



Estimation of Various Nutritional Deficiencies in School Going Children of district Peshawar, Pakistan

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ABSTRACT

Background: The aims of the study are to estimate gender wise and age wise nutritional status of school children of aged 4 to 15 years, in the local area of district Peshawar. **Method:** Institutional based cross-sectional study design was used. In the current research work a total of 500 samples were isolated from school-going children. In which 150(30%) were found positive for nutritional deficiency. The samples collected from male and females students of age 4-15 years. **Result:** Among the all samples nutritional anemia was found more frequent 60(12%), leading by malnutrition 50 (10%), moderate prevalence were shows by underweight 20(4%) and stunting 16 (3.2%) prevalence rate. while very low frequency was shows by wasting 4 (0.8%) respectively. Out of 500 children the number of male was slightly higher than females. The incidence of malnutrition, underweight and nutritional Anemia among the study population varied with gender and with age. Although the prevalence of nutritional anemia was higher in both age groups. **Conclusion:** Over all ratio of underweight and stunting were found moderate among all ages and gender wise distribution of nutritional sates

Keywords: Malnutrition, Anemia, Underw eight, stunting, wasting

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INTRODUCTION

nutritional status is the condition of multi-factorial but has been explained by three major health condition of an individual as influenced by nutrient intake factors: poor nutrition, high levels of infection and utilization in the body (De Onis, 2017). In the developing world, approximately nutrients in preparation for rapid growth of adolescence 146 million children are underweight, (Handa, Ahamad, Kesari, & Prasad, 2008). Therefore, it becomes very important to know the nutritional status of school going children; the building machine was used to measure the body weight to the blocks of state and country and hence the present nearest 0.5 kg (Best, Neufingerl, Van Geel, van den Briel, & Osendarp, 2010). Malnutrition is a major public health problem in Pakistan, a South Asian nation with over 130 million people. Half of its children aged five years or less are stunted, over a third (38%) are underweight, and a quarter of all births are low birth weight (Best et al., 2010).

These high levels of malnutrition contribute to about half of the 740,000 child deaths that occur every year in Pakistan (Shivaprakash & Joseph, 2014). In view of the scale of the problem in children under five, nutritional programs in Pakistan during the last few decades have been targeted at this age group. However, malnutrition is a significant problem in older children as well, a fact that is often overlooked by policy makers and program managers (Fazili, 2012). Though little is known about the state of nutrition in this older group, studies conducted in the 1980s indicate that malnutrition is a significant problem in this population, with prevalences ranging from 47-70% in male school children in rural Pakistan (Karak, Maiti, Das, & Karmakar, 2018; Rezaeian et al., 2014).

The situation among school-aged children in urban squatter settlements in Pakistan is even less well known. These settlements contain a large proportion of the rapidly growing urban population with high levels of malnutrition already documented in the under-five child population (Eze, Oguonu, Ojinnaka, & Ibe, 2017). To assess the nutritional status of 7-10 year old Nutritional assessment is a depth evaluation of an individual food, nutrient intake lifestyle and their medical history. Nutritional assessment of collecting information in order to make decisions about the nature and cause of nutritional related health issues that can affect an individual.

we can evaluate the nutritional status of an individual by using these components whether, he or she is obese overweight or underweight. Because obesity and overweight may lead to chronic diseases such as diabetes, heart failure, hypertension and so on. While under nutrition can lead to osteoporosis getting frequent ill, teeth, skin and hair problems, iron deficiency anemia, malnutrition, pre-mature birth. In 2015, the study on teachers indicate that 34% were overweight, 16% were anemic and 2% had under nourished According to WHO the prevalence of obesity has been doubled and 2.8 million individuals died due to obesity and 15.8 billion were considered obese. (khushnuma amin, Oct 2015)

Another study was conducted on females of Pakistan showed that approx. 60% of the population consumed less than recommended daily allowance and 40% consumed less than 80% of the recommended daily allowance. In Pakistan 19.9% lactating females consumed calories less than 70% of the recommended dietary allowance while 54% a pregnant female in Pakistan were anemic as compare to India, were more than 50% of the populations were anemic, while iodine deficiency also has significance effects on poor pregnancy outcomes. A high mortality rate in Pakistan is due to under nutrition and almost 25 to 30% of babies under 25,00g at the birth. And low birth weight is a significant reason

behind high mortality and this high mortality rate was due to poor availability and accessibility of food. Workload and pressure of house-hold work directly effects on the nutritional status of females. **(Chatterjee & Lambert, 1989).**

A study was conducted on depression, anxiety and stress level of female school teachers according to the study teaching not only affect physically but also mentally because a lot of energy is used in the class rooms ,in family commitments, which is a source of stress and depression.. In Egypt primary teachers take 24classes per week, while secondary level teachers took 18 hours per week. The study indicated that 61.3% had teaching experience more than 10 years while 91% teachers were not satisfied with their pay scale. The prevalence of severe, moderate and mild depression were (0.7%, 2.8%and 19.7%), while the prevalence of extremely severe, moderate and mild anxiety level was (19.7%, 7.0% and 23.2%). These results showed that there is need to bring interventions to overcome such issues and order to prevent teachers from increasing psychological issues which would affect mentally and physically on nutritional status of teachers **(Allam2017)**. Therefor.the objective of this study estimates gender wise nutritional status of school children of distryct Peshawat.estimate age wise prevalence of the nutritional incidence of school aged children and find out Nutritional Anemia Stunting and Underweight school aged children

OBJECTIVE

- To estimate gender wise nutritional status of school children of district Peshawar.
- To estimate age wise prevalence of the nutritional incidence of school aged children.
- To find out Nutritional Anemia, Stunting and Underweight school aged children.

METHODOLOGY

This observational, cross sectional study was conducted in local area of District Peshawar from June 2023 to November 2023. After ethical approval, students of 4-15 years were selected from the Govt schools located in this area. Demographic information along with weight and height of the selected children were taken and plotted to gender specific, growth charts.

The age of the children was determined using school records. In the schools nutritional status of children were assessed as follows: Weight: Measured using equipment and procedure. The measurements were taken to the nearest .5Kg Height: well taken using a measuring tape applied to the wall. The measurements were taken with children barefoot with their back of heels, buttocks and head touching the wall. Readings well be taken to the nearest .5cm.

WHO- score system was used to classify the nutritional status of children.

Study Area and Period

The study was conducted in local area of district Peshawar, which is located Khyber Pakhtunkhwa.

Study Design

Institutional based cross-sectional study design were used.

Study Population

All secondary and primary school students (age group wise the source population, whereas sampled or selected students were the study population of this study.

Sample Size Determination

A Total of 500 children between the ages of 4-15 years were studied. A systematic random sampling technique was applied for sample collection.

Lab investigations and Tests: All patients were subjected to: Complete Blood count and reticulocyte count. Patients with microcytosis underwent the following:

Serum Iron and ferritin

An automatic hematological analyzer and Biochemistry analyzer were used for clinical examination

Routine blood tests

This is done to assess anemia and other vitamin and mineral deficiencies. There may be dehydration, low blood sugar and signs of severe infection as is evident by raised level of blood cell counts.

Diagnosis of malnutrition in children

In children weight and height is measured and compared with the charts showing the expected average height and weight for a child of that age. Some children are persistently smaller for age and may be genetically so.

Blood tests in children

Routine blood tests in children include those for blood glucose, blood counts, urine for routine examination.

Levels of iron in blood, folic acid and vitamin B 12 are also done. For protein estimation other tests including

Normal ranges of ferritin 10 to 150 ng/mL for children 4th years to 15 years.

MCV normal range is 80 to 95 for children

ANALYSIS & INTERPRETATION

► Analysis and Interpretation of data

Data will analyzed and interpret by using M word, Origin 16 and Excel. Frequency and Percentage were calculated for all quantitative variables.

5. ETHICAL CONSIDERATION

- The subjects were briefed about the study.
- Consent was taken from the subjects after explaining the purpose of study for the collection of data.

MATERIALS AND METHODS

Questionnaire form

| | |
|--|---|
| <p>Demographics information:</p> <p>Child's Name: _____</p> <p>Age: _____ Gender: _____</p> <p>Grade/Class: _____</p> <p>School Name: _____</p> <p>Family background:</p> <p>How many people live in the child's household.? Male and female ratio in child's household.? Family income status? Hereditary diseases in family?</p> | <p>General information</p> <p>Do you have breakfast every day before going to school? (Yes/No)</p> <p>How many meals do you typically eat in a day?</p> <p>Do you eat fruits and vegetables daily? (Yes/No)</p> <p>How often do you consume fast food? (Yes/No)</p> <p>Anthropometric Measurements</p> <p>Height (cm): ____</p> <p>Weight (kg): ____</p> <p>BMI (Body Mass Index): ____</p> |
|--|---|

| FOOD FREQUENCY QUESTIONNAIRE FOR ASSESSMENT OF NUTRITION STATUS OF SCHOOL CHILDREN IN DISTRICT PESHAWAR KPK | | | | |
|---|------------------|------------------|----------------------|--------------|
| FOOD FREQUENCY QUESTIONNAIRE (FFQ) | | | | |
| Code | | | | |
| MEAL TIMINGS | | | | |
| Do You Take | Always | Sometimes | Rarely | Never |
| Breakfast | 100 | 50 | 25 | 25 |
| Lunch | 100 | 55 | 30 | 15 |
| Tea time | 50 | 15 | 20 | 15 |
| Dinner | 250 | 100 | 80 | 70 |
| FOOD RESPONSE AND REACTIONS | | | | |
| Cravings | Aversions | | Unsuitability | |
| | | | | |
| WATER INTAKE (1Glass=250ml) | | | | |

RESULTS AND DISCUSSION

According to (WHO) formula $BMI = \frac{\text{weight}}{\text{High (M}^2\text{)}}$

| s.no | status | Student BMI | Normal BMI | HB level |
|------|--------------|-------------|------------|-------------|
| 1 | Anemia | 20BMI | 18.5-24.9 | >12,>14g/dL |
| 2 | Underweight | 18BMI | 18.5-24.9 | <12,14g/dL |
| 3 | Malnutrition | 17.3BMI | 18.5-24.9 | <12,14g/dL |
| 4 | Stunting | 11.2BMI | 18.5-24.9 | <12,14g/dL |
| 5 | wasting | 9.5BMI | 18.5-24.9 | <12,14g/dL |

RESULTS

In the current research work a total of 500 samples were isolated from school-going children. In which 150(30%) were found positive. The samples collected from male and females students of age 4-15 years. Among the all samples nutritional anemia was found more frequent 60(12%), leading by malnutrition 50(10%), moderate prevalence were shows by underweight 20(4%) and stunting 16(3.2%) prevalence rate. while very low frequency was shows by wasting 4(0.8%) respectively. Out of 500 children the number of male was slightly higher than females. The prevalence of Nutritional Anemia among the study population varied with age. Children of high aged group had a significantly high incidence of nutritional Anemia compared with the lower age group “Table 1”. Over all ratio of underweight and stunting were found moderate among all ages and gender wise distribution of nutritional status.

Table.1 Over all nutritional status of school going children

| S.no | Total | Nutritional status | Prevalence | Normal |
|------|-------|--------------------|------------|----------|
| 1 | 100 | Anemia | 60(12%) | 40 |
| 2 | 100 | Malnutrition | 50(10%) | 50 |
| 3 | 100 | Underweight | 20(4%) | 80 |
| 4 | 100 | Stunting | 16(3.2) | 84 |
| 5 | 100 | Wasting | 4(0.8) | 96 |
| 6 | 500 | -- | 150(30%) | 350(70%) |

A large number of males were anemic 32 (6.4%), malnourished 28 (5.6%), underweight 12 (2.4%), stunted 4 (1.6%) when compared with females nutritional anemia 14 (5.6%), malnutrition 11 (4.4%), underweight 4 (1.6), stunting 4 (1.6%) while wasting with zero prevalence rate 0 (0%). The males having a higher prevalence than the females.

Table.2 Gender wise nutritional status of school going children

| S.no | Nutritional status | Male | Female |
|------|--------------------|-----------|-----------|
| 1 | Anemia | 32 (6.4%) | 28 (5.6%) |
| 2 | Malnutrition | 28 (5.6%) | 22 (4.4%) |
| 3 | Underweight | 12 (2.4) | 8 (1.6) |
| 4 | Stunting | 8 (1.6%) | 8 (1.6%) |
| 5 | Wasting | 4 (0.8%) | 0 (0%) |
| 6 | -- | 84(17%) | 66(13%) |

Age wise nutritional status in male shows that the high prevalence rates were found between 4-7 years of children. In which nutritional anemia 12 (4.8%) leading by Malnutrition 10 (4%) less prevalence were seen in Underweight 5 (2%) Stunting 5 (2%) while some prevalence was seen for wasting 2 (0.8%). Between the age group 8-11 the prevalence ratio were nutritional anemia 10 (4%) leading by Malnutrition 8 (3.2%) less prevalence were seen in Underweight 3 (1.2%) Stunting 2 (0.8%) while no prevalence was seen for wasting. Also high prevalence were seen in nutritional anemia and malnutrition 8 (3.2%), 7 (2.8%) very low prevalence rate were seen between 12-15 age group in underweight, Stunting and wasting Table.3

Table.3 Age wise nutritional status of school going children

| Ages | Anemia | Malnutrition | Underweight | Stunting | Wasting |
|--------------|----------------|----------------|---------------|-----------------|----------------|
| 4-7 | 24 (4.8%) | 20 (4%) | 10 (2%) | 10 (2%) | 4 (0.8) |
| 8-11 | 20 (4%) | 16(3.2%) | 6 (1.2%) | 4 (0.8%) | 0 (0%) |
| 12-15 | 16 (3.2%) | 14(2.8%) | 4 (0.8%) | 2 (0.4%) | 0 (0%) |
| Total | 60(12%) | 50(10%) | 20(4%) | 16(3.2%) | 4(0.8%) |

Age wise nutritional status in male shows that the high prevalence rates were found between 4-7 years of children. In which nutritional anemia 8 (3.2%) leading by Malnutrition 6 (2.4%) less prevalence were seen in Underweight 4 (1.6%) Stunting 2 (0.8%) while some

prevalence was seen for wasting 2 (0.8%). Between the age group 8-11 the prevalence ratio were nutritional anemia 5 (2%) leading by Malnutrition 4 (1.6%) less prevalence were seen in Underweight 2 (0.8%) Stunting 2 (0.8%) while no prevalence was seen for wasting. Very low prevalence rate were seen between 12-15 age group Table.5

Table.4 Age wise nutritional status of male school going children

| Ages | Anemia | Malnutrition | Underweight | Stunting | Wasting |
|--------------|-----------------|-----------------|-----------------|---------------|----------------|
| 4-7 | 16 (3.2%) | 12 (2.4%) | 8 (1.6%) | 4 (0.8%) | 4 (0.8%) |
| 8-11 | 10 (2%) | 8(1.6%) | 4 (0.8%) | 4 (0.8) | 0 (0%) |
| 12-15 | 6 (1.2%) | 8 (1.6%) | 4 (0.8%) | 0 (0%) | 0 (0%) |
| Total | 32(6.4%) | 28(5.6%) | 16(3.2%) | 8(1.6) | 4(0.8%) |

Age wise nutritional status in female shows that the high prevalence rates were found between 4-7 years of children. In which nutritional anemia 7 (2.8%) leading by Malnutrition 5 (2%) less prevalence were seen in Underweight 2 (0.8%) Stunting 3 (1.2%) while no prevalence was seen for wasting. Between the age group 8-11 the prevalence ratio were nutritional anemia 5 (2%) leading by Malnutrition 4 (1.6%) less prevalence were seen in Underweight 2 (0.8%) Stunting 1 (0.4%) while no prevalence was seen for wasting Table.5

Table.5 Age wise nutritional status of female school going children

| Ages | Anemia | Malnutrition | Underweight | Stunting | Wasting |
|--------------|-----------------|-----------------|-----------------|----------------|--------------|
| 4-7 | 14 (2.8%) | 10 (2%) | 4 (0.8%) | 6 (1.2%) | 0 (0%) |
| 8-11 | 10 (2%) | 8 (1.6%) | 4 (0.8%) | 2 (0.4%) | 0 (0%) |
| 12-15 | 4 (0.8%) | 4 (0.8%) | 4 (0.8%) | 0 (0%) | 0 (0%) |
| Total | 28(5.6%) | 22(4.4%) | 12(2.4%) | 8(1.6%) | 0(0%) |

DISCUSSION

In the current research work, a total of 500 samples were isolated from school-going children. The samples were collected from male and female students of age 4-15 years. Among the all samples nutritional anemia was found more frequent 60(12%), led by malnutrition at 50(10%), moderate prevalence was shown by underweight 20(4%), and stunting at 16(3.2%) prevalence rate. while very low frequency was shows by wasting4 (0.8%) respectively. Out of 500 children, the number of males was slightly higher than females. Nutritional Anemia and malnutrition were observed in the study population respectively.

The prevalence of nutritional Anemia among the study population varied with age. Children in the 12–15 years group had a significantly higher prevalence of nutritional Anemia compared with the lower age group. (Ahsan et al 2020) also conducted a study in which a total of 571 children, 348 (56.4%) were boys and 223 (43.6%) were girls. Nearly 89 (15.5%) children including 52 (10.5%) boys and 37(6.4%) girls had normal anthropometric indices. Stunting was the most frequent anthropometric failure (n=219, 38.3%) followed by wasting (n=163, 28.51%) and underweight (n=100, 17.5%) respectively. Gender disparity was observed in the distribution of malnutrition with boys having a higher frequency of stunting, wasting, and underweight than girls.

Although the prevalence of nutritional anemia was higher in both age groups and sexes, it was not significant. Nutritional Anemia prevalence was significantly higher among school going children. The difference between the age groups as well as nutritional status remained significant as risk factors of anemia were also the main relation. The ratio of underweight and stunting was found moderate among all ages and gender-wise distribution of nutritional status. The prevalence of malnutrition and stunting varied significantly within the age group with the lower age group having higher prevalence. More males were anemic 32 (6.4%), malnourished 28 (5.6%), underweight 12 (2.4%), stunted 8 (1.6%) when compared with females anemia 28 (5.6%), malnutrition 22 (4.4%), underweight 8 (1.6%), stunting 8 (1.6%) while wasting with zero prevalence rate 0 (0%) respectively though the difference was not significant in malnutrition and stunting. The difference in prevalence of underweight among the sexes was significant with the males having a higher prevalence. Bivariate analysis revealed children of the 0–5 year age group were significantly at odds of being malnourished. Similar work was also performed by (Shakir Ullah et al 2023). Conducted a study in which out of 1500 school-going students 600(40%) were found positive and 900(60%) were found normal according to age. Gender-wise analysis shows that in male students 210(35%) were found positive for stunting and 150 (25%) male students were underweight. In overall female students, 135(22.5%) were found stunting and 105 (17.5%) were found underweight. According to age group wise between 4 to 10 years 90 (10%) female students were found stunting and 60(6.6%) were found underweight. While in the age of 11 to 15 years 48 (5.3%) students were stunted and 42 (4.6%) students were underweighted. The difference in stunted and underweight showed more boys than girls. In the pre-nursery group, more boys were stunted than girls, the ratio being 70%:30%, on the contrary, underweight was more in boys than in girls, with a ratio of 57%:43%. In the Primary section, both stunting and underweight were more in boys as compared to girls. The ratios were 54.8%:45.2% and 82.9%:17% respectively.

Age-wise nutritional status in males shows that the high prevalence rates were found between 4-7 years of children. Nutritional anemia 24 (4.8%) led by Malnutrition 20 (4%) less prevalence was seen in Underweight 10 (2%) Stunting 10 (2%) while some prevalence was seen for wasting 4 (0.8%). Between the age group 8-11 the prevalence ratio was nutritional anemia 20 (4%) led by Malnutrition 16 (3.2%) less prevalence was seen in Underweight 6 (1.2%) Stunting 4 (0.8%) while no prevalence was seen for wasting. Also, high prevalence was seen in nutritional anemia and malnutrition 16 (3.2%), 14 (2.8%) very low prevalence

RECOMMENDATION

There was a very high prevalence of anemia, underweight, stunting and wasting among male than in female children. The results of the present study will be useful for policy makers in their struggle to formulate various developmental and health care programs. Nutritional intervention is also necessary to upgrade the nutritional status among the children.

The results should be presented logically in the results section, highlighting critical information presented in tables and figures. The discussion section should highlight the significance of the findings in relation to the issues and theories raised in the introduction and set the new data in the perspective of previous pertinent r¹ Tables may have a footer.

CONCLUSION

The findings of the study revealed that slightly above one third (30%) school going of the local area of Peshawar were thin, underweight and malnourished. Being male, were more effected than female students. Based on the finding; there must be collaboration among health sectors and education sectors of the city to address under nutrition problems of the city. As an intervention the scoters could do school based nutrition education and awareness must be conducted.

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