One Health Journal of Nepal

Original Article Open Access

Nutritional Status of Primary School Students of Shiddhicharan Municipality, Okhaldhunga

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ABSTRACT

Introduction: Malnutrition is a severe public health issue in Nepal. The nutritional status is critical part of health and development among school going children and is the important indices of their quality of life. This study aimed to assess nutritional status of primary school students.

Methods: We conducted descriptive cross-sectional study among 301 primary school students of Shiddhicharan municipality. A semi-structured questionnaire was used to assess socio-demographic and behavioral factors. Nutritional assessment was done through anthropometric measurements (height in centimeters and weight in kilograms) using anthropometric tools (weighing machine, height measuring board) and Body Mass Index (BMI) was calculated. The nutritional status of students were classified into underweight, normal, overweight and obese on the basis of Growth Chart (BMI for age) by Center for Disease Control and Prevention criteria. Data were entered and analyzed in Statistical Package for Social Sciences, version 16.0.

Results: Of total students, 142 (47.2%) were boys and 159 (52.8%) were girls. The age of the students ranged from 8 years to 16 years with the mean of 12.3±1.7 years. The prevalence of underweight, overweight and obesity among students were 49 (16.3%), 18 (6.0%) and 2 (0.7%) respectively. Malnutrition was slightly concentrated among the boys (26.1%) compared to girls (20.1%).

Conclusions: The present study showed the prevailing status of under nutrition with an increasing burden of over nutrition. The current status can be mitigated by increasing awareness in mothers and conducting school health programs focusing on nutrition.

Keywords: *Nepal; Nutritional status; Students.*

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INTRODUCTION

Malnutrition rates remain alarming; stunting is declining too slowly while wasting still impacts the lives of far too many young children.[1] Children between the ages of 10 and 14 go through a transitional period in which they experience puberty and many physiological and psychological changes that alter their nutritional requirements and expose them to the risk of malnutrition.[2]

Nutrition is an important aspect of health and development. Better nutrition is associated with better newborn, child, and mother health, stronger immune systems, a decreased risk of non-communicable illnesses, and longer life.[3]

In the context of Nepal, there is very limited data available on the nutritional status of school children in general. Nutritional status is a mirror picture of health and one of its most accurate markers, and diet is one of its primary factors.[4] We aimed to assess nutritional status of primary school students in Shiddhicharan municipality, Okhaldhunga.

METHODS

A descriptive cross-sectional study was conducted among 301 primary students studying in government schools of Shiddhicharan municipality, Okhaldhunga. Data was collected from May to June 2019. Ethical approval letter from the Institutional Review Board (Ref no. 76/17) was obtained. Permission letter was obtained from selected schools. Written parental consent was obtained before enrolling students in the study.

Three government schools of Shiddhicharan municipality were selected conveniently. Study population was primary school students of class 4, 5, 6 and 7. Absentees and the students who were unwilling to participate or who did have parental consent were excluded from the study.

The sample size was determined using the formula,
$(n) = Z^2 pq/d^2$
where,
n=required sample size
d = margin of error (5%)
p= 23.2% = 0.232 (Prevalence from a study conducted in Nepal) [5]
q=1-p=1-0.232=0.768
z= 1.96 at 95% level of confidence.
$n= (1.96)^2 * 0.232 * 0.768 / (0.05)^2$
= 274

Including 10% non-response rate, calculated sample size was 301.

Teachers were first called and an orientation was given on the questionnaire, the study's aim, the importance of privacy, and protecting the anonymity of the responders. Consent form was distributed to the students to get the signature from their parents. Those students who brought the signed form were recruited in the study.

Semi structured questionnaire was used to assess socio-demographic variables and anthropometric tools were used (weighing machine, height measuring board) to assess nutritional status. The questionnaire was used to get information from each study participant for: 1) Demographic characteristic such as age, sex, education and socioeconomic status and 2) behavioral factors such as dietary habits, physical activity, digital scale weighing machine for weight measurement and measuring tape for height measurement. Weight was taken using bathroom scale. The scale was placed on a flat surface and the meter was adjusted to zero. The subject was asked to step on it in bare feet with minimum clothes. Height measurement was done using measuring tape (fiber glass measuring tape).

Candidates were asked to:

- Remove all shoes and socks
- Stand on a flat floor next to a wall. Stand with his/her neck to the wall, with his/her feet together and heels touching the wall.
- Look straight ahead and keep shoulders at the same level.
- A flat ruler was placed onto his/her head, and the person was asked to move out.
- The distance from the floor to the flat ruler was measured with a tape and height was recorded.

Pre-testing of the data collection tool was done prior to the study on primary students of Shree Gambhir Samundra Setu Secondary School, Imadol, Lalitpur. All equipment used were correctly calibrated on a regular basis. Double observation technique was used in height and weight measurement. Weighing machine before using was checked with standard weight. Adequate concerned literature review throughout the research was done to ensure the external validity of the study.

Weight was measured in kilogram (kg) and height in centimeter (cm). Body Mass Index (BMI) was

calculated using the formula BMI= (weight in kg)/(height in meter)^2. The nutritional status of students were classified into underweight, normal, overweight and obese on the basis of Growth Chart (BMI for age) by Center for Disease Control and Prevention criteria.

Data were reviewed for completeness and consistency after data collection. The collected data was organized, coded and entered in SPSS version 16.0. Categorical variables were described using frequencies and percentages.

RESULTS

The prevalence of underweight, overweight and obesity among 301 school going children of Siddhicharan municipality were 49 (16.3%), 18 (6.0%) and 2 (0.7%) respectively. The prevalence of underweight and overweight among boys were 27 (19.0%) and 8(5.6%) respectively and among girls were 22 (3.8%) and 10 (6.3%) respectively.

Table 1. Nutritional status of respondents based on BMI (n=301)

Nutritional Status	Overall, n (%)	Boys, n (%)	Girls, n (%)
Underweight	49 (16.3)	27 (19.0)	22 (13.8)
Normal Weight	232 (77.1)	105 (74.0)	127 (79.9)
Overweight	18 (6.0)	8 (5.6)	10 (6.3)
Obese	2 (0.7)	2 (1.4)	0 (0.0)

Table 2 presents the demographic characteristics of the surveyed participants. The age of the children ranged from 8 years to 16 years with the mean age 12.3±1.7 years. Of total children 142 (47.2%) were males and 159 (52.8%) were females. The majority were Adhibasi/Janajati (58.5%) followed by Brahmin (29.6%) and Dalit (11.6%).

The majority of participants lived in a nuclear family (59.5). While comparing the education status of parents, both parents (mother and father) had a higher percentage of secondary level education (44.0% in father and 38.8% in mother).

Table 2. Demographic characteristics of the respondents (n=301)

Characteristics	n (%)
Sex	
Male	142 (47.2)
Female	159 (52.8)
Age (in years), Mean±SD	12.32±1.690
Ethnicity	
Brahmin and Chettri	79 (29.6)
Adhibasi/Janajaati	177 (58.8)
Dalit	35 (11.6)
Types of Family	
Nuclear	179 (59.5)
Joint	122 (40.5)
Education of Parents	
Education Status of Father (n=282)	
Illiterate	12 (4.3)
Literate	57 (20.2)
Primary	87 (30.8)
Secondary	124 (44.0)
University Education	2 (0.7)
Education Status of Mother (n=299)	
Illiterate	28 (9.4)
Literate	85 (28.4)
Primary	116 (38.8)
Secondary	69 (23.1)
University Education	1 (0.3)

Table 3 depicts the behavioral information of the respondents. Out of total respondents, the majority (85.4%) were daily engaged in at least 30 minutes of exercise or walking while. Among all, about two third (69.8%) of respondents spent their leisure time doing physical exercise. Major forms of exercise were walking (43.8%) followed by cycling (16.7%) and playing outdoors (16.2%).

All the schools in which respondents studied had extra-curricular activities, however among total respondents only 69.4% of respondents regularly took part in extracurricular activities. Among those who were engaged in ECA, the majority were engaged in sports (52.6%), followed by indoor games like chess, quiz (22.5%), art and crafts (16.3%) and outdoor games (8.6%). Similarly, out of 301 respondents' household food patterns, 89.4% were non-vegetarian and 10.6% were vegetarian. Only 20.9% respondents had five types of fruits and vegetables daily and 16.3% respondents had any previous history of disease within 6 months.

Table 3. Behavioral characteristics of the respondents (n=301)

Factors	n (%)
Physical Activity	
Daily 30 minutes of exercise or walking	
Yes	257 (85.4)
No	44 (14.6)
Physical Exercise in leisure time	
Yes	210 (69.8)
No	91 (30.2)
Forms of Exercise (n = 210)	
Walking	92 (43.8)
Swimming	23 (11.0)
Dancing	23 (11.0)
Cycling	34 (16.2)
Playing outdoor games	35 (16.7)
Others	3 (1.4)
Duration of Exercise	
Less than 30 minutes	156 (74.3)
More than 30 minutes	54 (25.7)
Participation in Extracurricular Activities in School	
Yes	209 (69.4)
No	92 (30.6)
Type of Activity (n=209)	
Indoor Games	47 (22.5)
Outdoor games	18 (8.6)
Sports	110 (52.6)
Art and crafts	34 (16.3)
Dietary Habit	
Household food pattern	
Vegetarian	32 (10.6)
Non- Vegetarian	269 (89.4)
Intake of five types of fruits and Vegetables	
No	238 (79.1)
Yes	63 (20.9)
Disease in past 6 months	
No	252 (83.7)
Yes	49 (16.3)

DISCUSSION

Malnutrition is a major public health problem with direct effect on growth and development of child in long terms. The prevalence of moderate and severe underweight is highest in South Asia; one in 5 girls aged 5–19 years and nearly one-third of their male peers are underweight.[6] According to the Global School-Based Student Health Survey, about 4% of girls aged 13–15 years are underweight, although more than 10% of surveyed girls were underweight in Bangladesh and Maldives.[7]

The percentage of children with BMI below 5th percentile (underweight) was 16.3%. A previous study conducted among the students in Lalitpur district showed that BMI for age less than 5th percentile in 23.2% of children which was slightly higher compared to our study. [5] This difference might be due to difference in geographic location,

Malnutrition was slightly higher in boys (26.1%) compared to girls (20.1%) which was similar to the findings of NDHS 2016 which states that boys are at more risk of underweight and stunting. [8]

The systematic review and meta-analysis study in Bangladesh, showed that prevalence rates of overweight and obesity among children and adolescents varied widely from 1.0% to 20.6% and 0.3% to 25.6%, respectively which is comparable to this study which shows the prevalence of overweight to be 6.0% and obesity as 0.7%.[9]

Studies showed that students often have poor eating habits. Students tend to eat fewer fruits and vegetables on a daily basis[10] which is similar to this study where consumption of at least five type of fruits and vegetables daily is only 20.9%.

CONCLUSIONS

The present study highlights the high prevalence of malnutrition among the primary school students in Nepal. This can be reduced by increasing awareness in mother and conducting school health programs focusing on nutrition. Also, there is a great need to focus the attention of policy makers on the nutritional status of children as one of the main indicators of development and as precondition for socioeconomic advancement of societies in long term.

ACKNOWLEDGEMENT

We would like to acknowledge all the participants of the study and all peoples who directly and indirectly helped us for the successful accomplishment of this study.

CONFLICT OF INTEREST

None

FUNDING

This study was funded with the authors' own contributions.

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