Prevalence and Contributing Factors of Overweight and Obesity in Lahore

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ABSTRACT

Background: Obesity and overweight is a condition which is highly prevalent in both developed and developing countries. Limited data available in Pakistan regarding the said problem. This study was done to find out the prevalence of obesity and overweight and its contributing factors in District Lahore.

Methods: A cross sectional study was performed on the individuals of either sex, age between 15-55 in the district of Lahore. The sample size of 345 individuals was taken randomly using the sampling technique of non-probability purposive sampling from the different towns of district Lahore. Data were collected by in person interview by using a pre-design questionnaire. The data were analyzed by SPSS version 18.

Results: The prevalence of overweight and obesity as per WHO body mass index (BMI) criteria is 27.8% and 25.2% respectively in the subjects included in the study. The combined prevalence of overweight and obesity is 53%. The prevalence of overweight and obesity in the age group between 21-25 is 22.9% and 67.9%, respectively, which is the highest values among all other age groups. Physical inactivity, positive family history, male gender, middle age, depression, consumption of carbonated drinks and fast food, overeating, and high calorie food intake are the contributing factors identified in my study.

Conclusion: The study shows the high prevalence of overweight and obesity. Change of lifestyle, dietary habits and the promotion of physical activity is strongly needed. Immediate action both preventive and curative is needed to reverse the epidemic. effective policies and the strategies should be made for the long term solution.

Keywords: Prevalence, obesity, overweight, body mass index.

INTRODUCTION

The term "Obesity" is commonly used to describe fatness or excess of adipose tissue and has been defined in many different ways. However, according to the World Health Organization (WHO), Obesity is defined as having the Body Mass Index (BMI) of equal or greater to 30 kg/m2[1].

Obesity has become a global health issue and is associated with many serious diseases[2]. Because of its recent increase to epidemic levels, obesity has become a challenge for public health practitioners[3]. In 1997 world health organization formally recognized obesity as a global epidemic[4]. A total of 68.7 percent of U.S adults (more than two-third) are either overweight or obese[5]. In the past 30 years, the rate of obesity in adults has more than doubled — from 15% in 1976-1980 to 35.7% in 2009-2010. The average American adult is more than 24 pounds heavier today than in 1960[6]. If U.S. trends continue without any stop then it's an estimate that by 2030 half of all men and women will be obese[7]. If nothing is done to reverse the epidemic, more than 1 billion adults are projected to be obese by 2030[8].

The prevalence of obesity has doubled from 13.4-34.3% for simple obesity and from 0.9% to 6% of severe obesity, between 1960-62 to 2007-08 that has also increased threats for obesity related disorders[9,10]. Obesity prevalence varied by age group and by racial and ethnic group for both men and women. Over the 10-years period, obesity showed no significant trend among women for 2007-2008 vs. 1999-2000, 1.12. For men, there was a

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significant linear trend (AOR for 2007-2008 vs 1999-2000, 1.32 [95% CI, 1.12-1.58])[11].

All cultures from Western to African countries are facing the increasing trend of this problem. The burden of obesity has noticeably gotten higher in South Asian countries including Pakistan[12]. According to the National Health Survey of Pakistan (1990-1994), the prevalence of obesity has reached up to 25%[3]. This trend is rising rapidly and one recent study by Khawaja and Kadir showed that half of the participants under study were overweight which is quite alarming. [13] Contrarily to the developed countries where socio-economic status and education level are negatively associated with the prevalence of obesity, here in Asian countries including Pakistan young population with high level of socio-economic status as well as education are facing obesity and associated non-communicable diseases[14].

A number of modifiable and a few non-modifiable risk factors have been documented for causing obesity. Among these, physical inactivity leads the rest followed by sedentary life style, abnormal or unhygienic eating habits, urbanization, high socio-economic status and education and low birth weight[15]. Whereas, ethnicity, genetic or hereditary transfer and female gender are some non-modifiable risk factors for obesity. Though sufficient evidence exists to claim that increasing age is also a risk for obesity, however recent trends show the peak of obesity level at younger age of 15-30 years[16].

Obesity has been reported to cause many serious diseases worldwide that may lead to irreversible morbidities and even death. These associated diseases include stroke, coronary heart disease, type 2 diabetes mellitus, hypertension, certain cancers, and cardiovascular diseases[17,18]. Bhopal et al. showed differences between Pakistanis, Indians and Bangladeshis regarding the

prevalence of coronary heart disease risk factors in the UK; obesity was more prevalent in Pakistanis and Indians than in Bangladeshis[15]. Another study focusing on Pakistani women in Oslo, Norway listed obesity among one of the prominent risk factors of diabetes among them[19].

This extensive body of literature necessitates a deep understanding of etiology of obesity, identify their risk factors in our country and devise strategy to control obesity. Hence Considering the public health implications of obesity, we aim to report the prevalence of overweight and obesity in population of Lahore and to identify contributing risk factors.

MATERIALS AND METHODS

This cross sectional study was carried out with the help of pretested questionnaire. The study was completed at institute of public health, University of Lahore by gathering data from District Lahore. All apparently healthy people taken from Public places like parks and bus stations. Also from colleges and multiple area and colonies which fall in different towns. This study was completed in 6 month. A total of 345 subjects were taken in this study. We used expected % of obesity = 25%[3], 95% confidence level and 5% margin of error. The sample size is calculated using following formula

$$n = \frac{z^2_{1-\alpha/s}P(1-P)}{d^2}$$

Non-probability purposive sampling was used. Resident of Lahore age between 15-55 years of either gender were included in the study while all pregnant women with visible disabilities were excluded in the study.

Data collection methodology: 345 subjects who fulfilled the selection criteria were enrolled in the study. verbal consent was obtained from each subject. Demographic profile (name, age, contact no.) was taken from every participant. The weight and height of each subject was taken to calculate their body mass index and classified according to operational definition. After measuring their body mass index every subject was asked questions for contributing risk factors on prescribed Performa. Before applying my study on the calculated sample population, I did the pilot study to find out the reliability of my questionnaire. The value of cronbach's alpha is 0.682 which shows that its reliable

Data analysis: Data were analyzed by SPSS version 18. The qualitative data such as gender, risk factors, and BMI classification was presented in the form of frequency (%). Mean ± S.D was calculated for quantitative data like age, weight, height and BMI. Association of different risk factors with BMI classification was calculated using chi-square test. P-value ≤ 0.05 was taken as significant.

Ethical consideration: Approval from the ethical review committee of university of Lahore was taken. Verbal consent was taken from respondents prior to the interview. Privacy and confidentiality was preferred.

RESULTS

Obesity is epidemic worldwide and contribute to number of co morbidities which leads to decrease productivity and even death. Different studies around the globe have identified multiple modifiable and non modifiable factors which contribute to overweight and obesity.

This study also identified few contributing factors of overweight and obesity, the following table shows the detail of the factors.

The combined prevalence of overweight and obesity is 53% where overweight accounts for 27.8% and obesity 25.2%.The total subjects studied were 345 among 211 were male and 134 were female. Among total participant 80.6% was punjabi, 1.4% pathan, 2.0% balochi, 10.7% sindi, 5.2% kashmiri. The overweight and obesity in male and female was 61.2% and 38.8% respectively. The prevalence of overweight and obesity in the age group between 21-25 is 22.9% and 67.9% respectively, which is highest values among all other age groups. The age is found to be associated with obesity (p=0.00).

Male gender (p=0.02) ,marital status (p=0.000), nature of the job (p=0.04),and physical activity (p=0.04), found to be associated with obesity. there were few other factors which shows association with obesity like consumption of carbonated drinks (p=0.006),consumption of fast food (p=0.028), high calorie intake (p=0.030), overeating (p=0.028), and positive family history (p=0.000). Physical inactivity, positive family history, male gender, middle age, depression, consumption of carbonated drinks and fast food, overeating, and high calorie food intake were the contributing factors identified in the study.

Table 1: Identified contributing Risk factors of overweight and obesity

Variable	BMI					
	underweight <18.5	normal 18.5-24.9	average overweight(pre-obese) 25-29.9	mildly increased obese >30.0	class 1 30.0-34.9 moderate	class 11 35-39.9 severe
Gender (0.02)*						
Male	18(40.0%)	84(71.8%)	64(66.7%)	4(57.1%)	24(50.0%)	17(53.1%)
Female	27(60.0%)	33(28.2%)	32(33.3)	3(42.9%)	24(50.0%)	15(46.9%)
Age (<0.001)*						
15-35	39(86.6%)	92(78.7%)	58(60.4%)	5(71.5%)	26(554.2%)	9(28.2%)
36-55	6(13.4%)	25(21.3%)	38(39.6%)	2(28.5%)	22(45.8%)	23(71.8%)
Nature of Job (0.004)*						
Office job	9(20%)	27(23.1%)	23(24.0%)	3(42.9%)	5(10.4%)	0(0.0%)
Field work	2(4.4%)	13(11.1%)	15(15.6%)	1(14.3%)	9(18.8%)	5(15.6%)
Labor	6(13.3%)	15(12.8%)	17(17.7%)	0(0.0%)	9(18.8%)	4(12.5%)
Not working	17(37.8%)	26(22.2%)	22(22.9%)	2(28.6%)	21(43.8%)	15(46.9%)
Student	8(17.8%)	27(23.1%)	11(11.5%)	1(14.3%)	2(4.2%)	2(6.3%)
Other Profession	3(6.7%)	9(7.7%)	8(8.3%)	0(0.0%)	2(4.2%)	6(18.8%)

Education (0.120)*						
Under matric	9(20.0%)	21(17.9%)	16(16.7%)	0(0.0%)	17(35.4%)	6(18.8%)
Matriculation	5(11.5%)	11(9.4%)	16(16.7%)	0(0.0%)	5(10.4%)	11(34.4%)
Intermediate	9(20.0%)	23(19.7%)	18(18.8%)	1(14.3%)	9(18.8%)	4(12.5%)
Bachelor	14(31.1%)	38(32.5%)	28(29.2%)	4(57.1%)	14(29.2%)	6(18.8%)
Masters	5(11.1%)	13(11.1%)	7(7.3%)	2(28.6%)	2(4.2%)	3(9.4%)
Professional degree	2(4.4%)	10(8.5%)	11(11.5%)	0(0.0%)	1(2.1%)	2(6.3%)
others	1(2.2%)	1(0.9%)	0(0.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Hours of Physical Activity (0.012)*						
More than 6 hours	15(33.3%)	41(35.0%)	27(28.1%)	1(14.3%)	13(27.1%)	3(9.4%)
4-6 Hours	4(8.9%)	23(19.7%)	18(18.8%)	4(57.1%)	6(12.5%)	4(12.5%)
2-4 Hours	8(17.8%)	21(17.9%)	19(19.8%)	1(14.3%)	17(35.4%)	8(25.0%)
Less Than 4 Hours	18(40.0%)	32(27.4%)	32(33.3%)	1(14.3%)	12(25.0%)	17(53.1%)
Use of Carbonated Beverages (0.005)*						
Daily or almost daily	16(35.6%)	28(23.9%)	9(9.4%)	0(0.0%)	5(10.4%)	6(18.8%)
Few times a week	17(37.8%)	53(45.3%)	44(45.8%)	5(71.4%)	23(47.9%)	12(37.5%)
About once a week	8(17.8%)	14(12.0%)	20(20.8%)	1(14.3%)	14(29.2%)	11(34.4%)
Few times a month	3(6.7%)	15(12.8%)	12(12.5%)	0(0.0%)	5(10.4%)	3(9.4%)
Rarely or never	1(2.2%)	7(6.0%)	11(11.5%)	1(14.3%)	1(2.1%)	0(0.0%)
Frequency of exercise (0.012)*						
Daily	8(17.8%)	21(17.9%)	15(15.6%)	1(14.3%)	4(8.3%)	7(21.9%)
Twice a week	6(13.3%)	12(10.3%)	15(15.6%)	0(0.0%)	3(6.3%)	3(9.4%)
Thrice a week	2(4.4%)	9(7.7%)	6(6.3%)	1(14.3%)	4(8.3%)	5(15.6%)
Once a week	4(8.9%)	4(3.4%)	13(13.5%)	3(42.9%)	4(8.3%)	1(3.1%)
Once a month	7(15.6%)	13(11.1%)	3(3.1%)	2(28.6%)	4(8.3%)	4(12.5%)
Almost never	18(40.0%)	58(49.6%)	44(45.8%)	0(0.0%)	29(60.4%)	12(37.5%)
Frequency of Eating Fast Food (0.028)*						
Daily or almost daily	6(13.3%)	9(7.7%)	7(7.3%)	0(0.0%)	0(0.0%)	0(0.0%)
Few times a week	18(40.0%)	50(42.7%)	39(40.6%)	3(42.6%)	31(64.6%)	17(53.1%)
About once a week	13(28.9%)	36(30.8%)	34(35.4%)	4(57.1%)	13(27.1%)	15(46.9%)
Few times a month	7(15.6%)	11(9.4%)	12(12.5%)	0(0.0%)	2(4.2%)	0(0.0%)
Rarely or never	1(2.2%)	11(9.4%)	4(4.2%)	0(0.0%)	2(4.2%)	0(0.0%)
Frequency of feeling sadness (0.015)*						
Most of the times	12(26.7%)	18(15.4%)	12(12.5%)	0(0.0%)	7(14.6%)	10(31.3%)
Some times	17(37.8%)	42(35.9%)	41(42.7%)	1(14.3%)	17(35.4%)	10(31.3%)
Rarely	8(17.8%)	34(29.1%)	24(25.0%)	6(85.7%)	20(41.7%)	9(28.1%)
Never	8(17.8%)	23(19.7%)	19(19.8%)	0(0.0%)	4(8.3%)	3(9.4%)

*Chi-square p value

DISCUSSION

Body mass index by WHO is most widely used criteria and most useful epidemiological measure of obesity. In this study I also used this tool to assess the prevalence of obesity. In this study i have noted a high prevalence of overweight and obesity specially in male gender. Limited data were available on this topic in Pakistan but my study can be comparable to few other studies done in different countries.

A study was done in Spain on 1197 subjects between 2002-2004, which reveals the overall prevalence of overweight 37.6% (95%CI: 34.2-41); 43.8% (95%CI: 37.2-50.5) in males, and 32.4% (95% CI: 28.6-36.1) in females (p<0.01). Prevalence of obesity was 22.3% (95%CI: 19.1-25.5); 23.2% (95%CI: 16.9-29.5) in males, and 21.5% (95%CI: 18.3-24.8) in females[20].

A cross-sectional study done in the Cyprus on 1001 individual which reveals high prevalence of overweight and obesity in male when compared to a female group[21] Another study done in Turkey to estimate the prevalence of overweight and obesity (general and central) in the Trabzon Region and its associations with demographic factors (age, sex, marital status, reproductive history in women, and level of education), socioeconomic factors (household income and occupation), family history of selected medical conditions (diabetes, hypertension, and obesity), lifestyle factors (smoking habits, physical activity, and alcohol consumption), and hypertension in the adult population A total of 5016 subjects (2728 women and 2288 men) were included in the study. the prevalence of obesity was 60.3%.The prevalence of obesity increased with age, being highest in the 60- to 69-year-old age group (40.8%) but lower again in the 70+ age group. Obesity was associated positively with marital status, parity, cessation of cigarette smoking, alcohol consumption, and household income and inversely with level of education, cigarette use, and physical activity. Also, obesity was associated positively with hypertension[22].

The interpretation and comparability of prevalence data on obesity is difficult, as the defining criteria vary for different populations and generalisability of the results are questionable. In the study, anthropometric measurements were done by a single trained investigator in order to have a uniform pattern of data collection.

REFERENCES

1. Tacon AG, Metian M. Fish Matters: Importance of Aquatic Foods in Human Nutrition and Global Food Supply. Reviews in Fisheries Science. 2013;21(1):22-38.
2. Nguyen DM, El-Serag HB. The epidemiology of obesity. Gastroenterology Clinics of North America. 2010;39(1):1.
3. Samir N, Mahmud S, Khuwaja AK. Prevalence of physical inactivity and barriers to physical activity among obese attendants at a community health-care center in Karachi, Pakistan. BMC research notes. 2011;4(1):174.
4. Haslam D. Obesity: a medical history. Obes Rev 8 Suppl. 2007:1-31.
5. Fryar CD, Carroll MD, Ogden CL. Prevalence of Overweight, Obesity, and Extreme Obesity Among Adults: United States, Trends 1960-1962 Through 2009-2010. National Center for Health Statistics. 2012:Assessed 2013.
6. Odgen CL. Childhood Obesity in the United States: The Magnitude of the Problem.:Powerpoint (accessed June 2013).
7. Wang YC, McPherson K, Marsh T, Gortmaker SL, Brown M. Health and economic burden of the projected obesity trends in the USA and the UK. The Lancet. 2011;378(9793):815-25.
8. Kelly T, Yang W, Chen CS, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. Int J Obes (Lond). 2008;32:1431-7.
9. De Onis M, Blössner M, Borghi E. Global prevalence and trends of overweight and obesity among preschool children. The American journal of clinical nutrition. 2010;92(5):1257-64.
10. Sherwood NE, Senso MM, Fleming CK, Roeder AM. Behavioral Risk Factors for Overweight and Obesity. Nutrition in the Prevention and Treatment of Disease. 2012:479.
11. Flegal KM, Carroll MD, Ogden CL, Curtin LR. Prevalence and trends in obesity among US adults, 1999-2008. JAMA: the journal of the American Medical Association. 2010;303(3):235-41.
12. Ramachandran A, Snehalatha C. Rising burden of obesity in Asia. Journal of obesity. 2010;2010.
13. Khuwaja AK, Khawaja S, Motwani K, Khoja AA, Azam IS, Fatmi Z, et al. Preventable lifestyle risk factors for non-communicable diseases in the Pakistan Adolescents Schools Study 1 (PASS-1). Journal of Preventive Medicine and Public Health. 2011;44(5):210-7.
14. McLaren L. 40 Social and Economic Determinants of Obesity. Handbook of Obesity: Epidemology, Etiology, and Physiopathology. 2014;1:445.
15. Jayawardena R, Byrne NM, Soares MJ, Katulanda P, Hills AP. Prevalence, Trends and Associated Socio-Economic Factors of Obesity in South Asia. Obesity facts. 2013;6(5):405-14.
16. Gupta DK, Shah P, Misra A, Bharadwaj S, Gulati S, Gupta N, et al. Secular trends in prevalence of overweight and obesity from 2006 to 2009 in urban asian Indian adolescents aged 14-17 years. PLoS One. 2011;6(2):e17221.
17. Ludwig AF, Cox P, Ellahi B. Social and cultural construction of obesity among Pakistani Muslim women in North West England. Public health nutrition. 2011;14(10):1842.
18. Khadilkar V, Khadilkar A, Cole T, Chiplonkar S, Pandit D. Overweight and obesity prevalence and body mass index trends in Indian children. International Journal of Pediatric Obesity. 2011;6(2Part2):e216-e24.
19. Hjellset VT, Bjørge B, Eriksen HR, Høstmark AT. Risk factors for type 2 diabetes among female Pakistani immigrants: the InvaDiab-DEPLAN study on Pakistani immigrant women living in Oslo, Norway. Journal of Immigrant and Minority Health. 2011;13(1):101-10.
20. Aguilera-Zubizarreta E, Ugarte-Miota T, Munoz Cacho P, Vara-Gonzalez L, Sanz de Castro S. [Prevalence of overweight and obesity in Cantabria [Spain]]. Gaceta sanitaria / SESPAS. 2008;22(5):461-4. Epub 2008/11/13. Prevalencia de sobrepeso y obesidad en Cantabria.
21. Andreou E, Hajigeorgiou P, Kyriakou K, Avraam T, Chappa G, Kallis P, et al. Risk factors of obesity in a cohort of 1001 Cypriot adults: An epidemiological study. Hippokratia. 2012;16(3):256-60. Epub 2013/08/13.
22. Erem C, Arslan C, Hacihasanoglu A, Deger O, Topbas M, Ukinc K, et al. Prevalence of obesity and associated risk factors in a Turkish population (trabzon city, Turkey). Obesity research. 2004;12(7):1117.