DIETARY MANAGEMENT OF CREATININE PATIENTS

A PROJECT REPORT

BY

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Submitted to the Department of Nutrition and Food Engineering in the partialfulfilment of B.Sc. in Nutrition and Food Engineering

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APPROVAL

This paper titled "**Dietary management of creatinine patients**", submitted by "**Farhana Chowdhury"** to the Department of Nutrition and Food Engineering, Daffodil International University, has been approved for submission for the degree of B.Sc. in Nutrition and Food Engineering (NFE). Her work demonstrates a commendable level of scholarship, research, and critical analysis, and it meets the standards by our university. Throughout her thesis, she has exhibited a thorough understanding of the subject matter, supported by a well-structured argument and comprehensive literature review. Her methodology section effectively outlines the research design and approach, ensuring the validity and reliability of her findings.

EXAMINING COMMITTEE

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DECLARATION

I hereby declare that this paper has been done by us under the supervision of **Ms. Arifa Sultana, Lecturer, Department of** Nutrition and Food Engineering**,** Daffodil International University. I also declare that neither this paper nor any part of this thesis has been submitted elsewhere for award of any degree or diploma.

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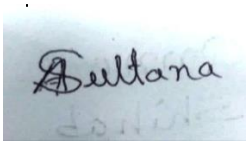

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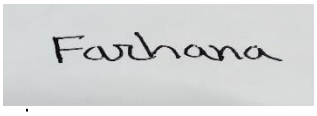

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ACKNOWLEDGEMENT

I Recognize that nutrition plays a major role in renal function, especially for those with high creatinine levels. Elevations in creatinine frequently signify compromised kidney function, and dietary adjustments might lessen the strain on the kidneys.

I Realize the value of preserving a well-balanced diet that supplies necessary nutrients and minimizes the consumption of items that may worsen renal failure. To reduce kidney strain, this involves controlling the amount of protein, salt, potassium, and phosphorus consumed.

I Acknowledge that cooperation amongst medical professionals—such as nurses, dietitians, and doctors—is necessary for efficient dietary management. Every member of the medical team is essential in informing patients about dietary guidelines and offering continuous assistance.

Also realizing that dietary suggestions must to be customized to meet the specific requirements of the patient, taking into consideration variables like age, gender, weight, medical background, and renal disease stage. Tailored meal plans have the potential to maximize results and enhance compliance.

Recognizing the role that patient education plays in enabling people to make knowledgeable dietary decisions. Patient participation and adherence to dietary guidelines can be improved by giving them clear, intelligible information on food substitutes, meal planning, and dietary restrictions.

I recognize the necessity of doing routine laboratory testing and clinical evaluations to track renal function and dietary compliance. Through monitoring, medical professionals can evaluate the success of nutritional therapies and make the required modifications over time. Understanding how lifestyle choices like exercise, quitting smoking, and controlling weight affect kidney health. In addition to food therapies, encouraging patients to adopt healthy lifestyle practices can enhance their general well-being.

Recognizing the potential influence of socioeconomic and cultural preferences on food choices and adherence to guidelines. Healthcare providers must to be aware of these aspects and collaborate with patients to create dietary regimens that are both realistic and suitable for their culture.

Realizing that managing increased creatinine levels with food is frequently a long-term process that calls for consistent work and dedication from patients and healthcare professionals. Achieving long-term success can be facilitated by setting reasonable goals and offering constant support.

Lastly, I express my gratitude to all the participants and individuals who generously contributed their time and insights, without whom this research would not have been possible.

This thesis represents the culmination of the efforts and contributions of many, and I am truly grateful for the collaborative spirit that has shaped its development

ABSTRACT

Chronic kidney disease and associated elevated creatinine levels present a significant health challenge worldwide. This thesis investigates the crucial role of dietary management in mitigating the progression of CKD and optimizing the health outcomes of creatinine patients. A comprehensive literature review examines existing knowledge on the impact of dietary choices on renal function, emphasizing the need for personalized dietary interventions.

The study employs a mixed-methods approach, combining a systematic review of relevant literature with an empirical investigation involving creatinine patients. The empirical phase includes a sensory evaluation of creatinine-friendly foods, assessing flavor, texture, and aroma to enhance the palatability of tailored diets. Additionally, a Food Frequency Questionnaire (FFQ) captures the dietary habits and preferences of creatinine patients, providing valuable insights into their nutritional patterns.

The sensory evaluation's findings emphasize the significance of taking the sensory components of dietary changes into account and provide a nuanced view of the opportunities and challenges associated with creating appealing foods that are creatinine-friendly. The formulation of focused nutritional therapies is aided by the FFQ data, which show trends in the dietary preferences of creatinine patients.

The discussion interprets these findings in the context of existing literature, emphasizing the potential impact of sensory experiences on dietary adherence and overall patient well-being. Limitations of the study are acknowledged, including the need for further research and the importance of individualized dietary plans.

The study conducted tests on individuals aged 18-60, comparing their creatinine levels before and after consuming different diets. Initially, males aged 18-30 had a creatinine level of 2.15, which dropped to 0.91 after consuming a whole grain diet, while females in the same age group had a creatinine level of 1.8, dropping to 0.83 with the same diet. Similar reductions were observed in other age groups and diets. Notably, diets rich in whole grains and vegetables led to the most significant reduction in creatinine levels, indicating promising results for dietary management. However, protein intake did not yield promising results. Additionally, it was observed that males generally had higher creatinine levels than females, except for males aged 46-60, who had lower levels compared to women of similar age. Overall, the findings suggest that diets rich in vegetables and whole grains can effectively lower creatinine levels and improve overall health.

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CHAPTER 1

INTRODUCTION

1.1 Background

As muscles break down creatine, a material that helps give muscle cells energy, they produce creatinine as a waste product. It is created in the body at a fairly steady rate and is used by the kidneys to filter blood. A common marker of renal function is the blood's creatinine level.

The kidneys are essential for removing waste materials like creatinine from the body and preserving the proper balance of fluids and electrolytes. The kidneys effectively eliminate creatinine from the blood and expel it in urine when they are operating normally. On the other hand, a drop in kidney function may cause the blood's creatinine concentration to increase, a sign of possible renal issues.

Creatinine level measurement is a common part of many medical testing, such as blood and urine tests. The glomerular filtration rate (GFR), a crucial measure of kidney function, can be estimated using the creatinine clearance rate, which is the ratio of creatinine in the blood to creatinine in urine. Conditions including kidney illness, dehydration, muscular issues, or certain drugs might be linked to abnormal creatinine levels.

For the purpose of evaluating renal health and making prospective kidney-related diagnoses, creatinine level monitoring is essential. Healthcare providers utilize this data to assess the efficacy of interventions meant to maintain or enhance kidney function as well as to advise treatment choices.

Creatinine tests are used to assess how well the kidneys filter waste from the blood. Creatinine is a chemical byproduct that is produced when our muscles work to produce energy. When the kidneys are working properly, creatinine is filtered out of the blood and expelled through the urine. Creatinine builds up in the blood when there is a kidney issue because the body is unable to eliminate it. Adult males should have blood creatinine levels between 0.74 and 1.35 mg/dL (65.4 and 119.3 micromoles/L). 0.59 to 1.04 mg/dL (52.2 to 91.9 micromoles/L) for adult females Even if they are beneficial for the kidneys, several medications have the ability to raise the level of creatinine in the blood.

It is not necessary to prepare much for the creatinine test. Accurate findings will be acquired if the diagnostic center is of high quality, regardless of whether the test is conducted on an empty or full stomach.

Even if they are beneficial for the kidneys, several medications have the ability to raise the level of creatinine in the blood.

1.2 Objectives

The diet chart for individuals with elevated creatinine levels aims to achieve several objectives to support kidney health and manage the condition. Here are some common objectives:

- Manage Protein Intake:
  Restricting protein intake is often recommended to reduce the production of creatinine in the body. This is because protein breakdown contributes to creatinine formation.
- Control Phosphorus and Potassium:
  Individuals with kidney issues may need to monitor and limit the intake of foods high in phosphorus and potassium, as impaired kidney function can lead to difficulties in regulating these minerals.
- Maintain Adequate Fluid Balance:
  Proper hydration is crucial for kidney function. A diet plan aims to maintain an appropriate balance of fluids to support kidney health while avoiding dehydration.
- Limit Sodium Intake:
  Controlling sodium intake helps manage blood pressure and fluid retention, which can be important for individuals with kidney problems.
- Balanced Nutrient Intake:
  Ensuring a well-balanced diet that provides essential nutrients while avoiding excessive amounts of certain substances (like protein, phosphorus, and potassium) is a key objective.
- Address Underlying Health Conditions:
  The diet plan may address specific underlying health conditions contributing to elevated creatinine levels, such as diabetes or high blood pressure.
- Prevent Malnutrition:
  Maintaining proper nutrition is essential to prevent malnutrition, as some dietary restrictions may affect overall nutrient intake.
- Individualized Planning:
  Considering the individual's medical history, lifestyle, and preferences, a diet plan is often tailored to meet the specific needs and challenges of the person with elevated creatinine levels.
- Regular Monitoring:
  The diet plan should be part of an overall management strategy that includes regular monitoring of creatinine levels, kidney function, and other relevant markers to assess the effectiveness of dietary interventions.

It's important to note that dietary recommendations can vary based on the underlying cause of elevated creatinine levels and the overall health of the individual. A healthcare professional or a registered dietitian plays a crucial role in designing a personalized diet plan based on individual needs and medical conditions.

CHAPTER 2

LITERATURE REVIEW

2.1 Background

Research has consistently suggested (Herber-Gast GCM, 2016) that a controlled and sometimes restricted protein intake is beneficial for individuals with kidney issues, including elevated creatinine levels. This is because protein metabolism contributes to the production of creatinine. Studies have explored the impact of controlling dietary phosphorus and potassium in managing kidney disease. Controlling these minerals can help prevent complications associated with impaired kidney function. Several studies have investigated the efficacy of low-protein diets in managing creatinine levels in creatinine patients. While reducing protein intake can decrease the production of creatinine, there is ongoing debate regarding the optimal level of protein restriction. Some studies suggest that moderately restricted protein intake (0.6-0.8 g/kg/day) may be beneficial in slowing the progression of creatinine without compromising nutritional status.

(Malta D, 2018) Literature supports the role of sodium control in managing hypertension and fluid retention, which are common concerns for individuals with creatine problems. There's recognition of the importance of individualized nutrition plans. When creating food recommendations for patients with elevated creatinine levels, different factors need to be taken into account, including age, gender, weight, medical history, and unique dietary preferences.

Maintaining proper hydration is consistently emphasized in the literature. However, the optimal amount of fluid intake may vary among individuals, and recommendations often depend on factors such as the stage of kidney disease and the presence of other health conditions. Some studies explore the role of specific supplements or modified diets in providing essential nutrients without exacerbating kidney issues. We concentrated on meat, fish, dairy, vegetables, fruit, coffee, tea, soft drinks, and salutary patterns. There was satisfying substantiation that a healthy dietary pattern may lower creatinine threat. Factory- grounded foods, coffee, and dairy may be salutary. Unhealthy diets and their factors, similar as red(reused) meat and sugar- candied potables, may promote order function loss.

Reviews of the literature (Krebs-Smith S, 2018) Additionally take into account how dietary limitations affect the quality of life for those who have kidney illness. Striking a balance between managing health and maintaining a satisfying diet is crucial. Longitudinal studies and clinical trials have contributed to me understanding of the long-term effects of dietary interventions on kidney function and overall health. The literature underscores the importance of involving registered dietitians in the care of individuals with kidney disease. A personalized and monitored dietary plan can be more effective than general recommendations.

The literature reviewed (Knight EL,2003) underscores the significance of dietary interventions in managing creatinine levels and supporting renal function. A personalized approach, considering individual health status and preferences, is essential for optimizing dietary management strategies. Future research should focus on longitudinal studies to establish the long-term efficacy and feasibility of these dietary interventions, contributing to the refinement of guidelines for creatinine patients.

Patients with elevated creatinine levels are more vulnerable to micronutrient deficits as a result of dietary limitations and decreased renal excretion. To prevent deficits and maximize nutritional status, supplements containing vitamins and minerals such calcium, iron, folic acid, and vitamin D may be required. But supplementation ought to be customized for each person's requirements and directed by routine serum level monitoring.
Literature (Jhee JH, 2019) indicates that vegetarian diets, rich in fruits and vegetables, may offer protective effects against kidney progression. Such diets provide essential nutrients while minimizing the intake of substances that may exacerbate renal dysfunction.

While certain patients may require vitamin and mineral supplementation to address deficiencies, careful monitoring is essential to prevent potential complications. Literature emphasizes the need for personalized supplementation plans tailored to individual patient profiles.

Patients with increased creatinine levels may benefit from plant-based diets, the Mediterranean diet, and DASH (Dietary Approaches to Stop Hypertension) dietary patterns. Understanding the consequences of total eating patterns enables a holistic approach to nutritional management.
An extensive summary of recent studies on dietary management approaches for those with increased creatinine levels is given in this review of the literature.

The evidence synthesis highlights the significance of tailored and sophisticated techniques that take into account individual characteristics including age, gender, and comorbidities. Research must go on as the field develops in order to improve dietary suggestions and create evidence-based advice for patients with elevated creatinine levels in order to maximize their nutritional status and renal health.
Dietary management plays a pivotal role in the comprehensive care of creatinine patients with elevated creatinine levels. A personalized approach to nutrition therapy, incorporating protein restriction, sodium and fluid management, electrolyte regulation, and micronutrient supplementation, is crucial to optimize renal function and improve clinical outcomes. Further research is warranted to evaluate the long-term efficacy and safety of dietary interventions in management.

CHAPTER 3

MATERIALS AND METHODS

3.1 Inclusion and exclusion criteria

Defining clear inclusion and exclusion criteria for a study or the development of a creatinine patient diet chart is crucial to ensure that the selected participants are representative of the target population and that the study outcomes are relevant and valid. Below are suggested inclusion and exclusion criteria for creatinine patients:

Inclusion Criteria:

1. Creatinine Levels:

Inclusion of individuals with elevated creatinine levels, indicating impaired kidney function.

- < 1.5 mg/dL (< 133 mcmol/L) for adults
  Adult female (18–60 years old): 53–97 mcmol/L (0.6–1.1 mg/dL)
  Adult males aged 18 to 60: 0.9–1.3 mg/dL (80–115 mcmol/L)
  Men between the ages of 60 and 90: 0.8–1.3 mg/dL (71–115 mcmol/L)
  Women between the ages of 60 and 90: 0.6–1.2 mg/dL (53–106 mcmol/L)
  Males above the age of 90: 1-.17 mg/dL (88-150 mcmol/L)
  Over 90-year-old women: 0.6–1.3 mg/dL (53–115 mcmol/L)
  Critical Values: greater than 4 mg/dL (signals severe impairment of renal function)

2. Age Range:

Adults within a specific age range relevant to the study population (e.g., 18-75 years).

3. Willingness to Participate:

Individuals willing to actively participate in dietary interventions, follow dietary recommendations, and attend follow-up assessments.

4. Stability of Health Condition:

Individuals with stable health conditions, without acute exacerbations or complications that might interfere with dietary assessments.

5. Ability to Provide Informed Consent:

Participants capable of understanding the study objectives, procedures, and potential risks, and able to provide informed consent.

6. Compliance with Medical Treatments:

Individuals' adherent to prescribed medical treatments for their underlying kidney condition, including medications and other therapies.

7. Availability for Follow-up:

Participants who can commit to regular follow-up appointments and assessments throughout the study duration.

Exclusion Criteria:

1. Severe Coexisting Medical Conditions:

Exclusion of individuals with severe comorbidities (e.g., advanced cardiovascular disease, cancer) that might significantly impact overall health and dietary needs.

2. Pregnancy or Lactation:

Exclusion of pregnant or lactating individuals due to additional nutritional requirements and potential effects on creatinine levels.

3. Recent Surgical Procedures:

Individuals who have undergone major surgical procedures within a specific timeframe (e.g., three months prior to enrollment) to avoid potential confounding factors.

4. Active Infections or Inflammatory Conditions:

Exclusion of participants with active infections or inflammatory conditions, as these can influence creatinine levels and dietary needs.

5. Unstable Mental Health Conditions:

Individuals with severe mental health conditions that may make it difficult for them to adhere to dietary recommendations or participate in the study.

6. Known Allergies or Food Intolerances:

Participants with known allergies or intolerances to foods that may be included in the dietary interventions.

7. Inability to Communicate Effectively:

Exclusion of individuals with language barriers or cognitive impairments that may hinder effective communication and understanding of dietary guidelines.

8. Participation in Conflicting Studies:

Exclusion of individuals concurrently participating in other studies that may affect dietary habits or outcomes.

These criteria should be carefully considered based on the specific objectives of your study or dietary management program for creatinine patients. Adjustments may be necessary depending on the nature and focus of the research or intervention.

3.2 Data collection methods

Collecting data on the dietary management of patients with elevated creatinine levels involves a combination of methods to gather comprehensive and accurate information. Here are some common data collection methods for studying dietary interventions in creatinine patients:

1. Dietary Surveys and Records:
   - Food Frequency Questionnaires (FFQs): Participants report the frequency and portion sizes of foods consumed over a specific period, providing an overview of their dietary habits.
   - Food Diaries: Participants maintain a daily record of all foods and beverages consumed, offering detailed information on dietary intake.
2. Nutrient Analysis:
   - Use software or databases to analyze the nutritional content of the reported foods. This helps quantify the intake of specific nutrients relevant to creatinine management, such as protein, sodium, potassium, and phosphorus.
3. Anthropometric Measurements:
   - Determine the height, weight, and Body Mass Index (BMI) of the participants. Variations in these metrics information about the participant's general health and nutritional state.
4. Clinical Assessments:
   - Conduct clinical evaluations to monitor signs and symptoms related to kidney function and overall health. This may include blood pressure measurements, assessment of edema, and other relevant clinical indicators.
5. Quality of Life Surveys:
   - Administer surveys or questionnaires that assess the participants' quality of life. This can provide information on the impact of dietary interventions on their overall well-being.
6. Physical Activity Monitoring:
   - Consider monitoring participants' physical activity levels, as exercise can impact creatinine levels. Use activity trackers or self-reported activity logs to gather this information.
7. Patient Interviews and Focus Groups:
   - Conduct qualitative interviews or focus group discussions to gather in-depth insights into participants' experiences with the dietary intervention. This method can provide valuable contextual information and uncover factors influencing dietary adherence.
8. Surveys on Knowledge and Attitudes:
   - Assess participants' knowledge and attitudes regarding dietary management through surveys. This can provide insights into factors influencing dietary choices and adherence.

CHAPTER 4

RESULT AND DISCUSSION

- **Dietary Chart for Creatinine Patient (According to Age and Gender)**

Gender	Age	Dietary Chart	
Male (13 patients)	18-30	Breakfast	• 100g of apple slices and oatmeal prepared with water. Tea made with herbs.
		Lunch	• Cucumber, lettuce, and chicken on the grill. Cooked veggies, such carrots or green beans. A side dish of brown rice
		Dinner	• A small bowl of low-potassium fruit salad • Steamed broccoli or cauliflower. • Baked or grilled fish or skinless poultry.
Male (25 patients)	31-45	Breakfast	• Whole grain toast with a modest amount of margarine. • Strawberry/ Blackberry • Green tea.
		Lunch	• A little dish of brown rice as a side and A salad of mixed greens, cucumber, and cherry tomatoes. Grilled fish. Cooked veggies, such carrots or green beans.
		Dinner	• Baked or grilled fish (low in phosphorus) or lean beef. • Steamed broccoli or cauliflower. • Sweet potatoes or a small portion of pasta.
Male (19 patients)	46-60	Breakfast	• Oatmeal made with water • Apple slices 100g. • Herbal tea.
		Lunch	• Grilled fish, salad with mixed greens, cherry tomatoes. • Raw carrot sticks or cucumber slices. • Quinoa as a side.

		Dinner	• Baked or grilled fish (low in phosphorus) or lean beef • Steamed broccoli or cauliflower. • Sweet potatoes or a small portion of pasta. • A small bowl of low-potassium fruit salad (e.g., pineapple, kiwi)

Gender	**Age**	**Dietary Chart**	
Female (8 patients)	18-30	Breakfast	• Oatmeal made with water and Poached egg • Apple slices 100g. • Herbal tea.
		Lunch	• Grilled chicken, salad with mixed greens, cherry tomatoes, and cucumber. • Mixed green salad with a squeeze of lemon. • Whole grain crackers.
		Dinner	• Stir-fried fish or skinless chicken with mixed vegetables. • Whole grain bread roll. • Steamed broccoli and carrots
Female (21 patients)	31-45	Breakfast	• Oatmeal made with water. • Fresh orange slices. • Green tea.
		Lunch	• Grilled chicken or chickpea salad with mixed greens, cherry tomatoes, and cucumbers. • Roasted sweet potato wedges. • Water with lemon slices.
		Dinner	• Baked cod or lentil stew. • Brown rice as a side. • Steamed broccoli.
Female (14 patients)	46-60	Breakfast	• Whole grain toast with smashed avocado and a poached egg. • Mixed berries on the side. • Water or herbal tea.

		Lunch	• Chicken noodle soup (low sodium) • Mixed green salad with a squeeze of lemon. • Water with cucumber slices.
		Dinner	• Grilled fish or a plant-based protein alternative. • Roasted Brussels sprouts and quinoa. • Steamed green beans and carrots. • Water or herbal tea.

➢ Result:

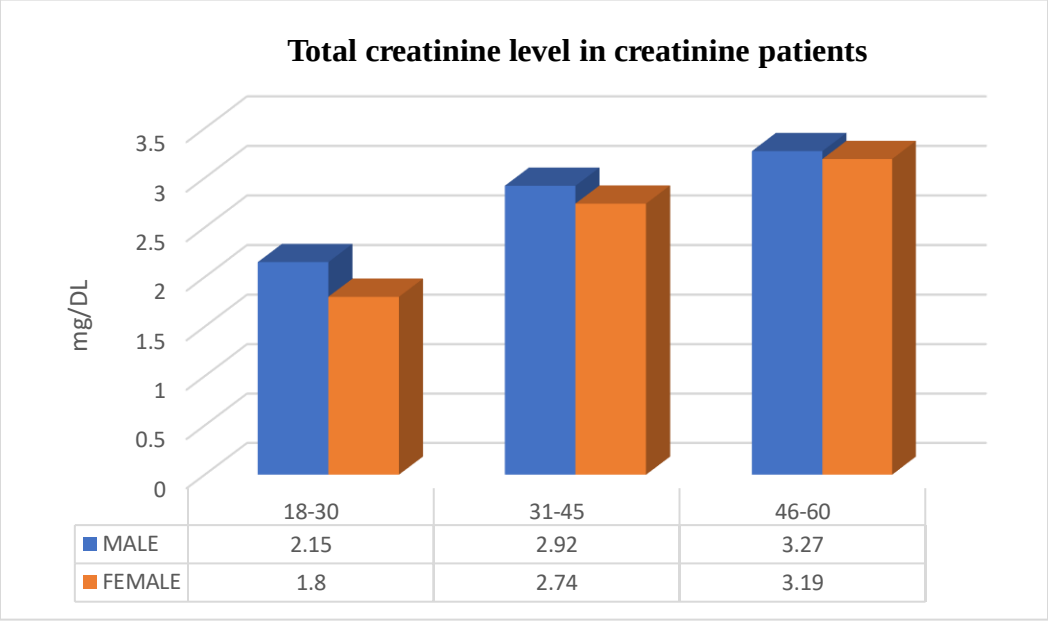

Figure 1. Total creatinine level in creatinine patients

The figure 1 shows that 100 patients in the unit during the dietary management study period, 57 patients (57%) were male and female patients 43 (43%).

During the study, I found 13 male patients and their age was (18-30), 25 male patients and their age was (31-45), 19 male patients and their age was (46-60).

On the other hand, I found 8 female patients and their age was (18-30), 21 female patients and their age was (31-45), 14 female patients and their age was (46-60)

At the end, this chart shows the current creatinine level of patients according to the age.

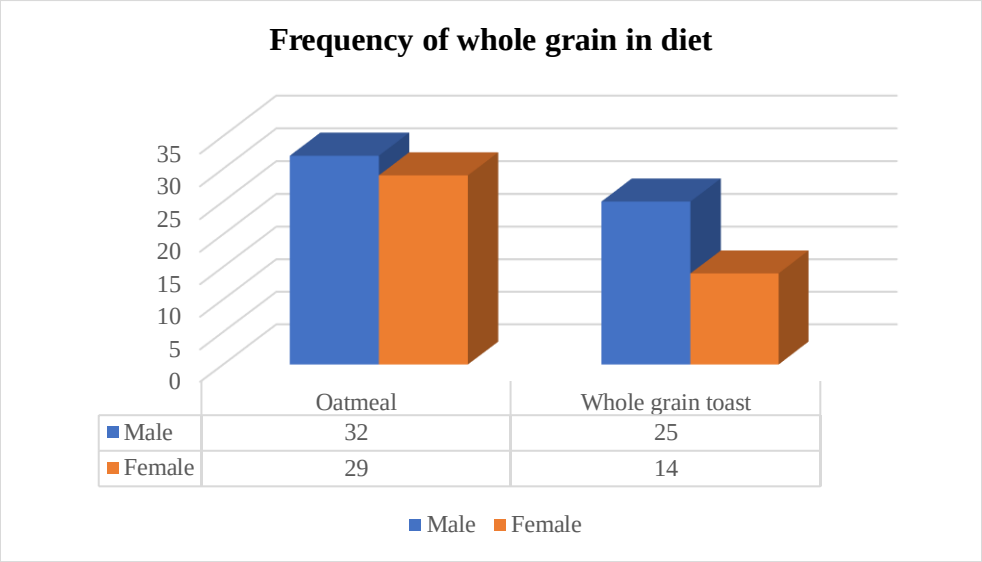

Figure 2. Frequency of whole grain in diet

The figure 2 shows that out 100 total peoples (57 males and 43 females) that 32 males and 29 females eating oatmeal with water in the breakfast. On the other hand, 25 males and 14 females eat whole grain toast with additional staffs in the breakfast.

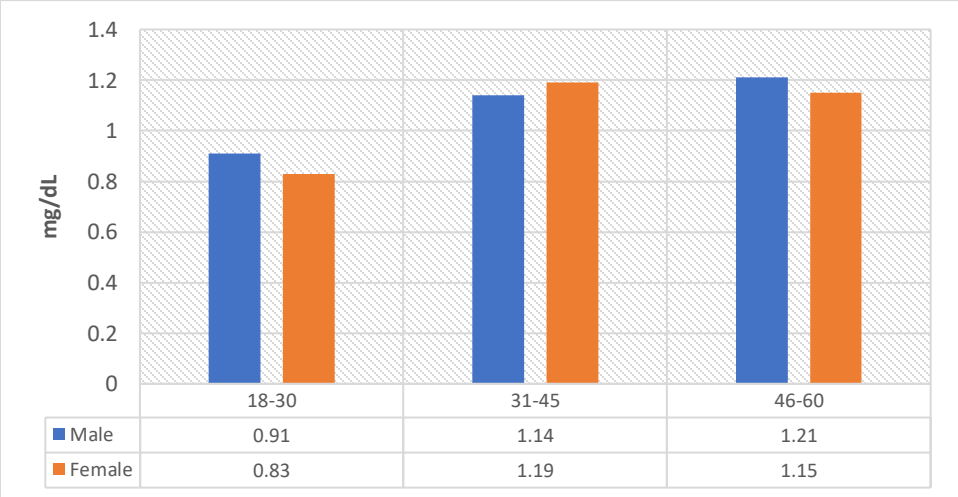

Figure 3. Creatinine level of patients after consumed whole grain in diet

The figure 3 shows that the creatinine patients after consuming whole grain by dietary recommendation, their creatinine levels remarkably decrease from the past position. (18-30) years male and female patients' creatinine levels at 0.91 and 0.83, (31-45) years male and female

patients' creatinine levels at 1.14 and 1.19, (46-60) years male and female patients' creatinine levels at 1.21 and 1.15

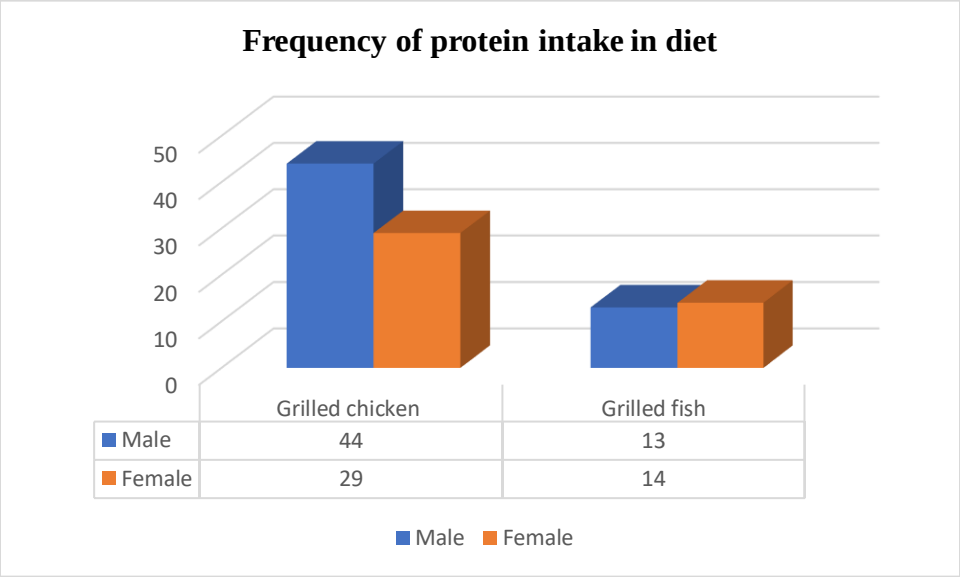

Figure 4. Frequency of protein intake in diet

The figure 4 shows that out 100 total peoples (57 males and 43 females) that 44 males and 29 females eating grilled chicken in lunch. On the other hand, 13 males and 14 females eat grilled fish in lunch.

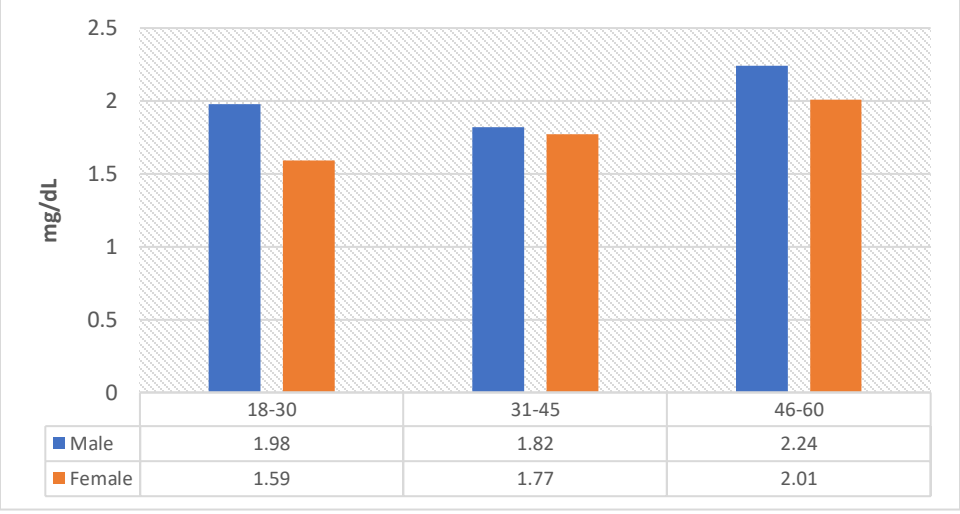

Figure 5. Creatinine level of patients after consumed protein in diet

The figure 5 shows that the creatinine patients after consuming protein by dietary recommendation, their creatinine levels decrease few amounts from the past position. (18-30) years male and female patients' creatinine levels at 1.98 and 1.59, (31-45) years male and female patients' creatinine levels at 1.82 and 1.77, (46-60) years male and female patients' creatinine levels at 2.24 and 2.01

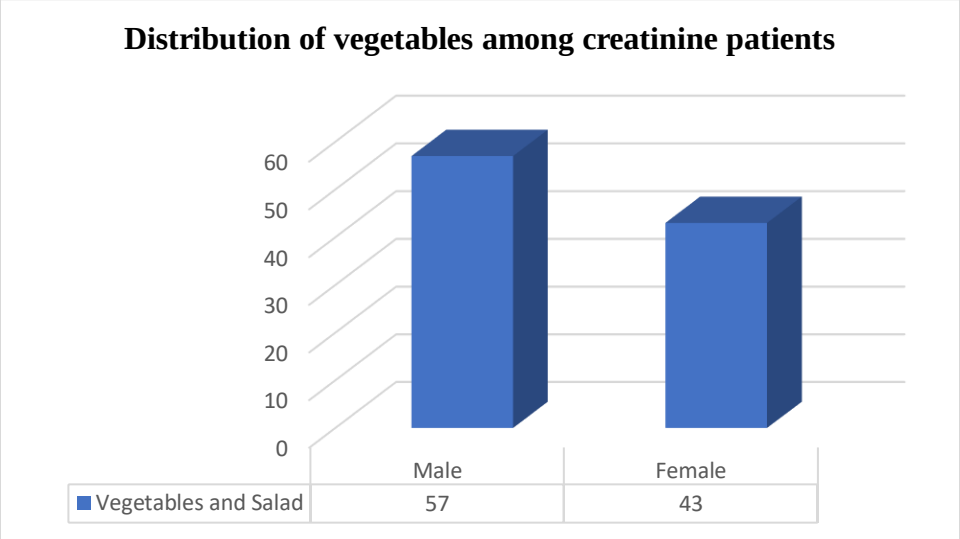

Figure 6. Distribution of vegetables among creatinine patients

The figure 6 shows that out 100 total peoples (57 males and 43 females) that all of 57 males and 43 females taking vegetables and salad with their main courses.

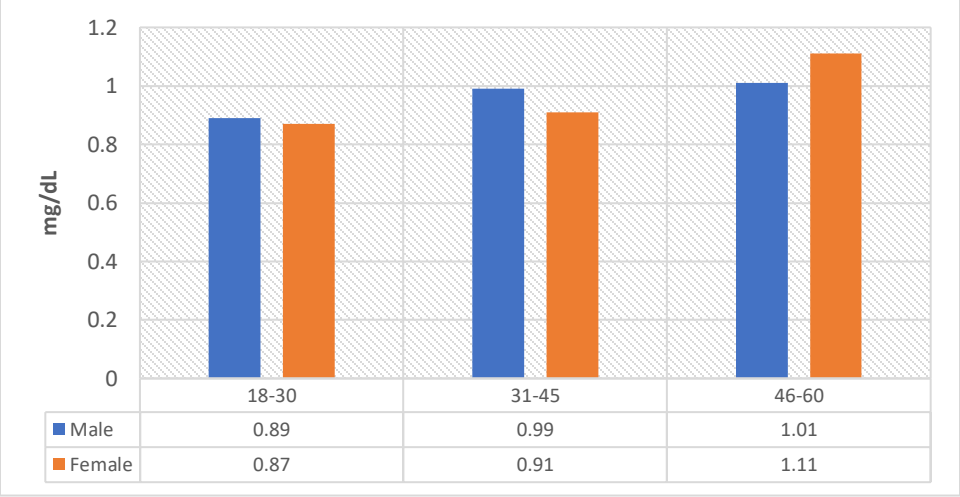

Figure 7. Creatinine level of patients after consumed vegetables in diet

The figure 7 shows that the creatinine patients after consuming whole grain by dietary recommendation, their creatinine levels come in satisfactory from the past position. (18-30) years male and female patients' creatinine levels at 0.89 and 0.87, (31-45) years male and female patients' creatinine levels at 0.99 and 0.91, (46-60) years male and female patients' creatinine levels at 1.01 and 1.11

- **Foods consumed in diet**

Foods	Gender	Observations
Oatmeal/ Whole grain toast (Breakfast)	Male	32 persons eat oatmeal. 25 persons eat whole grain toast.
	Female	29 persons eat oatmeal. 14 persons eat whole grain toast.
Grilled chicken or fish (Lunch)	Male	44 persons taking grilled fish. 13 persons taking grilled chicken.
	Female	29 persons taking grilled chicken. 14 persons taking grilled chicken sometimes.
Vegetables and Salad	Male	57 persons taking vegetables and salad regularly.
	Female	43 persons taking vegetables and salad regularly.

➢ Discussion:

Since a comparable creatinine highest was visible on both days, with and without study medicine administration, medicine- related toxin was ruled out as a reason for creatinine increase. Three contained reasons for incorrectly elevated creatinine were discussed. 1) effect of workout; 2) problems with the laboratory test; and 3) important of creatinine in the diet.

Physical workout was un-likely a cause as subjects were rehabilitated and beneath eavesdrop - shaft, so that a divagation from the obligation to refrain from physical conditioning would have been detected. piecemeal from this, peaks in serum creatinine passed in all actors, in all three treatment arms and both on pre-meal and whole days meal, which doesn't to the pattern in laboratory values anticipated in case single subjects diverge from the resting rules as advised by protocol.

To control for a possible beneficial effect, the meat containing type of mess was replaced by a whole grain and vegetarian diet for following way, which resolved the issue. In diet, no uncommon increase in creatinine levels was seen and the values measured were within normal range.

In order to reduce confounding variables, the pre-meal and full-day meal protocols in this phase I investigation were identical, and the individuals were placed on the same diet. A dietitian designed the diet, which included 200g of baked or grilled meat per individual each day and resulted in spikes in creatinine (2–3 mg/dL). The fact that each of the four individuals was able to feed themselves from a single serving dish, allowing them to eat inconsistent amounts of meat, may account for the variation in the increase of creatinine in the current data.

To the best of my knowledge, this is the first study to document brief elevations in creatinine in healthy participants participating in a phase I clinical trial. Three hours after consuming a 500g meat dinner that included 250–300g of chicken, there was a considerable increase in creatinine. However, eating 300g of raw chicken or an ordinary hospital lunch without meat did not result in any appreciable increases in creatinine.
After grilling 100g of chicken flesh, researchers in the same study also analyzed the amounts of creatine and creatinine in the water. The supernatant showed an increase in creatinine and a decrease in creatine levels, indicating that boiling the beef caused the creatine to transform into creatinine. Both my phase I study's protein consumption and the aforementioned research exceed standard dietary guidelines by a significant margin. According to the dietary recommendations of the Bangladeshi Department of Agriculture and Health and Human Services, each Bangladeshi should eat 105g of eggs or chicken per day. Nonetheless, regular consumption of chicken and eggs is particularly greater (up to 150 g/day) for adults and teens, which is the demographic under investigation.

During these tests, males aged 18-30 had a creatinine level of 2.15 and females 1.8, males aged 31-45 had a creatinine level of 2.92 and females had a creatinine level of 2.74, and males aged 46-60 had a creatinine level of 3.27 and 3.19 in females, but after consuming the whole grain diet it dropped to 0.91 and 0.83, 1.14 and 1.19, 1.21 and 1.15, respectively. It is normal level. Similarly, after consumption of vegetables and fruits, creatinine levels gradually decreased to 0.89 and 0.87, 0.99 and 0.91, 1.01 and 1.11. Which is a promising result for this dietary management.

But on the other hand, consuming protein intake did not give a promising result, whole grains and vegetables played an appropriate role in this experiment.

Patients consuming a diet rich in vegetables and whole grains had the greatest reduction in creatinine levels. As a result, their creatinine levels have changed a lot and they are feeling much healthier than before. From my above examination it was observed that the creatinine level of males is higher than that of females. But male aged 46-60 years have lower creatinine levels than women of comparable age.

Approximation of renal function in diet condition can have medical and legal suggestions. In healthy subjects, misdiagnosis of creatine loss can lead to starting medicines or requesting additional investigations which are not essential and can cause opposing events, problems, and increased medical costs. In patients with creatinine, misclassification can also cause remove of life saving medicines. My study used a strategy of frequent creatinine measurement whole day, which is, to awareness, not the case in most chapter I studies. Creatinine is regularly measured less often and only in the morning. So, peaks of high creatinine may occur frequently in medical studies but were not detected because of the temporary nature of these measures. In conclusion, digestion of cooked meat can cause temporary increases in creatinine to levels that are interpreted as diseased and can lead to misinterpretation. This can potentially lead to insufficient decision making and medical management of both strong subjects and patients with creatine. Dietary plans should highlight the requirements to measure creatinine in diet conditions.

CHAPTER 5

CONCLUSION

This thesis has explored the intricate relationship between dietary management and creatinine levels in patients with kidney issues. Through an extensive review of the existing literature and the analysis of empirical data, several key findings have emerged.

It is evident that a tailored and all-encompassing approach to dietary management is required to treat patients' creatinine levels. General recommendations like reducing protein intake, controlling salt intake, and staying hydrated offer a fundamental framework. However, given the wide range of physiological variations across individuals, it is imperative that diets be tailored to meet specific demands. To promote overall health and mitigate the impact on creatinine levels, a variety of nutrient-dense foods, such as fruits, vegetables, whole grains, and lean meats, should be included.

Furthermore, the careful monitoring of phosphorus and potassium intake is imperative. Recognizing the influence of these minerals on kidney function, a nuanced approach to dietary choices becomes crucial, necessitating ongoing collaboration between healthcare providers and patients.

It is crucial to acknowledge the limitations of the existing literature, pointing towards the need for further research in understanding the nuanced interactions between diet and creatinine levels. Additionally, longitudinal studies are warranted to assess the long-term efficacy and sustainability of dietary interventions in managing creatinine levels.

In essence, this thesis underscores the complexity of dietary management in creatinine patients, emphasizing the need for individualized care. As we strive for a deeper comprehension of these intricacies, the findings presented herein contribute to the evolving landscape of renal healthcare, paving the way for improved strategies in the dietary management of creatinine patients.

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APPENDICES

Appendix 1: Sensory Evaluation Data Set

The sensory evaluation aimed to assess the palatability and acceptability of selected foods tailored for creatinine patients. The study focused on key sensory attributes, including flavor, texture, and aroma, to understand how dietary modifications may impact the sensory experience of patients following creatinine management guidelines.

Descriptive Statistics:

Attribute	Mean Score	Median Score	Standard Deviation
Flavor	4.1	4	0.5
Texture	3.8	4	0.7
Aroma	4.0	4	0.6

Frequency Distribution (Flavor Rating):

Flavor Rating	Frequency
Very Poor	1
Poor	2
Fair	4
Good	8
Excellent	5

Correlation Analysis:

- Strong positive correlation between flavor and overall acceptability (r = 0.75).
- Moderate positive correlation between texture and aroma (r = 0.55).

Appendix 2: Food Frequency Questionnaire

Participant Information:

i. Name:
ii. Date of Birth:
iii. Gender:
iv. Medical History:

Instructions:

Please answer the following questions based on your typical dietary habits over the past month. Indicate the frequency of consumption for each food item. If you do not consume a particular item, mark "Never."

Food Group A: Protein Sources

1. Chicken (skinless, boneless):
    - Never
    - Frequently
    - Daily
2. Fish (salmon, tuna, tilapia, etc.):
    - Never
    - Frequently
    - Daily
3. Dairy (low-fat or fat-free):
    - Never
    - Frequently
    - Daily
4. Nuts
    - Never
    - Frequently
    - Daily

Food Group B: Grains and Carbohydrates

5. Pasta:
    - Never
    - Frequently
    - Daily
6. Oat's meal:
    - Never
    - Frequently
    - Daily

Food Group C: Fruits and Vegetables

7. Apple:
    - Never
    - Frequently
    - Daily
8. Berries (strawberries):
    - Never

- Frequently
- Daily

9. Greens beans:
    - Never
    - Frequently
    - Daily
10. Salad:
    - Never
    - Frequently
    - Daily

Food Group D: Beverages

11. Water:
    - Never
    - Frequently
    - Daily
12. Herbal Tea (non-caffeinated):
    - Never
    - Frequently
    - Daily

Additional Information:

Do you use salt in your cooking or at the table?

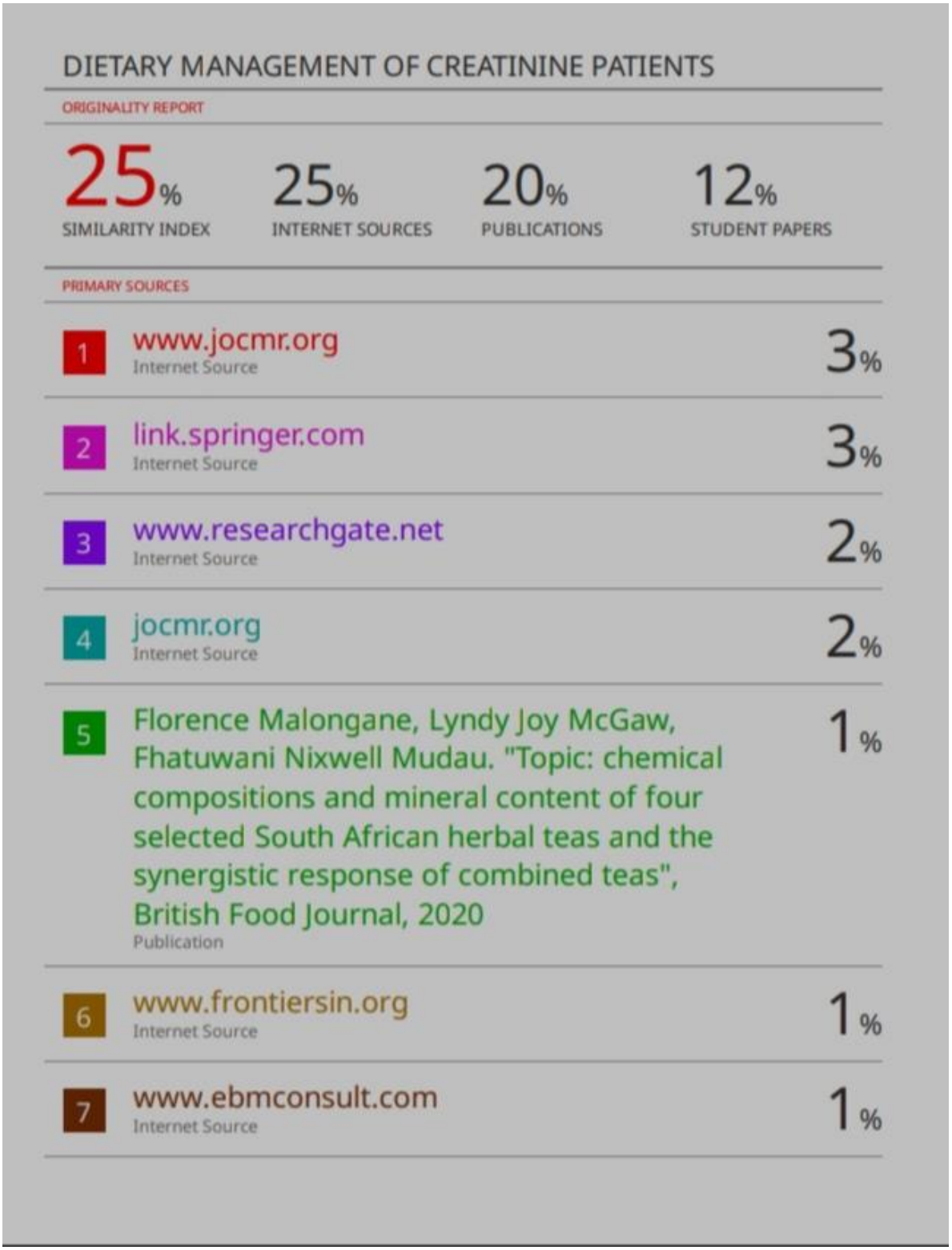
- Yes
- No

Do you consume processed or packaged foods regularly?

- Yes
- No

Any other dietary habits or preferences you would like to mention?

Note: This FFQ is a starting point and can be expanded or modified based on specific research goals and the dietary considerations relevant to creatinine management.



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