Original article
Somatic Profile of North Kolkata school students

Palash Das[1], Mausumi Basu[2], Gautam Dhar[3], Ranabir Pal[4]

[1]Associate Professor, Associate Professor, Department of Community Medicine,
 Medical College, Kolkata, West Bengal

[2]Associate Professor, Department of Community Medicine, PGIMER and SSKM (PG) Hospital, Kolkata

[3]Associate Professor, Department of Community Medicine, NRS Medical College, Kolkata

[4]Professor, Department of Community Medicine, Sikkim Manipal Institute of Medical Sciences (SMIMS), Gangtok, Sikkim- 737 102

Correspondence to: Dr. Mausumi Basu, E-mail ID - basu.mausumi544@gmail.com

Abstract

Background: School students of North Kolkata have been investigated for their bio-physical characters to assess the present status of their health and nutrition with morbidity findings if any. **Objective**: The study was conducted to assess the health and nutritional status of school children in the age group of 12 -17 years and to find out their morbidity pattern.

Methods: Nine hundred and eighteen students of class VI to XII of one higher secondary school for boys of North Kolkata were selected through simple random sampling from the list of three schools of this area. It was a cross-sectional descriptive study. Pre-designed and pre-tested schedule was adopted to collect data through interview and medical examination. Height, weight, medical morbidities were the variables of the study. Simple mean and proportions were the statistical application in the study. **Results**: Nutritional deficiency disorders were found among the students of all standard of the school. Anemia and Vitamin B complex deficiency was found in 32.79% and 3.92% respectively in the study population. Height and weight of the students of all classes except XII (7.84%) was found below normal. Accordingly BMI was also found below normal (92.12%) except class XII. Among the students, problem of acuity of vision from 20 feet / 25 feet onwards in any or both of the eyes in the best corrected vision was found to be 24.62 percent.

Conclusions: The study revealed the poor health and nutritional status of school children including presence of anemia, vitamin deficiency, low BMI along with poor acuity of distant vision. This identified a student group for targeted services aiming at improvement of their overall health and nutritional status.

Key Words: Bio-physical characters, Health and Nutrition, North Kolkata

Introduction:

The health problems of a school child vary from place to place and several studies conducted in India revealed that the main morbidity conditions include infectious diseases, malnutrition, helminthiasis, diseases of the skin, eye & ear and dental caries.[1] The school taken in our project will fall in the middle tire in respect of economy, cultural behavior etc. The nutritional and health status of students was found poor in our country. [2] Obesity and under-nutrition co-exist in Pakistani school-children.[3] Nutritional status of middle and high socio economic status (MHSES) children in India needs attention especially with respect to the high prevalence of anemia, overweight and obesity. There are indications that micronutrient deficiencies exist, but sufficient data are lacking. [4] Health of the students should be optimum for a healthy society. The health of our youth to a large extent determines the health of our society. [5] Seventy percent of the world's malnourished children live in Asia.[6] The school age children and adolescents have to be considered a priority area as severe visual loss in children can affect their development, mobility, education and employment opportunities with far reaching implications on their quality of life and their affected families. [7]

Morbidity of the students exists among them without their concern. These must be defined among them and teachers of the schools and also to the health administrators so that the health administrators can take some or other actions to minimize the problem and to

prevent the emergence of these problems in future. Keeping the above observations in view the present study was designed and conducted with the aim to understand the current magnitude of health problems, their pattern and nutritional status of school children in the age group of 12 -17 years and to find out their morbidity pattern that may contribute in the preventive and control activities in future as well as help in the implementation of educational programme for this group.

Materials and methods:

Study Design and Settings: A descriptive cross-sectional study was conducted among 918 male students of class VI to XII. One higher secondary school for boys of North Kolkata was chosen randomly for the study.

Study Period: Concept and study design, formulation of schedule and clinical examination items, data collection and analysis were done during November 2010.

Study Instrument: The pre-designed and **pre-tested data collection tool was an interview** schedule that was developed at the institute with the assistance from the faculty members and other experts. This close-ended anonymous questionnaire contained questions relating to the socio-demographic situation prevailing in East India. By initial translation, back-translation, re-translation followed by pilot study the questionnaire was custom-made for the study. The first part of the interview schedule was on socioeconomic and demographic characteristics. This included the variables – age, sex, religion, community status, educational status and per-capita monthly income. The second part of the interview schedule was on the morbidity pattern.

Sample Size and Sampling Design: Total strength of school students was 979. All the students were the targets for investigation. The day of students' medical examination was earlier declared so that all students could be reached. Taking the prevalence rate of anaemia around 0.3 and allowable error 0.03, the sample size of students became 933. The authors adopted the rate of anaemia (20 – 40%) in adolescent group found in a study conducted by IPHA in West Bengal in the similar socio-economic strata of general people.[7A] All the students attended the school on the day of medical examination and 918

students were our ultimate study population excluding schedule with missing data.

Main Outcome Variables: height, weight, BMI, anemia, angular stomatitis, chielosis, glossitis, visual acuity etc.

Data Collection Procedure: After decision making and concept development of this particular study, investigators made a meeting with head of the institution. The permission to conduct the study in the school was taken well ahead of data collection. Institute Ethics Committee approved the study. Date and time was fixed up. All the participants were explained about the purpose of the study and were ensured for strict confidentiality, and then verbal informed consent was taken from each of them before the interview. The participants were given the option of not to participate in the study if they wanted. Then on the day of investigation, data were collected through interview followed by detailed health examinations. Height was measured by a WHO approved wall-mounted height measuring scale. A calibrated and standardized mechanical weighing scale was used to measure weight. The reference data used to identify the cut-off points were taken from the CDC 2000 dataset for BMI. [8]

The investigators collected the data in the winter season of 2010 and disseminated the information on morbidity in health education sessions to complement the findings of the study.

Statistical Analysis: The collected data were thoroughly cleaned and entered into Excel spread sheets and analysis was carried out. Compilations of data was done through tabulation and then mean of the observed findings in respect of height, weight, body mass index (BMI), pulse rate and simple proportion were calculated in other variables used in data analysis.

Results:

School students of north Kolkata were investigated during winter season of 2010. Nine hundred and eighteen students were present and their age range was 12 to 17 years. Nutritional deficiency disorders were found among all standard students of school. Pallor (equivalent to anaemia) was found high (32.79%) with variation of different class group. Class VII standard students showed highest (43.89%) and Class XII standard students showed lowest (16.90%). Vitamin B

complex deficiency disorders were also found among students (3.92%). No one was found with this sign of Vitamin B complex deficiency disorders among students of class VIII and XII. 63.29% students of all classes were found normal. (Table 1)

Table I: Distribution of students according to nutritional deficiency signs

Standard (n, %)	Pallor / Anaemia (%)	Angular stomatitis / Chielosis / Glossitis (%)	Normal (%)
Class VI (198, 21.57)	65 (32.83)	7 (3.53)	126 (63.64)
Class VII (180, 19.61)	79 (43.89)	5 (2.78)	96 (53.33)
Class VIII (121, 13.18)	50 (41.32)	0 (0.00)	71 (58.68)
Class IX (155, 16.88)	52 (33.55)	18 (11.61)	85 (54.84)
Class X (193, 21.02)	43 (22.28)	6 (3.11)	144 (74.61)
Class XII (71, 7.73)	12 (16.90)	0 (0.00)	59 (83.10)
Total (918, 100)	301 (32.79)	36 (3.92)	581 (63.29)

The median pulse rate (per min.) was found 81 with gentle variations in different classes. Mean weight (both individual class and all students) of the students was found low (92.16%) except Class XII. Mean height (both individual class and all students) of the students was found low (92.16%) except Class XII. Mean BMI (both individual class and all students) of the students was found low (92.16%) except Class XII. The cause of this variation was not studied. In one sentence it can be said that weight, height and deducted BMI was found low in most of the students (92.16%). (Table 2)

Table 2: Distribution of weight, height, BMI and pulse rate

Standard (n, %)	Mean Weight (Kg)	Mean Height (Meter)	Mean BMI	Median Pulse Rate / Min
Class VI (198, 21.57)	27.03	1.36	14.48	82
Class VII (180, 19.61)	32.27	1.43	15.59	79
Class VIII (121, 13.18)	37.6	1.50	16.20	82
Class IX (155, 16.88)	41.69	1.57	16.81	80
Class X (193, 21.02)	31.75	1.39	15.93	82
Class XII (71, 7.73)	53.83	1.66	19.22	77
Total (918, 100)	35.02	1.46	15.99	81

Among the students of all classes the problem of acuity of vision from 20/25 onwards in any or both of the eyes in the best corrected vision was found to be 24.62 percent. Variations were noted in different classes from highest 35.49 percent in class IX to lowest 9.37% in class X. The findings were alarmingly high. The cause of this variation was not studied. (Table 3)

Table 3: Distribution of acuity of distant vision in any or both eyes

Standard (n, %)	Normal (20/20) (%)	20/30 to 20/60 (%)	20/80 onward (%)
Class VI (198, 21.57)	145 (73.23)	41 (20.71)	12 (6.06)
Class VII (180, 19.61)	133 (73.88)	42 (23.33)	5 (2.78)
Class VIII (121, 13.18)	86 (71.07)	30 (24.79)	5 (4.13)
Class IX (155, 16.88)	100 (64.52)	48 (30.97)	7 (4.52)
Class X (193, 21.02)	175 (90.67)	11 (5.70)	7 (3.63)
Class XII (71, 7.73)	53 (74.65)	18 (25.35)	0 (0.00)
Total (918, 100)	692 (75.38)	190 (20.70)	36 (3.92)

Discussion:

A cross-sectional descriptive study was done in winter season of 2010. North Kolkata school students (boys) were investigated for their bio-physical characters to assess the present status of their health and nutrition with morbidity findings if any. Socio-economic status of the local people who send their wards to this school belonged to middle class. Social structure included middle class people with mixed culture, high variation in education and under control of municipal organization. The age limit was from 12 to 17 years.

In this study pallor (equivalent to anemia) was found in 32.79% of all students. This was found in all class students. In Tirupati study, 84.3% of children were found to have one or more morbid conditions. The prevalence of clinical anemia was 8.5% and 5.8% respectively in boys and girls. In one similar study done at Ludhiana, the anemia was found 22.9% among male students and 30.50% among female. This is notable to that reported in Hyderabad (68.0%) [10] and in Gujarat (60.0%); [11] a lower prevalence of 8.2% was found in Chittoor.[9] The proportion of angular stomatitis in the present study (3.92%) corresponded well with Chittoor study (2.7%). [9]

Weight, height and resultant BMI were found low as per ICMR standard among 92.16% of students except class XII students. In Ludhiana study, the expected height for age as per ICMR standard was also less in both boys and girls. [2] In Karachi study among 284 students, 52% were found to be underweight. Of this study population, 6% were obese and 8% were overweight. [3] In sharp contrast to this study result, the majority of students rated their health as good, very good or excellent (males 94.2%, females 90.3%) in one similar study of New Zealand. [5]

One or both the eyes were found with refractive error among 24.62 percent students of all classes in our study. This was definitely an alarming finding among school students. This low vision influences school performance among students. In a Surat school study, overall prevalence of refractive error was found to be 15.22 percent; Refractive error was observed higher among the Muslims (54.05%) and in general caste (50.98%). Associated ocular morbidity was noted in 20.35 percent cases of participants along with the refractive error.[12] A south Indian study among children aged 15 years or younger for visual acuity measurements noted that 6.2% of 10,000 children were blind. [13] The Tirupati study reported the defective vision to be 4.4% and 4.7% in school going boys and girls. [1] In contrast to our study finding, lower proportion of students showed refractive errors in few of the studies ranging from 2.60% (Andhra Pradesh) [14] to 3.65% (Darjiling of Bengal). [20] Some studies found the refractive errors in between our findings and the mentioned low findings were ranging from 6.43% (Pokhra, Nepal) [16] to 9.80% (Hyderabad). [17] Much more studies found the similar results in their studies ranging from 17.10% to 34.20%. [18, 19, 20, 21]

There were several limitations. Magnitude of morbidity in a specified geographic area was not attempted in all the pediatric and adolescent population age

groups; instead it described the types and characteristics of a specified population group.

The findings of the present study cannot be generalized to the entire population as it is specific to the school children. In order to keep the anonymity, the reasons for incompleteness of responses could not be sorted out. There were variations in the pulse rate, mean weight, mean BMI and problem of acuity of vision in different classes. Follow up studies can resolve the variations.

Recommendations:

Secondary school children are in the receiving end of knowledge percolation and habit formation. High school stage is a period where individual in the physical, psychological, intellectual role develops. They are the backbone and future treasure of nation. The study revealed the poor health and nutritional status of high school children with poor acuity of distant vision identifying this student group for targeted services aiming at improvement of their overall health and nutritional status. An integrated approach to control the health problems in this age-group should be the goal of their caregivers. As the school is an indispensable part in the life of this growing population, we have to include and promote optimum healthy life-style. Interventions that augment parental self-efficacy in conveying and enforcing approach to shape their children could reduce health problems of this age. Healthy life style campaigns, focusing on youth, are essential to reduce the burden of related diseases. Repeat surveys would help in monitoring the issues in the schools and in evaluating the efficacy of national programmes targeted to this age group.

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"There can be no vulnerability without risk; there can be no community without vulnerability; there can be no peace, and ultimately no life, without community."

"It is our task—our essential, central, crucial task—to transform ourselves from mere social creatures into community creatures."

M. Scott Peck