

CKD Support Supplement: A formulation for enhancing the quality of life of Chronic Kidney Disease Patients

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INTRODUCTION

Chronic Kidney disease (CKD) is a major leading cause of morbidity, mortality and economic burden globally. It is spreading like an epidemic in Pakistan. The two co-morbidities generally associated with renal failure includes hypertension and diabetes. Apart from that obesity, cardiovascular diseases, renal stones and glomerulonephritis are also the contributing pathologies in the rise of chronic kidney disease. The overall prevalence of chronic kidney disease in Pakistan is 21.2% [1].

Chronic kidney disease is a progressive disease that causes a gradual decline of kidney function over time. The kidneys filter waste items and excess fluids from the blood, maintain electrolyte balance in the body, and produce hormones that regulate blood pressure and red blood cell development. When the kidneys undergo damage and their function decreases, waste products, poisons, and fluids build up in the body, causing a variety of difficulties like body's nutritional imbalance. Malnutrition and nutrient deficiencies in CKD patients' leads to weaken the immune system, increase the risk of infections, impair wound healing, and exacerbate muscle wasting, leading to decreased physical function and quality of life. Furthermore, nutritional imbalances can disrupt metabolic processes, contribute to bone disorders, and increase the burden on the cardiovascular system. Individuals of different ages, genders, and socioeconomic backgrounds are affected by CKD, and the number of cases has been gradually growing in recent years [2 – 4].

This research project is designed in accordance with the theme of the competition designed under Prime Minister's Program of Green Youth Movement. It is aligned with the SDG 3: Good Health & Well-being. It recognizes the importance of addressing nutritional deficiencies in CKD management. The aim of this research is to formulate a natural supplement formulations as an adjuvant therapy for CKD treatment. Precisely, the goal is to develop nutritional supplement that can help improve nutritional deficiency and enhance patient quality of life, and be supportive in slowing down the progression of chronic kidney disease.

PROBLEM STATEMENT

Chronic kidney disease supplement will be supportive for sustainable health. It will resolve the issue of the lack of affordable nutritional support available to people with chronic kidney disease (CKD). People with chronic kidney disease face the challenge of eating a balanced and

appropriate diet due to various factors such as limited food options, expensive specialty foods, reduced absorption of nutrients and limited access to food sources.

If this problem is not solved, the following consequences may occur:

1. **Malnutrition and nutritional deficiencies:** Patients with CKD need specific nutrients and a careful diet to prevent complications and maintain optimal health. Without proper nutritional support, they can suffer from malnutrition and lack of essential nutrients, leading to further health complications and reduced quality of life.
2. **Disease progression and complications:** Proper nutrition plays an important role in managing CKD and slowing its progression. Without adequate nutritional options, patients may experience rapid disease progression and increased risk of complications such as cardiovascular disease, bone disease, and impaired immune function.
3. **Increased health burden:** Inadequate nutritional support can contribute to worsening health status in CKD patients and lead to increased health care utilization, hospitalizations, and associated costs. This puts a lot of pressure on the health care system and affects the overall health of patients.
4. **Affordability and limited availability:** Patients with CKD often face financial constraints and limited access to affordable food options that meet their specific nutritional needs. This can lead to malnutrition because they cannot afford or have access to the essential nutrients and supplements needed to optimize kidney health. By providing affordable and easily accessible food supplements, this project reduces the financial burden of chronic kidney disease patients, increases their access and provides them with the food they need without financial problems. The goal is to ensure that you get the right nutrients.
5. **Lack of personalized nutritional advice:** Patients with CKD require personalized dietary recommendations that consider their specific stage of kidney disease, comorbidities and individual nutritional needs. However, many patients lack access to tailor nutritional counselling, resulting in confusion and suboptimal dietary choices. The project aims to bridge this gap by providing a nutritional supplement and personalized nutritional advice to enable patients to make informed decisions and optimize their dietary intake.
6. **Limited awareness and education:** Chronic kidney disease patients and their caregivers often have limited awareness and understanding of the importance of proper nutrition in managing their condition. This can lead to incorrect dietary patterns, inappropriate food choices and missed opportunities for optimal health management. The project aims to raise awareness and provide educational resources about CKD nutrition, empowering patients and caregivers with the knowledge to make informed decisions and take an active role in their own care.

HOW TO SOLVE THE PROBLEM

Patients with CKD have a significant risk of losing both macro and micronutrients, which can result in poor nutritional status and issues like anemia, weak bones, etc. In order to address this issue, we developed a nutritional supplement that satisfies the daily nutritional needs of CKD patients while also taking into account their condition and associated co-morbidities.

Additionally, because these patients have compromised immune systems, the supplement will also have the benefit of boosting immunity, helping to reduce the risk of further infections and inflammation while also enhancing the quality of life for CKD patients. Natural sources were used to create the ingredients for this dietary supplement in order to prevent any negative side effects that might arise from using synthetic ones. Moreover this supplement will be reasonably priced to put it in everyone's hands. This supplement is under the process of standardization.

COST/ SCHEDULE

Per month cost of diet for eating right for chronic kidney disease is approximately 10 thousand per month including fresh milk, supplemental milk, vitamins, mineral supplements, immunity boosters, supplements that enhance kidney functions. Patient usually doesn't know what they should eat and what they should avoid to maintain proper diet and how to manage the cost and intake of all these supplements. A supplement is designed to formulation, that includes all required nutritional components in one supplement and reduce the cost from thousands to hundreds and minimize patient problem about what they should take and what they should avoid to maintain proper diet so it will be useful for all patients to manage cost and maintain proper diet and add this in their daily diet so that they can easily take per day proper nourishment as their body want and improve quality of life.

EXECUTIVE SUMMARY

Chronic kidney disease supplement is an innovative project that aims to address the problem of inadequate nutritional support for patients with chronic kidney disease (CKD). Our solutions include specialized and affordable nutritional supplements provision to improved health outcomes and better quality of life.

The following are the steps are from guidelines of *National Institute of Health* and our formulation fulfill all steps in a very cost effective way.

The first three steps (1-3) are important for all people with kidney disease. The last two steps (4-5) may become important as your kidney function goes down steps to eating right.

Step 1: Choose and prepare foods with less salt and sodium.

Step 2: Eat the right amount and the right types of protein.

Step 3: Choose foods that are healthy for your heart.

Step 4: Choose foods and drinks with less phosphorus.

Step 5: Choose foods with the right amount of potassium.

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