Prevalence of Obesity and Malnutrition among School-Aged Children of the District Peshawar

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ABSTRACT

Malnutrition and Obesity are worldwide health phenomena so the aims of the study were to assist the prevalence of obesity and malnutrition among school-aged children of the district Peshawar. Institutional based cross-sectional study designs were used. In which total of 3000 children between the ages of 4-15 years were studied. A regular random sampling method was used for sample collection. A total of 3000 students were participated in this study. The numbers of male students and females students were same. The overall results shows that out of 1500 students the ration of underweight were 103(7%) and obese (6.1%) respectively. Our study shows that nutritional factors are important since obesity and overweight increase with socioeconomic status as well as with nutritional intake. So Obesity was found High socioeconomic status groups should be directed for overweight while underweight and nutritional deficiency is a problem of lower socioeconomic status. Meat, Milk intake and lack of physical activity that have been identified in the current study. We observed that a strong relation was found in nutrition with food intake and socioeconomic status.

Keywords: Obesity, Overweight, Underweight, Malnutrition

INTRODUCTION

Obesity is one of the most prevalent nutritional disease of children and adolescents in many developed and developing countries. The World Health Organisation (**WHO 1998**) has declared overweight as one of the top ten health risks in the world and one of the top five in developed nations. Existing **(WHO 2002)** standards and data from 79 developing countries including a number of industrialized countries suggest that about 22 million children five years old are overweight worldwide. (**WHO 1998**) Once considered a problem of affluence, obesity is fast growing in many developing countries also. (**WHO 2000)** Even in countries like India, which are typically known for high prevalence of under nutrition, a significant proportion of overweight and obese children now coexist with those who are under nourished. **(Popkin et al 2001)** Increasing relative weight trends in populations have caused much concern among health care providers. Limited studies have been conducted on the prevalence of overweight (OW) and obesity (OB) in the children belonging different socio economic groups in the National Capital Territory (NCT) of Delhi hence the present study was conducted.

Obesity has emerged as one of the global health problems with 200 million school-aged children world-wide categorized as being overweight/obese, of which 40-50 million are obese **(Shikhakhandelwal et al 2016)**. The factors attributing to increasing childhood obesity are increased intake of high-calorie foods that are low in vitamins, minerals and micronutrients coupled with decreased physical activity **(Kaushik et al 2011)**. Various studies done in India from 2002-2012 indicate a rising trend in the prevalence of overweight and obesity in children and adolescents **(Shah et al 2011**).

MATERIALS AND METHODS

STUDY AREA

A cross-sectional study was conducted in the local area of district Peshawar. All the primary, middle and high schools were enlisted in this study. Socio economic were made including Lower Income socio economic Group (LIG), Middle socio economic Income Group (MIG) and High Income socio economic Group (HIG). All the Government and private schools were measured for obesity.

SAMPLE SIZE

This study was undertaken for the Exploration of vitamin D deficiency in school aged children of the local area of District Peshawar. We retrospectively studied the records of a total of 3000 children of aged between 4-15 January 2024 to October 2024. All patients were subjected to a careful physical examination. Weights were measured using a calibrated digital scale. Height measurements were done in triplicate to the nearest millimeter using a calibrated stadiometer. Body mass index (BMI) were calculated according to the formula [weight (kg)/height (m)2]. Patients with a history of a chronic disorder or on any medication that may alter vitamin D metabolism were excluded from the study. Serum calcium (Ca), phosphorus (P), magnesium (Mg), alkaline phosphatase (ALP) and glucose levels were measured using the enzymatic colorimetric method (Roche Integra 800), while serum 25 hydroxy vitamin D [25(OH) D] levels were measured by highperformance liquid chromatography (Shimadzu UFLC).

According to WHO formula   BMI=   weight

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Hight (M^2)

S.no	status	Student BMI	Normal BMI	HB level
1	Anemia	20BMI	18.5-24.9	>12,>14g/dL
2	Underweight	18BMI	18.5-24.9	<12,14g/dL
3	Malnutrition	17.3BMI	18.5-24.9	<12,14g/dL
4	Stunting	11.2BMI	18.5-24.9	<12,14g/dL
5	wasting	9.5BMI	18.5-24.9	<12,14g/dL

STUDY AREA AND PERIOD
The study was conducted in local area of district Peshawar, which is located in 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 3000 children between the ages of 4-15 years were studied. A systematic random sampling technique was applied for sample collection.

CLINICAL EXAMINATION
ROUTINE BLOOD TESTS
This is done to assess anemia and other vitamin and mineral deficiencies. There may be dehydration, low blood sugar and signs of severe infection as is evident by raised while blood cell counts.

BLOOD TESTS IN CHILDREN
Routine blood tests in children include those for blood glucose, blood counts, urine for routine examination.
Levels of iron in blood, folic acid and vitamin B 12 are also done. For protein estimation other tests including
Normal ranges of ferritin 10 to 150 ng/mL for children 4th years to14 years.
MCV normal range is 80 to 95 for children

ANALYSIS & INTERPRETATION
▸ **ANALYSIS AND INTERPRETATION OF DATA**
Data will analyze and interpret by using M word, Origin8 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.

QUESTIONNAIRE FORM

Demographics information:	General information	Dietary Habits
Child's Name: _____	Do you have breakfast every day before going to school? (Yes/No)	What is your favorite healthy food?
Age: _____Gender: _____	How many meals do you typically eat in a day?	How often do you drink water in a day?
Grade/Class: _____	Do you eat fruits and vegetables daily? (Yes/No)	Less than 3 glasses
School Name: _____		3-5 glasses
Family background:	How often do you consume fast food? (Yes/No)	6-8 glasses
How many people live in the child's household.?	**Anthropometric Measurements**	More than 8 glasses
Male and female ratio in child's household.?	Height (cm): __	Are you aware of the importance of a balanced diet? (Yes/No)
Family income status?	Weight (kg): __	Do you receive any nutrition education at school? (Yes/No)
Hereditary diseases in family?	BMI (Body Mass Index): __	

S.no	Serum 25(OH)D	Status
1	Serum 25(OH)D	Deficient < 50nmol/L
		Insufficient 50-75nmol/L
		Sufficient <75nmol/L
2	Mean Serum 25(OH)D	55$\pm$ 6nmol/L

STATISTICAL ANALYSIS
Statistical analysis was performed by using Origin8 and MS office word 2010.

RESULTS
Total of 3000 students were participated in this study. The numbers of male students and females students were same. The overall results show that out of 1500 students the ration of underweight were 208(7%) and obese 185(6.1%) respectively (Table.1).

Table.1 Overall nutritional assessment of school-aged children

Socioeconomic status	Male			Female		
	Normal	Underweight	Obese	Normal	Underweight	Obese
Low Income	425	75(2.5%)	00(0%)	450	50(1.66%)	0(0%)
Middle income	450	25(0.83%)	25(0.83%)	425	45(1.5%)	30(1%)
High Income	415	5(0.16%)	80(2.66%)	442	8(0.25%)	50(1.66%)

Total	1290	105(3.5%)	105(3.5%)	1317	103(3.41%)	80(2.66%)

Our study shows that nutritional factors are important since obesity and overweight increase with socioeconomic status as well as with nutritional intake. So Obesity was found High socioeconomic status groups should be directed for overweight while underweight and nutritional deficiency is a problem of lower socioeconomic status. Meat, Milk intake and lack of physical activity are some of the other factors that have been identified in the current study that are shown in table.1 and table.2.

Table.1 Nutritional intake wise assessment of school-aged children

MEAL TIMINGS

Do You Take	Always	Sometimes	Rarely	Never
Breakfast	73	100	125	60
Lunch	83	67	60	90
Tea time	25	75	65	110
Dinner	125	58	50	40

FOOD RESPONSE AND REACTIONS

Cravings	Aversions	Unsuitability
125	90	85

WATER INTAKE (1Glass=250ml)

Our study also shows those nutritional intakes are important meanwhile obesity and overweight increase with socioeconomic status as well. So Obesity was found High socioeconomic status groups should be directed for overweight while underweight and nutritional deficiency is a problem of lower socioeconomic status. Meat, Milk intake and lack of physical activity are some of the other factors that have been identified in the current study that are shown in table.1 and table.2.
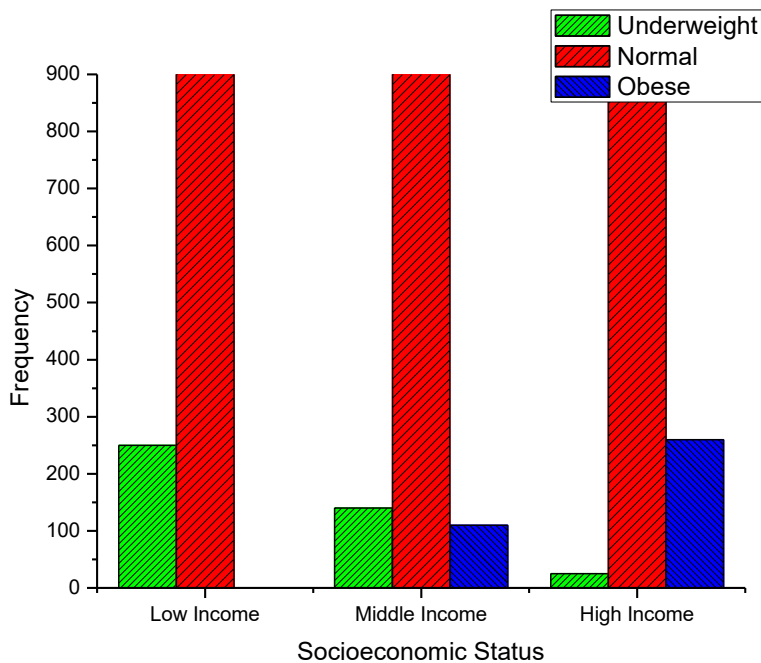
Figure.1 socioeconomic status wise nutritional assessment of school-aged children

Gender wise nutritional assessment of the current study shows that the underweight and obese were found high in male group than the female with the prevalence rate of male underweight 210(3.5% and obese 105(3.5%) while female were found slightly low underweight 103(3.41%) and obese 80(2.66%) respectively has been shown in figure no.2.
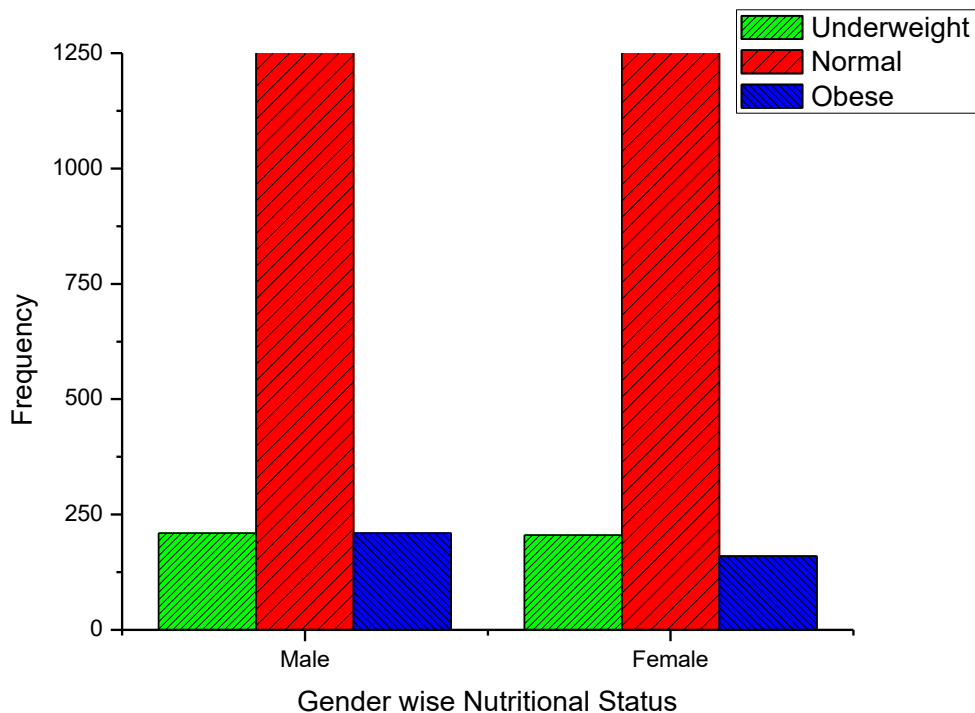
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Figure.2 Gender wise nutritional assessment of school-aged children

DISCUSSION

 Our study shows that nutritional factors are important since obesity and overweight increase with socioeconomic status as well as with nutritional intake. So Obesity was found High socioeconomic status groups should be directed for overweight while underweight and nutritional deficiency is a problem of lower socioeconomic status. Meat, Milk intake and lack of physical activity are some of the other factors that have been identified in the current study. Similarly a study also conducted by **(Chhatwal et al 2004)** and (**Khader et al 2009**) in a population, 70% of all obese children belonged to the higher SEC, while of the underweight children, 63.3% were in the lower SEC. This finding is consistent with the view of previous studies that obesity in developing countries increases with socioeconomic class. Meat consumption was high across the board; however, it was significantly higher in children from higher SES. Within overweight and obese kids, there was not a single report of children not eating meat at all. This was however, not true of many underweight children belonging to lower SEC, who reported not having meat at all. Meat intake has been found to be associated with obesity and its cardiovascular complications. Children in Switzerland showed a direct association between intake of meat products and overweight.

Gender wise nutritional assessment of the current study shows that the underweight and obese were found high in male group than the female with the prevalence rate of male underweight 210(3.5% and obese 210(3.5%) while female were found slightly low underweight 205(3.41%) and obese 160(2.66%) respectively. Same study were also performed by **(Wijga et al 2010)** in which the total 2,131 children, 19.4% were overweight (18.8% of boys and 19.9% of girls) and 5.6% were obese (5.6% of boys and 5.5% of girls). Watching television [2 h/day, daily pocket money [20 piasters (1 piaster = 1.42 cents), having overweight or obese mother/father were significantly associated with increased odds of both overweight and obesity. Age C 10 years, female gender, and family size of B4 were significantly associated with being overweight and total monthly family income [300 Jordanian Dinars (JDs), (1 JD = $1.42) was associated with obesity.

CONCLUSION

 We observed that a strong relation was found in nutrition with food intake and socioeconomic status. The time expended in sleeping was a progressive factor for keeping a balance between weight and height. There was also a nutritional association found between male and female children.

ACKNOWLEDGEMENTS

ETHICAL CONSIDERATIONS

Participation was voluntary and confidentiality was assured to all respondents. They were informed about the study's objectives and that the data collected would be used only for the stated research purposes.

AVAILABILITY OF DATA AND MATERIALS

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

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