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Factors of Overweight and Obesity Related to Eating Habits and Physical Activity in Students of Azra Naheed Medical College

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Abstract: ***The prevalence of obesity and overweight is rising to alarming levels in developed and developing countries including Pakistan. The objective of study was to determine the factors responsible for overweight and obesity in students of Azra Naheed Medical College. This case control study comprised 150 overweight/obese participants (BMI >25) and 150 Normal participants (BMI 18.5-25). Odds ratio was calculated to estimate the relative risk and to control the confounding variable; logistic regression was used. The findings of this study indicate that the use of carbonated drinks, lack of moderate and aggressive physical activity and watching TV could be the factors that increase the probability of being over-weight/obese***

Keywords: Body mass index, Azra Naheed Medical College, Eating Habits, Physical Activity, Obesity

1. Introduction

1.1 Overview

Obesity is a disease based on multiple factors that develops as a result of close interaction between the person's genotype and his environment. This serious health issue has caused serious social, physical and psychological damage [1].A statistical indicator, Body Mass Index (that is determined by a person's height in cm and weight in kg) is used to measure obesity. The scale (cut-off points) of BMI fits well for the adult and obese but is often misleading for the children as the BMI values varies with the child's age.

Obesity is among the most alarming dietetic problems in the world including Pakistan[2].It is often linked with, but is not the same as being overweight. A person weighing over 20% of the his desirable weight is considered obese, whereas a person weighing over 10% of the desirable weight falls under the category of being overweight due to increased fat content. Over weight could also be due to hormone induced muscles development. The school of thought of Hereditary studies show that an individual's genotype may be responsible for up to 70% of variation in Body Mass Index (BMI) of individuals in later life [3]. Besides hereditary factors obesity could also be acquired. The imbalance of energy intake and expenditure leads to obesity. Increased energy intake leads to increased calories in the body that favor fat synthesis and fat accumulation in various parts of the body that ultimately results in obesity.

Obesity is recognized as a major and prevalent disease of the century and a public health priority at national level [4, 5]. Obesity has several physical consequences including many risk factors like hyperlipidemia, hyperglycemia, and abnormal glucose tolerance. These factors are associated with cardiovascular disease. Other physical hazards include increased asthma symptoms, fatty liver, sleep apnea and development of type 2 diabetes [6]. Obese people also face various psychosocial concerns like high risk of depression, low self-esteem and different other social burdens [7]. These negative factors of obesity are carried forward from childhood to adulthood as obese and overweight children have greater chance to be the same as adults and are exposed to higher risk of mortality from all causes. Cardiovascular disease, musculoskeletal disorders, stroke and even some cancers can be caused by excessive weight gain. Moreover, it has been reported by some studies that nearly 80% of obese adults are those who were obese in their adolescence, thus preventing obesity during adolescence is important [8, 9].

Obesity prevails in adolescents due to physical inactivity and a deskbound lifestyle[10].Furthermore, another independent reason behind unnecessary weight gain is high energy intake[11]. For this reason obese people choose diet control program to reduce energy intake.

One of the methods commonly used for diet control is skipping breakfast. This method reduces the energy intake in the morning, but interestingly, it is related to high pervasiveness of obesity and overweight[12]. In western countries a research is carried out to estimate the association between skipping breakfast and obesity. But unfortunately no such study is being conducted in our setting to identify risk factors of obesity in young adults of our population.

1.2 Objectives

The objective of this study is to determine the factors responsible for overweight and obesity in those students who are overweight and obese as compared to normal healthy students of Azra Naheed Medical College.

1.3 Rationale

The rationale of the study is to improve the health of students of Azra Naheed Medical College

1.4 Operational Definitions

1.4.1 BMI

The body mass index (BMI) is the standard scale for measuring human body shape based on their height and weight. BMI is calculated as kg/m2. The cut-off value 30 describes BMI as obese and BMI above 25 as overweight [13] The BMI is measured by anthropometric parameters such as height, weight. The cut off points for obesity and overweight is 30 Kg/m^2 and 25 Kg/m^2 respectively using the WHO criteria.

1.4.2 Eating Habits

The methods relevant to diet; include types of foods, eat behavior. These eating habits were recorded on feedback form

1.4.3 Fast food

Foods developed for ease of use or intake and offered at food courts for speedy accessibility or take away, in this study all type of foods are fast food that are available at fast food stores e.g. McDonalds, KFC, Pizza Hut and others.

1.4.4 Physical activity

Physical activities are usually described as any physical motions created by skeletal muscle tissue resulting in energy expenditure above relaxing level. Physical activities were based on feedback form

1.4.5 Moderate Physical Activity

Actions that increase the pulse rate and keep the person feeling heated and a little bit out of breathing .the activities include strolling, biking, house-work, farming conducted 5 days/week, moments/day. Forceful physical activities:

1.4.6 Aggressive physical activity

Bodily movements which make people sweat and cause them out of breath. These involve sports or exercise like soccer swimming, badminton, basket ball, tennis, swimming, etc

1.4.7 Sedentary Entertainment activities:

Activities that cause energy consumption similar as that of resting level for example as watching TV or using internet, video games etc

1.5 Materials and Methods

1.5.1 Study Design

The present study is a case control study

1.5.2 Setting

The study was conducted in Azra Naheed Medical College Raiwand Road Lahore

1.5.3 Study Population

Male and Female students of Azra Naheed Medical College

1.5.4 Duration of Study

The study took 4 months from November 2013 to February 2014 after approval from advance research committee

1.5.5 Sample size

The sample size was calculated by the following formula keeping the power of study equal to 90% and level of significance equal to 5%. The sample size should be 127 in each group. In order to match the variables between cases and control sample size of 150 in each group was used.

$$n = \frac{\left(Z_{1-\alpha/2}\sqrt{2\bar{p}(1-\bar{p})} + Z_{1-\beta}\sqrt{p_1(1-p_1)+p_2(1-p_2)}\right)^2}{(p_1-p_2)^2}$$

$$Where\ \ \bar{p} = \left(\frac{p_1+p_2}{2}\right)$$

(Sample Size determination in health studies version 2.0.21 WHO)

P1= Anticipated proportion of adults who are not active physically are obese= 60%

P2= Anticipated proportions of adult who are not physically active and not Obese= 40% [14]

p1 – p2 is the difference between proportions = 20%

Z 1 – β is the desired power of study = 80%

Z 1-α/2 is the desired level of significance = 05%, test Value of odds ratio=2

1.5.6 Eligibility

1.5.6.1 Case group

Inclusion Criteria

- Being student of Azra Naheed Medical College
- BMI above 25
- Both genders were equally inclusive
- Age limit 18-25 years

Exclusion Criteria

- Any associated disease like diabetes or Hypertension
- Any metabolic disease
- Married marital status

1.5.6.2 Control group

Inclusion Criteria

- Being student of Azra Naheed Medical College
- BMI between 18.5 to 25.
- Both genders were equally inclusive
- Age limit 18-25 years

Exclusion Criteria

- Any associated disease like diabetes or Hypertension
- Any metabolic disease
- Married marital status.

1.5.7 Data collection

The study was conducted in Azra Naheed Medical College which has about 681 students enrolled in MBBs and DPT at the start of study.19 students refused to participate in the study and 13 were not available during study duration. Remaining 649 students were surveyed for BMI.203 students were found to be overweight/obese and remaining 446 were normal weighted. From these 150 Cases (overweight/obese) and 150 controls (Normal weight) were selected by simple random sampling using random number table who were matched in gender, course of study and residence status. The questionnaire was

designed by modifying the standardized questionnaire of Youth Risk Behavior Surveillance System .The reliability of resultant questionnaire was tested by performing reliability analysis on SPSS by conducting a pilot study on 20 subjects (cronbach's alpha ≥ 0.7)

1.5.8 Ethical consideration

The ethical committee and Department of Medical Education of Azra Naheed Medical College approved to conduct the study in College .Only those students were included in the study who signed the written consent. All the personal information of participants were kept hidden

1.5.9 Statistical Procedure

The Data was analyzed using SPSS v20.Mean±SD was calculated for numeric variables i.e. age BMI and frequency and percentage was shown with categorical variables e.g. Gender, residence status, course of study and year of education. Odds ratio was calculated to estimate the relative risk and to control the confounding variable, logistic regression was used.95% confidence for all odds ratios was calculated (bivariate analysis).P value ≤ .05 was considered statistically significant

2. Results

2.1 Socio-demographic Profile

Table 1: Socio-demographic Profile of Subjects

Variables	*Cases*	*Control*	*P-value*
Age (Mean±S.D)	21.24±1.996	21.04±1.95	0.381
BMI (Mean±S.D)	28.55±3.98	21.5667±1.780	<0.001
Gender			
Male	61	61	
Female	89	89	>0.999
Residence			
Hostel	84	90	
Home	66	60	0.483
Coarse			
MBBS	60	60	
DP**T**	90	90	>0.999
Education Year			
1st year	54	66	
2nd year	42	36	0.531
3rd year	36	30	
4th year	18	18	

* p-value significant at or less than 0.05

In this study 300 subjects were enrolled, 150 were cases and 150 were their control according to Gender and Course and residence. Overall mean age was 21.14±1.975. Most of the students were female (59.3%) and 40.7% were male

2.2 Overweight/obesity and Eating Habits

Table 2 Frequencies and Odds ratio with respective 95% Cl for variables related to eating habits

Variable		*Cases Overweight/obese*	*Control Normal*	*Total*	*OR(95%CI)*	*p-value*
Skipping Breakfast	Yes	87	72	159	1.496(0.948-2.360)	0.083
	No	63	78	141		
Total		150	150	300		
Irregular Lunch	Yes	66	54	120	1.397(0.878-2.221)	0.157
	No	84	96	180		
Total		150	150	300		
Irregular Dinner	Yes	79	84	163	0.874(0.555-1.377)	0.562
	No	71	66	137		
Total		150	150	300		
Tea/Coffee	Yes	86	81	167	1.145(0.726-1.826)	0.561
	No	64	69	133		
Total		150	150	300		
Fast Food	Yes	88	91	179	0.922(0.582-1.465)	0.724
	No	62	59	121		
Total		150	150	300		
Take Vitamins/Supplements	Yes	40	45	85	0.848(0.513-1.403)	0.522
	No	110	105	220		
Total		150	150	300		
Eating out	Yes	115	98	213	1.743(1.051-2.892)	0.031*
	No	35	52	87		
Total		150	150	300		
Micro waved Food	Yes	101	95	196	1.193(0.741-1.921)	0.467
	No	49	55	104		
Total		150	150	300		
Carbonated Drinks	Yes	125	99	224	2.576(1.491-4.448)	0.001*
	No	25	51	76		
Total		150	150	300		
Eating Frozen Food	Yes	66	82	148	0.655(0.413-1.027)	0.065
	No	84	68	152		
Total		150	150	300		
Eating Fish	Yes	94	101	195		
	No	56	49	105		
Total		150	150	300		

* p-value significant at or less than 0.05.

2.3 Obesity and Physical activity

Table 3: Frequencies and Odds ratio with respective 95% Cl for variables related to physical activity

Variable		Cases Overweight/obese	Control Normal	Total	OR(95%CI)	p-value
Lack of Mild Physical Activity	Yes	41	45	86	0.878(0.532-1.448)	0.611
	No	109	105	214		
Total		150	150	300		
Lack of Moderate Physical Activity	Yes	122	99	221	2.245(1.31-3.82)	0.003*
	No	28	51	79		
Total		150	150	300		
Lack of Aggressive Physical Activity	Yes	120	95	215	2.316(1.377-3.895)	0.001*
	No	30	55	85		
Total		150	150	300		
TV Watching	Yes	110	77	187	2.607(1.608-4.227)	<0.001*
	No	40	73	113		
Total		150	150	300		
Playing Video Games	Yes	50	46	96	1.133(0.696-1.837)	0.621
	No	100	104	204		
Total		150	150	300		
Playing Sports	No	72	70	142	1.055(0.671-1.661)	0.817
	Yes	78	80	158		
Total		150	150	150		

* p-value significant at or less than 0.05

2.4 Adjustment of Variables

Table 4 Frequencies and Odds ratio adjusted for gender, residence and year of education (4 categories) with respective 95% Cl for variables related to eating habits and physical activity in university students

Variable		Cases Overweight/obese	Control Normal	Total	Adjusted OR(95%CI)	p-value
Carbonated Drinks	Yes	125	99	224	2.306(1.286-4.135)	0.005*
	No	25	51	76		
Total		150	150	300		
Lack of moderate Physical Activity	Yes	122	99	221	2.274(1.294-3.994)	0.004*
	No	28	51	79		
Total		150	150	300		
Lack of aggressive Physical Activity	Yes	120	95	215	2.2881(1.287-4.066)	0.005*
	No	30	55	85		
Total		150	150	300		
Watching TV	Yes	110	77	187	2.914(1.728-4.914)	<0.001*
	No	40	73	113		
Total		150	150	300		

* p-value significant at or less than 0.05

A total of 17 potential confounding variables related to eating habit and physical activities were studied. The four most significant variables were use of carbonated drinks, lack of moderate and aggressive physical activity and watching TV.A regression analysis technique was used and after allowing these four factors, all other differences were non-significant. Reanalysis of data introducing a greater number of confounding variables made no difference to the final conclusion

2.5 Model of Logic Regression

Logit (Overweight/obesity) = -1.039 +0.885(using carbonated drinks) +.819(lack of moderate PA) +.828(lack of aggressive PA) +1.023(watching TV)

3. Conclusion

The study demonstrated that four factors which include consumption of carbonated drinks, spending too much time in watching television and lack of moderate and aggressive physical activity were found to be the key factors which increase the probability of having overweight/obesity. Public health programs are warranted to increase awareness on these factors among these students to reduce the future burden of obesity-associated chronic diseases.

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