Prevalence of Various Nutritional Deficiencies in School Going Children of District Malakand Pakistan

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ABSTRACT

The aims of the study are to explore the Prevalence of various Nutritional Deficiencies in School Children of Malakand; Pakistan of aged 4 to 15 years, An Institutional based cross-sectional study design was used. In the current research work, a total of 250 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 at 30(12%), led by malnutrition at 25(10%), moderate prevalence was shown by underweight 10(4%) and stunting 8(3.2%) prevalence rate. while very low frequency was shows by wasting(2(0.8%) respectively. Out of 250 children, the number of males was slightly higher than females. Nutritional Anemia and malnutrition were observed in the school-going children respectively. The prevalence of nutritional Anemia among school-going children varied with age. Children of the lower age group had a significantly higher prevalence of nutritional Anemia compared with the higher age group. Although the prevalence of nutritional anemia was higher in both age groups and sexes, Nutritional Anemia prevalence was significantly higher among school-going children. The findings of our study reveal that the lower ages of both genders 1/3rd of children were found anemic, maltreated, and underweight. So the parents, doctors, and government should focus on the nutritional status of the children.

INTRODUCTION

Variety of poor outcomes including growth retardation, historically, the science of nutrition developed in and development of psychosocial difficulties. Water low 1995 of disease entities brought about reported that etiology of linear growth retardation is by inadequate diet (**Sireesha & Rajani, 2015**).Nutritional status is the condition of multi-factorial but has been explained by three major health of an individual as influenced by nutrient intake factors: poor nutrition, high levels of infection and utilization in the body (**De Onis, M. 2017**).

In developing world, approximately nutrients in preparation for rapid growth of adolescence 146 million children are underweight[3].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. 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 (Arlappa et al 2010). 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 me managers (**Batool et al 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 (**Eze et al 2017**)

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 (**Fazili 2012**).To assess the nutritional status of 7-10 year old Anthropometric. 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 thin-built. 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 (**Karak 2018**).

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 (**Kovalskys, 2013**)

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 18classesper week. The study indicated that 61.3% had teaching experience more than 10years 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 (**Ullah et al 2023**).The prevalence of anaemia and undernutrition are each associated with significant morbidity and mortality, with higher rates among children, particularly in sub-Saharan Africa (**Shah et al 2024**).

OBJECTIVE
➢ To find out the Incidence of Various Nutritional Deficiencies in School Going Children of Malak and Pakistan.
➢ To explore gender wise the nutritional status of school going children.
➢ To explore age wise prevalence of the nutritional status of school going children.
➢ To find out nutritional Anemia, Stunting and Underweight school-going children.

METHODOLOGY

This observational, cross sectional study was conducted in District Malakand from January 2024 to October 2024. 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 collected.

The School Health Program was carried out on regular basis. For the purpose of the present paper, the survey was findings from schools surveyed from January 2024 to October 2024was included. The age of the children was determined using school records. In the schools nutritional status of children were assessed as follows: Weight: Measured using a floor type weighing scale with due respect to the standardization of the 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

Study Area and Period
The study was conducted in Malakand, which is located Khyber Pakhtunkhwa.
Study Design
Institutional based cross-sectional study designs 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 250 children between the ages of 4-15 years were studied. A systematic random sampling technique was applied for sample collection.
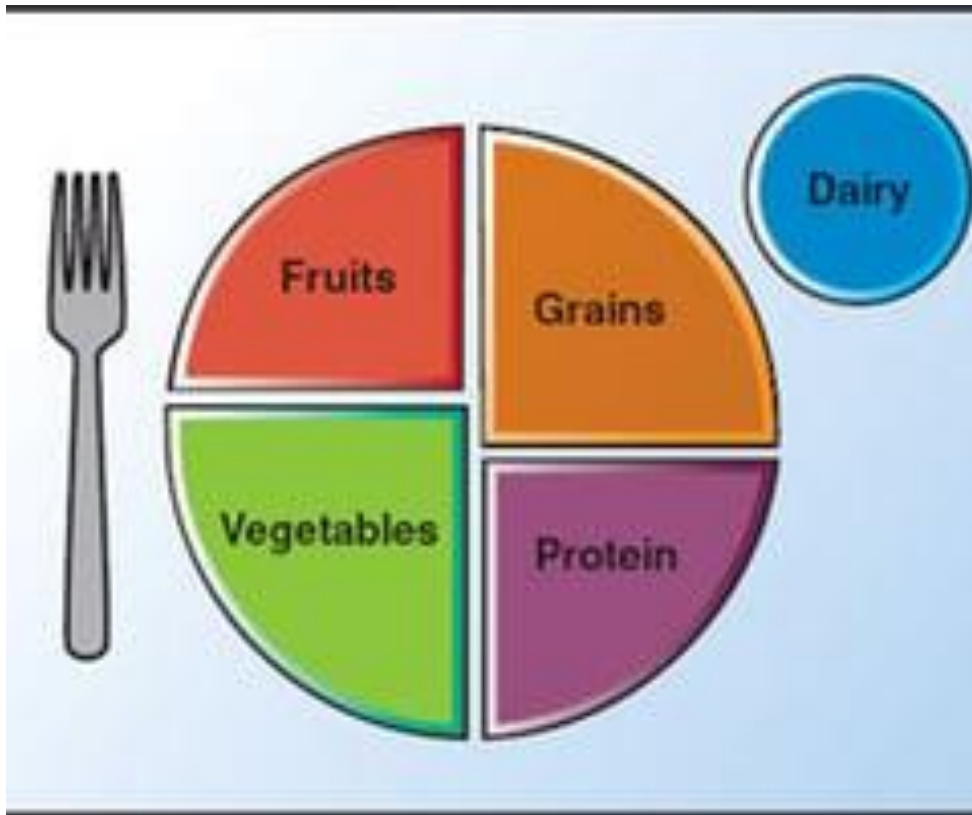**ANALYSIS & INTERPRETATION**
▸ **Analysis and Interpretation of data**
Data will analyze and interpret by using M word, Origin 16 and Excel. Frequency and Percentage were calculated for all quantitative variables.
5. ETHICAL CONSIDERATION
• The subjects were briefed about the study.
• Consent was taken from the subjects after explaining the purpose of study for the collection of data.

Prevalence of Various Nutritional Deficiencies in School Going Children of District Malakand Pakistan

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

| FOOD FREQUENCY QUESTIONNAIRE FOR   INCIDENCE OF VARIOUS NUTRITIONAL DEFICIENCIES IN SCHOOL GOING CHILDREN OF MALAKAND PAKISTAN |

| FOOD FREQUENCY QUESTIONNAIRE (FFQ) |

| Code | |

MEAL TIMINGS

Do You Take	Always	Sometimes	Rarely	Never
Pre-Breakfast				
Breakfast				
Brunch				
Lunch				
Tea time				
Dinner				
Post Dinner				

FOOD RESPONSE AND REACTIONS

Cravings	Aversions	Unsuitability

WATER INTAKE (1Glass=250ml)

The Eat-Well Plate

RESULTS

In the current research work a total of 250 samples were isolated from school-going children. The samples collected from male and females students of age 4-15 years. Among the all samples nutritional anemia was found more frequent 30(12%), leading by malnutrition 25(10%), moderate prevalence were shows by underweight 10(4%) and stunting 8(3.2%) prevalence rate. while very low frequency was shows by wasting(2(0.8%) respectively. Out of 250 children the number of male was slightly higher than females. Nutritional Anemia, underweight and malnutrition were observed in the school chldren respectively Table 1.Although the prevalence of stunting and wasting were very low in both gender in "Table 1".

Table.1 Over all nutritional status of school going children

S.no	Nutritional status	Prevalence	Percentage
1	Anemia	30	12%
2	Malnutrition	25	10%
3	Underweight	10	4%
4	Stunting	8	3.2%
5	Wasting	2	0.8%

More males were anemic 16 (6.4%), malnourished 14 (5.6%), underweight 6 (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%) respectively. The difference in prevalence of underweight among the sexes was significant with the males having a higher prevalence. "Table 2"

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Table.2 Gender wise nutritional status of school going children

S.no	Nutritional status	Male	Female
1	Anemia	16 (6.4%)	14 (5.6%)
2	Malnutrition	14 (5.6%)	11 (4.4%)
3	Underweight	6 (2.4)	4 (1.6)
4	Stunting	4 (1.6%)	4 (1.6%)
5	Wasting	2 (0.8%)	0 (0%)

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	12 (4.8%)	10 (4%)	5 (2%)	5 (2%)	2 (0.8)
8-11	10 (4%)	8 (3.2%)	3 (1.2%)	2 (0.8%)	0 (0%)
12-15	8 (3.2%)	7 (2.8%)	2 (0.8%)	1 (0.4%)	0 (0%)

Males' age-wise nutritional status reveals that the highest incidence rates were observed in youngsters aged 4 to 7. 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.4

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

Ages	Anemia	Malnutrition	Underweight	Stunting	Wasting
4-7	8 (3.2%)	6 (2.4%)	4 (1.6%)	2 (0.8%)	2 (0.8%)
8-11	5 (2%)	4 (1.6%)	2 (0.8%)	2 (0.8)	0 (0%)
12-15	3 (1.2%)	4 (1.6%)	2 (0.8%)	0 (0%)	0 (0%)

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	7 (2.8%)	5 (2%)	2 (0.8%)	3 (1.2%)	0 (0%)
8-11	5 (2%)	4 (1.6%)	2 (0.8%)	1 (0.4%)	0 (0%)
12-15	2 (0.8%)	2 (0.8%)	2 (0.8%)	0 (05)	0 (0%)

DISCUSSION

the current research work, a total of 250 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 30(12%), led by malnutrition at 25(10%), moderate prevalence was shown by underweight 10(4%), and stunting at 8(3.2%) prevalence rate. while very low frequency was shows by wasting(2(0.8%) respectively. Out of 250 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 (**Shah et al 2024**) 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%). Stunting was the most frequent (n=219, 38.3%) followed by wasting 163 (28.51%) and underweight 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 16 (6.4%), malnourished 14 (5.6%), underweight 6 (2.4%), stunted 4 (1.6%) when compared with females anemia 14 (5.6%), malnutrition 11 (4.4%), underweight 4 (1.6), stunting 4 (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 2024**). 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 12 (4.8%) led by Malnutrition 10 (4%) less prevalence was 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 was nutritional anemia 10 (4%) led by Malnutrition 8 (3.2%) less prevalence was seen in Underweight 3 (1.2%) Stunting 2 (0.8%) while no prevalence was seen for wasting. Also, high prevalence was seen in nutritional anemia and malnutrition 8 (3.2%), 7 (2.8%) very low prevalence rates were seen between the 12-15 age group in underweight, Stunting, and wasting. While a study also conducted by (**Yaser et al 2024**). The mean age of the sample was 9.38±4.14 with the maximum number of children (49.1%) in the age bracket of 5-9. Out of 1710 children, 54.4% had normal weight for age, 25.3% were underweight, and 7.5% overweight and 12.8% were found to be obese. Stunting was found to be 26%. The prevalence of being underweight was higher than overweight /obesity, particularly in younger and higher age groups as indicated by a p-value of 0.000. Compared with females, male students had a significantly higher frequency of being underweight and stunted as reflected by p-values of 0.004 and 0.000 respectively.

CONCLUSION

The findings of the study revealed that slightly above one third (37.8%) school going children of Malakand were thin, anemic, overweight and obese respectively. The finding of our study revel that the lower aged of both gender were 1/3rd of children were found anemic, malnutrated and underweight. So the parents, doctors and government should focus on the nutritional status of the children.

RECOMMENDATION

On the bases of the aims of the study the Incidence of various Nutritional Deficiencies in School Going Children of Malakand Pakistan of aged 4 to 15 years, The results of the present study will be useful to make specific policies to over less this nutritional problem of school-going children, So the parents, doctors and government should focus on the nutritional status of the children in their various developmental and health care programs.

Considerations

All the authors, Head of the schools and Head of the department of the Hospital were informed about the study **Ethical** aims and that the data collected would be used only for the research purposes.
The study materials are available from the corresponding author upon request.

Competing Interests

The authors declare that they have no competing interests.

Availability of Data and Materials

The study materials are available from the corresponding author upon request.

Authors' Contributions

All authors equally contributed in the designing, experiments and wrote the manuscript. All authors read and approved the final manuscript.

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