

Health Screening of Primary School Children-A Case Study of district Sargodha-Pakistan

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Abstract

The main objective of the study was to carry out health screening (general medical check up) of primary school children in district Sargodha and to make assessment regarding prevalence of health problems. All school children of one union council in tehsile Bhalwal were examined. A total of 1185 students enrolled in 16 schools of union council No.15/SB, were examined for their age, height, weight, dental carries, skin disease, visual defects and physical deformities. The age group of children ranged mainly from 5-14 years. The Protein energy, malnutrition of children was assessed from weight and height using Jelliffe's classification on the basis of their weight as percentage of standard weight. From this study, it revealed that the common health problems in primary school children are protein energy malnutrition. Out of 1185 students about 53.59 % were of normal nutritional status. The remaining 46.41 % school children were suffering from various degrees of malnutrition. It was further revealed that in 3.88 percent children malnutrition was of severe type (4th degree) and 8.35 % children were suffering from 3rd degree of malnutrition. The marginal cases in 1st and 2nd degree of mal-nutrition were 15.78 % and 18.4% respectively. The height for age was converted into percentage of standard height. It was observed that heights were not significantly affected by malnutrition because 68.61 % of the total 1185 children were above 90% of the standard height. Prevalence of dental caries in school children was 22.70 % which reflects poor oro-dental hygiene. It was revealed during the survey that scabies were common in primary school children. The second common skin disease was multiple boils which is result of bacterial infection. Visual defects were not common because

only 4.38% children had myopia which needs refraction. Physical deformities were also not common in school children. Only 0.425% children had deformity which was result of post polio paralysis. No child was found to be suffering from other type of physical deformities.

Key words: Malnutrition, Dental Carries, Prevalence, Deformities, Visual Defects.

Introduction

There are many health problems in school children in developing countries like Pakistan. Little attention is paid to this important issue. Following are the common health issues of primary school children.

1. Nutritional deficiencies;
2. Dental carries;
3. Skin Diseases;
4. Visual defect; and
5. Physical deformities;

Nutritional deficiencies are of three types; protein, energy and malnutrition (PEM), Vitamin deficiencies, mineral and trace element deficiencies (Ilias and Ansari 1988). Nutritional deficiency is a serious problem in the developing countries like Pakistan. Protein energy malnutrition (P.E.M.) is a known clinical condition, the primary cause of which is an inadequate in-take of protein and energy for considerable period of time. On one end there is marasmus, extreme of energy (calories) deficiency and on the other end is kwashiorkor, extreme protein deficiency. Both conditions are common under two years of age. Primary school children (5-14 ages) are in active growth period. If protein and energy deficiency hits this critical period of active growth, there is failure to gain weight.

Fifteen percentile of weight of Pakistani infants belonging to different socio-economic strata have been reported to remain below the 25th percentile of Harvard standard (Nagra et-al 1984). According to National Nutritional Survey 59.5% Pakistani pre-school children are suffering from malnutrition and only 40.5% of them are above the 90% standard weight for their age (Gop, 1978).

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A study was conducted by UNESCO which revealed that in developing countries malnutrition affecting the infants and young children is amongst the principal public health problems. Among all the indicators used to assess the child's growth and development, body weight is the most important and sensitive parameter. Variations in weight are rapid and significant, particularly categories, energy protein under nutrition was significantly more in girls and boys. In both sexes, the mortality rate increased linearly as weight for age decreased; it was also significantly higher in the girls below 60 % of standard. The difference in nutritional state due to family size and the family's socio-economic status was highly significant, particularly during early childhood and yield a variety of information regarding the child's health and nutrition especially when repeatedly measured over a period of time (UNESCO, 1976).

The Gomez classification of protein energy malnutrition based on weight for age is one of the earliest. In this system 1st, 2nd, 3rd, degree malnutrition were defined as 76 to 90, 61 to 75 and 60 percent or less, respectively, of expected weight for age using fiftieth percentile of the Boston Standard as reference. This classification has been widely used in assessing nutritional status in communities but is less applicable for classifying the severe forms of P.E.M; D.B. Jelliffe modified this system by defining four groups at intervals of ten percent body weight deficit (Alleyn et al, 1978).

Underwood et al. (1967) evaluated the nutritional status, as measured by height and weight, in a sample of 2096 Pakistanies, randomly selected from a combined rural and urban population of 12, 393. The results were tabulated and grouped according to age and socio-economic status. Heights and weights of boys from 1 to 18 years old showed growth pattern which approximated 3rd percentile low standards and weight for Height at a given age was behind that of average low children by 6 to 24 months. Heights and weights were lower in the most under privileged socio-economic groups.

Rahman (1968) revealed, from a study of height and weight of children up to 4 years in East and West Pakistan, that the rate of growth was all right up to 8 to 9 months and was comparable to the normal of North European children but thereafter the rate of growth of our children remained far below this normal (East Pakistan, now called Bangla Desh). The average weight of 2 years boy was 9.4 kilos and 7.0 kilos in West and East Pakistan, respectively while his North European counter part's weight was 12.4 kilos.

Fisher and Davison (1970) estimated heights and weights for 100 boys aged from 7.5 to 16.5 years,

from families in all age groups in Zambia. Each measurement was plotted against age and standard curves were drawn and compared with world standard curves. The Curves for Zambian boys were always below the standard curves. The findings were attributed to the poor quality of the Zambian diet. Hussain (1970) concluded that Pakistani children 5-18 years of age were not only shorter but also lighter than the European children of the same age groups. Jami (1972) reported the boys in Sargodha Division to be superior to East Pakistani (East Pakistan now called Bangla Desh) counterparts both in height and weight but fairly behind the North Europeans.

A survey was conducted by Ahmed (1976) to assess the nutritional status of infants and preschool children in Faisalabad. The weights were found to be below the 3rd percentile from birth up to 18 months. It crossed the 3rd percentile and ran above it up to 36 months. In the rest of the period it ran parallel above the 10th percentile. It was concluded that height and weight were sufficient for assessing growth and development.

Iftikhar (1985), in the Nutritional survey total of 476 children of the school were weighed and classified according to Jelliffe's classification on the basis of their weight as percentage of standard weight. The age distribution in the school was mainly from 6 years to 13 years. Only 16.81 % of total 476 children of school were of normal nutritional status. The rest of the population of the school was suffering from mal nutrition. In 4.2 % of cases the malnutrition was of severe type (4th degree) 20.59 % of cases were suffering from 3rd degree of malnutrition. The marginal cases in 2nd and 1st degree of malnutrition were 36.55 % and 21.85 % respectively.

National Nutrition Survey of Pakistan (1985-87) was conducted to indicate the extent, severity and location of malnutrition in the country. A total of 8360 randomly selected households; almost 60,000 individuals including 11,285 children under 5 years, 1,135 pregnant and 2, 949 lactating mothers were examined. Anthropometry, selected clinical signs and hemoglobin tests were conducted on all household members. The report summarizes that children under five years of age, 48% are mal-nourished (low weight-for-age); 10 % are seriously malnourished. 46% have chronic malnutrition (stunting; low height-for-age); 15 % have acute malnutrition (wasting; low weight-for- height); infants have a higher rate of acute malnutrition (20 %) 65 % are anemic (under 11 gm % hemoglobin); 27 % are severely anemic (under 9 gm %). About distribution of mal nutrition the report summarizes as follows: 1. Protein-calories malnutrition affects all areas of the country. 2. There is little difference in the prevalence of malnutrition between boys and girls. 3. There is less chronic but

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more acute malnutrition in the urban areas; this affects the children of lower socio-economic status more. 4 Malnutrition is most prevalent in Baluchistan, where only 27 % of children are normally nourished. In NWFP normal children are 31 % in Sindh 36 % and in Punjab, 49%. This paper is about the health screening of primary school children in which children were examined to know their height and weight and to compare with ideal weight as taken from the data of United States of National Center for Health Statistics (N.C.H.S) Moreover, the data was arranged according to Jelliff's classification for determining the mal-nutrition degrees.

The dental carries is the second major issues of primary school children and the teeth are affected in the early age. The visual defects also affect the study of school children. The sitting arrangements are inconvenient in majority of the schools in Pakistan which are the causes of physical deformities in early growth period of the children. This paper is about the diagnostic study of assessing the prevalence of major health issues in primary school children.

Materials and Methods

The health screening (general medical check up) study was undertaken on primary school children (5-14 years) to find out some of the nutritional deficiencies by measuring various anthropometric values and other health problems.

District Sargodha was selected from Punjab province. There are five tehsiles in district Sargodha. Keeping in view the type of the study, data availability, cost and times, kind of data analysis, resources available, and practical evidences, one tehsile (Bhalwal) out of five from district Sargodha was selected randomly. Fitzbiggon and Morris (1987) stated a simple principle or rule of thumb that "as the size of the population increases the sample size decreases". This principle was the basis of sample selecting procedure for this study. A list of all union councils was collected from the District Government Sargodha which was used as sampling frame for this study. One union council (union council # 15/SB) was selected again randomly as the universe of study. There are 16 schools (nine boys and seven girls) as per list provided by Education department in this union council, which are given in Table No. 1. Total population of this union council is 12653 persons. Total children population of 1185 children of all primary schools and primary sections in elementary and secondary schools in this union council was examined. Primary school children (both male and female) were selected because this is the period of active growth and any deficiency in nutrition particularly protein and energy is going to affect their

weight, height and content of fat in the body. Teeth were examined as well to know the prevalence of caries. Moreover, children were also examined for scabies, visual defects and physical deformities.

A panel discussion of the medical experts was arranged to finalize the parameters of the study. A team of experts comprising on medical specialist, pathologist, public health expert, eye specialist, the author (a sociologist) and paramedical staff after long debate agreed to delimit study up to examination of the children for:

1. Height of children in centimeters;
2. Weight of children in Kilograms;
3. Categories of nutrition;
4. Dental carries (No. of defective teeth-D.M.F);
5. Vision of children;
6. General skin diseases; and
7. Physical deformity in children due to inconvenient sitting arrangements.

A well designed questionnaire was prepared for recording the above variables. Height and weight are two very important measurement indicators of protein and energy deficiency. The obesity and oedema can distort the accuracy of the weight and height measurements. It is seldom possible to weigh people naked. Each child was weighed bare-footed in light clothes. Weight was recorded in kilo-grams by plat-form beam balance. Percentage of ideal body weight was calculated by using the following formula.

$$\% \text{ age of ideal weight} = \frac{\text{Actual weight}}{\text{Ideal Weight}} \times 100$$

The ideal weight was taken from the data of United States of National Center for Health Statistics (N.C.H.S). The heights were recorded in centimeters with height measuring stand. Children were made to stand on the plat form and height was recorded by moving the head lever from above down words and pressing it lightly on the head. Percentage of standard height was calculated by using the following formula. $\% \text{ age of standard} = \frac{\text{Actual Height}}{\text{Ideal Height}} \times 100$ The ideal height was taken from the data of United States, National Center for Health Statistics (N.C.H.S.).

Lot of consideration was given to record age. It was taken from school record. In all cases age was calculated from date of birth. Moreover, the children were categorized according to the degree of mal-nutrition. The data was arranged according to Jelliff's classification for determining the mal-nutrition (Alleyne et-al-1978). In this classification the children whose weight is above 90 % of the standard weight of their age are considered normal and the children below 90 % of the standard weight are divided into various degrees of mal-nutrition as

Table No. 1 list of schools

Sr. #	Name of School	No. of Students
1	Girls Elementary School Chak No.15/SB	176
2	Girls Elementary School Chak No.13/SB	118
3	Girls Elementary School Chak No.16/SB	121
4	Girls Primary School Chak No. 13/SB/A	31
5	Girls Primary School Chak No.14/SB Lokri	98
6	Girls Primary School Chak No.14/SB Pathanwala	26
7	Girls Primary School Chak No.14/SB Risala	19
8	Boys High School Chak No.15/SB.	112
9	Masjid Maktab Primary School Chak No.15/SB	44
10	Boys Elementary School Chak No.16/SB	133
11	Boys Primary School Chak No.13/SB	57
12	Boys Primary School Chak No.13 A/SB	44
13	Boys Primary School Haval Shahani	30
14	Boys Primary School Chak No.14/SB Lokri	105
15	Boys Primary School Chak No.14 A/SB Pathanwala	43
16	Boys Primary school Chak No.14/SB Risala	28
TOTAL		1185

reproduced below:

Weight of Children as Percentage of the Standard Weight	Degree of mal-nutrition
81 to 90	1 st
71 to 80	2 nd
61 to 70	3 rd
Less than 60	4 th

Teeth of all the children were examined by using torch as source of light. Number of total carious tooth was recorded. Teeth showing cavities visible by naked eye were counted. Then results were tabulated showing normal and carious tooth. The examination of skin was done by naked eye and torch was used where needed. The vision was tested by a simple method. A vision chart was hanged on the wall and students were made to stand at a distance of six meter. Physical deformities were detected by examining the children by stripping of their shirts. Whole body from head to foot was examined.

Results and Discussion

First, the descriptive analysis of all data collected from primary schools through health screening study like weight for age, prevalence of malnutrition in boys and girls, height for age, dental carries, and prevalence of skin diseases, visual defects and physical deformities is given. Second, simple frequencies were calculated from the data collected

from the field survey and comparison with standards weight and height, which were calculated in United States by National Centre for Health (NCHS), was made.

Weight for Age

The age of these children ranged from 5 to 14 years. The distribution of students showing normal and below normal nutritional status is shown in Table No. 2. Students whose body weight was above 90% of standard weight were taken normal. In this table 635 students (53.59 %) were found to be normal and 550 students (46.41 %) were below normal standard.

Prevalence of malnutrition according to Jelliffe's classification is shown in table No.3 According to this classification students whose body weight is above 90% of the standard weight are taken normal. The reference standard weight used for this purpose is taken from charts constructed in United States by National Centre for Health (NCHS). The students showing below normal body weight are divided into 1st, 2nd, 3rd and 4th category. First category is with body weight between 81-90%, second category is between 71-80%, 3rd category is between 61-70% and 4th category is below 60% of the standard weight.

Table No.3 shows that 635 students are of normal body weight, which makes 53.59% of the total population. About 218 students, which make 18.4 % of total, are in 1st category, 187(15.78%) are in 2nd category, 99(8.35 %) are in 3rd and only 46 (3.88%) are in 4th category.

Prevalence of malnutrition according to Jelliffe's classification among primary school boys and girls examined during the health screening study is shown

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in Table No. 4. Among total of 596 boys and 589 girls the various categories of malnutrition were calculated. Among normal students, 293 (49.16 %) were boys and 342 (58.06 %) were girls.

Similarly, in 1st degree students, 124 (20.81 %) were boys and 94(15.96%) were girls, in 2nd degree, 96 (16.11 %) were boys and 91(15.45 %) were girls, in 3rd degree, 54 (9.06 %) were boys and 45(7.64 %) were girls. In all categories, more boys were suffering from malnutrition than girls.

Height for Age

Height for age is summarized in Table No.5. Here again standard is taken from the chart constructed by National Centre for Health Statistics (NCHS) in United States. Out of 1185 students whose heights were recorded, 326 (27.51 %) are above 100% of the standard height and 487(41.10%) are above 90% of the standard height. It means that a total of 813 (68.61%) are above 90% of the standard height. The nutritional status has not significantly affected the heights of the children. Only 142 (11.98%) students are below standard height. Apparently low nutritional status must affect the heights but in these school children height for age is not grossly affected. Acute type of malnutrition affects the weight grossly but height attained remains near normal.

Assessment of Dental Caries

The dental carry is the second major issue of primary school children. The caries is usually due to poor orodental hygiene, and second most common disease of the teeth (M.A. Sufi 1990). Prevalence of caries in this age group was determined. According to WHO (1962) dental caries is defined as localized post eruptive, biological process of external origin involved softening of the hard tooth tissue and proceeding to forming a cavity in tooth. Whereas others defined it, dental carries is a disease if calcified tissues of the tooth caused by acids resulting by the action of micro-organism on carbohydrates; characterized by de-calcification of inorganic portion and accompanied by destruction of organic portion. Lesion is in outset portion of the teeth. Acids are derived from carbohydrates after the enzymes of microbial flora have acted them. These bacteria are aggravated in a plaque, which is formed by accumulation of the food debris, Mucoids of the saliva and the carbohydrates in the diet. The bacterial plaque is a major factor, which influences the disintegration of the teeth. It is also proved that deficiency of fluoride in the drinking water leads to dental caries where as high concentration of fluoride in the water leads to flourosis that is mottling of teeth (M. Ilias 1988).

Prevalence of dental caries in children is presented in Table No.6 as per study results. Out of total 1185

students examined, 916 (77.30%) students had normal teeth and remaining 269 (22.70%) students showed caries of teeth. It reflected poor orodental hygiene. It also shows that poor nutrition do not affect the teeth as far as dental caries is concerned.

Prevalence of Skin Diseases

Scabies is a contagious (catching) disorder of the skin case by very small, wingless insects of mites called the human itch mite or scabies itch mite *sarcoptes scabiei* var. *hominis* (hering) The female insects burrows into the skin where she lays 1-3 eggs daily. A very small, hard to see, zigzag blister usually marks the trial of the insects as she lays her eggs. Other more obvious symptoms are an intense itching (especially at night) and a red rash that can occur at the area that has been scratched. The most common locations for scabies are on the sides of fingers, on the back of hands, on the wrists, heels, Elbows, armpits inner thighs and around the waist (belt line). The disease spreads by close contact and children with poor personal hygiene. Large house hold size and over crowding encourages the spread of disease. In village base population it is a common skin problem. Prevalence of skin diseases is shown in Table No.7. In total 1185 children were examined, out of which 959 (80.93%) were normal, 43 (3.63%) were suffering from scabies and 183 (15.44 %) had multiple boils on their bodies. Both these condition are indicative of poor personal hygiene.

Prevalence of Visual Defects

The common visual defect in school children is myopic and hypermetropia. Children suffering from myopia cannot read while sitting on the backbenches that is why it was included in the present health screening study. Prevalence of visual defect is shown in table No.8. Out of 1185 students, 1133 (95.6%) had normal vision and only 52 (4.38%) had myopia which means that visual defect is not a major health problem in primary school children of this area.

Prevailing Physical Deformities

Physical deformities are of following type, which can be found in primary school children.

- Congenital like flat foot, telipes acqenovarous and congenital scoliosis.
- Acquired deformities are posttraumatic deformities, postural deformities, post polio and nutritional deformities like rickets.

The school children were also examined for physical deformities in this study. It reveals from Table No. 9 that out of 1185 students only 5 (0.42%) had deformity. All these 5 students had post polio paralysis of one or more limbs. However, congenital and others acquired deformities were not detected in school children.

TABLE 2. Number of Students Showing Normal and Below Normal Nutritional Status

Nutritional Status	Number of Students	Percentage
Normal	635	53.59
Below Normal	550	46.41
Total	1185	100.00

TABLE 3. Prevalence of Malnutrition According to Jelliffe's Classification

Degree of Malnutrition	Number of Student	Percentage
Normal	635	53.59
1 st	218	18.4
2 nd	187	15.78
3 rd	99	8.35
4 th	46	3.88

TABLE 4. Prevalence of Malnutrition in Boys and Girls

Degree of Malnutrition	Total Number of Students (Percentage)	
	Boys	Girls
Normal	293 (49.16%)	342 (58.06%)
1 st	124 (20.81%)	94 (15.96%)
2 nd	96 (49.16%)	91 (15.45%)
3 rd	54 (9.06%)	45 (7.64%)
4 th	29 (4.86%)	17 (2.89%)
Total	596 (100.00%)	589 (100.00%)

TABLE 5. Number of Students Falling In Various Percentage of Standard Height

Percentage of Student Height (CMS)	No. of Students	Percentage
More than 100	326	27.51
91 to 100	487	41.10
81 to 90	230	19.41
Less than 80	142	11.98
Total	1185	100.00

TABLE 6. Prevalence of Dental Caries in Primary School Children

Categories	No. of Students	Percentage
Normal	916	77.30
With Various Teeth	269	22.70
Total	1185	100.00

TABLE 7. Prevalence of Skin Diseases in Primary School Children

Categories of Skin Diseases	No. of Students	Percentage
Normal	959	80.93
Scabies Positive	43	3.63
Non-Specific boils	183	15.44
Total	1185	100.00

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TABLE 8. Prevalence of Visual Defects in Primary School Children

Categories	No. of Students	Percentage
Normal	1133	95.6
With Visual Defects	52	4.38
Total	1185	100.00

TABLE 9. Prevalence of Physical Deformity in Primary School Children

Categories	No. of Students	Percentage
Normal	1180	99.58
With Physical Deformity	5	0.42
Total	1185	100.00

Conclusions and Recommendations

- Nutrition Education Program in the rural area must be intensified. Mass Media may be used for this purpose.
- School health services should be extended to schools in rural areas. Mid-day lunch program comprising of protein-rich diet e.g. Egg and Milk must be started for primary school children.
- Children must be educated on orodental hygiene to prevent dental caries.
- For prevention of dental caries and skin diseases an awareness programme should be started in primary schools and lecture should be delivered on orodental hygiene and personal cleanliness.
- A programme for the provision of latrines and safe drinking water should be started in schools which will go a long way in the prevention of infectious diseases among children.
- School buildings should be improved as far as ventilation and cleanliness is concerned.
- A regular screening for visual defects should be done.
- School health services should be started for regular health screening and health cards for each student should be maintained.

References

- Ahmed, R. Nutritional status of infants and preschool children. M. Sc. Thesis, U.A, Faisalabad, 1976.
- Alleyne, G.A.O., R.W. hay., D.I. Picou., J.P. Stanfield and R.G. Whitehead. Protein-energy malnutrition. The English Language book society and Edward Arnold (Publishers) Ltd. London. 1978.
- Fisher, M. and W. Davison. Growth curves for some Zambian school children. J. Trop Paed No.16, 103-111, (Nut. Absts. Rev.41: 3276), 1970.
- Fitzgibbon, C. T., and Morris, L. Lyons How to Design a Programme Evaluation, Newbury Park, CA: Sage. 1987
- Government of Pakistan. Micro-nutrient survey of Pakistan (1976-77) Vol, Nutrition Cell Planning and Development Division, Govt. of Pakistan, Islamabad. PP.53-54. 1978
- Government of Pakistan. National Nutrition Survey Report, 1985-87. Nutrition Division National Institute of Health Government of Pakistan, 1988.
- Hussain, A. Nutrition Survey of West Pakistan. Directorate of the Nutrition Survey and Research Govt. of Pakistan. 1970
- Ifitkhar Ahmed Farooq. Some pathological Aspects of Nutritional anaemia. Thesis submitted in University of Agriculture, Faisalabad. 1985.
- Jami, M.S. Nutritional status of the population of Sargodha Division M.Sc. thesis, U.A., Faisalabad. 1972.
- Jelliffe, D. B. The assessment of the Nutritional Status of the Community WHO Geneva. 1966.
- Muhammad Ilias, M.A. Ansari, Ifitikhar Ahmed Khan, Ghulam Qadir Malik. Text book of community Medicines, 2nd Edition January, 1988.
- Nagra, S.A., A.H. Gilani, M.D. Ahmed and Ehsan-ul-haq. A Longitudinal study in body weight .of Pakistani Infants as influenced by socio-economic status. J. Trop. Paed. 1984. 30: 217-221.

Rahman, M.H. The present situation of children in Pakistan. Report of Cento Conference on combating Malnutrition in Preschool children, CENTO, P.80. 1968

Underwood, B.A; R. Repner, E. Cross, A.B .Mirza, K. Hayat, and A. Kallue. Weight, height and skin fold thickness data of rural and Urban populations of West Pakistan. Amer. J.Clin. Nutr. 1967. 20(7) 694-701.
UNESCO. The Child and his development from birth to six year's old (2nd) Paris. 1976.