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PREVALENCE OF OBESITY AMONG TEENAGERS IN A HIGHER SECONDARY SCHOOL OF BIRGUNJ, NEPAL

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Keywords:
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Abstract
Obesity is often defined as a condition of abnormal or exercise fat accumulation in adipose tissue, to the extent that health may be impaired. In this study an attempt was made to estimate the prevalence of obesity among teenagers. Total 130 students of grade IX and X age group between 13 - 19 years of Children's World Higher Secondary School were included in the study. Cross-sectional study was done to estimate the prevalence of obesity. Data was collected on age and sex specific criteria. Height and weight was measured according to the standard procedure and BMI was calculated. Frequency and percentage was calculated for assessing the prevalence of obesity. Finding of the study indicated that prevalence rate of obesity in relation to age and sex are 83 (63.85%) among males and 47 (36.15%) among females. Prevalence of obesity is slightly more in males than females. The obesity epidemic is showing its maximum effect in low- and middle-income countries like Nepal. Countries like Nepal concentrating its all effort in curing the disease rather than prevention. In this study an effort has been made to study the prevalence of obesity among the teenagers of a school in Nepal.

Introduction

Obesity is the most prevalent nutritional disorder in which there is excessive storage of fat as per height, weight. It is characterized by excessive accumulation of fat which reflects on the most basic level, on overall positive balance between energy intake and energy expenditure.[1] It is associated with many significant health problems including high blood pressure, heart disease, diabetes, stroke, osteoarthritis, sleep apnea, premature death and decreased quality of life. [2]

Obesity was rarely seen for thousands of years until twentieth century, it was not at all common and only in 1997, WHO formally recognized obesity as global epidemic.[3] Over the decades the prevalence of obesity among adults and children are increased dramatically and it has now reached as it extreme proportion and stands as a major contributor to the global burden of chronic disease and disability. It was estimated through study that the global burden of disease by the year 2020, death due to non communicable disease includes hypertension, diabetes mellitus, coronary heart disease, stroke and metabolic syndrome where obesity is the common predisposing factor. [4]

Obesity is now well recognized as a disease in its own, one which is largely preventable through changes in lifestyle. This fact together with its association with the leading cause of illness and death has made obesity a high priority problem in the world. It is prevalent among all the age groups and it is on the rise among adults especially among the adolescents. [5] It had been proved that increased consumption of more energy dense, nutrient poor foods with high levels of sugar and saturated fats have led to three folds rise in obesity rates. The rising epidemic reflects the profound changes in society and in behavioral pattern of communities over recent decades. [6] To make it clear the societal changes and worldwide nutrition transition are driving the obesity epidemic.

Above all, today urban youth spend more time in the car, at the computer and especially in front of television. Decrease in physical activity, high caloric smacks, junk food revolution, and inconsistent meal pattern are some of the force which underlie the epidemic. [7]

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Materials and methods

Study area

The study area was Children's World Higher Secondary School, Birgunj. A descriptive cross sectional design was adopted for this study.

Sample population

Teenagers of aged group 13-19 years of class IX and X studying in Gyan Jyoti English Higher Secondary School, Birgunj.

Sample size

Sample size of study was 130 (n=130).

Sampling criteria

a) Inclusive crtiteria:-

Teenagers the age group 13-19 years in class IX and X.
Teenagers who are willing to participate in the study.

b) Exclusive criteria:-

Teenagers with physical deformities.
Students who are not willing to participate in the study.

Data collection tools

The tool was prepared on the basis of the objectives of the study. Review of literature was done to develop tool. A self developed structured questionnaire was prepared for collecting demographic data. The following steps were adopted prior to the development of the tool.

Section A

Demographic data i.e. age, sex, religion, area of residence, type of family, total number of family members, income of parents, occupation of parents, obesity in the family.

Section B

Anthropometrical instruments:-

a) Hight: (in inches)

b) Weight:- (in kg)

c) Body Mass Index (BMI):

$$\text{BMI} = \frac{Weight\ (kg)}{Height\ (m^2)}$$.[8]

Reliablity of insturments

In order to establish the reliability of the tool, Karl Pearson's co-relation coefficient was used. The tool was administered to 13 school students. The reliability of the tool was r =1 which showed tool to be highly reliable for the data collection.

Data collection plan

Data was collected during 19th May to 24th May 2015.

Methods of data collection

i) Administrative approval was obtained from the concerned authority.
ii) Verbal consent was obtained from all the participants.
iii) The subjects were assured for privacy and confidentiality of the data given by them.

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Following steps were taken to collect data
Step 1: A self administered structured questionnaire consisting 12 items was used to collect demographic data.

Step 2: Anthropometric measurement Height, Weight, BMI was checked and recorded by the investigator.

Methods for data analysis
Collected data was checked for their completeness and accuracy and categorized according to the research objective.

The data collected was analyzed by using descriptive statistics.

Demographic data was analyzed using Frequency and percentage to assessing the prevalence of obesity. Findings was presented in tables, pie charts and bar graphs.

Ethical considerations
i) Human dignity and principle of justice was maintained.
ii) Formal permission was taken from concerned authority of school.
iii) Purpose of data collection was explained to the respondents before data collection.
iv) Verbal consent was taken from respondents.
v) Privacy and confidentiality of all respondents was maintained.

Analyzed data and results are presented through tables and figures. Appropriate descriptive statistics were used to analyze the data. Frequency and percentage was calculated and presented in pie-charts and bar diagrams. Data were organized based on the research objectives on the following headings:

According to our objective, all 130 students of 9th and 10th class were selected. Height and weight was taken and body mass index was calculated. Total 130 students of Children's World Higher Secondary School were assessed for gender and age specific BMI criteria. Data regarding age, sex of school children is presented in tabular form.

The data pertaining with the demographic variables of respondents included age, sex, religion, education, types of family, total number of family members, father's occupation, mother's occupation , parent's monthly income, place of resident, obesity in family, pocket money. Data was analyzed using the descriptive statistics and represented in the form of frequency and percentage.

Results
In Children's World Higher Secondary School, 83 (63.85%) were males and 47 (36.15%) were females. Among them, prevalence of obesity is 12 (9.23%) in males and 8 (6.15%) in females.

At the age of 14 years, 32 (18.46%) were males and 17 (13.08%) were females. Prevalence of obesity was 3 (9.37%) in males and 4 (23.52%) in females.

At the age of 15 years, 24 (24.62%) were males and 27 (20.77%) were females. Prevalence of obesity was 5 (20.8%) in males and 4 (14.81%) in females.

At the age of 16 years, 22 (16.92%) were males and 3 (2.31%) were females. Prevalence of obesity was 3 (13.6%) in males and 0 (0.00%) in females.

At the age of 17 years, 2 (1.54%) were males and 0 (0.00%) were females. Prevalence of obesity was 0 (0.00%) in males and 0 (0.00%) in females.

At the age of 18 years, 3 (2.31%) were males and 0 (0.00%) were females. Prevalence of obesity was 1 (33.33%) in males and 0 (0.00%) in females.

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Out of 130 subjects, 83 (63.85%) were males and 47 (36.15) were females. The frequency and percentage of subjects were 49 (37.69%) at the age of 14 years, 51 (39.23%) at the 15 years, 25 (19.23%) at 16 years, 2 (1.53%) at 17 years, and 3 (2.30%) at 18 years (table 1).

In religion, 118 (90.77%) were Hindu, while 7 (5.38%) were Muslim, 3 (2.31%) were Christian, and the remaining 2 (1.54%) were others (table 1).

In education 57 (43.84%) were studying in grade IX and 73 (56.15%) were studying in grade X (table 1).

In type of family, 86 (66.15%) were included in nuclear family, 42 (32.31%) were included in joint family, 2 (1.54%) were included in extend family (table 1).
In father's occupation, 18 (63. 85%) were included in agriculture, 83 (13.85%) were included in business, 2 (1.54%) were included in labor, and remaining 27 (20.77%) included in others (table 1).

Similarly in mother's occupation, 122 (93.85%) subjects mother were housewife and 8 (6.15%) were service holder (table 1).

In parent's monthly income, 0.00% were included in <5000, 18 (13.84%) were included in 5000-10000 and 112 (86.15%) were included in >10000 (table 1).

In place of residence, 12.31% were living in rural area and 114 (87.69%) were living in urban area (table 1).

98 (75.38%) had obesity in the family and 32 (24.62%) had no obesity in the family (table 1).

99 (76.15%) subjects get <Rs.100 per week and 31 (23.84%) get > Rs.100 per week (table 1).

Table :1 Frequency and Percentile Distribution of various Demographic Variables

S.N.	Characteristics	Categories	Frequency	Percentage
1.	Age	14	49	37.69
		15	51	39.23
		16	25	19.23
		17	2	1.53
		18	3	2.30
2.	Sex	Male	83	63.85
		Female	47	36.15
3.	Religion	Hindu	118	90.77
		Muslim	7	5.38
		Christian	3	2.31
		Others	2	1.54
4.	Education	9 class	57	43.84
		10 class	73	56.15
5.	Type of family	Nuclear	86	66.15
		Joint	42	32.31
		Extended	2	1.54
6.	Total no. of family Members	1-5	67	51.5
		6-10	45	34.61
		11-15	11	8.46
		15-20	7	5.38
7.	Father's occupation	Agriculture	18	63.85
		Business	83	13.85
		Labour	2	1.54

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		Others	27	20.77
8.	Mother's occupation	Housewife	122	93.85
		Service holder	8	6.15
		Labour	0	0.00
		Others	0	0.00
9.	Parent's monthly income	<5000	0	0.00
		5000-10000	18	13.84
		>10000	112	86.16
10.	Place of residence	Rural	16	12.31
		Urban	114	87.69
11.	Obesity in family	Yes	98	75.38
		No	2	24.62
12.	Pocket money	<Rs.100/week	99	76.15
		>Rs. 100/week	31	23.84

Out of 130 students, Prevalence rate of obesity was higher in males 9.23% compared to females 6.15% (table 2).

Table :2 Prevalence of Obesity by Gender

	Obesity	
Gender	**N**	**%**
Male	12	9.23%
Female	8	6.15%

At the age of 14 years, prevalence of obesity was 3 (9.37%) out of 32 in males and 4 (23.52%) out of 17 in females. At the age of 15 years, prevalence of obesity was 5 (20.8%) out of 24 in males and 4 (14.81%) out of 27 in females. At the age of 16 years, prevalence of obesity was 3 (13.6%) out of 22 in males and 0 (0.00%) out of 3 in females. At the age of 17 years, prevalence of obesity was 0 (0.00%) out of 2 in males and 0 (0.00%) out of 0 in females. At the age of 18 years, prevalence of obesity was 1 (33.33%) out of 3 in males and 0 (0.00%) out of 0 in females (table 3).

Table : 3 Prevalence of Obesity by Age and Sex

Age	**Gender**	**N**	**Obesity**	
			No.	%
14	Male	32	3	9.37
	Female	17	4	23.52
Age (years)	**Gender**	**N**	**Obesity**	
			No.	%
15	Male	24	5	20.8
	Female	27	4	14.81
Age (years)	**Gender**	**N**	**Obesity**	
			No.	%
16	Male	22	3	13.6
	Female	3	0	0.00
Age	**Gender**	**N**	**Obesity**	
			No.	%
17	Male	2	0	0.00
	Female	0	0	0.00
Age	**Gender**	**N**	**Obesity**	
			No.	%
	Male	3	1	33.33

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18	Female	0	0	0.00

Discussion

The present study was conducted to assess the prevalence of obesity among teenagers of grade IX and X. In order to achieve the objectives of the study, total population sampling technique was used to select the samples. This study was conducted over a period of two week from 05.06.2016 to 18.06.2016. The data was collected among 130 respondents by administration of self- developed structured questionnaire. The main study was conducted in Children's Worlds Higher Secondary School.

130 students of Grade - IX and X were given a self - developed structured questionnaire consisting of 12 items of socio - demographic variables and anthropometrical measurements height, weight, BMI was measured by investigator. The assessment of prevalence of obesity is analyzed and depicted in table 3.

Prevalence of obesity is 12 (9.23%) in males and 8 (6.15%) in females among 130 subject in Children's World Higher Secondary School. Singh *et al.* conducted a study in Manipur which revealed a higher prevalence of overweight in girls (5.10%) as compared to boys (2.34%). [9] This may be due to the physiological fact that adolescence is a period of increase in fatness of females and transient decrease in fatness of males due to increase in muscle and bone mass in the body. [10] Secondly, due to social reasons, girls play less outdoor games as compared to boys, as parents do not allow them to go far from houses and little space is available in homes to play outdoor games effectively.

Childhood obesity has both immediate and long-term effects on health and well-being. Immediate health effects on obese youth are more likely to have risk factors for cardiovascular disease, such as high cholesterol or high blood pressure. [11] In a population-based sample of 5- to 17-year-olds, 70% of obese youth had at least one risk factor for cardiovascular disease. Obese adolescents are more likely to have pre- diabetes, a condition in which blood glucose levels indicate a high risk for development of diabetes. [12] Children and adolescents who are obese are at greater risk for bone and joint problems, sleep apnea, and social and psychological problems such as stigmatization and poor self-esteem. [13]

The strength of this study is usage of age and sex specific BMI criteria for overweight and obesity which is arguably better than criteria used by WHO for adults. [14] Another limitation is that although BMI is an inexpensive tool to categorize obesity, it cannot be compared with waist/height ratio or waist/hip ratios that are superior in ability to predict cardiovascular disease as compared to BMI or body fat percentage. The data available on overweight/obesity is patchy and it is sometimes difficult to compare food habits and lifestyle that vary across the country. However, there has been no clear cut guideline for classification of adolescent obesity and there should be a consensus among policy makers, health administrators, and clinicians. New longitudinal studies are required for estimation of adolescent overweight and obesity.

Conclusion

In Children's World Higher Secondary School. Prevalence of obesity was 9.23% in males and 6.15% in females. Prevalence of obesity is slightly more in male than females.

The prevalence of overweight and obesity is a problem of adolescent school going children in this study area. In simple terms, obesity is an energy imbalance; energy intake exceeds energy expenditure over a considerable period. Obesity is also defined as cluster of non - communicable disease now observed in both developed and developing countries. This has been called the 'New World Syndrome' and is already creating an enormous socio-economic and public health burden in poorer countries. [15]

The 'New World Syndrome' is responsible for disproportionately high level of morbidity and mortality in newly industrialized countries. Thus, while obesity is viewed by health professional from medical perspective, it also needs to be recognized as a symptoms of a much larger global social problem.

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Using bus as the mode of transport, not playing outdoor games, and sibling count more than two are independent predictors for being overweight and obesity. School-based programs for lifestyle and behavioral modification, motivation of school teachers, active participation in sports irrespective of the gender, regular anthropometric examinations of students in schools and sensitization of parents are some of the remedial measures to curb this rising menace.

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