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Prevalence of obesity and some associated factors among adult residents of Mazar-e-Sharif city, Afghanistan

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ABSTRACT:-Background: Obesity as a major public health problem is defined as fat accumulation in excessive pattern in adipose tissue. This study aims to estimate the prevalence of obesity and determine some risk factors of adults in Mazar-e-Sharif, Afghanistan.
Methods and Materials: Using WHO stepwise approach a cross-sectional study was conducted in Mazar-e-Sharif and enrolled adult citizens of 25-70 years. The face to face questionnaire was used to collect demographic, socioeconomic and behavioral factors. Anthropometric measurements including height, weight, waist circumference and blood pressure were done. Subjects with a body mass index ≥ 30 kg/m^2 were considered obese. Data management and analysis was done using SPSS. V.20.
Results:-The overall prevalence of obesity was 15.4 % (20.5 % women and 9.5 % men). Of total 664 (53.9%) were females and 567 (46.1%) males with a mean age of 40.5±13.2 years. More than half of the respondents (59.3%) were illiterates; majority of respondents (83.7%) were married and more than 85.5% of women were housewives. Nearly 10% were smokers and (8.3%) were mouth snuff users with differentiation of 3.5% among women. The main factors associated with obesity were sex, age, blood pressure, blood sugar and central obesity.
Conclusions:-Obesity is a public health problem in Mazar-e-Sharif. Living in urban areas, and those with high blood pressure, high blood sugar and central obesity should be focused for health education campaigns and public awareness.

Keywords: *Prevalence, Obesity, Overweight, Risk Factors, Balkh, Afghanistan*

I. INTRODUCTION

Obesity as a major public health problem is defined as fat accumulation in excessive pattern in adipose tissues [1]. Prevalence of obesity and overweight is stridently increasing in both developed and developing countries [2, 3]. Over the last couple of decades obesity have been transformed from fairly minor public health issues of the most affluent societies to a major public health challenge worldwide [4]. Obesity and overweight is the sixth most important risk factor causative to the total worldwide diseases [5]. Between 1980 and 2008 during 28-year period, the prevalence of obesity nearly doubled worldwide [6]. In 2013 it is estimated that more than 2 billion people in the world were overweight or obese and about 671 million of them were obese [7]. Obesity increases the risk of some noncommunicable diseases such as diabetes, cardiovascular disease, hypertension, hyperlipidemia, sleep apnea and estimated to reduce life expectancy around 7 years [8-10]. The analyses for the Global Burden of Disease Study 2013 documented that the proportion of adults with a body mass index (BMI=weight/height^2) of 25 or greater increased between 1980 and 2013 from about 29 to 37% in men and from about 30 to 38% in women [7]. Formerly obesity was considered to be a problem of high-income countries [11] while it is not currently true because obesity had also become a problem of lower socioeconomic groups, particularly of women in middle-income countries [12]. Apparently the Body Mass Index is the most prevalent and practical indicator for evaluation of overweight and obesity in adults around the world [13]. During1990s the BMI became a universally accepted measure of the degree of overweight, and now, identical cutoff points are generally recommended [14]. Individuals with BMI >18.5 kg/m^2 are defined underweight while the ranges of 18.5–25 kg/m^2 and 25–30 kg/m^2 are defined normal and overweight. Finally group of >30 kg/m^2 30 is defined as obese [15]. Literature reports that increasing burden of obesity is associated with the remarkable changes in the life style such as dietary habits and insufficient physical activity [1, 16]. Some underlying basis could be genetic factors, pattern of eating; and low socioeconomic status [17-19]. The influencing factors for obesity included sex, age, marriage status, occupation, smoking, drinking, diet, hours of sleep and lifestyle in different studies [20-23]. Obesity co-morbidity disorders is another problem which require serious attention [24-25].
Although nationwide information on obesity and overweight is not available for Afghanistan, however few studies reported the prevalence of obesity in Kabul and Jalalabad 31.2% and 27.4% respectively [26-27]. In another provincial study in Afghanistan in 2002 the average BMI was recorded to be 21.1 [28]. Anyway adequate management of obesity as a chronic condition for those who are already obese is important and requires the principles of integrated care for disease management [29]. A combination of top-down corporate

and government interventions with bottom-up community-led ones is most likely to be successful integrated approach [30]. This study was conducted to evaluate the prevalence of obesity in northern big city of Mazar-e-Sharif with particular attention to main risk factors such as demographic, socioeconomic, and lifestyle variables in adult's population.

II. METHODS AND MATERIALS

This report is part of provincial-based cross-sectional survey using WHO STEP wise instrument [31] conducted in April-May 2015 to estimate the prevalence of NCDs including obesity and its associated factors in Mazar-e-Sharif city, Balkh province. The ultimate target sample size was established to be 1200 adult age group of (25 -70) years. Structured questionnaire were used in face-to-face interviews to collect demographic and socioeconomic variables. All permanent household members aged 25 -70) years of both sex being residents of the cities during the study period and gave consent to participate were included in the study. Using the multistage cluster strategy at onset from this list we conventionally selected five districts using random number of excel sheet. In the second stage from each selected district we randomly selected the five areas. Then the number of households in each area divided by the sample size assigned for each areas, which enabled us to select households. Within household the adults of more than eligible age groups counted and randomly one of them selected and interviewed. A household was defined as a group of people who share the same food pot not the same roof. Sample size estimation was based on an a priori specified precision level of 5% and the assumption that the proportion of potential risk was similar to other studies conducted in other similar settings. Height and weight were measured by measurement tape and electronic weighing scale. A waist circumference of ≥94cm for men and ≥ 80cm for women were considered centrally obese. Blood pressure was measured and dichotomized to high and normal blood pressure by either systolic of ≥ 140 mmHg, or diastolic of ≥ 90 mmHg, or both. Those already on treatment were considered hypertensive irrespective of our own readings. Following the interview blood samples were collected the next morning after the respondent were fasted for 10–12 hours. Blood samples were transported in cool boxes (2-8°C) from field to provincial public health office on the day of sample collection. After processing and separation, the samples were shipped to Central Public Health Laboratory (CPHL) to Kabul in consignments. On a where all serum samples were stored at -80°C until biochemical examination were completed. After data collection, entry and cleaning 1231 records were ready for analysis. Variables such as age, sex, educational status, income, blood pressure, diabetes mellitus, smoking status, snuff using, physical activity and dietary behavior were included in the structured pretested and modified questionnaire. For normally distributed variables, we calculated mean and Standard Deviation (SD) and for categorical variables we used chi-Squared and logistic regression. We derived both bivariate and multivariate estimates of Odds Ratios (OR) and 95% Confidence Interval (95%CI). Data were analyzed using SPSS 20 [32]. This study was approved by the Ethics Committee of Ministry of Public Health and written informed consent was obtained from all subjects in the survey.

III. RESULTS

In this survey, we interviewed 1,231 study subjects of them 664 (53.9%) were females and 567 (46.1%) males with a mean age of 40.5±13.2 years. More than half of the respondents (59.3%) were illiterates; majority of respondents (83.7%) were married and more than 85.5% of women were housewives. Nearly 10% were smokers and (8.3%) were mouth snuff users with differentiation of 3.5% among women. Eighty percent of respondents ate fruits 3 days or less per week while it was increased to half with respect to vegetables. Basically 12% of the respondents practiced vigorous physical activity and 28.2% of subjects reported doing moderate physical activity. Almost half (48.5%) of study respondents were recorded to be overweight or obese and more than half (58.9%) were suffering from central obesity. The prevalence of either systolic or diastolic hypertension was 30.9%. For detail information on description of variables please see the table 1 and 2.The overall prevalence of obesity and overweight were15.4 % and 34% respectively. The obesity was further classified as obesity grade I to grade III. The proportion of obesity in grades were 11.8%, 2.4% and 1.3% respectively. The blood lipids were also determined by descriptive analysis. The mean of triglycerides, total cholesterol, HDL and LDL (in mg/dL) were 161.66 (95%CI: 155.71-167.49), 179.20 (95%CI: 175.48-183.20), 49.44 (95%CI: 47.52-51.64), 113.45 (95%CI: 50.75-59.54) respectively. At univariate level obesity was significantly associated with the sex, age, marriage, hypertension, high blood sugar and central obesity. While the rest of factors including blood lipids were not associated with obesity. In females, the prevalence of obesity was higher (20.5%) than general population and males (9.5%) see table 3 and 4. At multivariate level, the logistic regression revealed relations between obesity and factors such as sex ($P < 0.05$), age groups of 35-34 years ($P < 0.05$), systolic blood pressure ($P < 0.001$), high blood sugar ($P < 0.05$) and central obesity ($P < 0.001$) see table 5.

IV. DISCUSSION

Due to high burden and more attention of government and donors to infectious diseases and maternal health very few studies conducted on noncommunicable diseases and their risk factors including obesity and overweight. To the extent that literature shows this is the first community based face-to-face survey and analysis of data to investigate the prevalence of obesity in Balkh province in Mazar-e-Sharif city. We found that the prevalence of both overweight and obesity together was high and approximately half of the population is suffering from this problem. However in comparison to other studies this proportion of obesity is still low such as studies which was conducted in Kabul and Jalalabad, the big cities in Afghanistan [26-27]. In addition other studies which is conducted elsewhere found higher proportions as compare to our findings [33-34] in the region and out of region. This low burden as compared to other parts of the country require more wide and nationwide studies. This study found the higher prevalence of obesity as well as overweight in females versus males. It could be due to genetic factors and/or female are less active and bound to homes due to cultural issues in Afghanistan. In addition age was also associated with obesity in our findings. Such results reported in other studies [26-27, 35-39]. High blood pressure and high blood sugar were also independent risk factors associated with obesity [26-27, 40]. General obesity and central obesity are associate with each other which shows accumulation of fat in abdomen has caused to increase the body mass index. Although this study provides the first ever proportions of obesity and its related factors which is a trigger for taking attention of policy makers, however it has some limitations. The study originally has not been designed for obesity and information regarding predefined variables would have not been collected. In addition due to financial constraints it was impossible to list the households and then select the units randomly. Due to being cross sectional study the causal relationship would not established. In short it can be concluded that that obesity is a major public health problem that requires concerted interventions to be prevented and controlled. The findings obtained from this study can contribute in formulation of more advanced and national studies to have a generalized picture of non-communicable disease and their risk factors in the country. The provincial health department in Mazar-e-Sharif is encouraged to use the findings for health promotion and changing lifestyle in favour of reduction the burden of all risk factors including obesity.

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REFERENCES

[1] Marinou K, Tousoulis D, Antonopoulos AS, Stefanadi E, Stefanadis C. Obesity and cardiovascular disease: from pathophysiology to risk stratification. Int J Cardiol. 2010; 138(1):3–8. doi: 10.1016/j.ijcard.2009.03.135.

[2] Ayatollahi S, Ghoreshizadeh Z. Prevalence of obesity and overweight among adults in Iran. Obes Rev. 2010; 11(5):335–337. doi: 10.1111/j.1467-789X.2010.00725.x.

[3] Janghorbani M, Amini M, Willett WC, Gouya MM, Delavari A, Alikhani S. First nationwide survey of prevalence of overweight, underweight, and abdominal obesity in Iranian adults. Obesity. 2007; 15(11):2797–2808. doi: 10.1038/oby.2007.332.

[4] Seidell J.C. • Halberstadt J. The Global Burden of Obesity and the Challenges of Prevention. Ann Nutr Metab 2015;66(suppl 2):7-12 (DOI:10.1159/000375143)

[5] Ezzati M, Lopez AD, Rodgers A, Vander Hoorn S, Murray CJ. Selected major risk factors and global and regional burden of disease. Lancet. 2002; 360(9343):1347–1360. doi: 10.1016/S0140-6736(02)11403-6.

[6] Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, et al: National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. Lancet 2011; 377:557-567.

[7] Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, et al: Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2014; 384:766-781.

[8] Ramachandran A, Snehalatha C. Rising burden of obesity in Asia. J Obes. 2010;

[9] Payab M, Hasani-Ranjbar S, Larijani B. Whether all obese subjects both in metabolic groups and non-metabolic groups should be treated or not. J Diabetes Metabolic Disord. 2014; 13(1):21. doi: 10.1186/2251-6581-13-21.

[10] Hasani-Ranjbar S, Jouyandeh Z, Abdollahi M. A systematic review of anti-obesity medicinal plants-an update. J Diabetes Metab Disord. 2013; 12(1):28. doi: 10.1186/2251-6581-12-28.

[11] Molarius A, Seidell JC, Sans S, Tuomilehto J, Kuulasmaa K: Educational level, relative body weight, and changes in their association over 10 years: an international perspective from the WHO MONICA project. Am J Public Health 2000;90:1260-1268.
[12] Monteiro CA, Moura EC, Conde WL, et al: Socioeconomic status and obesity in adult populations of developing countries: a review. Bull World Health Organ 2004;82:940-946.
[13] Gill T. Epidemiology and health impact of obesity: an Asia Pacific perspective. Asia Pac J Clin Nutr. 2006; 15(Suppl):3–14.
[14] World Health Organization: Obesity: Preventing and Managing the Global Epidemic. Report of a WHO Consultation. WHO Technical Report Series, No 894. Geneva, World Health Organization, 2000
[15] World Health Organization (WHO). Obesity and Overweight. Fact Sheet No. 311. 2006.
[16] Tee E. Obesity in Asia: prevalence and issues in assessment methodologies. Asia Pac J Clin Nutr. 2002; 11(s8):S694–S701. doi: 10.1046/j.1440-6047.11.s8.12.x.
[17] Lal A, Moodie M, Ashton T, Siahpush M, Swinburn B. Health care and lost productivity costs of overweight and obesity in New Zealand. Aust N Z J Public Health. 2012; 36(6):550–556. doi: 10.1111/j.1753-6405.2012.00931.x.
[18] Hasani-Ranjbar S, Amoli MM, Tabatabaei-Malazy O, Rumi Y, Tavakkoly-Bazzaz J, Samimi H, Abbasifarid E. Effect of adiponectin gene polymorphisms on waist circumference in patients with diabetes. J Diabetes Metab Disord. 2012; 11(1):14. doi: 10.1186/2251-6581-11-14.
[19] Tabatabaei-Malazy O, Hasani-Ranjbar S, Amoli MM, Heshmat R, Sajadi M, Derakhshan R, Amiri P, Namakchian M, Rezazadeh E, TavaKkoly-Bazzaz J, Keshtkar A, Larijani B. Gender-specific differences in the association of adiponectin gene polymorphisms with body mass index. Review Diabetic Stud. 2010; 7(3):241.
[20] Wang R. et al. Prevalence of overweight and obesity and some associated factors among adult residents of northeast China: a cross-sectional study. BMJ Open 2016;6:e010828 doi:10.1136/bmjopen-2015-010828
[21] Oliveira GF, Oliveira TR, Ikejiri AT, et al. Prevalence of obesity and overweight in an Indigenous Population in Central Brazil: a population-based cross-sectional study. Obes Facts 2015;8: 302–10. doi:10.1159/000441240
[22] Siddiquee T, Bhowmik B, Da Vale Moreira NC, et al. Prevalence of obesity in a rural Asian Indian (Bangladeshi) population and its determinants. BMC Public Health 2015;15:860. doi:10.1186/s12889-015-2193-4
[23] u G, Hu G, Pekkarinen H, et al. Comparison of dietary and non-dietary risk factors in overweight and normal-weight Chinese adults. Br J Nutr 2002;88:91–7. doi:10.1079/BJNBJN2002590
[24] Bazzaz JT, Shojapoor M, Nazem H, Amiri P, Fakhrzadeh H, Heshmat R, Parvizi M, Hasani Ranjbar S, Amoli MM. Methylenetetrahydrofolate reductase gene polymorphism in diabetes and obesity. Mol Biol Rep. 2010; 37(1):105–109. doi: 10.1007/s11033-009-9545-z.
[25] Musaiger AO. Overweight and obesity in Eastern Mediterranean Region: Prevalence and possible causes. J Obes. 2011; 2011:17. doi: 10.1155/2011/407237.
[26] Saeed KMI, Rasooly MH. Prevalence and Risk Factors Associated with Obesity among Adult Kabul Citizens (Afghanistan), 2012. Iranian Journal of Diabetes and Obesity (2012); 4(4): pp152-161
[27] Saeed KMI, Prevalence and associated risk factors for obesity in Jalalabad city – Afghanistan, Alex J Med (2015), http://dx.doi.org/10.1016/j.ajme.2014.12.004
[28] Nutrition and Health Survey, Badghis Province, Afghanistan, February-March 2002 (IB Ref: 101440a1)
[29] Seidell JC, Halberstadt J, Noordam H, Niemer S: An integrated health care standard for the management and prevention of obesity in The Netherlands. Fam Pract 2012;29(suppl 1):i153-i156.
[30] Borys JM, Le Bodo Y, Jebb SA, Seidell JC, Summerbell C, Richard D, et al: EPODE approach for childhood obesity prevention: methods, progress and international development. Obes Rev 2012;13:299-315
[31] Bonita R, deCourten M, Dwyer T, Jamrozik K, Winkelmann R. Surveillance of risk factors for noncommunicable diseases: the WHO STEP-wise approach. Geneva: World Health Organization; 2002 (WHO/NMH/CCS/01.2002).
[32] IBM SPSS Statistics for Windows [computer program]. Version 20.0. Armonk, NY: IBM Corporation; 2011.
[33] Donald, MA. Et al. Prevalence of obesity in panama: some risk factors and associated diseases. BMC Public Health201515:1075. DOI: 10.1186/s12889-015-2397-
[34] Jafar TH, Chaturvedi N, Pappas G. Prevalence of overweight and obesity and their association with hypertension and diabetes mellitus in an Indo-Asian population. CMAJ 2006; 175(9):1071–7.
[35] Prevalence of Obesity Among Adults: United States, 2011–2012 [http://www.cdc.gov/nchs/data/databriefs/db131.pdf] December 23rd 2013.

[36] Ford ES, Mokdad AH. Epidemiology of Obesity in the Western Hemisphere. J Clin Endocrinol Metab. 2008; 93(11):S1–8.
[37] Befort CA, Nazir N, Perri MG. Prevalence of Obesity among Adults from Rural and Urban Areas of the United States: Findings from NHANES (2005–2008). J Rural Health. 2012; 28:392–7.
[38] Al-Nuaim AA, Bamgboye EA, al-Rubeaan KA, al-Mazrou Y.Overweight and obesity in Saudi Arabian adult population, role of sociodemographic variables. J Community Health 1997; 22(3):211–23.
[39] Sibai AM, Hwalla N, Adra N, Rahal B. Prevalence of and covariates of obesity in Lebanon: finding from the first epidemiological study. Obes Res 2003; 11:1353–61.
[40] Brown CD, et al. Body mass Index and prevalence of hypertension and dyslipidemia. Obes. Res. 2000; 8:605–19.

Table 1: Frequency distribution of the demographic, socioeconomic characteristics of study participants

Variables	Subgroups	Subjects (1231)	
		Number	%
Sex			
	Female	664	53.9
	Male	567	46.1
Age			
	25-30	413	33.5
	30-35	147	11.9
	35-40	157	12.8
	40-45	126	10.2
	45-50	104	8.4
	50-55	84	6.8
	55-60	85	6.9
	60+	115	9.3
Education			
	Illiterate	730	59.3
	Primary and unofficial	270	21.9
	Secondary school	110	9.7
	High school and over	111	9
Job Categories			
	Official Employees	126	10.2
	Students	36	2.9
	Private Business	128	10.4
	Worker/Farmer	190	15.4
	Jobless	69	5.6
	Housework	578	47
	Unable to work/missing	104	8.4
Monthly Income in AFN			
	Less than 10000	886	72
	More than 10000	245	19.9
Marriage			
	Unmarried	121	9.8
	Married	1030	83.7
	Widow/Widower	79	6.4

Table 2: Frequency distribution of the behavioral factors of study participants

Variables	Subgroups	Subjects (1231)	
		Number	%
Cigarette Smoking Status			
	No	1109	90.1
	Yes	122	9.9
Mouth Snuff Status			
	No	1129	91.7

	Yes	102	8.3
Fruit taking (days per week)			
	< 3	972	79.2
	≥ 3	255	20.8
Vegetables taking (days per week)			
	< 3	626	50.9
	≥ 3	605	49.1
Type of Kitchen Oil			
	Liquid	627	50.9
	Solid	437	35.5
	Both	161	13.1
Vigorous Physical Activity			
	No	1078	87.6
	Yes	153	12.4
Moderate Physical Activity			
	No	884	71.8
	Yes	347	28.2
Pedal or bicycle for 10 Minutes per day			
	No	770	62.6
	Yes	461	37.4
Reclining/siting (hours per day)			
	< 3	428	34.9
	≥ 3	800	65.1
Total Cholesterol			
	<190 mg/dL	822	66.8
	≥ 190 mg/dL	409	33.2
LDL			
	<100 mg/dL	554	45
	≥100 mg/dL	677	55
HDL(borderline 40 mg/dL for male and 50mg/dL for female)			
	≥40 and 50mg/dL	454	36.9
	<40 and 50mg/dL	777	63.1
Triglycerides			
	<150 mg/dL	980	79.6
	≥150 mg/dL	251	20.4

Table 3: Statistical analysis of bio-demographic, socio economic associated with obesity among Mazar Sharif (n=1231)

	Non-obese		**Obese**			**%95CI**	
Variables	**N**	**%**	**N**	**%**	**Odds Ratio**	**lower limit**	**upper limit**
Sex							
Females	528	79.5	136	20.5	1	Reference	
Males	513	90.5	54	9.5	0.589	0.459	0.754
Age in years							
25 - -35	501	89.5	59	10.5	1	Reference	
35 - 45	220	77.7	63	22.3	2.432	1.648	3.587
45 - 55	151	80.3	37	19.7	2.081	1.327	3.262
55 and over	169	84.5	31	15.5	1.558	0.975	2.488
Marriage							
Unmarried	113	93.4	8	6.6	1	Reference	
Married	928	83.6	182	16.4	2.77	1.329	5.774
Level of Education							
Illiterate	606	83		17	1	Reference	
Literate	434	86.8		13.2	0.743	0.538	1.027
Monthly Income							

≤ 150USD	749	84.5	137	15.5		Reference	
>150USD	204	83.3	41	16.7	1.099	0.75	1.609
Smoking Status							
No	930	83.9	179	16.1	1	Reference	
Yes	111	91	11	9	0.515	0.272	0.976
Snuff Using							
No	951	84.2	178	15.8	1	Reference	
Yes	90	88.2	12	11.8	0.712	0.382	1.329

Table 4: Statistical analysis of behavior risk factors associated with obesity among Mazar Sharif (n=1231)

	Non-obese		**Obese**			**%95CI**	
Variables	**N**	**%**	**N**	**%**	**Odds Ratio**	**lower limit**	**upper limit**
Strong Physical Activity							
No	910	84.4	168	15.6	1	Reference	
Yes	131	85.6	22	14.4	0.91	0.563	1.471
Moderate Physical Activity							
No	743	84	141	16	1	Reference	
Yes	298	85.9	49	14.1	0.866	0.61	1.232
Reclining in hours per day							
< 3 hours per day	366	85.5	62	14.5	1	Reference	
≥ 3 hours per day	673	84.1	127	15.9	1.114	0.801	1.548
Taking fruits weekly in days							
< 3 days per week	819	84.3	153	15.7	1	Reference	
≥ 3 days per week	218	85.5	37	14.5	0.909	0.616	1.34
Taking vegetables weekly in days							
< 3 days per week	535	85.5	91	14.5	1	Reference	
≥ 3 days per week	506	83.6	99	16.4	1.15	0.844	1.568
Taking red meat weekly in days							
< 2 days per week	939	84.7	170	15.3	1	Reference	
≥ 2 days per week	102	83.6	20	16.4	1.083	0.653	1.797
Taking rice weekly in days							
< 3 days per week	755	84.1	143	15.9	1	Reference	
≥ 3 days per week	286	85.9	47	14.1	0.868	0.607	1.239
Blood Pressure High							
No	762	89.5	89	10.5	1	Reference	
Yes	279	73.4	101	26.6	3.099	2.259	4.252
Central Obesity							
No	485	96		4	1	Reference	
Yes	555	76.6		23.4	7.428	4.601	11.993
Diabetes Mellitus							
No	955	85.4	163	14.6	1	Reference	
Yes	86	76.1	27	23.9	1.839	1.158	2.923
Triglycerides							
< 150mg%	831	84.8	149	15.2	1	Reference	
≥ 150mg%	210	83.7	41	16.3	1.089	0.747	1.588
Total Cholesterol							
<190 mg/dL	698	84.9	124	15.1	1	Reference	
≥ 190 mg/dL	343	83.9	66	16.1	1.083	0.782	1.5
LDL							
<100 mg/dL	470	84.8	84	15.2	1	Reference	
≥100 mg/dL	571	84.3	106	15.7	1.039	0.761	1.418
HDL(borderline 40 mg/dL for male and 50mg/dL for female)							
≥40 and 50mg/dL	648	83.4	129	16.6	1	Reference	
<40 and 50mg/dL	393	86.6	61	13.4	0.78	0.561	1.084

Table 5: Multivariate analysis of risk factors of obesity among study participants in Mazar-e-Sharif city Afghanistan

Variables	Categories	B	Exp(B)	CI 95% Lower Limit	CI 95% Upper Limit	P Value
Sex						
	Male		1	Reference		
	Female	0.383	1.467	1.013	2.123	0.042
Age group in years						
	25-34		1	Reference		
	35-44	0.462	1.588	1.045	2.413	0.03
	45-54	-0.024	0.976	0.594	1.605	0.924
	55 and more	-0.301	0.74	0.421	1.299	0.295
Average Systolic Blood Pressure		0.021	1.021	1.012	1.031	0.000
High blood sugar						
	Yes		1	Reference		
	No	-0.631	0.532	0.321	0.882	0.014
Central Obesity						
	Yes		1	Reference		
	No	-1.692	0.184	0.111	0.306	0.000