



Nutritional Evaluation of Preschool Children in An Urban Community

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ARTICLE DETAILS	ABSTRACT
History Revised format: Aug, 2019 Available Online: Sep, 2019 Keywords Nutritional Evaluation, Pre-School Children, Urban Community.	The aim of this project was to evaluate the nutritional requirements of children of pre-school age to help direct the creation of intervention. The study aims to analyze and define the nutritional status of young children (age range 1-5) that it relates to key nutrients may associated with the wasting and stunting) for the evaluation of what are associated with wasting and stunting with key macro- micro nutrients' deficiencies (primarily zinc and iron). The preschool child status of nutrition in the urban and rural areas of Multan Cit, from nursery schools in urban areas, preschool children aged between 3 and 5 years were chosen. The nutritional status was evaluated by using anthropometric height, arm, and weight circumference measurements and was contrasted with the requirements of the NCHS (National Center for Health Statistics). The dietary evaluation was based on the healthy inventory system and their mothers received 24 hours of memory. Compared with the RDA guideline were the nutrient inputs. Valid questionnaires were also utilized for the collection of data on their socio-economic status that was collected from mothers. The data was analyzed using version 10 of SPSS (software). In urban areas with a body mass greater than that of women, there were no major variations between males and females. 11.3 per cent and 82 per cent of urban children were underweight by using weight-for-age. Also, 1.33% and 33% were stunted, while 42% and 85% were wasted in urban schools respectively, the input of protein, iron, calcium, and vitamin.

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Introduction

Nutritional status is characterized as an individual's nutritional condition, or a population or a group. An integral aspect of tracking a community's health is to determine the nutritional status of groups of children. Community nutritional assessment acts as an essential data collection method to allow detailed preparation and execution of involvement to minimize morbidity and mortality rates with under nutrition.

Infection and malnutrition are the two very important factors that may impact on the growth of children. In many cases, child-hood infection becomes the cause that can be traced to inadequate absorption or food intake that may render the human system exposed to infections. Mostly all of them lived in developed countries or around in 60

developing countries. The whole life of a child is essentially decided by the food that is provided to him for the 1st five years. Child-hood is a time for the growth and development, and in this period of time, nutrition is most influencing factors. For the estimation of prevalence under-nutrition among pre-school kids, a range of anthropometric indices have also been used effectively for several years. Weight-for-age, height-for-age, and weight-for-height compare them. Height-for-age is the index of cumulative impact related to malnutrition over a child's lifespan. The cumulative results of both current and long-term diet levels are weight-for-age, while weight-for-height represents the child's recent food experiences. These indicators are fairly sensitive nutrition's immediate and underlying general causes.

Anthropometric information on the weight of children has been reported. Using a portable measuring machine, the children's weight was measured and measurements have been taken to the nearby 0.1 kg. The person was forced to remain still on the platform of weighting machine, along with the body weight equally distributed between the two feet. When the weight was determined, indoor light dress was permitted to be wear and footwear was omitted.

Objectives:

- To assess the level of nutritional status of preschool children through anthropometric measurements and clinical examination.
- To find the association level of dietary status of preschool kids with the variables that were selected personal.
- To develop an information booklet on importance of nutrition among preschool children.

Research Hypotheses

There may be a lack of iron and zinc among preschool kids according to WHO standards. School going children of urban areas with diarrhea are more probable to be zinc lacking and anemic than the kids who are not having diarrhea. There may be no important difference in the iron and zinc status of school going children of urban areas who are food insecure compare to the children who are secure from food.

Research Questions

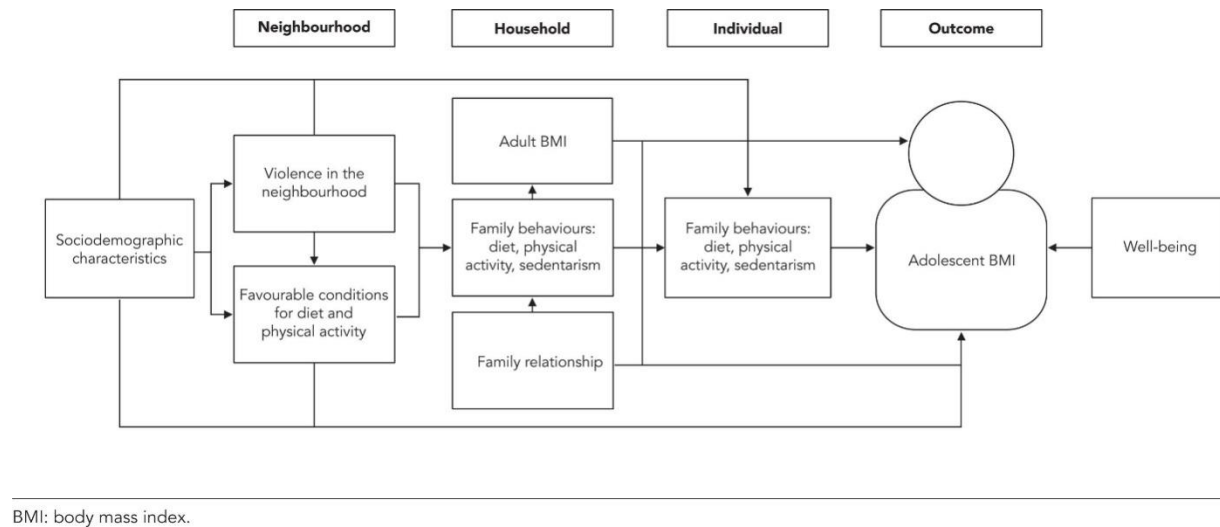
- Does kids of preschool show insufficient level of the defensive micro-nutrients zinc and iron in a community?
- Does the incidence of diarrhea in school-aged kids lead to zinc and anemia deficiency?
- Is food safety in pre-school going children an indicator of zinc and iron status?
- Are anemia and zinc deficiency related increase and developmental delay present in young kids aged 1-5 years?

Conceptual Framework

The reliant variable was youngster age wholesome status dependent on weight file (BMI) grouped by age and sex as indicated by World Health Organization (WHO, 2002) cut-off focuses "dainty" when the bend was not

exactly or equivalent to the third percentile; "ordinary weight" when between the third and 85th percentile; and "overweight" when equivalent to or more noteworthy than the 85th percentile.

A reasonable system, created dependent on the work and different creators, was utilized to investigations the relationship among distal and proximal hazard factors and nourishing status (Figure 1) in which factors were arranged into proximal and distal squares (socio-demographic, neighborhood person and family).



The most distal square was comprised of socio-demographic factors: age and sex; family unit salary, ordered as < 2, 2 to 5, 5 to 10, or > 10 least wages dependent on the lowest pay permitted by law in 2008/2009, as indicated by the on a conversion standard; and head of family instruction level classified as long periods of tutoring (0 to 4 years, 5 to 8 years, or ≥ 9 years).

The subsequent square was partitioned in two subgroups and comprised of factors identified with grown-up's impression of the physical and social condition of the area. The main sub-square was utilized as an intermediary for neighborhood viciousness estimated dependent on a little or huge danger of hostility, and view of security during the day and night. The subsequent sub-hinder, at the equivalent various leveled level, was made out of factors identified with positive conditions for diet and physical action: state of boulevards, road lighting and game territories (fortunate or unfortunate); lovely neighborhood for youngsters and teenagers; the simplicity of getting solid food and the nearness of shops (bread kitchen, showcase, butcher shop) in a walk-able separation; and the nearness of individuals practicing in or around the territory.

The third square included factors identified with the family, partitioned into three sub-squares. The primary sub-square contained factors identifying with family connections, utilizing a score dependent on the reactions made to dichotomous inquiries by the young people about their sentiments corresponding to their folks or watchmen: regardless of whether they remain by the juvenile; whether they cause them to feel terrible or adored; whether the teenagers are given enough consideration; whether there are battles in the family; and whether the young adult can share his/her issues.

The subsequent sub-square incorporated grown-up conduct comparable to physical movement and diet. Physical action was estimated as per the International Questionnaire of Physical Activity (IPAQ) long form, which evaluates the time spent on week-by-week physical movement. Those with a score of ≥ 150 minutes/week were viewed as dynamic, while the individuals who rehearsed under 150 minutes/week were viewed as deficiently dynamic, and the individuals who took an interest in no action were viewed as dormant. Stationary exercises were estimated dependent on factor 'screen time', which thinks about the aggregate sum of time spent before the TV, PC and on games sorted into under two hours or two hours or more. The accompanying dietary patterns were researched: evacuating the skin and noticeable fat from chicken and meat, utilization of products of the soil and sodas (at least five days per week, or under five days per week), and kind of milk expended (without fat milk, or entire milk). The third sub-square was made out of grown-up weight status as indicated by WHO classifications (overweight, characterized as $BMI \geq 25\text{kg/m}^2$; not overweight characterized as $BMI < 24.9\text{kg/m}^2$)²⁷.

Literature Review

Under-nutrition is characterized by a lack of food and repeated infections that contribute to inadequate macro- and micro-nutrients. Poverty and food security are indirect factors contributing to child malnutrition. (WHO, 2002). The two variables are imperceptibly linked since poverty disables the capability of a household to keep secure sufficient goods and services for a respectable quality of life. In real meaning, this may cause for a family to lose its food security or the ability to receive sufficient quantities of food to fulfill regular nutritional needs. Nutritional status is not only dependent on household and individual living circumstances, but is more specially based on the dietary quality of the food eating of the person. However, if a child seems to have enough food to consume, the food's nutrient quality plays a vital role in the nutritional status of the child. Micronutrient shortages become more common when inadequate nutrient-dense foods are not available. Although there are several nutrients of significance, two particular micro nutrients that can influence the growth and mental development of a child are iron and zinc.

Dietary Assessment

Dietary tests are an important method for the consideration of dietary habits and tendencies for individuals and meetings. The Food Frequency Questionnaire (FFQ), 24-hour analysis, and designed eating schedule records are the most commonly used dietary estimation instruments. The FFQ is used over a predefined timeframe to calculate the measure of a particular food item that a person has eaten. For instance, FFQs can demand that the subject examine the usual previously consumed intake (week, month, year). Two FFQs whose authority has tried to surveys. Supplement admission dependent on announced eating would then be able to be determined in light of the fact that the serving size is recognized 1994.

Dietary testing methods such as FFQs and 24-hour audits are real gadgets for observing food and nutrient use within a population as opposed to individual consumption (Henn, 2010). As per (Henn, 2010), substantial confinement is self-revealing when using these devices in science. This is because of daily under-estimation of the smidgen and food size measurement consumed that identifies with the social endorsement requirement of an individual. Regardless of the fact that these indicate discussion starts about validity and expanded understanding of the mistakes among existing researchers, 24-hour feedback and FFQs have been enhanced as estimation instruments (Henn, 2010).

Micronutrient Intakes

Diet is associated with external variables such as culture, protection related to money, and physical area. Some cultures have very assured about dietary tendencies that may also involve a wide range of foods, on the other hand few persons may be rely on occasional food products according to their environment. Diets may get dull and present problems in these regions when assessing serum micronutrient levels. This is a direct consequence of the quantity of micro-nutrients presence in those food-stuffs or the availability of micro-nutrients concerted in specific foodstuffs (Holst et al., 2008).

Iron

Iron inadequacy is the most well-known healthful issue found in a significant part of the creating scene and is the main micronutrient insufficiency that is additionally common all through industrialized nations. Over 30% of the total populace is accounted for to have weakness most cases being identified with iron inadequacy (WHO, 2013).

Zinc

Zinc is a small element that, for example, improvement and replication, has a capacity for quality articulation and simple cell types. While the basic indicators of zinc inadequacy are still conversed in the clinical environment, short height, hypogonadism, diminished safe ability, skin problems, cognitive brokenness, and anorexia have been portrayed. Mellow to direct zinc lacks are very basic all around and can be seen in roughly 33% of the total populace (WHO, 2002). These likenesses may help in representing serious assimilation between the two micronutrients despite the fact that the system isn't yet comprehended. In contrast to press insufficiency, analysts have been not able to disconnect a reasonable clinical pointer (for example biomarker or condition) explicitly connected to zinc lack. Development impediment is an overall indication of zinc lack yet can likewise be identified with different causes (Reed et al., 2015).

Factors Affecting Nutrition Status

Sustenance status is basically surveyed utilizing quantitative estimates indicating large scale and small-scale supplement inadequacies, development aggravations, and intellectual turn of events. Be that as it may, it is critical to take a gander at the outer natural factors that can contrarily influence a kid's nourishing status, for example, destitution, financial variables, food security, and nearness of loose bowels to give some examples (WHO, 2002). There are numerous potential outer variables that can cause under-sustenance; be that as it may, significant hazard elements can be followed back to the economics inside the nuclear family (Chaoet al., 2018).

Food Security

The weak urban group of people is usually a population of people that may spent more on food as compare to that food they cultivate by themselves. Those people who rely on the pay of food security, mostly spend huge sums with all of their business plans on food, and may have no entrance to property or horticulture to sworn by it for food expansion. In these circumstances, young people are typically defenseless depending on the capacity and eagerness of the family unit to re-allocate food to assist their healthy needs (Wegren, 2011) recognized characteristics that extend the danger of missing food safety in poor urban areas.

Socioeconomic Factors

Child hunger in developing countries continues to be a public health concern. Nutrition may also be a challenge as nearly all people totally connected with nutrition along with food consumption, but this wasn't always the case (1990). There are several possible external causes that can affect poor nutrition, even within the family system, big risk causes can be linked directly to socioeconomics.

Methodology

The research is quantitative although the knowledge collected from each laboratory estimates and 24-hour nutrition reports was deciphered and analyzed numerically. This research used an FFQ and 24-hour analysis of food reviews to assemble details on the kinds and calculation of nutrients spent over a one-week period published by the protector. Population comprises of preschool children (3-5 years) in urban community.

Study sample

Sixty-seven families of children under the age of one and five who enroll in the regular clinic of health care.

Study design

A cross-sectional study was led gathering segment information, clinical history, and dietary admission. Goal proportions of appearance and weight were achieved, and serum micronutrient levels were quantified by blood tests. Supplement admissions for systematic correlation based on creation limits is distinguished by the Sustenance Data System for Study (NDSR). Nutritional and well-being condition were compared with the comparative purposes of standard deviations on Z-scores of tallness for-age and weight-for-age for food safety and World Health Organization growth.

Data analysis

Descriptive analysis used in quantitative research. The researcher used this term to analysis this data in the descriptive form. Researcher used quantitative research analysis with percentage and frequencies.

Results

To differentiate supplement entries for correlation with development limits, the details from the reviews of food for each member we referred to the Nutrition Data System for Research (NDSR). After the supplement investigation in the NDSR, large scale and small-scale supplement levels were recovered to contrast blood lab esteems with the smaller scale supplements of concern. A correlation of nutritional and well-being position compares to food security and Z-scores of the size for the age that was included in the knowledge study. The Statistical Analysis Method (SAS) was utilized for the examination to measure correlation by using a measure of Fisher's sex.

Demographics

Family Size.

For each person, the family size related to the available resources. In each family the number of kids (n=67) vary from 17 days of age to 26 years of age, from one kid to 10 children.

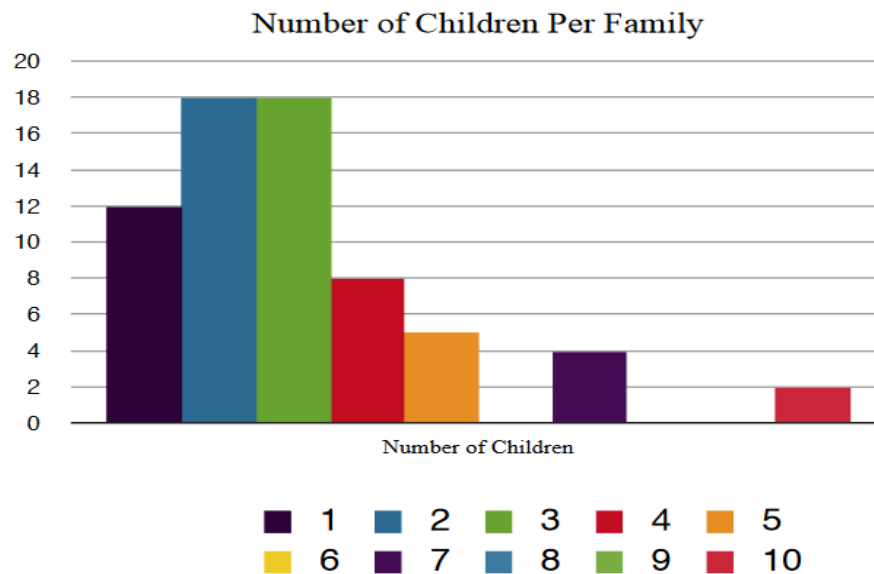


Figure 4.1. Number of Children Per Family.

The family had a couple of kids. More or less 27% (26.87%) had two children and 27% (26.87%) had three children, trailed by 18% (17.91%) having one child. Around 12% (11.94%) of couples have four children, 8% (7.46%) have five children, 6% (5.97%) have seven children, and 3% (2.99%) have ten children.

Education Level.

The education level of the mother participants' (n=67) exposed that 73 % of mother's education was for 4-6 years, along with 18 mothers who were showing 6 years of schooling.

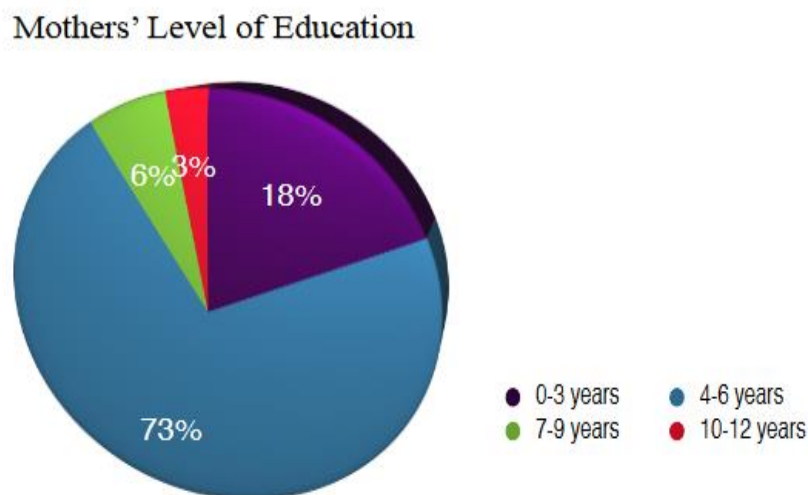


Figure 4.2. Mothers' Level of Education.

18% mothers had 0-3 years of schooling, 6% were between the year of 7-9, and 3% were in between 10-12 years.

Breastfeeding Duration.

Including its participants(n=67), 24 mothers (36 percent) were recorded for breast feeding for 1-6 months and 22 mothers (33 percent) reported breastfeeding for 7 months to one year.

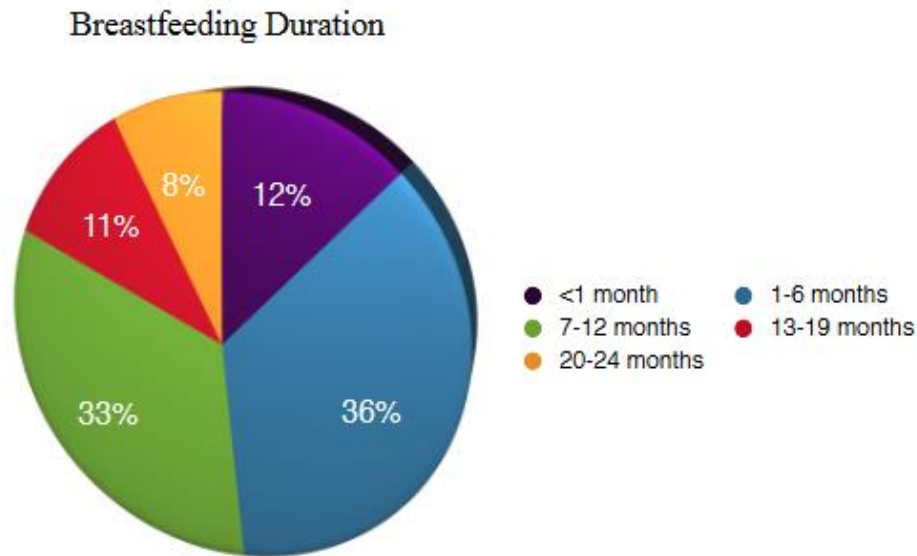
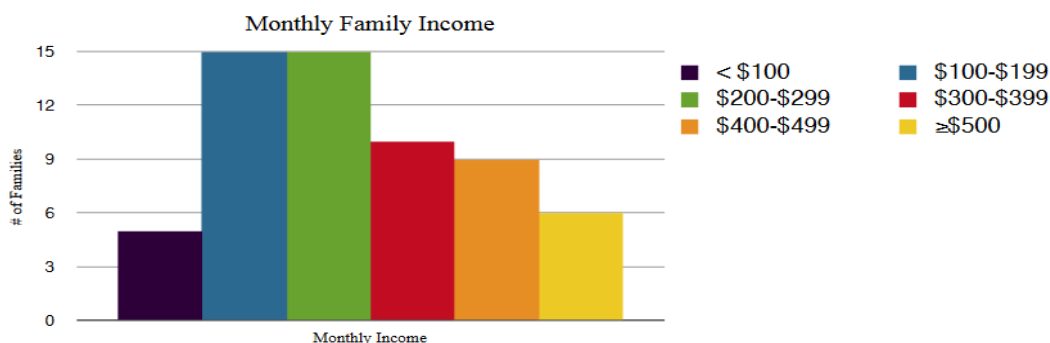


Figure 4.3. Breastfeeding Duration.

There had been 7 mothers (11 percent) between 13 – 19 months who reported breastfeeding and 5 mothers (8 percent) between 20 -24 months who reported breastfeeding. 8 mothers registered breastfeeding for less than 1 month, varying from non-breastfeeding to breastfeeding during 15 days (12 percent).

Family Income.

Of the respondents (n=67), 7 failed to report their usual month to month salary. Of the advertisement families, 30 (half) reported a per month pay somewhere within the range of \$100 and \$299.10 (17 percent) reported a per month pay somewhere within the range of \$300 and \$399, 9 (15 percent) reported a per month pay somewhere within the range of \$400 and \$499, 6 (10 percent) reported a per month pay of more than or equal to \$500.



There were 5 families (8%) who announced not exactly a \$100 month to month salary. The month to month pays is identified with the quantity of workers in the family. The quantity of workers in the family extended somewhere in the range of 0 and 5 workers.

Dietary intake of zinc to serum zinc levels.

The access of nutritional zinc was defined as greater than 3 mg/day that may be the Recommended Daily Allowances (RDA), 80.6% of the respondents have serum zinc level under the 66-194 to normal levels (NL). 7.46 percent of the members had low serum zinc at the stage where nutritional zinc entry was within the RDA, and 5.97 % members have low down serum zinc when dietary zinc entry was below the RDA. NL of serum zinc was present in 4.48 percent of members with elevated dietary zinc intake and 1.49 % of respondents with dietary admission within the RDA have substantial serum zinc levels. It's Table 4.1. Zinc Dietary Intake to Serum Zinc Levels. No notable distinctions were observed in the rates of thorough admission of dietary zinc levels as compared to serum zinc levels ($p=0.20$).

Table 4.1. Dietary Intake of Zinc to Serum Zinc Levels.

Dietary Zinc	Serum Zinc		
	Low	Normal	High
Low	5.97%	0%	0%
Normal	7.46%	0%	1.49%
High	80.60%	4.48%	0%
Fisher's Exact test (df): 4 p-value: 0.20			

Serum levels of zinc to WAZ and HAZ.

Standard serum levels of zinc are in the 66-194 mg/dL range. Z The participants' average serum zinc levels dropped below established range, although HAZ and WAZ indicate that the respondents are at risk of stunting and wasting on average 1 to 2 years, 3 to 4 years, and 4 to 5 years of age. On average, respondents aged 2 to 3 years are stunted. 4.12. Table Serum Zinc levels to HAZ and WAZ. No substantial variations have been observed between serum levels of zinc and WAZ ($p=0.81$) and HAZ ($p=0.52$).

Age Range	Avg Serum Zinc (mg/dL)	WAZ	HAZ
1-2 years	36.5	-1.02	-1.84
2-3 years	41.5	-1.16	-2.04
3-4 years	39.6	-1.28	-1.88
4-5 years	48.1	-0.76	-1.14

Number of Earners in the Family

Number of Earners in the Family



Figure 4.5.

Households (n=67) with 1 earner (74 percent) had approximately 73 percent of the participants reporting single income families. A double household were recorded by 18 percent while 4 percent of participants reported ≥ 3 employees in the home.

Factors Influencing Food Security;

The frequency of Job and home facilities, such as type of burner and accessibility to a refrigerator, are the factors affecting food safety. Frequency of Jobs. Among respondents (n=67) who registered single- or double-income households, 47 respondents (72%) identified seasonal work and 24 respondents (36%) reported year-round work. Approximately 29% of respondents reported not getting seasonal employment and 64% reported not getting year-round work.

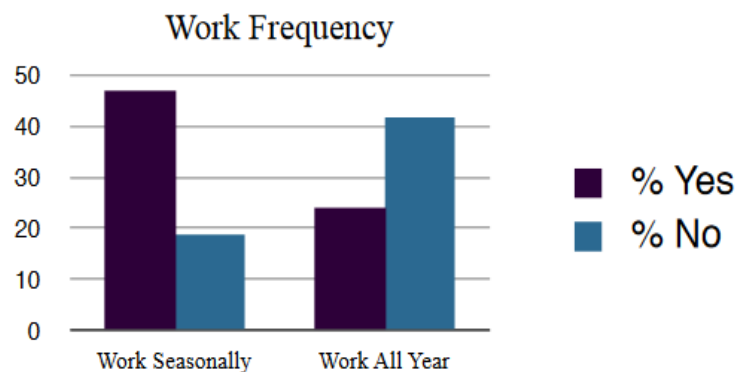


Figure 4.6. Work Frequency.

Type of Stove Used in the Home.

Inside the community, there are a range of choices for stoves: gas, coal, electricity and kerosene.

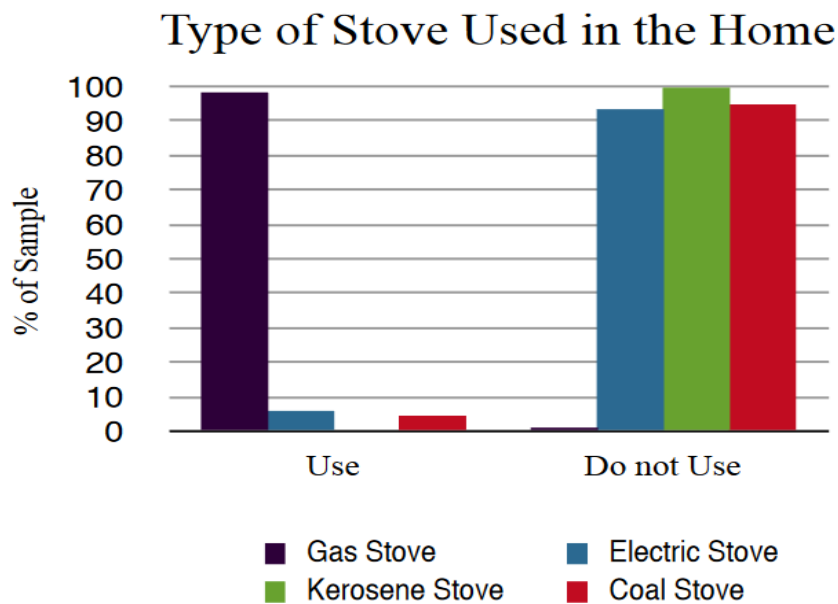


Figure 4.7. Type of Stove Used in the Home.

Compared to 4 respondents (6.06 percent) using an electric stove, 3 participants (4.55 percent) that used a coal stove, and 0 respondents were using a kerosene stove (n=67), sixty-five participants (98.48 percent) choose a gas stove.

Hypothesis Testing

In terms of serum zinc levels, HCT, nutritional iron and zinc, diarrhea and food protection, each hypothesis was evaluated by using the Fisher Exact Test. An ANOVA test has been carried out to determine the link between growing delays, serum zinc and HCT.

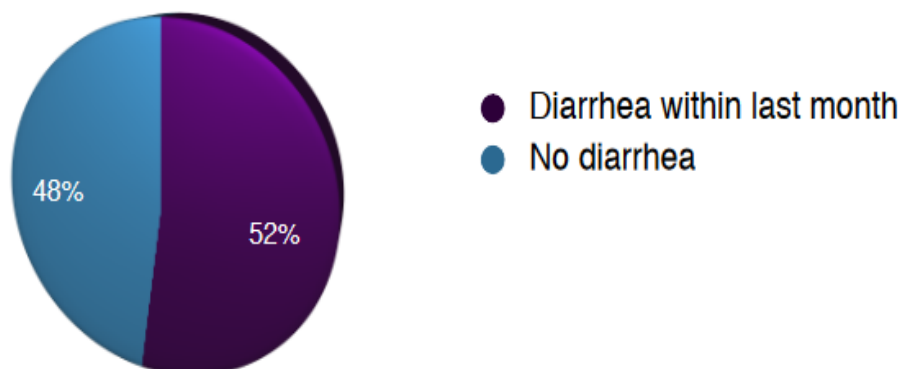
Hypothesis 1.

The measurement of the dietary intake of micronutrients in school-aged children in the Ecuadorean population would indicate deficiencies of both zinc and iron.

Hypothesis 2.

School going children with diarrhea in urban Ecuador are more likely than the children not having diarrhea to be zinc-deficient and anemic. Diarrhea episodes cause electrolyte loss and fluid, electrolyte loss, decrease the absorption of nutrients, and deplete the nutritional reserves of the body. The guardian was asked about the existence of diarrhea during the last month during the physical exam taken by each participant(n=67).

Occurrence of Diarrhea

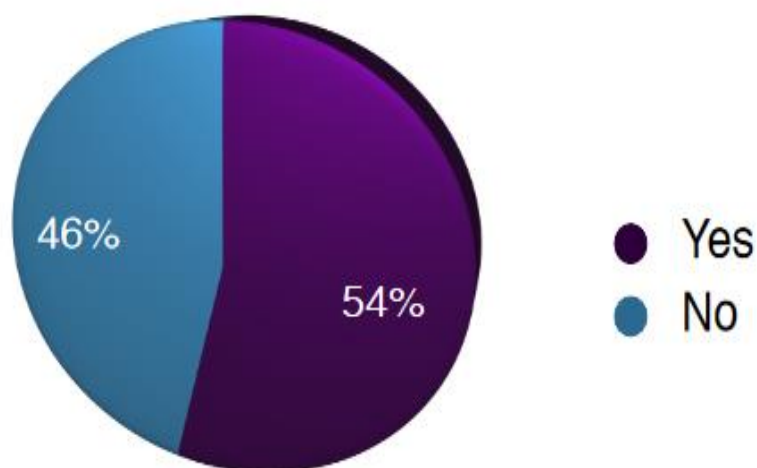


Within the month prior to the test, 35 (52 percent) of the 67 participants who reported diarrhea comparison to the 31 participants (48 percent) that did not experience any diarrhea during the last month.

Hypothesis 3.

Compared for those that are food insecure, there would be measurable variations in the zinc and iron status of school going children of urban Ecuador who are food safe. Nearly half of respondents reported food security. Around, 54 percent of the respondents were considered to be food insecure based on parameters from of the Food Security Survey (2012).

Reported Child Food Security



54 percent of the 67 respondents reported trouble accessing food mostly every month or even every month. In contrast, 46 percent of the respondent's report receiving food without trouble. -Of even the 46% of respondents reporting, for 1-2 months they did not really have trouble or had trouble.

Average Dietary Intake.

The reported dietary intake indicates that for participants between age 1-2 years, the estimated caloric intake is 1406 kcal per day, 2 to 3 years 1980 kcal per day, 3 to 4 years 1721 kcal per day, and 4 to 5 years 1764 kcal per day. 66 percent carbohydrates, 16 percent protein, and 18 percent fat are part of just this average diet. The RDA is 7 to 10 mg per day for iron intake and the estimated dietary iron intake for respondents was greater than the RDA. The RDA for the zinc is around 3 mg per day and the total intake of dietary zinc for respondents reached the RDA.

Age Range	Avg Total Fat (g)	Avg Total Carbs (g)	Avg Total Protein (g)	Avg Total Calories (kcal)	Avg Dietary Zinc (mg)	Avg Dietary Iron (mg)
1-2 years	32.2	223.8	56.7	1406	8.2	8.6
2-3 years	39.3	332.9	77.6	1980	9.9	13.1
3-4 years	34.6	285.4	76.0	1721	9.7	12.8
4-5 years	36.4	288.5	71.8	1764	9.8	13.9

Dietary guidelines differ for kids between the ages of 1-5. In order to promote growth and development, the American Heart Association (2014) suggests that energy consumption should also be appropriate. 1200-1300kcal per day can be eaten for active kids between 1 to 3 of age year, but the respondents in this age group recorded absorbing more on average. 1500 to 1700kcal per day can be ingested for active kids between the ages of 4 to 5 years, and this age group is significantly higher than recommended on average. Based on the data from the Medicine Institute DRIs for macronutrients (2005), the macronutrient suggestion ranges differ depending upon the age. 3 t the 52-macronutrient breakdown for children by age group is daily: 1 to 3 years should have 30-40percent fat and 4 to 5 years should also have 25-35percentage fat; 1 to 5 years must have 45-65percent carbohydrates; and 1 to 3 years may have 5-20percent protein and 4 to 5 years might have 10-30percentage protein. The following figure displays the macronutrient distribution of the study sample by age group.

Summary

However, a correlation between food safety and food habits of iron and food habits of zinc was established and a statistical significance was found in the percentages of respondents when matching dietary intake of iron to HCT levels. Multiple statistical analyses were carried out with no statistical significance. High numbers of respondents

were recognized as stunted or at danger of stunting, as well as at risk of waste. On average, with imbalanced macronutrient ranges, the recorded dietary intake exhibited strong caloric value.

Conclusion

Taking everything into account, the aftereffects of this examination show that: Overweight and stoutness are not pervasive among the considered example; Underweight, hindering and squandering were restricted in the tested populace; Underweight was commonly more predominant among young men; Different anthropometric records are similarly significant in tending to ailing health among preschool youngsters.

This is perhaps the biggest examination led for the younger students. Nourishment and wellbeing guidelines of government younger students are as yet far substandard compared to the norms and warrants enormous scope multicenter study to distinguish the confinements and lacunae of the projects executed at present. Concerned and facilitated wellbeing instruction measures ought to be incorporated through various projects to improve the individual cleanliness, poor sterile practices and to give dietary enhancements to younger students during times of helpless food consumption which may profit youngsters and help to forestall intense under nourishment. Studies on vitality and supplement substance of preschool menus ought to be completed routinely so as to improve sustenance of youngsters during their stay at preschool and vegan menus ought to be concentrated to all the hole in the writing. The strategy of evaluating preschool suppers ought to be the equivalent so as to give the likelihood to look at both the outcomes and the ends. Preschool menus ought to be changed in accordance with the necessities of 3-year-old youngsters and 4-6-year-old kids independently. The across the country training modified for preschool staff ought to be worked out and executed so as to instruct the preschool staff about the current nourishment proposals for kids, just as the healthful needs of 3-year-old kids and 4-6-year-old youngsters.

The consequences of BMI-for-age, which is utilized for screening of overweight and weight in 24–83-month-matured kids, demonstrated that the commonness of being overweight in kids is apparent. This examination presents that the pervasiveness of being overweight in surveyed youngsters is a less firm; hence, there is a requirement for anticipation and control programs. The acquired outcomes from this examination are in accordance with other worldwide investigations indicating that kids being overweight, and youth weight are expanding in less created nations just as in momentary social orders. The aftereffects of this examination are likewise like those of other overall investigations on the predominance of overweight and corpulence in preschool-matured youngsters that report a developing pattern in kids being overweight.

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