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ORIGINAL ARTICLE

Nutrtional Status and its Correlation with Academic Performance of School Going Children

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ABSTRACT

Introduction: The nutritional status of the children is satisfactory in Asian countries like Pakistan however the prevalence of malnutrition is observed to decrease because of the various health programs at national and international level in order to improve the health status of growing children. The aim of this study was to assess the prevalence nutritional status and correlation between nutritional status of students and their academic performance of school going children in Timergara.

Methodology: This cross sectional study was conducted by administering and filling the questionnaire from 400 children, 200 from private and 200 from public sector schools of ages 6 to 11 years in different public and private sector schools of tehsil Timergara Lower Dir, KPK. Nutritional status of children was calculated by anthropometric method and compared with WHO growth chart. Academic performance was calculated from the percentage of the marks obtained in the last annual exam. Data analysis was done using IBM SPSS 24.0.

Results: The prevalence of male gender were 61% and female gender were 39%. The prevalence of stunting, underweight, thin and Overweight+Obese were25.0 %, 17.0%, 7.5 % and 5.0% correspondingly. The low level of educational performance was significantly higher among the stunted (60.0%), underweight (38.2%), thin (33.3%) and Overweight+Obese (10.0%)children than that of the normal children.The low level of educational performance was significantly higher ($p < 0.05$) among the stunted, underweight and wasted children than that of the normal children.

Conclusion: The nutritional status of school going children of Lower Dir, KPK was satisfactory however emphasis on the awareness regarding nutrition must be given.

Keywords: Private, Public, School going children, Nutritional status

INTRODUCTION

Nutrition is the process of obtaining the balanced diet essential for health and growth. It plays an important role in human health and its growth. An individual's nutritional status is the outcome of many inter-related factors and it is influenced by qualitative and quantitative food intake and physical activity(1).Nutrition of the living things can be referred as all the processes generally the sum of all those processes which are implicated for the intake as well as the food nutrients utilization and the substances taken as a food by living organisms. The processes involved in food taking includes the process of ingestion, process of digestion, mechanism of absorption of taken food, transport of the food ingredients and the metabolism of all the nutrients which the food contain.[1] Balanced and adequate nutrients are essential for the normal growth of human beings and for the proper functioning of the body organs but the amount of food and nutrients in the early childhood of the children plays a key and fundamental role in the development and the growth of the potential, strength and functioning of all vital processes for a child. It has been observed by various studies on the nutrition status of children that the duration after the birth of a child to the age of the two years is known as the "critical window" for the children in order to ensures the proper endorsement and maintenance of the best possible health, growth, potential and the chances of survival of healthy children.[2] In order to maintain a good health the healthy diet and food is necessary to be taken in the required amount. In taking of the good and healthy food is significant to keep the status of good health. The children and fetus that are soundly and carefully fed after the birth to the span of two years early in the childhood life are observed to have the great and significant probability of living a healthy life during the rest of the childhood life. Only mother milk is considered and recognized as the ideal nutrient in the life of a child during the six months after the birth. As the mother milk contains all the essential and vital nutrients which are necessary and required for the normalgrowth and health of child. Additionally this milk contains various immune factors which are involved in the protection of children from various common infections in the childhood.[3] The children with good health and good nourishment can perform his/her all the activities efficiently like that child can perform better in the playing and learning activities in school, also can grow and develop into the healthy adults later on which leads to the better and healthy state of life for the children. According to the studies the children which are unable to have the enough and balanced diet or the accurate food items to eat are at the risk of becoming malnourished easily. The issue of malnutrition also accounts for 146 million infants and children are at the scale of underweight and also are at the amplified risk of the early childhood deaths, physical and mental disabilities and illness as well as underachievement in the life. According to the statistics of UNICEF reports on the malnutrition of the children in less and under developed countries mostly the third world countries the in the 42% out of all the children are observed to be underdeveloped while the underweight children accounts for approximately 36% of the population because of the poor or/and under nutrition.[3,4] WHO known as The World Health Organization defines the term malnutrition as "the failure or the malfunction of the body cells and tissues to function properly and to perform their functions like physical etc because of the incapability of the cells to obtain and utilize the nutrients and energy in the required amount and proportion, merge and not at the required time.[5] The definition of the malnutrition can also be demonstrated as "the failing or the poor health condition that occur due to the extensive status of the imperfect nutrition which probably fails to meet the exceeding and required needs of the body in terms of nutrition. This explanation also refers to the inappropriateness and the poor status of taking healthy diet and food. Moreover,[6-8] Whitney also defined the malnutrition as "The resulting effects due to the deficiency of any of the essential nutrient which includes proteins, carbohydrates, fats, energy, vitamins and any other micronutrients or minerals." Operationally the term malnutrition can also be distinctly defined as the deficiency of the essential and vital nutrients in the body or the failure of the body tissue regarding the use of the available diet nutrients present in the foods to its best to get the required advantages from the ingested food.[9] The undesirable effects implemented by the malnutrition results in the defects in the physical growth of the body , mortality, morbidity, cognitive growth and development, defects in the reproduction and defective capacity in the physical work performance and results in the consequent effects on the overall performance of human health and the survival of the wellbeing. A child which is well- nourished and healthy has the height and weight measurements which are compared greatly with the normal standard distribution criteria of

weight and heights of the children who are healthy belonging to the same gender and age group.[10]

Stunting is defined as “a low height-for-age children and it shows the past (chronic) under-nutrition of the child. Children with z-scores <-2.00 are said to be stunted and those with <-3.00 are severely stunted” “Low anthropometric values are those less than -2 SD) .[11-13] Thinness is measured with “BMI for age. BMI-for-age is z-score between 2 and -3” which mean<- 2SD is thinness, while severe thinness is z scores less than -3 which mean <-3SD (17). According to WHO guidelines the Z score for age is classified as <-3 as severe malnutrition, >-3 and<-2 as moderate malnutrition, >-2 and<-1 as mild malnutrition, >-1 and <Z<+1 as normal weight and +1<Z as overweight (18). The MDG 4 known as Millennium Development Goal 4 is intended for ensuring the survival of child and in decrease in the issues of children malnutrition which are of school going age targeted to at least reduce the mortality among one third to the two third of the children by year 2015 with particular consideration to the children with school going ages (UNICEF).[14-15] The malnourished children are highly vulnerable to the risks of various life threatening conditions of diseases like malaria, diarrhea, pneumonia and other microbial infections. The major complications observed in the children who are suffering from malnutrition includesConvulsions, Anemia, Rickets, Poor mental development, Cognitive growth, Poor physical development, Stunting, Infectious diseases, Respiratory tract infections, Kwashiorkor, Gastroenteritis and Diarrhea.There is not much information on the malnutrition of children in Pakistan so this research study was designed in such a way that it will be proved helpful in the assessment of the nutritional status of school going children and the major factors associated with the causes of malnutrition and its risk factors.

METHODOLOGY

This cross sectional study was conducted by administering and filling the questionnaire from 400 children, 200 from private and 200 from public sector schools of ages 6 to 11 years in different public and private sector schools of tehsil Timergara Lower Dir, KPK. Nutritional status of children was calculated by anthropometric method and compared with WHO growth chart. The sample size was estimated using the formula, $n = z^2pq/d^2$.Sample size was 400 based on 50% prevalence, 95 % confidence interval and 5 % precision. 200 students were selected from public and private schools. Multistage Probability sampling technique was used for data collection there are SIX union councils in Tehsil Timergara. Two union councils were selected by simple random method. These were Timergara and Khungi.All School going children of age 6 - 11 years and those students whose parents/guardians/teachers had given consent were included in the study. All the Children with history of chronic diseases and those students whose parents/guardians/teachers had not given consent were excluded from the study

The study variables were demographic variables, socioeconomic variables and anthropometric variables like height, weight, body mass index.

Data was collected by using data collection tool i.e. questionnaire to collect data from 400 school children (200 each from public & private schools). Ten local persons were recruited for data collection through questionnaire (five for each union council) after training them regarding the understanding of questionnaire and approaching school children and data collection.

The collected data was analyzed using IBM SPSS 20.0. Weight, Height and BMI for age was calculated and evaluated according to WHO growth charts. Descriptive data were presented as frequency and percentage. Correlation was done between academic performance and nutritional status.

RESULTS

The results obtained after the analysis are given below. The distribution of the children population of the study on the basis of gender is given below in table and figure 1. Table 2 shows the distribution of the children population of the study on the basis of on the basis of Height for age. Table 3 shows distribution of gender on the basis of Height for age.Distribution on the basis of weight for age and distribution of gender on the basis of weight for age is shown in table 4 and 5 respectively.The analysis on the basis of BMI and on the basis of gender is shown in table 6 and 7. Distribution on the basis of malnutrition and distribution on the basis of academic performance is shown in table 8 and 9 respectively. And distribution of Malnutrition patients on the basis of Academic performance is shown in table 10.

Table 1: Distribution of children on the basis of Gender (n=400)

Variable	Frequency	Percent
Gender		
Boys	244	61.0
Girls	156	39.0
Total	400	100

Table 2: Distribution on the basis of Height for age(n=400)

Variable	Frequency	Percent
Normal	300	75.0
Stunted	100	25.0
total	400	100

Table 3: Gender based Height for age distribution(n=400)

Variable	Frequency	Percent
Male		
Normal	182	74.6
Stunted	62	25.4
Total	244	100
Female		
Normal	118	75.6
Stunted	38	24.4
Total	156	100

Table 4: Distribution on the basis of weight for age(n=400)

Variable	Frequency	Percent
Underweight	68	17.0
Normal	312	78.0
Overweight+ Obese	20	5.0
Total	400	100

Table5: Distribution of gender on the basis of Weight for age(n=400)

Variable	Frequency	Percent
Male		
Underweight	44	18.0
Normal	194 6	79.5 2.5
Overweight+Obese	244	100.0
Total		
Female		
Underweight	24	15.4
Normal	118	75.6
Overweight+Obese	14 156	9.0 100.0
Total		

Table 6: Distribution on the basis ofBMI(n=400)

Variable	Frequency	Percent
Underweight	30	7.5
Normal	350	87.5
Overweight	12	3.0
Obese	8	2.0
Total	400	100.0

Table7: Distribution of gender on the basis ofBMI(n=400)

Variable	Frequency	Percent
Male		
Underweight	24	9.8
Normal	214	87.7
Overweight	2	.8
Obese	4	1.6
Total	244	100.0

Female		
Underweight	6	3.8
Normal	136	87.2
Overweight	10	6.4
Obese	4	2.6
Total	156	100.0

Table 8: Distribution on the basis ofMalnutrition.

Variable	Frequency	Percent
Stunted	100	25.0
Underweight	68	17.0
Thin	30	7.5
Overweight+Obese	20	5.0

Table 9: Distribution on the basis ofAcademic performance.

Variable	Frequency	Percent
Below	113	28.3
Average	120	30.0
Good	167	41.8
Total	400	100.0

Table 10: Distribution of Nutritional status on the basis ofAcademic performance(n=400)

Variable	Frequency	Percent
Stunted		
Below	60	60.0
Average	25	25.0
Good	15	15.0
Total	100	100.0
Under weight		
Below	26	38.2
Average	23	33.8
Good	19 68	27.9 100.0
Total		
Thin		
Below	10	33.3
Average	14	46.7
Good	6 30	20.0 100.0
Total		
Overweight+obese		
Below	2	10.0
Average	6	30.0
Good	12	60.0
Total	20	100.0
Normal		
Below	15	8.2
Average	52	28.6
Good	115 182	63.2 100.0
Total		

Table 11: Distribution on the basis of school(n=400)

Variable	Frequency	Percent
Public school	200	50.0
Private school total	200 400	50.0 100

Table 12: Gender wise distribution on the basisof school (n=400)

Variable	Frequency	Percent
Male		
Public school	120	47.2
Private school	134	52.8
Total	254	100.0
Female		
Public school	80	54.8
Private school	66	45.2
Total	146	100.0

Table 13: Correlation of nutritional status with academic performance

Variable	R Value	P Value
Academic performance	0.121	.015

DISCUSSION

Pakistan is considered as the under developed country and there is observed a high rate of malnutrition among children in comparison to the other modern world nations. The children malnutrition is critical because of the large children population is suffering from the problem of malnourishment.[16] The national disease burden also increased due to this malnutrition which leads to high rates of in mortality. According to statistics 20% of the under developed countries have the issues of malnutrition, and a 50% of the children die because of malnutrition globally. The health services and education provided in the schools can play a major role in the awareness and development of the child by providing comprehensive knowledge regarding health as well as the wellbeing of the child in the preliminary stages of life in schools. The education and the health are greatly interlinked with each other because the health can be attained at its best during school years of children. Education of the health should be given more importance because the prevention of health issues is better than cure. [17]The assessment of malnutrition in children is significant due to the fact that it is common issue among children. The aim of this study was to determine the relationship between nutritional status and academic performance among primary school going children. This research study was conducted on 400 students belonging to the age of 6 years to 11 years.Out of which, the students belonging to the age of 6 years were 30 (7.5%), 7 years students were 46 (11.5%), 8 years students were 60 (15), 9 years were 85 (21.25), the students of 10 years account for 63 (15.75) and the 11 years students were 116 (29.0%) respectively. The distribution of the children population of the study on the basis of gender is given below in table 1.Out of 400 children, 156 (39.0 %) students were girls and 244(61.0%) were boys. This finding was comparable with a study done by Biachew Asmare in Debre Markos town primary school(91).In this study, the prevalence of stunting, underweight and thin were 25.0%, 17.0%, and 7.5% respectively. Like our study the same finding was described in a study in Zambia reported that 28.9% of Stunted, 14.5% of underweight and 3. 9% of thin [18] Our study findings were also parallel with the study conducted by Zaida Herrador et al. in Amhara State, Ethiopia and also in parallel line with other developed countries observed data.[19] For proper growth and development adequate amount and balanced diet must be used. The stunting and thinness are the main anthropometric indicators that define malnutrition, as in our study we also focus on stunting and thinness. Stunting is defined as “a low height-forage children and it shows the past (chronic) under-nutrition of the child. Children with z-scores <2.00 are said to be stunted and those with <-3.00 are severely stunted” “Low anthropometric values are those less than -2 SD).[20] In our study the distribution of gender on the basis of Height for age was done and shows that as compared to female, the male ratio was high in regard of stunting. Mostly the probability of a child being malnourished increases with age.BMIis an index of weight-for-height normally used to categorize thinness, overweight and obesity. We analyzed our study data on the basis of BMI and concluded that only minor percent people fall in the overweight and obese category and about 17.0 percent fall in the underweight category, in which mostly male gender fall in the underweight category. And 7.5 percent in thin category. The study was conducted Hasan in order to assess the nutritional status of the school going children with age range of 5years to 14 year. He found that approximately 58.2% of the study population of children was underweight and 40.4% were stunting.[21] The result of present study showed much less underweight and stunting children which is good thing to observe. A study conducted by Ruchika reported 25% prevalence of underweight and stunting account for 17.3% in 7 years to10 years old children of Allahabad. A study conducted on Kashmir by Anjum on the age groups of 5years to 14 year reported only thepercentage of underweight children to be11.1% and only 9.25% stunting (96). The results of this study support the results of our study.[21]

CONCLUSION AND RECOMMENDATION:

It was concluded from my study that nutritional status of school going children has a strong influence on their academic performance. Those students who were stunted, underweight and low BMI were having low academic performance.The government should pay attention to implement nutrition screening program and intervention strategy to improve academic performance at primary school children.

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