patients having a diet modification showed a high significant ($p<0.001$) difference between the two in the experimental group as witnessed from the table 4.9.6, Thus, in this case, the H_0 1 was rejected and it can be said that the null hypothesis was also proved.

- **Protein:**

H_0 2: There is no significant difference between Protein (Baseline and Follow up) of Experimental Group with diet modification.

Table 4.9.6 showed high significant ($p<0.001$) difference between Protein (Baseline and Follow up) of haemodialysis patients with diet modification in the experimental group. Consequently, the researcher rejected the H_0 2 and proved it simultaneously.

5.23 Difference between Energy (Baseline and Follow up) & Protein (Baseline and Follow up) of Haemodialysis Patients in Control Group.

- **Energy:**

$H_0$1: There is no significant difference between Energy (Baseline and Follow up) of Control Group without diet modification.

Table 4.9.7 showed that Energy (Baseline and Follow up) of haemodialysis patients in the control group, have no significant difference as the p-value comes out to .685 thereby $H_0$1 was accepted and could not be proved concurrently**.**

- **Protein:**

H_0 2: There is no significant difference between Protein (Baseline and Follow up) of Control Group without diet modification.

High significant ($p<0.001$) difference even in the absence of diet modification in case of difference between Protein (Baseline and Follow up) of Control Group was found from the table 4.9.7 which makes the rejection of H0 2 and it can be said that null hypothesis was proved at the same time.

5.24 Relationship between Energy Baseline and Protein Baseline with BMI in Experimental Group

$H_0$1: There is no significant correlations between Energy Baseline and Protein Baseline with BMI in Experimental Group

No significant correlations between Energy Baseline and Protein Baseline with BMI of haemodialysis patients in Experimental Group was found as seen from the table 4.9.8. As the p-value comes out to be more than 0.05, therefore $H_0$1 was accepted and couldn't be proved parallel.

5.25 Impact of Energy Baseline & Protein Baseline on BMI in Experimental Group

$H_0$1: There is no significant effect of Energy Baseline on BMI in experimental group.

From the table 4.9.9, it was observed that the p-value comes out to be insignificant at 0.128, which signifies that the Energy Baseline have no significant effect on BMI of haemodialysis patients in experimental group. Thus, $H_0$1 was accepted and could not be proved simultaneously.

$H_0$2: There is no significant effect of Protein Baseline on BMI in experimental group.

Protein Baseline was found to have insignificant (0.186) effect on BMI of haemodialysis patients in experimental group which was evident from the table 4.9.9 therefore, H02 was accepted which signifies that the null hypothesis was not proven concurrently.

5.26 Relationship between Energy Baseline and Protein Baseline with BMI in Control Group

$H_0$1: There is no significant correlations between Energy Baseline and Protein Baseline with BMI in Control Group

Energy Baseline and Protein Baseline were found to have no significant relationship on BMI of haemodialysis patients in Control Group as seen from the table 4.9.10 Thus, $H_0$1 was accepted as the p-value was less than 0.05 & the null hypothesis could not be proven.

5.27 Impact of Energy Baseline & Protein Baseline on BMI in Control Group

$H_0$1: There is no significant effect of independent variable- Energy Baseline on dependent variable- BMI for Control group.

Table 4.9.11showed that Energy Baseline of haemodialysis patients have an insignificant (0.466) impact with their BMI in the control group. Thus, $H_0$1 was accepted which means it could not be simultaneously proven.

$H_0$2: There is no significant effect of independent variable- Protein Baseline on dependent variable- BMI for Control group.

The effect of Protein Baseline on BMI of haemodialysis patients in Control group was found insignificant at 0.430 as revealed from the table 4.9.11 Therefore, H02 was accepted and null hypothesis could not be proven at the same time,

5.28 Relationship between Energy Follow Up and Protein Follow-Up with BMI in Experimental Group

$H_0$1: There is no significant correlations between Energy Follow Up and Protein Follow Up with BMI in Experimental Group

The relationship of Energy Follow Up and Protein Follow Up of haemodialysis patients was found to be insignificant with their BMI in the experimental group as evident from the table 4.9.12, thus $H_0$1 was accepted and could not be proved together.

5.29 Impact of Energy Follow Up & Protein Follow Up (independent variables) on BMI (dependent variable) in Experimental Group

$H_0$1: There is no significant effect of independent variable- Energy Follow Up on dependent variable- BMI for experimental group.

It was found from the table 4.9.13 that Energy Follow Up was having an insignificant (0.796) impact on the BMI of haemodialysis patients in the experimental group with the diet modification, therefore, $H_0$1 was accepted which means that it could not be proved at the same time

$H_0$2: There is no significant effect of independent variable- Protein Follow Up on dependent variable- BMI for experimental group.

It was from the table 4.9.13 found that the Protein Follow Up of haemodialysis patients is insignificantly (0.335) influenced by their BMI. So, the $H_0$2 was accepted leading to the inability to prove it concurrently.

5.30 Relationship between Energy Follow Up and Protein Follow Up with BMI in Control Group

$H_0$1: There is no significant correlations between Energy Follow Up and Protein Follow Up with BMI in Control Group.

It was revealed in the table 4.9.14 that Energy Follow Up and Protein Follow Up have an insignificant relationship with BMI in Control Group. Thus, the $H_0$1 was accepted and could not be proved at the same time.

5.31 Impact of Energy Follow Up & Protein Follow Up (independent variables) on BMI (dependent variable) in Control Group

$H_0$1: There is no significant effect of independent variable- Energy Follow Up on dependent variable- BMI for Control Group.

The impact of Energy Follow on BMI (dependent variable) in Control Group as observed

from the table 4.9.15 was found insignificant (0.546), therefore $H_0$1 was accepted and could not be proved simultaneously.

$H_0$2: There is no significant effect of independent variable- Protein Follow Up on dependent variable- BMI for Control Group.

As evident from the table 4.9.15, it was found that Protein Follow Up have an insignificant (0.739) effect on the BMI of haemodialysis patients for Control Group. Thus, on this basis, $H_0$2 was accepted but could not be proved at the same time.

5.32 Distribution of Haemodialysis Patients according to their Biochemical parameters (Haemoglobin, Creatinine, Sodium, Potassium, Calcium, Phosphorus and Uric acid) in both Experimental Group and Control group.

1. **Distribution of respondents according to Haemoglobin baseline and follow-up of experimental and control group.**

- **Experimental Group:** Majority 67 (89.3%) respondents were having low level and just 8 (10.7%) were having normal level in the baseline. In the follow-up, majority 51 (68.0%) respondents were having low level and .24 (32.0%) respondents reported normal level of haemoglobin.
- **Control group:** Majority 47 (62.7%) were having low level and 28 (37.3%) were having normal level in the baseline In the follow-up, majority 52 (69.3%) respondents reported low level and 23 (30.7%) respondents were found to have normal level of haemoglobin.

2. **Distribution of respondents according to Creatinine baseline and follow-up of experimental and control group**

- **Experimental Group:** In the baseline, majority 36 (48.0%) respondents were having Grade II (Very high) level of creatinine followed by 30 (40.0%) respondents were having Grade III (Severely high) level of creatinine while 5 (6.7%) respondents reported Grade IV (Extremely high) and just 4 (5.3%) respondents had Grade I (Moderately high) On the other hand, in the follow-up, most 46 (61.3%) respondents were having Grade II (Very high) level of creatinine followed by 15 (20.0%)

respondents having Grade I (Moderately high) level, 12 (16.0%) respondents having Grade III (Severely high) and just 2 (2.7%) respondents were having Grade IV (Extremely high) level of creatinine.

- **Control group:** In the baseline, 46 (61.3%) respondents were having Grade II (Very high) level of creatinine followed by 17 (22.7%) respondents were having Grade III (Severely high) level while 7 (9.3%) respondents were having Grade IV (Extremely high) level and few 5 (6.7%) respondents were having Grade I (Moderately high) level of creatinine. In case of follow-up, it was found that most 48 (64.0%) respondents were having Grade II (Very high) level of creatinine followed by 13 (17.3%) respondents that reported Grade I (Moderately high) level while 8 (10.7%) respondents were found to have Grade III (Severely high) level and only 6 (8.0%) respondents were having Grade IV (Extremely high) level of creatinine.

3. Distribution of respondents according to Sodium baseline and follow-up of experimental and control group

- **Experimental Group:** In the baseline, majority 41 (54.7%) respondents were found to have normal level and remaining 34 (45.3%) were having Hyponatremia level of sodium. In the follow-up, majority 50 (66.7%) respondents were having normal level of sodium and 25 (33.3%) respondents had Hyponatremia level of sodium.
- **Control group:** Only 16 (21.3%) were having hyponatremia level and majority 59 (78.7%) were having normal level in the baseline. However, in the follow-up 25 (33.3%) respondents had hyponatremia level and majority 50 (66.7%) reported normal level of sodium.

4. Distribution of respondents according to Potassium baseline and follow-up of experimental and control group

- **Experimental Group:** In the baseline, 51 (68.0%) were having normal level, 21 (28.0%) were having Hyperkalaemia level and only 3 (4.0%) were having Hypokalaemia level of Potassium. In the follow-up, 29 (38.7%) had normal level, 27(36.0%) had Hyperkalaemia and 19 (25.3%) reported Hypokalaemia level of potassium.

- **Control group:** In the baseline most 44 (58.7%) were having Hypokalaemia level and remaining 31 (41.3%) were having normal level of potassium. In the follow-up, 31 (41.3%) had normal level, 30(40.0%) had Hyperkalaemia level and rest 14 (18.7%) respondents had Hypokalaemia level of Potassium.

5. Distribution of respondents according to calcium baseline and follow-up of experimental and control group

- **Experimental Group:** In the baseline, majority 41 (54.7%) were having Hypocalcaemia level and 34 (45.3%) were having normal level of calcium. In the follow-up, majority 41 (54.7%) were having Hypocalcaemia level and remaining 33 (44.0%) respondents had normal level of calcium.
- **Control group:** Majority 38 (50.7%) were having Hypocalcaemia level and 37 (49.3%) were having normal level of Calcium in the baseline. In the follow-up, 40 (53.3%) had normal level and rest 29(38.7%) had Hypocalcaemia level of calcium.

6. Distribution of respondents according to phosphorus baseline and follow-up of experimental and control group

- **Experimental Group:** In the baseline, 42 (56.0%) had Hyperphosphatemia level. 30 (40.0%) had normal level and only 3 (4.0%) had Hypophosphatemia level of phosphorus. In the follow-up, 38 (50.7%) had Hyperphosphatemia level, 36 (48.0%) had normal level and just 1 (1.3%) respondent had Hypophosphatemia level of phosphorous.
- **Control group:** In the baseline, just 20 (26.7%) had Hypophosphatemia level and remaining 55 (73.3%) had normal phosphorus level. In the follow-up, 48 (64.0%) had normal and rest 27 (36.0%) had Hypophosphatemia level of Phosphorus.

7. Distribution of respondents according to Uric acid baseline and follow-up of experimental and control group

- **Experimental Group:** In the baseline, 49 (65.3%) had normal level, 23 (30.7%) had high level and 3 (4.0%) had low level of uric acid. In the follow-up, 55 (73.3%) had normal level, 18 (24.0%) had High level and just 2 (2.7%) had low level of uric acid.

- **Control group:** In the baseline, 45 (60.0%) had normal level, 28 (37.3%) had high level and only 2 (2.7%) had Low level of uric acid. In the follow-up, majority 45 (60.0%) had normal level remaining 30 (40.0%) respondents had low level of Uric acid.

5.33 Difference between (Baseline and Follow up) of Biochemical Parameters: Haemoglobin, Creatinine, Sodium, Potassium, Calcium, Phosphorus and Uric acid of Haemodialysis Patients in Experimental Group

- **Haemoglobin:**

$H_0$1: There is no significant Difference between Haemoglobin (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

It was found from the table 4.10.8, there was a statistically high significant ($p<0.001$) difference between Haemoglobin (Baseline and Follow up) of Haemodialysis Patients so, the H01 and rejected and proven at the same time.

- **Creatinine:**

$H_0$2: There is no significant Difference between Creatinine (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

Table 4.10.8 showed that Creatinine (Baseline and Follow up) of Haemodialysis Patients had a statistically high significant ($p<0.001$) difference between them that is why the $H_0$2 was rejected and proven alongside.

- **Sodium:**

$H_0$3: There is no significant Difference between Sodium (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

It was exhibited in the table 4.10.8 that Sodium Baseline and Sodium Follow-up have insignificant (0 204(difference between them hence the $H_0$3 was accepted and could not be proved concurrently.

- **Potassium:**

$H_0$4: There is no significant Difference between Potassium (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

The difference between Potassium (Baseline and Follow up) as witness from the table 4.10.8. comes out to be insignificant (0.541) thereby the $H_0$4 was accepted and could not be proved at the same time.

- **Calcium:**

$H_0$5: There is significant Difference between Calcium (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

It was found from the table 4.10.8 that the Calcium (Baseline and Follow up) had no significant (0.767) difference between them which signifies the acceptance of $H_0$5 and inability of the null hypothesis to be proven.

- **Phosphorus:**

$H_0$6: There is no significant Difference between Phosphorus (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

Table 4.10.8 showed that there was an insignificant (0.654) difference between Phosphorus (Baseline and Follow up) hence, $H_0$6 was accepted and could not be proved at the same time

- **Uric acid:**

$H_0$7: There is no significant Difference between Uric acid (Baseline and Follow up) of Haemodialysis Patients in Experimental Group with Diet Modification.

It was found from the table 4.10.8 that the difference between Uric acid (Baseline and Follow up) of was insignificant (0.745). Since, p-value was insignificant therefore, $H_0$7 was accepted and it could not be proven simultaneously

5.34 Difference between (Baseline and Follow up) of Biochemical Parameters: Haemoglobin, Creatinine, Sodium, Potassium, Calcium, Phosphorus and Uric acid of Haemodialysis Patients in Control Group

- **Haemoglobin:**

$H_0$1: There is no significant Difference between Haemoglobin (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

It was found from the table 4.10.9 that there was a statistically significant ($p<0.005$) difference between Haemoglobin (Baseline and Follow up). Thus, the $H_0$1 was rejected and proved at the same time.

- **Creatinine:**

$H_0$2: There is no significant Difference between Creatinine (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

The difference between Creatinine (Baseline and Follow up) was found insignificant (0.053) as evident from the table 4.10.9, hence, the $H_0$2 was accepted and could not be proved simultaneously.

- **Sodium:**

$H_0$3: There is no significant Difference between Sodium (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

Table 4.10.9 revealed that the Sodium (Baseline and Follow up) had insignificant (0.664) difference which is why $H_0$3 was accepted and couldn't be proved at the same time.

- **Potassium:**

$H_0$4: There is no significant Difference between Potassium (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

It was found that there was no significant (0.629) difference between the Baseline and Follow-up of Potassium level therefore the $H_0$4 could not be proved concurrently and was accepted.

- **Calcium:**

$H_0$5: There is no significant Difference between Calcium (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

The difference between Calcium (Baseline and Follow up) as observed from the table 4.10.9 was found insignificant (0.053). therefore, the researcher accepted the $H_0$5 which also meant that it could not be proved alongside.

- **Phosphorus:**

$H_0$6: There is no significant Difference between Phosphorus (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

Table 4.10.9 exhibited that Phosphorus Baseline and Follow up have insignificant (0.613) difference between them pointing to the acceptance of the $H_0$6 and conveying further that $H_0$6 could not be proved simultaneously.

- **Uric acid:**

$H_0$7: There is no significant Difference between Uric acid (Baseline and Follow up) of Haemodialysis Patients in Control Group without Diet Modification.

The results from the table 4.10.9 showed that there was statistically significant ($p<0.005$) difference between the Uric acid Baseline and Uric acid Follow up thus, the $H_0$7 was rejected and was proved alongside.

CONCLUSION

Assessing the nutritional diet of patients undergoing haemodialysis is of utmost importance for their overall health and well-being. Haemodialysis patients face unique challenges that can affect their nutritional status due to the removal of waste products and nutrients during dialysis. This can lead to malnutrition, deficiencies in essential vitamins and minerals, and imbalances in fluid and electrolyte levels. By carefully evaluating their dietary intake, healthcare providers and dietitians can identify potential deficiencies or excesses and design individualized dietary plans to meet their specific needs.

A proper nutritional diet for haemodialysis patients is essential for several reasons. It helps prevent malnutrition and muscle wasting by ensuring an adequate intake of proteins and calories to support their body's demands. Moreover, managing fluid and electrolyte balance is crucial to prevent complications related to fluid overload and imbalances in sodium, potassium, and phosphorus levels. Proper dietary control of phosphorus intake is also essential for maintaining bone health and preventing bone and mineral disorders. Additionally, a heart-healthy diet can help manage blood pressure and reduce the risk of cardiovascular complications, which are prevalent in haemodialysis patients.

Furthermore, dietary control of carbohydrates is essential for managing blood sugar levels in patients with diabetes, a common cause of kidney disease requiring dialysis. Adequate intake of iron and folic acid supports red blood cell production and helps manage anaemia, a frequent concern in these patients.

Ultimately, an optimized nutritional diet enhances the overall quality of life for patients undergoing haemodialysis, providing them with more energy, improved health, and well-being. By closely monitoring and assessing their dietary intake, healthcare professionals can make timely adjustments and prevent nutritional deficiencies or imbalances, thus contributing to better treatment outcomes and improved patient care. Emphasizing the importance of nutritional assessment and support in the care of haemodialysis patients is essential to promote their health, comfort, and overall quality of life throughout their treatment journey.