

**ORIGINAL RESEARCH ARTICLE****RISK FACTORS ASSOCIATED WITH OBESITY AMONG MIDDLE AGED ADULTS RESIDING IN BHAKTAPUR, NEPAL**Sajeesh Shrestha<sup>1</sup>, Nischal Devkota<sup>2</sup>, Rosy Shrestha<sup>3</sup><sup>1,2</sup>Department of Public Health, Central Institute of Science and Technology, Kathmandu, Nepal<sup>3</sup>School of Nursing, Chitwan Medical College, Bharatpur, Chitwan, Nepal*\*Correspondence to: Sajeesh Shrestha, Department of Public Health, Central Institute of Science and Technology, Kathmandu, Nepal.**Email: [casuxtha99@gmail.com](mailto:casuxtha99@gmail.com)***ABSTRACT**

**Introduction:** Obesity is a major public health problem worldwide and also in Nepal in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy and/or increased health problems. Hence, this study was conducted to identify the factor associated with obesity among middle aged adults in Duwakot, Changuarayan. **Methods:** A descriptive, cross-sectional research design was used among 109 middle aged adults residing in Duwakot, Changuarayan, Bhaktapur. Probability, systematic random sampling technique was used. Semi structured questionnaire was used to collect data by conducting semi-structured interview schedule as well as anthropometric measurement was also taken to calculate the body mass index. Data was analyzed in descriptive and inferential statistics (chi-square test with odd ratio). **Results:** The prevalence of obesity among middle aged adults was 12.8%. On the basis of statistical analysis, age ( $p=0.035$ ), ethnicity ( $p=0.050$ ), alcoholic consumption ( $p=0.003$ ), sleeping hours at night ( $p=0.006$ ), physical activity ( $p=0.014$ ), presence of chronic diseases ( $p=0.001$ ), used medicine ( $p=0.001$ ) and family history of obesity ( $p=0.005$ ) were significant associated factors for obesity among middle aged adult. **Conclusion:** Prevalence of obesity among middle aged adult was 12.8%. Significant associated factors of obesity were age, ethnicity, alcoholic consumption, sleeping hours at night, physical activity, presence of chronic diseases, used medicine and family history of obesity. So the concerned municipality, health care personnel and related health organization should conduct awareness raising program regarding importance of maintaining normal weight and consequences of obesity in their health.

**Key words:** Middle aged adult, Obesity**INTRODUCTION**

Obesity is a significant public health concern affecting more than half a billion people worldwide. Obesity rise is not only limited to developed countries, but to developing nations as well.<sup>1</sup>

More than 50% of the world's 671 million obese live in 10 countries (ranked beginning with the countries with the most obese people): US, China, India, Russia, Brazil, Mexico, Egypt, Germany, Pakistan, and Indonesia. In high-income countries, some of the greatest increases in adult obesity have been in the US, Australia (where nearly 30% of men and women are obese), and the UK (where around a quarter of the adult population is obese).<sup>2</sup>

In 2014, more than 1.9 billion adults aged 18 years and older were overweight. Of these over 600 million adults were obese. Overall, about 13% of the world's adult's population (11% of men and 15% of women) were obese in 2014. In 2014, 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight. The worldwide prevalence of obesity more than doubled between 1980-2014.<sup>3</sup>

Obesity usually results from a combination of causes and contributing factors including genetics, family lifestyles, inactivity, unhealthy diet, medical problems (e.g. prader-willi syndrome, Cushing's syndrome, arthritis), certain medication (such as

some antidepressants, anti-seizure medications, diabetes medications, antipsychotic medications, steroids and beta blockers), social and economic issue, age, pregnancy, quitting smoking, lack of sleep.<sup>4</sup>

In United States the obesity prevalence was 39.6% among rural adults compared to 33.4% among urban adults. Prevalence of obesity remained significantly higher among rural compared to urban adults controlling for demographic, diet, and physical activity variables. Race/ethnicity and percent kcal from fat were significant correlates of obesity among both rural and urban adults. Being married was associated with obesity only among rural residents, whereas older age, less education, and being inactive was associated with obesity only among urban residents.<sup>5</sup>

Hence, this study was conducted to identify the prevalence of obesity and to find out the risk factors associated with obesity among middle aged adults

residing in Bhaktapur, Katmandu, Nepal.

## METHODS

EA community based cross sectional study was conducted among hundred nine middle aged adults (35-55 years) residing in Changunarayan-1, Duwakot, Bhaktapur, Nepal during July to September, 2017. Probability, systematic random sampling technique was used to enrolled sample for this study. Prior to data collection, informed consent was taken from each respondent and ethical clearance was also taken. Semi structured, interview schedule along with anthropometric measurement of the respondents was used to findout prevalence of obesity. Research instrument was developed based on extensive literature reviewed which consisted three parts like socio-demographic, life style related variable, presence of chronic illness, history of used medication and family history of obesity.

Data was analysed using IBM SPSS version 20.0 using descriptive and inferential statistic (chi-square with unadjusted odd ratio).

**Table 1: Age, Gender, Ethnicity, Religion and Educational Status of the Respondents (n=109)**

Variables	Number	Percentage
<b>Age Group (in completed years)</b>		
36-40	28	25.7
41-45	24	22.0
46-50	27	24.8
51-55	30	27.5
<i>Mean age ±SD = 45.62± 5.83, Min =35 years, Max=55 year</i>		
<b>Gender</b>		
Male	61	56.0
Female	48	44.0
<b>Ethnicity</b>		
Brahmin	46	42.2
Chhetri	26	23.9
Janajati	37	33.9
<b>Religion</b>		
Hinduism	105	96.4
Buddhism	2	1.8
Christianity	2	1.8
<b>Educational Status</b>		
Literate	101	92.7

Variables	Number	Percentage
Illiterate	8	7.3
<b>If literate, educational Level (n=101)</b>		
General literate (can read and write)	12	11.9
Basic level (up to 8 class)	18	17.8
Secondary level (9-12 class)	43	42.6
Higher secondary level and above	28	27.7

**Table 2: Marital Status, Family Type, Occupation, Income Status and Family Income Sufficient to Support a Year of the Respondents (n=109)**

Variables	Number	Percent
<b>Marital Status</b>		
Married	104	95.4
Unmarried	5	4.6
<b>If married (n=104)</b>		
Living with spouse	103	99.0
Separated	1	1.0
<b>Family Type</b>		
Nuclear family	64	58.7
Joint family	45	41.3
<b>Occupation</b>		
Service	32	29.4
Business	27	24.8
Agriculture	12	11.0
laborer/ Daily wages	11	10.0
Home maker	23	21.1
Other	4	3.7
<b>Income status (NPR / year)</b>		
< One lakh	15	13.8
One- Two lakh	29	26.6
>Two lakhs	65	59.6
<b>Family income sufficient to support year</b>		
Yes	68	62.4
No	41	37.6

**Table 3: Body Mass Index (BMI) of the Respondents (n=109)**

Variables	Number	Percentage
Normal (BMI 18.5 - $\leq$ 24.9 kg/m <sup>2</sup> )	74	67.9
Overweight (BMI 25.0 - 29.9 kg/m <sup>2</sup> )	21	19.3
<b>Obesity (BMI <math>\geq</math> 30 kg/m<sup>2</sup>)</b>	<b>14</b>	<b>12.8</b>

**Table 4: Association between Status of BMI with Selected Socio-demographic Variables (n=109)**

Variables	Status of Body Mass index		$\chi^2$	UOR	p-value
	Obese No.(%)	Non Obese No.(%)			
<b>Age Group (in years)</b>					
≥45	11(19.3)	46(80.7)	4.446	3.906	0.035
<45	3(5.8)	49(94.2)			
<b>Gender</b>					
Male	9(14.8)	52(85.2)	0.451	1.488	0.502
Female	5(10.4)	43(89.6)			
<b>Ethnicity</b>					
Janajati/ Dalit	8(21.6)	29(78.4)	2.760	3.034	0.050
Brahmin/Chhetri	6(8.3)	66(91.7)			
<b>Religion</b>					
Non Hinduism	2(50.0)	2(50.0)		7.750	0.079 <sub>F</sub>
Hinduism	12(11.4)	93(88.6)			
<b>Family Type</b>					
Joint family	8(17.8)	37(82.2)	1.667	2.090	0.197
Nuclear family	6(9.4)	58(90.6)			
<b>Educational Status</b>					
Literate	13(12.9)	88(87.1)	0.000	1.034	1.000
Illiterate	1(12.5)	7(87.5)			
<b>Occupation*</b>					
Employed	8(13.6)	51(86.4)	0.059	1.150	0.808
Self employed	6(12.0)	44(88.0)			
<b>Income status</b>					
≥ Two lakhs	9(13.8)	56(86.2)	0.144	1.254	0.704
< Less than two lakhs	5(11.4)	39(88.6)			

UOR: Unadjusted odd ratio; \* Employed: Service + Business, Self employed: Farming + Laborer/Daily wages + Home maker; F: Fisher exact test ; p value significant at <0.05

**Table 5: Association between Status of BMI with Selected Lifestyle related Variables (n=109)**

Variables	Status of Body Mass index		$\chi^2$	UOR	p-value
	Obese No.(%)	Non Obese No.(%)			
<b>Dietary Pattern</b>					
Non-vegetarian	12(15.8)	64 (84.2)	1.173	2.906	0.279
Vegetarian	2(6.1)	31(93.9)			
<b>Cigarette Smoking</b>					
Yes	6(21.4)	22(78.6)	1.556	2.489	0.212
No	8(9.9)	73(90.1)			
<b>Alcohol Consumption</b>					
Yes	9(30.0)	21 (70.0)	8.871	6.343	0.003
No	5 (6.3)	74 (93.7)			

Variables	Status of Body Mass index		$\chi^2$	UOR	p-value
	Obese No.(%)	Non Obese No.(%)			
<b>Sleeping Hours at Night</b>					
>7 hours	8 (27.6)	21 (72.4)	5.982	4.698	0.014*
≤7 hours	6 (7.5)	74 (92.5)			
<b>Physical activity</b>					
Absence	7 (26.9)	19 (73.1)	4.507	4.000	0.034*
Presence	7 (8.4)	76 (91.6)			

UOR: Unadjusted odd ratio; \*Pearson chi square; p value significant at <0.05

**Table 6: Association between Status of BMI with Presence of Chronic Disease, History of Medications and Family History of Obesity (n=109)**

Variables	Status of Body Mass index		$\chi^2$	UOR	p-value
	Obese No.(%)	Non Obese No.(%)			
<b>Presence of Chronic Diseases</b>					
Yes	11 (37.9)	18 (62.1)	19.266	15.685	0.001#
No	3 (3.8)	77 (96.3)			
<b>Used Medicines</b>					
Yes	11 (37.9)	18 (62.1)	19.266	15.685	0.001#
No	3 (3.8)	77 (96.3)			
<b>Family History of Obesity</b>					
Yes	7 (30.4)	16 (69.6)	8.058	4.938	0.005
No	7 (8.1)	79 (91.9)			

UOR: Unadjusted odd ratio; \*Pearson chi square; p value significant at <0.05

## RESULTS

### Socio-demographic Characteristics of Respondents (table 1 & 2)

In regards to socio-demographic characteristics, out of 109 respondents, mean age was  $45.62 \pm 5.83$  and majority of the respondents were belong to 51-55 years (27.5%), male (56.0%), Brahmin (42.2%), Hinduism (96.4%), literate (92.7%), married (95.4%), nuclear family (58.7%), service holder (29.4%) and annual income more than two lakh (59.6%).

### Body Mass Index of the Respondents and Prevalence of Obesity (table 3)

Body mass index (BMI) of the respondents found that more than half (67.9%) of the respondents had normal body mass index, 19.3% of the respondents were overweight and 12.8% of the respondents were obese. And To determine the prevalence of obesity, merging overweight and normal BMI into one group as Non Obese (87.16%) and the remaining respondents were grouped as obese (12.84%).

### Association between Status of BMI with Selected Variables (table4-6)

Similarly, The factors associated between status of BMI with age ( $p=0.035$ ), ethnicity (0.050), alcohol consumption ( $p=0.003$ ), sleeping hours at night ( $p=0.014$ ), physical activity ( $p=0.034$ ) presence of chronic disease ( $p=0.001$ ), used medicines ( $p=0.001$ ) and family history of obesity ( $p=0.005$ ).

## DISCUSSION:

The present study aimed to find-out prevalence of obesity and associated factors of it among middle aged adults residing in Bhaktapur, Nepal. The major findings were reported 12.84% respondents were obese.

This finding was supported by various studies conducted in different parts of the world like in two studies by Wang et al (2016) reported that 14.6% of respondents found to be obese<sup>6</sup> and by Rodríguez-Martín, Ruiz, Nieto, and Jiménez (2009) reported that prevalence of obesity among adult people was

17.0%.<sup>7</sup>

The significant factors associated with obesity among respondents were age, ethnicity, alcohol consumption, sleeping hours at night, physical activity, presence of chronic disease, used medicines and family history of obesity.

These findings were consistent with a study conducted by Sidik and Rampal (2009) which revealed that obesity was significantly associated with the ethnicity of the respondents ( $p=0.001$ )<sup>8</sup> Whereas inconsistent with a study conducted by Shahi, Rai, Adhikari, & Sharma (2013) reported that there is no association between obesity and age of the respondents.<sup>9</sup> In our study findings male are more prevalent than female to get obesity which is statistically insignificant. These findings were contradictory with a study done by Ogden, Carroll, Fryar & Flegal (2012), which showed Prevalence of obesity was higher in women.<sup>10</sup>

## CONCLUSION

It is concluded that prevalence of obesity among middle aged adults in Nepalese population was 12.84%. The significant factors associated with obesity among respondents were age, ethnicity, alcohol consumption, sleeping hours at night, physical activity, presence of chronic disease, used medicines and family history of obesity.

## ACKNOWLEDGEMENTS

We would like to thank to Officer of ward office of Duwakot, Changunarayan-1 and all the respondents for giving permission and their valuable information to this study.

## REFERENCES

1. Bhurosy T, Jeewon, R. Overweight and obesity epidemic in developing countries: a problem with diet, physical activity, or socioeconomic status? *Sci. World J.* 2014; Article ID 964236:1-7.

2. Murray L, Ng M, Mokdad A. The vast majority of American adults are overweight or obese, and weight is a growing problem among US children. *The Lancet.* 2014; 384(9945):766-781.
3. World Health Organization. Obesity and Overweight. Fact Sheet, 2017 October.
4. Befort A, Nazir N, Perri G. Prevalence of obesity among adults from rural and urban areas of the United States: findings from NHANES (2005–2008). *J Rural Health.* 2012;28(4):392-397.
5. Twells K, Gregory M, Reddigan J, Midodzi K. Current and predicted prevalence of obesity in Canada: a trend analysis. *Can Med Assoc J.* 2014; 2(1):18-26.
6. Wang R, Zhang P, Gao C, Li Z, Lv X, Song Y, Yu Y, Li B. Prevalence of overweight and obesity and some associated factors among adult residents of northeast China: a cross-sectional study. *BMJ.* 2016;6(7):1-8.
7. Rodríguez-Martín A, Ruiz N, Nieto M, Jiménez E. Life-style factors associated with overweight and obesity among Spanish adults. *Nutr Hosp.* 2009;24(2):144-151.
8. Sidik SM, Rampal L. The prevalence and factors associated with obesity among adult women in Selangor, Malaysia. *Asia Pac Fam Med.* 2009;8(1):2.
9. Shahi M, Rai L, Adhikari RD, Sharma M. Prevalence and factors associated with obesity among adult women of Nepal. *GJMedPH.* 2013;2(4):1-9.
10. Ogden CL, Carroll MD, Fryar, CD, Flegal KM. Prevalence of obesity among adults and youth: United States, 2011–2014. *National Center for Health Statistics (NCHS) Data Briefs.* 2015;(219):1-8.