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Analysis of the occurrence and effects of the nutritional shortage on well-being

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Abstract

Nutritional deficiencies have a substantial impact on physical and mental health worldwide, including side effects such as visual issues and dizziness. This study analyzes data from 150 people to investigate the prevalence, causes, and consequences of nutritional deficits in Coimbatore. Chi-square tests, correlation, rank, and percentage analyses reveal important findings, including a strong relationship between gender and Vitamin A intake. Low Vitamin A consumption is responsible for around 39% of vision problems, 21% of them are inherited, and 40% are caused by other reasons. The findings highlight the importance of tailoring treatments to address these deficits and promote life satisfaction, such as targeted dietary education and public health programs.

Keywords: Nutritional deficiencies, Vitamin A, intake, vision problems, physical health, dietary education

Introduction

Malnutrition, or nutritional deficiencies, impacts millions of people worldwide and have a major impact on economic productivity, cognitive function, and physical health. The World Health Organization (WHO) estimates that 821 million people are undernourished globally. Poor dietary choices lead to nutrient inadequacy even in rich countries, therefore this phenomenon is not limited to low-income areas. The repercussions are severe and include immune system weakness, chronic diseases, and stunted growth. The purpose of this study is to look into the frequency and consequences of dietary deficiencies in Coimbatore, with an emphasis on how they affect people's everyday lives and general wellbeing. In order to provide information for focused interventions, the study aims to discover dietary patterns, deficiencies, and their relationship to health outcomes. Nutritional deficiencies are defined by an insufficient intake or absorption of critical vitamins, minerals, and other nutrients required for good physical and cognitive health. These inadequacies cause a slew of negative consequences, including stunted growth, impaired immune systems, chronic diseases, and a reduced quality of life. For example, iron deficiency is the most common nutritional problem worldwide, affecting 1.62 billion individuals and causing anaemia, exhaustion, and reduced cognitive performance. Similarly, vitamin A, zinc, and iodine shortages raise the risk of infection, delayed development, and other serious health problems. The reasons for dietary deficiencies are numerous and interconnected. Poverty and food insecurity remain major factors, limiting access to diversified and nutrient-dense diets. Poor farming methods, as well as environmental variables like climate change, compound the situation by restricting access to healthful meals. Furthermore, medical disorders such as malabsorption syndromes, as well as lifestyle decisions such as excessive consumption of processed foods, contribute to the incidence of malnutrition. Pregnant women, children, and the elderly are disproportionately affected because of their increased nutritional needs. Nutritional deficits have a far-reaching impact on society and economic results. Malnutrition plays a significant role in lower workforce productivity and higher healthcare expenses. For example, malnutrition is predicted to reduce a country's GDP by up to 11% (World Bank). Furthermore, it fosters a cycle of poverty since people in poor health are less able to work and support their families, exacerbating socioeconomic disparities.

Review of literature: Sibanda *et al.* (2023) ^[9] promote community-driven health improvements through education and active involvement, highlighting policy support for collective action and self-managed health solutions. Lucas and Abbas (2023) ^[8] explore the negative health consequences of nutritional deficiencies,

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such as decreased immunity and chronic illnesses, emphasizing the need for improved dietary guidelines and public health programs to address nutrient gaps like iron and vitamin D. Lawrenson and Downie emphasize the relevance of nutrients such as omega-3 fatty acids and antioxidants for eye health, recommending dietary interventions to avoid vision-related disorders such as macular degeneration. Temple (2023) [2] supports for a forward-thinking approach to public health nutrition, stressing personalized dietary plans based on genetic and environmental characteristics, as well as advocating the use of technology to develop creative solutions. Bhupathiraju (2023) [4] investigates the far-reaching consequences of undernutrition, particularly among vulnerable groups, and emphasizes the significance of tackling its core causes, such as poverty and food insecurity, through global cooperation and policy reforms. Van De Laar *et al.* (2005) [11] discuss the difficulties that general practitioners confront in recognizing and managing nutritional deficiencies, highlighting the importance of standardized screening techniques and improved training for early diagnosis. Gunes-Bayir *et al.* (2023) [12] investigate the lifestyle and nutritional habits of people suffering from dizziness or vertigo, associating these disorders to variables such as inadequate hydration, skipping meals, and a lack of essential nutrients, and an urge for healthy living practices to reduce symptoms. These studies underscore the importance of comprehensive, multidisciplinary approaches to addressing dietary deficiencies and improving overall health outcomes.

Methodology: Data Description: The data used in this analysis were primary. The initial data was acquired from approximately 150 people throughout Coimbatore via a Google form link. The questionnaire is designed to examine the amount of nutrition consumed and concerning two health issues: visual problems and dizziness.

Objective of the study

- To determine the frequency and types of nutritional deficiencies within the target population.
- To identify the factors like socio-economic, eating habits, and demographics that influence the impact of nutritional deficiencies on life satisfaction
- To evaluate how Vitamin A deficiency is involved in vision problems.
- To analyze the impact of key vitamins and minerals on dizziness relief.

Nutrients consumption pattern

Males consume protein often, whereas females have a more diversified intake pattern. Daily carbohydrate consumption is high in both genders, but males ingest fats more frequently than females. Males consume more fibre, whereas females have a more varied intake pattern. Both genders consume Vitamin A 2-3 times per week, with fewer people taking it daily. Males consume Vitamin C more frequently during the week, but females have a more regular daily intake. Males ingest vitamin D on a more regular basis than females. Males consume more calcium than females, who usually only take it once a week. Everyone can ingest iron at least once a week, however the frequency of intake varies more in women.

Table 1 shows the nutrients and nutritional intake among age and gender. Gender differences were statistically significant only for Vitamin A consumption ($\chi^2 = 6.510, p = 0.011$). No significant association was found for other nutrients like protein, carbohydrates, and calcium. No significant relationship was found between age and nutrients intake. However, slight trends indicated decreasing protein and carbohydrate intake with age.

Table 1: Nutrient intake varies by gender and age significance.

Nutrients	Relationship between Gender and Nutrient intake		Association between Age and Nutrient intake	
	Value	Asymp. sig (two side)	Pearson Correlation	Significant value
Protein	0.014 ^a	0.906	-0.081	0.161
Carbohydrate	1.715 ^a	0.19	-0.017	0.417
Fats	0.097 ^a	0.755	0.129	0.055
Fibre	0.058 ^a	0.809	-0.091	0.131
Vitamin A	6.510 ^a	0.011	0.099	0.113
Vitamin C	0.526 ^a	0.468	0.109	0.09
Vitamin D	1.084 ^a	0.298	0.119	0.071
Calcium	0.681 ^a	0.409	0.138	0.171
Iron	0.411 ^a	0.522	0.025	0.381

Table 2: Rank Analysis

Nutrients	Male	Female	R1	R2
Protein	67	56	3	5.5
Carbohydrates	48	34	8	9
Fat	66	57	4	4
Fibre	46	40	9	8
Vitamin a	62	63	5.5	2.5
Vitamin c	61	48	7	7
Vitamin d	73	65	1	1
Calcium	62	56	5.5	5.5
Iron	72	63	2	2.5

R_K = 0.84167

The comparison shows that females generally have lower intake of nutrients like protein, carbohydrates, vitamin A, and vitamin C, as indicated by higher ranks. Males tend to have a slightly lower intake of fat and fibre. For vitamin D

and calcium, both genders show similar intake levels, with females overall consuming fewer essential nutrients compared to males.

Percentage Analysis

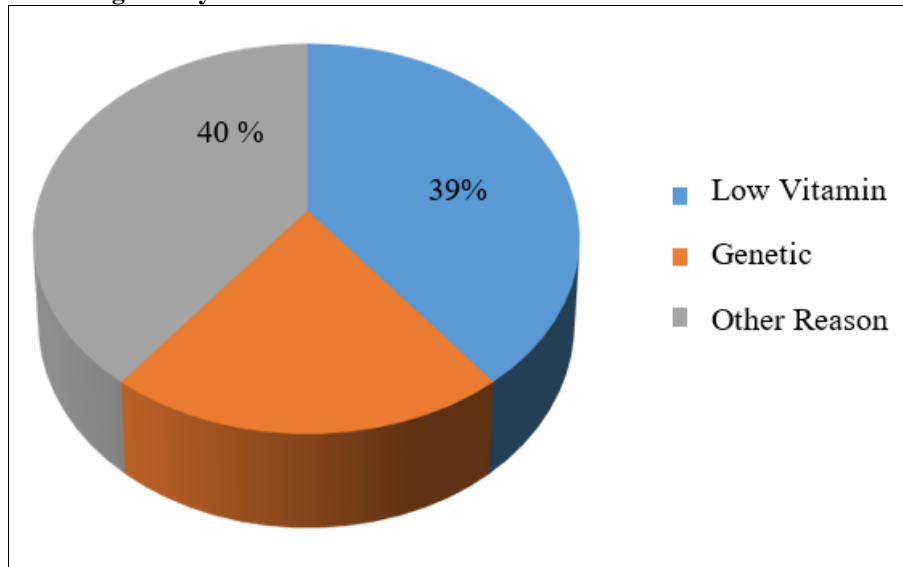


Fig 1: Vitamin A Intake Is Influencing Among 4 Out Of 10 People Approximately.

Table 3: Factors Influencing Low Nutrient Intake

Factors Influencing Low Nutrient Intake				
Nutrients	Insufficient	Time	Dislike	Unavailability
Protein	25	44	11	11
Carbohydrates	16	33	14	9
Fat	11	30	33	13
Fibre	13	31	18	10
Vitamin A	11	32	21	19
Vitamin C	13	37	17	15
Vitamin D	24	33	15	21
Calcium	12	36	16	15
iron	25	32	15	13
TOTAL	150	308	160	126

Across most nutrients, time constraints emerged as a significant factor influencing low intake. This trend

underscores the need for practical solutions, such as meal planning or convenient nutrient-dense options.

Table 4: Nutrients impact health, sourced from veg and non-veg.

Nutrients	Sources in veg	Sources in non-veg	Deficiency	Symptoms
Carbohydrates 200g	Bread, Rice, Pasta, milk.	Duck meat, Chicken liver	Hypoglycaemia ketoacidosis	Dizziness, Sweating, Shakiness, Weakness, Confusion, weight loss.
Vitamin A 900 mg	Carrots, Sweet potatoes, Mango	Egg yolks, Crab, Beef liver	Nyctalopia dermatitis Reproductive health issue	Night blindness, Infertility, Dry eyes,
Vitamin B2 1.5mg	Soy Yogurt, Spinach, Milk	Lamb’s liver, Beef liver	Dermatitis stomatitis	Sore Throat, Cracked Lips and Sores at the Corners of the Mouth (Cheilosis), Swollen and Cracked Tongue (Glossitis), Inflammation and Redness of the Skin Eye Problems
Vitamin B12 2 mg	Soy milk, coconut milk, cereals	Pork liver, salmon fish, beef	Pernicious Anaemia Neurological disorders Vision problem	Fatigue and Weakness, Numbness and Tingling in Hands and Feet Memory Loss and Cognitive, Decline Inflammation of the tongue, Difficulty Walking and Balance problems
Iron 12mg	Lentils, sesame seeds, spinach	Chicken, fish, egg, mutton	Anaemia Restless Legs Syndrome Hair loss Muscle cramps Brittle nails	Fatigue and Weakness, Shortness of Breath, Dizziness or Light headed ness Cold Hands and Feet.

Conclusion

Exploratory Data Analysis (EDA) of the survey responses showed that 54% of participants were male and 46% female, highlighting the importance of considering different

demographic groups in research. It also revealed that 35% of respondents had vision problems, indicating a need for eye care, while 65% had no such issues. Dizziness was common, with many experiencing frequent episodes. The

study emphasized the serious impact of nutritional deficiencies, such as lack of protein, Vitamin A, and iron, on health. These deficiencies, influenced by diet, income, and food access, lead to chronic diseases, weakened immunity, and developmental delays. While macronutrient intake was generally sufficient, many lacked essential micronutrients, especially Vitamins A and D. Women, in particular, consumed less Vitamin A. Health problems like vision issues and dizziness were widespread, highlighting the need for focused treatment. Addressing these deficiencies requires raising awareness, fortifying foods, and improving access to nutrition. Governments, healthcare providers, and communities need to work together for long-term solutions. Future research should explore the effectiveness of these interventions.

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