



Daffodil
International
University

Thesis report

on

Vitamins Deficiency in Children

A thesis report submitted to the Daffodil international university, Dhaka for the fulfillment of nutrition and food engineering

Submitted by

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Letter of Transmittal

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Subject: Submission of project report on “Vitamins Deficiency in Children”.

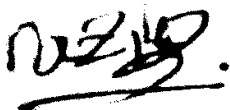
Dear Sir,

It is a tremendous joy and honor for me to be willing to present a project report as part of the Nutrition & Food Engineering (NFE) program curriculum on "**Vitamins Deficiency in Children**". From that perspective, I created my report based on what I learned during my project work term. Under your great guidance, I have done my best to focus the project report on conformity to the ideal standard.

Md. Harun-Ar Rashid, Lecturer (Senior Sclae), Department of Nutrition and Food Engineering, Daffodil International University, supervised the completion of my project report.

I, therefore, would like to place this report to your judgment and suggestion. Your kind advice will encourage me to do better in planning in future.

Sincerely Yours,



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Certificate of Approval

I am pleased to certify that Nazifa Anjum Tuli's project report "**Vitamins Deficiency in Children**" from the department of Nutrition and Food Engineering, bearing ID: 172-34-648, has been approved for presentation and defense/viva-voice.

I am glad to certify that the data and findings contained in the report are the result of Tuli's excellent effort. I heartily recommend Tuli's report for further academic recommendations and defense/viva voce. Tuli has a lovely demeanor and a great moral character. Working with her has been a real pleasure. I wish her the best of luck in life.

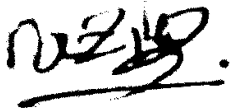


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Declaration

This treatise, titled "**Vitamins Deficiency in Children**" is being submitted to the Department of Nutrition and Food Engineering, Faculty of Allied Health Sciences, Daffodil International University, Daffodil Smart City, Khagan, Ashulia, Savar, Bangladesh, as part of the requirements for the degree of Bachelor of Science in Nutrition. No part of the thesis's work has been submitted in support of an application for another degree or qualification from this or any other university or institute of learning.



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Dedication

This thesis is dedicated to my beloved mom **Laily Anjuman Ara** and beloved father **Nurul Islam Tuta**. They have sacrificed everything since my birth to make me the person I am and to inspire me in every step of my life. Their dreams for me have resulted in this achievement, and I would not be where I am today and what I am today if it were not for their loving upbringing and nurturing.

I am so happy that I share my joy and wonderful success that I have achieved today with my parents, my mother and a beautiful sibling have been by my side, and I had promised to make them proud of these monumental academic goals, which I hope I have fulfilled.

Once again, I'd like to thank my **brothers**, whose names I won't mention here, for sharing their words of advice and encouragement to help me complete this study.

Without their help, I would not have been able to complete this study. Furthermore, I also never forget to let on here to my close relatives, who provide advice in order to reach the final goal.

Acknowledgement

Firstly, and foremost, I am grateful to Allah for guiding my life and guiding me through my years of education. This work is dedicated to God Almighty, who has provided me with the wind beneath my wings. I am grateful to God for His mercy and grace in bringing me this far.

Second, I would like to express my heartfelt gratitude and appreciation to my respected guide and supervisor, Md. Harun-Ar Rashid, senior lecturer in the department of nutrition and food engineering, for his guidance and encouragement that assisted me keep focused and complete this work from start to finish. This thesis would not have been possible without his efforts. His perseverance and consistency kept me on track. Thank you so much for your extraordinary efforts.

Additionally, I'd like to thank the morally upright Dean Professor Dr. Abu Naser Zafar Ullah, Associate Dean Professor Dr. Bella Hossain of the Faculty of Allied Health Sciences (FAHS), and Head of the Department of Nutrition and Food Engineering, Dr. Nizam Uddin for their advice and support, especially during my studies in the Department of NFE.

Thirdly, I would like to express my gratitude to Daffodil International University's professors, associate professors, assistance professors, senior lectures, lecturers, and all other faculty members for their useful courses and knowledge that have enhanced my education and behavior and enabled me to complete my education for a bachelor's degree in nutrition and food engineering (NFE) at Daffodil International University.

I am especially grateful to my beloved and best-ever family, my dearest mom Fartun Mohamud, uncles Mohamud Ali and Mohamed Ali, and the beloved brothers and sisters who have always understood the situation in which I was appearing on the stand, and we have a great deal of appreciation for you all the time.

Finally, special thanks to my classmates who gave me support during my program to become successful and all the other students at my university.

Abstract

Vitamins supplementation diminishes youngster grimness, mortality, as well as visual impairment all around the world particularly in non-industrial nations like Bangladesh. The progress of the public vitamins program executed by the public authority of Bangladesh in rustic and metropolitan regions have portrayed by a few financial and segment factors. This study endeavors to distinguish the significant variables related with vitamins utilization utilizing the public delegate Bangladesh Segment and Wellbeing Review 2014 dataset. The Chi-square test is utilized for estimating the relationship between the situation with Vitamins Supplementation and financial as well as segment qualities. Besides, strategic relapse is utilized to decide the significant elements of the situation with vitamins utilization. Results portray that District, Religion, Abundance list, Kids' age, Mother's age, Mother's schooling, Father's schooling and Bosom taking care of status are viewed as fundamentally connected with vitamins supplementation in rustic region while, religion, abundance record, Youngsters' age, Number of kids, Mother's schooling, Father's schooling and Bosom taking care of status are critical in metropolitan areas of Bangladesh. Out of 500 youngsters who are matured 6-59 months, 398 (57.8%) have gotten a vitamin A case in the country region and among 108 kids, 1117 (61.8%) have gotten vitamin A supplementation in the metropolitan region. In Bangladesh, mid-age youngsters (OR: 3.018, CI: 1.440-3.833), others religion kids (OR: 1.636, CI: 1.306-2.049), and offspring of higher taught moms (OR: 1.410, CI: 1.216-1.635) of country regions and mid-age kids (OR: 2.326, CI: 1.585-3.414) and offspring of essential instructed moms (OR: 1.617, CI: 1.192-2.342) of metropolitan regions are fundamentally bound to consume vitamin A than others. This finding demonstrates that the utilization of vitamin A doesn't cover the objective of reasonable improvement objectives. Hence, extraordinary endeavors are expected to guarantee that the inclusion of the public vitamin A program is expanded so the weakest youngsters are likewise better safeguarded against dismalness, mortality, and visual deficiency in Bangladesh.

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Chapter 1: Introduction

1.1 Background

An organic substance known as a vitamin is a crucial micronutrient that an organism needs in minute amounts for the normal operation of its metabolism. Essential nutrients must be received from the diet since they cannot be manufactured by the organism, either completely or in adequate amounts. Some species can synthesize vitamin C, but not others; in the second case, vitamin C is the term used to describe it. The three further categories of important nutrients—minerals, essential fatty acids, and essential amino acids—are not included in the word "vitamin" [1]. The majority of vitamins are vitamers, which are collections of closely similar molecules. For instance, there are eight vitamins, including four tocopherols and four tocotrienols, that make up vitamin E. Major health organizations recognize thirteen vitamins, but some sources list fourteen, adding choline [2]: Vitamin B1 (thiamine), vitamin B2 (riboflavin), vitamin B3 (niacin), vitamin B5 (pantothenic acid), vitamin B6 (pyridoxine), vitamin B7 (biotin), vitamin B9 (folic acid or folate), vitamin B12 (cobalamins), vitamin C (ascorbic acid), vitamin D (calciferol), vitamin E (tocopherols and tocotrienols), and vitamin K are some of the vitamins (phylloquinone and menaquinones) [3, 4]. Vitamins perform a variety of biological processes. The proliferation and differentiation of cells and tissues are regulated by vitamin A. Vitamin D performs a hormone-like function by controlling how quickly bones and other organs use minerals. The B complex vitamins serve as cofactors (coenzymes) for enzymes or as their precursors. Antioxidants include vitamins C and E [5]. Although excessive ingestion of water-soluble vitamins is less likely to do so, both vitamin deficiencies and excesses have the potential to result in clinically serious sickness. Vitamin deficiencies are categorized as primary or secondary. When an organism does not consume enough of the vitamin in its diet, a basic deficiency results. A "lifestyle factor" like smoking, drinking too much alcohol, or using drugs that interfere with vitamin absorption or use might cause a secondary deficiency by causing an underlying disease that inhibits or restricts vitamin absorption or usage [7]. A national food and supplement survey carried out in the US from 2003 to 2006 found that over 90% of people who did not take vitamin supplements had insufficient levels of some of the essential vitamins, particularly vitamins D and E [8]. People who eat a varied diet are unlikely to develop a severe primary vitamin deficiency, but they may be consuming less than the recommended amounts. Thiamine (beriberi), niacin (pellagra), vitamin C (scurvy), folate (neural tube abnormalities), and vitamin D (rickets) are well-studied human vitamin deficiencies [9]. These deficits are uncommon in much of the industrialized world since there is an ample supply of food and because typical foods have vitamins added to them [7]. Some research has revealed associations between vitamin shortage and a variety of problems in addition to these conventional vitamin deficient syndromes [10, 11]. Among school-aged children, calcium, fiber, folate, iron, magnesium, potassium, and vitamin E deficiencies are the most prevalent. According to reports, iron and vitamin D

deficiency are the 2 most typical deficits detected in children who are typically healthy [12].

1.2 Objectives

- ❖ To research about Vitamins deficiency in Children of Bangladesh.
- ❖ Get particular experience about nutritional status of child.
- ❖ To get the ability to assess a child status.
- ❖ To learn how to communicate with patient directly.
- ❖ To ensure (should I become that expert.! for the upcoming days since I concluded it).

1.3 Limitations of this study

- ❖ Poor number of data
- ❖ Very few number of samples

1.4 Research inquiries

- (1) What is the pervasiveness of lack of vitamins sustenance of kids younger?
- (2) What are main factors that impact healthful status?
- (3) How is the degree of breastfeeding in Bangladesh?
- (4) What is the responsibility of the public authority and public associations of Bangladesh?

1.5 Significance of the review

This investigation of the healthful status of children under in Bangladesh is vital for the followings:

a) To the public authority of Bangladesh

This study is vital for Government in creating healthful status of youngsters under five years old. It assists government with getting solid data, additionally, it helps strategy producers in delineating reasonable measures to manage difficulties and issues connected with dietary status of youngsters under five years old.

b) To Non-legislative association (LNGOs, INGOs and Common Social orders)

The discoveries of the review can prepare to LNGOs, INGOs and common social orders to get raw numbers on current creating healthful status of youngsters under five years old in Bangladesh.

c) To the understudies

The discoveries of this study might help the scientists (understudies) in obtaining commonsense exploration abilities, and to do effectively their last scholarly venture readiness and furthermore to serve in securing fractional prerequisites for the honor of a Single guy in Colleges and Universities.

d) To the scholastic scientists

The discoveries of the review might assist scholastic specialists with gaining admittance to cutting-edge relating the chance of wholesome status of youngsters under five years old.

1.6 Scope of the review

The extent of the review has blundered in the terms of items (variable of the review), geological region, and time extent of the review.

1.6.1 Content Degree

This study concerned the healthful status of youngsters under five years in Rural region.

1.6.2 Geographical Extension

The review covered at Rural region. Rural is one of the urban communities of Dhaka city of Bangladesh. The Rural locale comprises of about somewhere around seven towns. It is the business city of Bangladesh.

1.6.3 Time degree

This study took at five months (june202021-November 2021) to plan and present for this investigation of wholesome status of kids under five years in capital area.

1.7 Operational meanings of the review

Nourishment: Wholesome condition alludes to the accessibility of supplements and calories in an individual's eating regimen in contrasting with dietary guidance for their age class and general medical problem.

Nourishing status: Dietary status is a wellbeing necessity for a fulfilled individual with food, has satisfactory supplement levels in the body, and has typical digestion. Typical healthful status is kept up with by adjusting the eating regimen and consuming supplements consistently.

Unhealthiness: as characterized by the World Wellbeing Association (WHO), is characterized as lacks, overabundances, or lopsided characteristics in an individual's energy or potentially supplement consumption. The expression "ailing health" alludes to two unmistakable gatherings of conditions.

1.8 Thesis Organization

The entire paper has been divided into some chapters. Where the section number 2 introduced related work of this research that has already exist. In the section 3, marked the whole procedure to completion this study. Section number 4 indicates what actually we have got in this study. And the last section 5 mentioned the brief of this study.

Chapter II: Literature Review

2.1 Concept of Wholesome Status of Kids Under Five Years

Wholesome status of kids is a mark of the degree of improvement and future capability of the local area. The nourishing status of babies and kids under five years old is of specific worry since the early long periods of life are urgent for ideal development and advancement, (Preschulek et al., 1999). Wholesome lacks influence long haul actual development and advancement and may prompt elevated degree of disease and handicap in grown-up life. Besides, high predominance of ailing health imperils future financial development by decreasing the scholarly and actual capability of whole populace (Kabubo Mariara et al., 2006).

Unhealthiness is characterized as "a state wherein the actual capability of an individual is impeded to where he/she can never again keep up with sufficient substantial execution cycles like development, pregnancy, lactation, actual work, resting and recuperating from infection (MMS/MPHS,2009).

Concurring WHO (2011), around 178 million kids under five years overall are excessively short for their age bunch; while 115 million are underweight. Lack of healthy sustenance generally influences all gatherings locally, however babies and small kids are the most defenseless on account of their high wholesome necessities for development and advancement (Blossner et al., 2005). Around the world, an expected 165 million kid's under-five years old, or 26%, were hindered, 16%, were underweight, 8% were squandered and 7% were overweight. High predominance levels of hindering among kid's under-five years old in Africa (36%) and Asia (27%) stay a general medical issue, one which frequently goes unnoticed. Over 90% of the world's hindered kids live in Africa and Asia (UNICEF et.al, 2012).

2.2 Methods of Surveying Wholesome Status

Healthful evaluation is the most important phase in the treatment of hunger. The objectives of healthful evaluation are ID of people who have, or are in danger of creating hunger, to measure the level of lack of healthy sustenance and to screen the sufficiency of nourishment treatment. The techniques for evaluation depend on series of anthropometric, dietary, lab and clinical perceptions

utilized either alone or all the more actually, in mix. Right translations of the outcomes frequently require thought of different factors, for example, financial status, social practices, and wellbeing and fundamental insights (Gibson, 2005). In this study anthropometric estimations were utilized due to restricted assets.

2.3 Anthropometric technique

Anthropometry includes estimation of variety of actual aspect and gross organization of human body at various age level and level of nourishment. Anthropometry is especially helpful when there is ongoing awkwardness between admission of protein and energy (Gibson, 2005).

Anthropometric lists are gotten from mix of crude estimation. These incorporate level, weight, and age of the people whose dietary status not entirely set in stone. The

estimations are then used to compute the anthropometric marks of nourishing status like level for-age, weight-for-age and weight for level. The pointers are then used to characterize 10 and decipher dietary status of people, (BADAKE, 2014).

The primary imprecision blunders in anthropometric are arbitrary flaw in estimating instruments or in the estimating and recording methods (Arroyo et al., 2010).

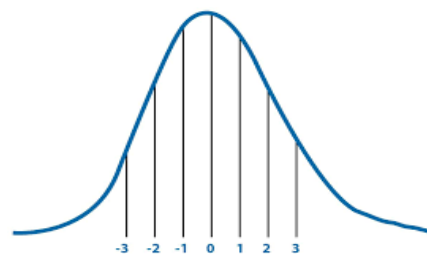


Figure 1: Measurement of z-score compared with the median

Underweight overweight

Weight

Weighing is normally the most vital phase in anthropometric evaluation and is expected to work out the weight-for-level z-score (WHZ) for kids and BMI for grown-ups. Weight is unequivocally connected with one's wellbeing status. The most widely recognized anthropometric estimation for infants is birth weight, which doesn't demonstrate intense unhealthiness. Newborn children brought into the world with a low birth weight (under 2,500 g) are bound to foster physical and mental disabilities as well as nourishment related

constant illnesses sometime down the road. The most predominant anthropometry for newborn children under a half year is weight-for-length, weight-for-age, and head outline. Weight-for-length is utilized to survey intense ailing health (USAID, 2016).

Length and Height

Estimating length or level requires the utilization of a level load up or an estimating tape named in centimeters (cm). Kids younger than two ought to be estimated at something like 87 cm long. Measure the level of kids 2 years and more established who are taller than 87 cm, as well as grown-ups, (USAID, 2016).

Weight-for-Length

The WHZ list is regularly used to assess the nourishing status of kids matured birth to 59 months. To order a kid's nourishing status, the WHO Youngster Development Principles contrast the kid's weight with the heaviness of an offspring of a similar length/level and sex. You will require tables that contain the WHO Kid Development Norms. WHO Youngster Development Guidelines vary for young men and young

ladies. Despite the fact that WHZ can be utilized on babies younger than a half year, there are no universally settled upon limits for dietary status order, (USAID, 2016).

MUAC

The MUAC is the periphery of the left upper arm estimated at the midpoint between the tip of the shoulder and the tip of the elbow with an estimating tape or MUAC tape. MUAC estimations in millimeters (mm) are more exact than estimations in centimeters (cm).

MUAC is likewise a satisfactory answer for estimating youngsters (rather than WHZ), teenagers (rather than BMI-for-age), and non-pregnant/post pregnancy grown-ups whose weight and level can't be estimated (e.g., in light of the fact that they can't stand or no gadget is accessible). MUAC is as of now not decided utilizing the recipe under a half year old enough, and ought not be utilized to evaluate dietary status in people with edema (USAID, 2016).

Table 1: MUAC cutoffs for determining nutritional status in children aged 6 months to 14 years

Extreme intense ailing health (SAM)	Moderate intense hunger (MAM)	Normal wholesome status	
6-59 months	< 115 mm	≥115 to < 125 mm	≥ 125 mm
5-9 years	< 135 mm	≥135 to < 145 mm	≥ 145 mm
10-14 years	< 160 mm	≥160 to < 185 mm	≥ 185 mm

2.4 Child taking care of training

2.4.1 Breast taking care of

Breastfeeding is the sustenance of a baby or small kid with maternal bosom milk through lactation. Infants have a characteristic sucking reflex that empowers them to suck and swallow milk. The World Wellbeing Association suggests that moms breastfeed their babies only from birth to around a half year old enough, without the expansion of any fluids or strong food sources, including water or baby equation. Following a half year old enough, babies might be taken care of strong food, as a supplement to kept breastfeeding, (Girerd-Barclay, 2013).

2.4.2 Complementary taking care of

The corresponding taking care of period is characterized as the period during which bosom milk should be supplemented by different food sources of adequate amount and quality to cover baby's healthful necessities (WHO, 2003). As indicated by WHO (2003), correlative taking care of period begins from 6 to no less than two years and this is the most basic time frame for babies' development and advancement (WHO, 2003). The nourishing deficiency of the correlative eating regimen, both in quality

and amount, and the sabotaging impacts of diseases on the dietary status of the kid stay serious issues influencing babies and little youngsters in this present reality (Nti and Lartey, 2007).

2.5 Role of Government of healthy sustenance

The public government can make harmony and be a superior organized government. Somalia can improve by having framework. Streets can be fabricated so individuals can have better admittance to the business sectors so they can get food. It can make occupations so work can increment. Individuals will actually want to bring in additional cash and purchase more nourishment for their loved ones. The public government can construct more clinics for the local area and other medical services offices so the Somali's approach the offices when they need them. In the event that all of this occurs, individuals won't fight so a lot and treat each other better.

The Somali government to diminishes ailing health laid out Somalia nourishment procedure (2020-2025). The vision of the Somalia Nourishment Procedure (2020-2025) is that the Somali public partake in the most elevated feasible norm of wellbeing and personal satisfaction, including expanded accessibility, access and reasonableness of nutritious eating regimens and general, evenhanded admittance to fundamental quality wellbeing administrations with a need center around maternal, neonatal and kid wellbeing and sustenance, and on the counteraction and control of high weight illnesses and related risk factors, (MoH, 2020).

To guarantee the arrangement of value fundamental nourishment explicit and delicate administrations for all individuals in Somalia, with an emphasis on ladies, kids, and other weak gatherings and to reinforce the public and nearby ability to convey proof based and savvy administrations in view of the Fundamental Bundle of Wellbeing Administrations (EPHS) and Essential Medical care approach. The principal point is the extent of kids matured 0-6 months who are solely breastfed increments to 53+% from 33% by 2025, (MoH, 2020).

Albeit the Somali government has a nourishment procedure it doesn't assume a decent part in that frame of mind because of monetary limitations and the public authority establishments to address youngster hunger

Chapter III: Methodology

3.1 Data Collection

This study depends on an optional dataset gathered from Bangladesh Segment and Wellbeing Review (BDHS) 2014. The overview utilized the rundown of count regions (EAs) of the 2011 Populace and Lodging Registration of Individuals' Republic of Bangladesh, given by the Bangladesh Department of Measurements, as a testing outline. The essential inspecting unit for the overview is an EA made to have a normal of around 120 families. The overview depends on a two-stage separated example of families. In the primary stage, 600 EA size, with 207 EAs in metropolitan regions and 393 in rustic regions. In the second phase of examining, an efficient example of 30 families on a normal was chosen for every EA to give genuinely solid evaluations of key segment and wellbeing factors for the country in general. Thus, 18,000 private families were chosen in four stages. In this review, we chose twelve factors from 2014 BDHS information (one ward variable and eleven logical factors) which are pertinent to vitamin A supplementation. Subsequent to cleaning the crude information, I have just 100 and 120 kids out of 200 youngsters for our concentrate in rustic and metropolitan region separately.

3.2 Variables

The thought process of the review is estimating the utilization status of vitamin A cases in the provincial and metropolitan areas of Bangladesh. To evaluate the utilization status of vitamin A container "Is your kid

consume vitamin A container inside the most recent a half year?" was through to the kid's mom. The result variable is a dichotomous variable showing regardless of whether a kid was consumed vitamin A.

The financial and segment covariates remembered for the examination like youngsters' age (in month), kids' sex, district/division, religion, number of youngsters, mother's age, mother's schooling, father's schooling, sex of family head, abundance file, and breastfeeding status remembered for the ensuing investigation.

3.3 Statistical Analysis

To inspect the connection between vitamin A container utilization status and socio-segment qualities of the respondents, the Chi-square test is utilized here. Double strategic relapse examination likewise used to decide the near hazard of the covariates to the reaction. The outcomes are introduced as chances proportions (ORs), with 95% certainty spans (95% CIs). All factual investigations are performed by the Measurable Bundle for Sociologies (SPSS) variant 22.

Chapter IV: Result and Discussion

Result

First and foremost, this paper endeavors to recognize the determinants of vitamin A container utilization with the assistance of Chi-square worth. The consequences of chi-square with p-an incentive for various financial and segment factors with vitamin A container utilization status are introduced in Table 1 for rustic and metropolitan areas of Bangladesh.

Table 2: Recurrence circulation of vitamin A supplementation status as per chose qualities in Country and Metropolitan areas of Bangladesh

Factors	Rural		Urban	
	Vitamin A capsule consumption status		Vitamin A capsule consumption status	
	Yes (%)	No (%)	Yes (%)	No (%)
Division				
Barisal	16 (55%)	13 (44%)	18 (65%)	11 (35%)
Chittagong	15 (54%)	14 (45%)	20 (66%)	14 (34%)
Dhaka	20 (60%)	12 (40%)	22 (61%)	1 339%
Khulna	17 (57%)	10 (43%)	19 (57%)	12 (43%)
Rajshahi	18 (62%)	14 (38%)	18 (58%)	14 (42%)
Rangpur	18 (62%)	14 (38%)	23 (65%)	15 (35%)
Sylhet	16 (55%)	12 (44%)	17 (61%)	16 (39%)
□ ² values	25.56		5.929	
□-values	< 0.001*		0.431	
Religion				
Islam	50 (57%)	35 (43%)	55 (61%)	40 (39%)
Others	15 (68%)	10 (32%)	20 (69%)	12 (31%)
□ ² values	18.62		4.422	
□-values	<0.001*		0.036*	
Sex of household head				

Factors	Rural		Urban	
	Vitamin A case utilization status		Vitamin A container utilization status	
	Indeed (%)	No (%)	Yes (%)	No (%)
Male	35 (58%)	25 (42%)	40 (62%)	25 (38%)
Female	40 (57%)	23 (43%)	44 (63%)	22 (37%)
χ^2 values	0.15		0.131	
χ^2 -values	0.693		0.739	
Abundance record				
Poor	18(56%)	13 (44%)	55 (56%)	36 (44%)
Middle	20 (58%)	12 (42%)	54 (52%)	32 (48%)
Rich	25 (62%)	11 (38%)	44 (63%)	33 (37%)
χ^2 values	16.17		6.354	
χ^2 -values	<0.001*		0.042**	
Kids' sex				
Male	1571 (57%)	1208 (43%)	574 (61%)	361 (39%)
Female	1524 (59%)	1051 (41%)	544 (62%)	329 (38%)
χ^2 values	3.86		0.163	
χ^2 -values	0.05		0.699	
Kids' age				
06-12 months	361 (35%)	669 (65%)	151 (42%)	206 (58%)
13-24 months	702 (61%)	457 (39%)	263 (68%)	125 (32%)
25-36 months	685 (65%)	373 (35%)	253 (69%)	112 (31%)
37-48 months	695 (66%)	362 (34%)	233 (67%)	113 (33%)
49-59 months	652 (62%)	398 (38%)	218 (62%)	134 (38%)
χ^2 values	2.79		76.666	

<input type="checkbox"/> -values	<0.001*		<0.001*	
Number of kids				
1 child	2046 (59%)	1426 (41%)	821 (64%)	471 (37%)
2 child	868 (55%)	701 (45%)	236 (56%)	183 (44%)
at least 3 child	182 (58%)	132 (42%)	61 (63%)	36 (37%)
<input type="checkbox"/> 2 values	5.767		7.037	
<input type="checkbox"/> -values	0.056		0.030**	
Mother's age				
<=20 years	619 (53%)	555 (47%)	187 (56%)	147 (44%)
21-25 years	1037 (59%)	712 (41%)	378 (61%)	241 (39%)
26-30 years	858 (58%)	614 (42%)	315 (64%)	174 (36%)
31-35 years	379 (62%)	235 (38%)	166 (64%)	95 (36%)
at least 35 years	202 (58%)	143 (42%)	71 (68%)	34 (32%)
<input type="checkbox"/> 2 values	18.092		8.202	
<input type="checkbox"/> -values	0.001*		0.084	
Mother's schooling				
No education	534 (57%)	401 (43%)	122 (52%)	114 (48%)
Primary	829 (52%)	763 (48%)	232 (56%)	182 (44%)
Optional and			764 (66%)	394 (34%)
above	1733 (61%)		1095 (39%)	
<input type="checkbox"/> 2 values	35.634		24.590	
<input type="checkbox"/> -values				

Factors	Rural		Urban	
	Vitamin A case utilization status		Vitamin A container utilization status	
	Indeed (%)	No (%)	Yes (%)	No (%)
No education	859 (56%)	666 (44%)	173 (53%)	151 (47%)
Primary	948 (55%)	773 (45%)	257 (58%)	183 (42%)
Optional and above	1289 (61%)	820 (39%)	688 (66%)	357 (34%)
□2 values	16.085		19.054	
□-values				
Bosom taking care of status			510 (66%)	268 (34%)
No	1353 (64%)	753 (36%)	608 (59%)	422 (41%)
Yes	1743 (54%)	1506 (46%)	799	3
□2 values	58.841		0.0	5*
□-values				

From Table 2, it is seen that out of 5356 youngsters 3098 (57.8%) kids had consumed and the rest 2258 (42.2%) kids have not consumed vitamin A case in the provincial area of Bangladesh. Once more, out of 1808 youngsters 1117 (61.8%) kids had consumed and the leftover 691 (38.2%) youngsters have not consumed nutrient container in the metropolitan area of Bangladesh. The two cases show unfortunate inclusion, so kids were unstable and it would make a major issue in future. Table 1 addresses the percent dissemination of various classes concerning vitamin A

utilization status for the rustic and metropolitan areas of Bangladesh. Results portray that Vitamin A utilization generally expanded in a rustic region with the rising abundance record, kids' age, mother's age, mother's schooling, father's schooling yet youngsters' sex, sex of family head and the quantity of all out kids were roughly similarly liable to consume vitamin A container. In the age bunch 6 a year offspring of provincial region just 35% kid have consumed vitamin A case and this portion was the principal portion. This investigation likewise discovered that vitamin A case consuming pace of various divisions differing around 51-63% and Muslim individuals are less (57%) consume than other strict (68%) individuals in the rustic area of Bangladesh. Bosom feeder kids were more consuming vitamin A container than their partner. Besides, Vitamin A utilization has been expanded with the rising abundance record, kids' age, mother's age, mother's schooling, father's schooling yet youngsters' sex, sex of family head and the quantity of all out kids were roughly similarly liable to consume vitamin A case in the metropolitan region. In the metropolitan region just 42% offspring old enough gathering 6 a year have consumed vitamin A case and this portion was the main portion. We likewise found that vitamin A container consuming pace of various divisions fluctuating around 57-66% and Muslim individuals are less (61%) consume than other strict (69%) individuals in the metropolitan area of Bangladesh. We likewise saw that Bosom feeder youngsters were more consuming vitamin A container than their partner.

The Chi-square test is performing here to distinguish regardless of whether the probabilities in various classes of covariates are equivalent. The examinations in light of the subsequent probabilities for chose covariates alongside the p-worth of chi-square are introduced in Table 1. Results recommend that Vitamin A supplementation was being related with locale, religion, abundance file, kids' age, mother's age, mother's schooling, father's schooling and bosom taking care of status at 1% degree of importance, and youngsters' sex is likewise critical at 5% degree of importance. In any case, sex of family head and number of youngsters were not found to fundamentally affect the vitamin A supplementation in provincial area of Bangladesh. While youngsters' age, mother's schooling, father's schooling and bosom taking care of status are related with Vitamin A supplementation at 1% degree of importance, and religion, abundance file and number of kids at 5% degree of importance and Sex of family head, district, youngsters' sex and mom's age were not found to fundamentally affect the vitamin A supplementation in metropolitan areas of Bangladesh.

Table 3: Logistic regression estimates and odds ratio of different socioeconomic and demographic variables on vitamin A supplementation in Rural areas of Bangladesh

Factors	Coefficient (β)	SE (β)	p-values	Odds ratio, exp(β)	95% CI for exp(β)	
					Lower	Upper
Division						
Barisal (ref)				1.000		
Chittagong	-0.456	0.150	0.002*	0.634	0.473	0.850
Dhaka	-0.298	0.109	0.006*	0.743	0.600	0.920
Khulna	-0.287	0.102	0.005*	0.751	0.615	0.916
Rajshahi	-0.420	0.139	0.002*	0.657	0.500	0.862
Rangpur	-0.112	0.122	0.361	0.894	0.704	1.136
Sylhet	-0.371	0.123	0.003*	0.690	0.542	0.878
Religion						
Islam (ref)				1.000		
Others	0.492	0.115	0.000*	1.636	1.306	2.049
Sex of household head						
Male (ref)				1.000		
Female	-0.111	0.105	0.289	0.895	0.729	1.099
Wealth index						
Poor (ref)				1.000		
Middle	0.152	0.079	0.053	1.164	0.998	1.359
Rich	-0.008	0.077	0.917	0.992	0.852	1.154
Children's sex						
Male (ref)				1.000		
Female	0.108	0.058	0.062	1.114	0.995	1.247
Children's age						
06-12 months (ref)				1.000		
13-24 months	1.118	0.115	0.000*	3.018	1.440	3.833
25-36 months	0.057	0.110	0.608	1.058	0.852	1.314
37-48 months	-0.101	0.101	0.319	0.904	0.7	1.102

49-59 months	-0.143	0.092	0.120	0.866	41 0.7 23	1.038
Number of children						
1 child (ref)				1.000		
2 child	0.140	0.130	0.279	1.151	0.8 93	1.483
3 or more child	0.191	0.132	0.149	1.210	0.9 34	1.567
Mother's age						
<=20 years (ref)				1.000		
21-25 years	0.089	0.136	0.511	1.094	0.8 38	1.428
26-30 years	0.000	0.129	0.994	0.999	0.7 75	1.287
31-35 years	0.32	0.129	0.803	1.033	0.8 02	1.330
35 or more years	-0.116	0.142	0.415	0.890	0.6 74	1.177
Mother's education						
No education (ref)				1.000		

Table 3 presents the impacts of various covariates on vitamin A supplementation among kids 6-59 months in the provincial area of Bangladesh by utilizing paired strategic relapse. The review uses a well fitted calculated relapse model and there was no multicollinearity issue in view of the extents of the standard mistake to come by substantial outcomes and changed impacts of the covariates. Youngsters' dwelling various divisions were getting vitamin A case less regard to Barisal division as the reference classification. Other strict families were more mindful than Islam (OR: 1.636, CI: 1.306-2.049). Female family head family's youngsters were consuming 11% less vitamin A case than their partners. On account of abundance file, kids with working class families were getting more (OR: 1.164; CI: 0.998-1.359) possible than destitute individuals. Female kids were consuming vitamin A case 11.4% more than guys (OR: 1.114, CI: 0.995-1.247). Youngsters' age was bound to consume vitamin An in contrast with the age bunch 6 a year, while the most extreme getting age bunch was 13 two years (OR: 3.018, CI: 1.440-3.833). Families having at least three kids were bound to consume vitamin A supplementation than single youngsters' families (OR: 1.210, CI: 0.934-1.567). All mother's age bunches were bound to consume vitamin An in contrast with age not exactly or equivalent 20 years, though the greatest getting age bunch was 21-25 years (OR: 1.094, CI: 0.838-1.428). Kids whose moms have advanced education were around one and half times more probable (OR: 1.410, CI: 1.216-1.635) to consume vitamin A supplementation than youngsters whose

moms were no informed. Indeed, even kids whose moms had basically essential instruction has been almost similarly (OR: 1.202, CI: 0.989-1.459) prone to consume vitamin A supplementation than those with ignorant moms. Advanced education of youngsters' dad was more probable (OR: 1.101, CI: 0.951-1.274) however kids whose father had essential schooling were more outlandish (OR: 1.013, CI: 0.853-1.203) to consume vitamin A supplementation than fathers were no informed. Breastfeeding had less impact to expand the pace of getting vitamin A case (OR: 0.983, CI: 0.828-1.166).

Table 4 presents the impacts of various covariates on vitamin A supplementation among youngsters'

Factors	Coefficient (β)	SE (β)	p-value	Odds ratio , exp(β)	95% CI for exp(β)	
					Lower	Upper
Rajshahi	0.459	0.283	0.105	1.58 2	0.90 9	2.753
Rangpur	0.372	0.280	0.184	1.45 1	0.83 8	2.511
Sylhet	0.012	0.313	0.970	1.01 2	0.55 8	1.868
Religion						
Islam (ref)				1.00 0		
Others	0.273	0.173	0.115	1.31 4	0.93 5	1.846
Sex of household head						
Male (ref)				1.00 0		
Female	-0.015	0.177	0.933	0.98 5	0.69 7	1.399
Wealth index						
Poor (ref)				1.00 0		
Middle	-0.041	0.207	0.842	0.96 0	0.64 0	1.439
Rich	0.214	0.220	0.331	1.23 9	0.80 5	1.907
Children's sex						
Male (ref)				1.00 0		
Female	0.036	0.101	0.722	1.03 7	0.85 0	1.264
Children's age						
06-12 months (ref)				1.00 0		
13-24 months	0.844	0.196	0.000*	2.32 6	1.58 5	3.414
25-36 months	-0.200	0.189	0.290	0.81 9	0.56 6	1.186
37-48 months	-0.264	0.173	0.127	0.76 8	0.54 7	1.078
49-59 months	-0.258	0.162	0.111	0.77	0.56	1.062

				2	2	
Number of children						
1child (ref)				1.00		
				0		
2 child	-0.63	0.234	0.788	0.93	0.59	1.485
				9	3	
3 or more child	0.235	0.246	0.339	1.26	0.78	2.049
				5	1	
Mother's age						
<=20 years (ref)				1.00		
				0		
21-25 years	0.403	0.255	0.113	1.49	0.90	2.465
				7	9	
26-30 years	0.342	0.238	0.150	1.40	0.88	2.243
				8	4	
31-35 years	0.263	0.239	0.272	1.30	0.81	2.076
				0	4	
35 or more years	0.176	0.254	0.489	1.19	0.72	1.962
				2	5	
Mother's education						
No education (ref)				1.00		
				0		
Primary	0.513	0.172	0.003*	1.67	1.19	2.342
				1	2	
Secondary and above	0.314	0.135	0.020**	1.37	1.05	1.786
				0	0	
Father's education						
No education (ref)				1.00		
				0		
Primary	0.322	0.159	0.043**	1.38	1.01	1.884
				0	1	
Secondary and above	0.130	0.130	0.317	1.13	0.88	1.471
				9	2	
Breastfeeding status						
No (ref)				1.00		
				0		
Yes	0.108	0.147	0.465	1.11	0.83	1.487
				4	4	
*and ** indicates the significance at 1% and 5% level of significance respectively.						

Table 4 presents the impacts of various covariates on vitamin A supplementation among youngsters' 6-59 months by utilizing twofold strategic relapse. Youngsters' dwelling various divisions yet Dhaka and Chittagong were getting vitamin A container more regard to the Barisal division as the reference classification. Other strict families were more mindful than Islam (OR: 1.314, CI: 0.935-1.846). Female family head family's kids were consuming 1.5% less vitamin A container than their partners. On account of abundance record, youngsters with rich class families were getting more (OR: 1.239; CI: 0.805-1.907) probable than needy individuals. Female youngsters were consuming vitamin A cases 3.7% more than guys (OR: 1.037, CI: 0.850-1.264). Kids' age was bound to consume vitamin A in contrast with the age bunch 6 a year, though the greatest getting age bunch was 13 two years (OR: 2.326, CI: 1.585-3.414). Families having at least three kids were bound to consume vitamin A supplementation than single youngsters' families (OR: 1.265, CI: 0.781-2.049). All mother's age bunches were bound to consume vitamin A in contrast with age not exactly or equivalent 20 years, while the most extreme getting age bunch was 21-25 years (OR: 1.497, CI: 0.909-2.465). Youngsters whose moms have essential instruction were more probable (OR: 1.671, CI: 1.192-2.342) to consume vitamin A supplementation than kids whose moms were no informed. Indeed, even kids whose moms had advanced education were almost similarly (OR: 1.370, CI: 1.050-1.786) prone to consume vitamin A supplementation than those with uneducated moms. Essential instruction of youngsters' dad was more probable (OR: 1.380, CI: 1.011-1.884) yet kids whose father had advanced education were more outlandish (OR: 1.139, CI: 0.882-1.471) to consume vitamin A supplementation than fathers were no informed. Breastfeeding had less impact to expand the pace of getting vitamin A container (OR: 1.114, CI: 0.834-1.487).

Chapter V: Conclusion

5.1 Recommendation

In fact, combating nutrient deficiency is simple with these four tips:

- ❖ Eat your leafy foods. The most effective way to stay away from any wholesome inadequacy is by consuming a wide assortment of products of the soil.
- ❖ Eat negligibly handled entire food varieties.
- ❖ Has your blood work examined?
- ❖ Pick an excellent multivitamin.

5.2 Conclusion

This study exhibited the correlation between financial and segment factors in the provincial and metropolitan areas of Bangladesh, with vitamin A supplementation among under-five youngsters. We have observed that in the rustic area of Bangladesh, district is a significant component for getting vitamin A container however it isn't huge for the metropolitan regions. Abedin, et al. (2019) found that kids living in various divisions have a shifting level of getting vitamin A cases. In this review, we likewise observed that vitamin A supplementation is something else for a working class family in contrast and a rich and unfortunate family in a rustic area of Bangladesh yet these situations are different for a metropolitan region. In metropolitan region vitamin A supplementation is something else for rich class families. This finding is upheld by Agrawal and Agrawal, (2013). We have likewise found the proof of orientation differentials in vitamin A supplementation inclusion in both provincial and metropolitan areas of Bangladesh which is upheld by Abedin, et al., (2019) however our outcomes don't coordinate with Kumar, et al., (2005). Youngsters' age is another element and this study shows that vitamin A case utilization in all age bunches is more probable contrasted with age bunch 06 a year for provincial and metropolitan regions. Janmohamed, et al. (2017), Agrawal and Agrawal (2013) found all age bunches are similarly prone to consume vitamin A case which is an opposite situation of our discoveries. We saw what families have at least 3 kids are bound to consume vitamin A supplementation in both provincial and metropolitan areas of Bangladesh which isn't upheld by Abedin, et al., (2019) and Agrawal, and Agrawal, (2013).

Mother's and father's schooling are a significant variable for getting vitamin A case in the provincial and metropolitan area of Bangladesh. In this review, we observed that in rustic regions kids whose mother and father are higher and optional taught are bound to consume vitamin A container yet in a metropolitan region, we have tracked down an alternate outcome. That is in metropolitan regions youngsters whose dad and mother are basically taught are bound to consume vitamin A container. This can happen in light of the fact that the informed individual in a metropolitan region stays occupied with other action aside from their work. Thus, this can be a significant variable. Breastfeeding is another component and this concentrate obviously shows

that for the rustic region it lessly affects getting vitamin A case in Bangladesh. We additionally tracked down that breastfeeding

Morley affected getting vitamin A cases in the metropolitan area of Bangladesh. This is upheld by Agrawal and Agrawal (2013) and Danneskiold-Samsøe, et al. (2013). At last, in this review, we observed that vitamin A supplementation inclusion for the rustic and metropolitan regions is 61% and 65% separately, which doesn't meet the SDG target. Discoveries propose that vitamin A supplementation is less in rustic regions than the metropolitan regions. Fitting mediation ought to be executed to further develop the vitamin A status of youngsters.

Reference

1. Maton, Anthea; Hopkins, Jean; McLaughlin, Charles William; Johnson, Susan; Warner, Maryanna Quon; LaHart, David; Wright, Jill D. (1993). *Human Biology and Health*. Englewood Cliffs, New Jersey, USA: Prentice Hall. ISBN 978-0-13-981176-0. OCLC 32308337.
2. Publishing, Harvard Health (9 June 2009). "Listing of vitamins". Harvard Health. Retrieved 12 May 2020.
3. "Vitamins and Minerals". National Institute on Aging. Retrieved 12 May 2020.
4. Vitamin and mineral requirements in human nutrition 2nd Edition. World Health Organization and Food and Agriculture Organization of the United Nations. 2004. pp. 340–341. ISBN 9241546123. Archived from the original on 12 December 2012.
5. Bender DA (2003). *Nutritional biochemistry of the vitamins*. Cambridge, U.K.: Cambridge University Press. ISBN 978-0-521-80388-5.
6. Vancamelbeke M, Vermeire S. The intestinal barrier: a fundamental role in health and disease. *Expert Rev Gastroenterol Hepatol*. 2017 Sep;11(9):821-834. doi: 10.1080/17474124.2017.1343143. Epub 2017 Jun 26. PMID: 28650209; PMCID: PMC6104804.
7. Bailey RL, Fulgoni VL 3rd, Keast DR, Dwyer JT. Examination of vitamin intakes among US adults by dietary supplement use. *J Acad Nutr Diet*. 2012 May;112(5):657-663.e4. doi: 10.1016/j.jand.2012.01.026. Epub 2012 Apr 25. PMID: 22709770; PMCID: PMC3593649.
8. Redzic S, Gupta V. Niacin Deficiency. [Updated 2022 May 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK557728/>.
9. Lakhan SE, Vieira KF. Nutritional therapies for mental disorders. *Nutr J*. 2008 Jan 21;7:2. doi: 10.1186/1475-2891-7-2. PMID: 18208598; PMCID: PMC2248201.
10. Boy E, Mannar V, Pandav C, de Benoist B, Viteri F, Fontaine O, Hotz C. Achievements, challenges, and promising new approaches in vitamin and mineral deficiency control. *Nutr Rev*. 2009 May;67 Suppl 1:S24-30. doi: 10.1111/j.1753-4887.2009.00155.x. PMID: 19453674.

11. Haimi M, Lerner A. Nutritional deficiencies in the pediatric age group in a multicultural developed country, Israel. *World J Clin Cases*. 2014 May 16;2(5):120-5. doi: 10.12998/wjcc.v2.i5.120. PMID: 24868510; PMCID: PMC4023304.