Original Article

Factors Associated with Abdominal Obesity among Reproductive Age Women of Kaski District

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ABSTRACT

Background: Obesity is increasing at an alarming rate and has now become a global public health problem. Reproductive age women who are obese are at increased risk of infertility, miscarriage and other adverse pregnancy outcomes. The risk of fetal anomalies and congenital heart disease could too increase in offspring of such women. In view of these considerations, this study aimed to assess the factors associated with abdominal obesity among reproductive age women of Kaski district.

Method: An analytical cross-sectional study was conducted in Kaski district among 276 reproductive aged women. The association between abdominal obesity and the explanatory variables were assessed in both bivariate and multivariate analysis.

Results: More than two third (69.6%) of the respondents were abdominally obese as per waist circumference and the prevalence of abdominal obesity as per Waist to Hip Ratio (WHR) in the study was 77.5% among the reproductive age women of Pokhara metropolitan, Kaski district. Fruits consumption (AOR=0.488; 95% CI: 0.251-0.950) was identified as the protective factor whereas increased age (AOR =2.88, 95% CI: 1.24-6.65), physical activity (AOR=2.154; 95% CI: 1.118-4.149) and parity (AOR=1.66; 95%CI:0.60-4.61) were found to be significantly associated with abdominal obesity.

Conclusion: The study demonstrates that the abdominal obesity among reproductive age women is of prime importance in Kaski district of Nepal calling for an action to educate them for lifestyle modifications.Also the concerned authorities of Pokhara metropolitan should consider this issues focusing on nutritional interventions while framing the nutritional programs.

Keywords: Abdominal obesity, Kaski, women, BMI, WHR, Obesity

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INTRODUCTION

Obesity is increasing at an alarming rate and has now become a global public health problem.[1]World Health Organization (WHO) declared overweight among the top 10 health risks in the world and one of the top five health problem of the developed nations.[2]Abdominal obesity an accumulation of adipose tissue often defined in terms of the ratio of waist to hip circumference (waist–hip ratio: WHR) is associated with numerous health risks as infertility ,hypertensive disorders, diabetes and gestational complications among women.[3-6]There are strong indications that middle aged obesity is associated with the high mortality.[7] Large scale studies have suggested that abdominal obesity is better predictor for the risk of diseases than the Body Mass Index (BMI).[8]Also among women, waist–hip ratio appeared to be a stronger risk factor of diseases than BMI.[9]

Gestational diabetes and gestational hypertension complicate the health issue of reproductive age women due to excess weight. Similarly, reproductive age women who are obese are at increased risk of infertility, miscarriage, and other adverse pregnancy outcomes. Along with this, risk of fetal anomalies and congenital heart disease could too increase in offspring of such women.[10] Parity is the important reproductive factor that is seen to contribute overweight and obesity in women. It is known to contribute to obesity due to postpartum weight retention.[11] Studies haveshown that the substantial weight gain associated with childbearing is an important risk factor for the development of overweight and obesity in women during midlife.[12] Physical activity is one of the keyfactors for maintenance of healthy body. With the lack of physical activity human body needs to compensate for the lack of exercise stimulation to maintain energy which leads to gain fat in the body. [13] Also the study conducted among the nursing students of Nepal revealed that the increased waist to hip ratio was associated with abnormal cycle length and period duration which shows the affect of abdominal obesity on fertility.[14] A Prospective cohort study for 12 years revealed increasing intake of fruits and vegetables reduce long-term risk of obesity and weight gain among middle-aged women.[15]

As Nepal is in the phase of nutritional transition, there is co-existence of double burden of underweight and overweight/obesity among Nepalese adults but most studies in Nepal focused on underweight. Kaski district of Nepal especially Pokhara is one of the best tourist destinations which lead the citizens living here to be close with western culture and lifestyle. The increasing population, location, urbanization, diversity, and influence of city life all make Kaski district an important study site to study about obesity and its associated factors. In view of these considerations, this study aimed to assess the factors associated with abdominal obesity among reproductive age women of Kaski district.

MATERIALS AND METHODS

This analytical cross-sectional study, residing in Pokhara metropolitan of Kaski district, Gandaki province between February-August 2019. The study population was married women of reproductive age (15-49 years). The sample size was calculated by taking the reference of prevalence of obesity (22%) among women in the Nepal Demographic Health Survey 2016.[11]The statistical formula of $n=Z^2pq/d^2$ was used and 5 % non -response was kept. Thus, the sample size of the study was 278. Probability Proportional to Size (PPS) sampling was used to obtain the sample size with the permissible error (5%; at confidence interval is 95%) taking the non-response rate of 5%.

Married women of age 15-49 years and permanently residing in Pokhara metropolitan were included in this study and the women who were seriously ill, mentally retarded, pregnant and lactating mothers below one year, not available at household at the time of data collection, temporarily (<6 months) regimenting women in study area were excluded. Similarly, if there was more than one woman of age 15-49 years in a single household other than one selected randomly other were excluded and women's having regular menstruation in previous months but had no menstruation since last 45 days were also excluded from this study.

Ethical considerations

Data were collected after getting ethical approval from Pokhara University Institutional Review Committee (PUIRC). Similarly, administrative approval was also taken from Pokhara metropolitan Health Division.

Written informed consent was taken from participants with clarification of the purpose of the study. The informed consent was written in the local language stating the study's objective, nature of participant's involvement and confidentiality of the data. For those who couldn't study, the inform consent was read out orally by interviewer and were informed about the objective and nature of study.

Data collection

The household visit was conducted and face to face interview of the respondents was taken. The dependent variable of the study was Waist to Hip Ratio (WHR). It was measured after taking both verbal and written informed consent of respondents.

Waist Circumference (WC) was measured by female volunteer through the measuring tape in a horizontal plane at the midpoint between the lower margin of the last palpable rib and the top of the iliac crest or around the trunk in a horizontal plane. The hip circumference was measured by placing the measurement tape at the maximum extension of the buttocks. WHR >0.85was considered to indicate the

presence of abdominal obesity as per the WHO classification.[12]

Statistical analysis

Data was entered in Epi data 3.1 version and was exported to SPSS 16 for analysis. The association between abdominal obesity and the explanatory variables were assessed in both bivariate and multivariate analysis.

RESULTS

The characteristics of sample population are presented with univariate analysis including the prevalence of abdominal obesity; next is the bivariate analysis using the Chi square to asseess the association between individual independent variables and the outcome variable (Abdominal obesity), then after binary logistic regression was done for independent variable to obtain UOR and finally a multivariate analysis was done to identify the predictors of abdominal obesity.

The mean age of the respondents of the study was 33.1± 8.14 years. Similarly, nearly three in every five (57.6%) respondents belong to upper caste and almost half (48.9%) of the respondents were housemaker by occupation (Table 1).More than two third (69.6%) of the respondents were abdominally obese as per waist circumference and the mean waist circumference was 85.54 ± 10.77.The prevalence of abdominal obesity as per WHR in the study was 77.5%. (Table 3)

Among the socio-demographic variables, age of the respondents was associated with abdominal obesity. With reference to women age less than 30 years (18-30 years), the odds of being abdominal obesity was 2.8 times more among women aged 30-39 years (AOR =2.88, 95% CI: 1.24-6.65)and 2.8 times more among women aged 40-49 years(AOR =2.89, 95% CI: 0.97-8.16). (Table 3)

As compared to women who had high physical activity level,women who had low or moderate level of physical activity level were 2.1 times more likely to have abdominal obesity (AOR=2.154; 95%CI: 1.118-4.149). Similarly, eating fruits for six or more days per week seems to be protective factor. Women consuming fruits for six or more days per week were less likely to be abdominally obese than women consuming fruits for 5 or less days per week (AOR=0.488; 95%CI: 0.251-0.950).Also compared to nulliparous women, women who had given birth to two or more child (multiparous) were nearly 2 times more likely to be abdominally obese (AOR=1.66; 95%CI:0.60-4.61) (Table 5).

Table 1: Socio-demographic characteristics of the respondents

Variables (n=276)	Frequency	Percentage (%)
Age category		
<30 years	90	32.6
30-39 years	124	44.9
40-49 years	62	22.5
Mean ±SD: 33.1± 8.14, Min:18, Max: 49		
Ethnicity		
Upper Caste	159	57.6
Advantage Janajatii	62	22.5
Disadvantage Janajati	39	14.1
Dalit	13	4.7
Others [a]	3	1.1
Occupation		
House maker	135	48.9
Students	35	12.7
Business	62	22.5
Service Sector	24	8.7
Agriculture	12	4.3
Daily wages	8	2.9

[a] *Religious Minorities, Non- Dalit Terai Caste group*

Table 2: Prevalence of Abdominal obesity (WHR>0.85) according to Waist Circumference and Waist Hip ratio WHO classification

Abdominal obesity (n=276)	Frequency	Percentage
Waist circumference classification		
Normal (WC<80cm)	84	30.4
Abdominal Obesity (WC ≥80cm)	192	69.6
Mean ± SD: 85.54 ± 10.77 Min: 61 Max: 125		
Waist Hip ratio classification		
Normal (WHR ≤0.85)	62	22.5
Abdominal Obesity (WHR >0.85)	214	77.5
Mean ± SD: 0.89 ± 0.054 Min: 0.7 Max: 1.05		

Table3: Association between socio-demographic variables and abdominal obesity

Variables	Abdominal obesity (WHR >0.85) Yes (%)	No(%)	χ2 statistics	p value	OR(At 95% CI	AOR(At 95% CI)
Age group						
<30 years	56 (26.2)	34 (54.8)	18.229	<0.001	Ref	
30-39 years	104 (48.6)	20 (32.3)			3.15(4.09-5.99) *	2.88(1.24-6.65) **
40-49 years	54 (25.2)	8 (12.9)			4.09(1.74-9.64)	2.89(0.97-8.61) **
Ethnicity						
Upper Caste	123 (57.5)	36 (58.1)	2.052	0.358	Ref	Ref
Advantaged Janajati	45 (21.0)	17 (27.4)			1.29(0.66 -2.52)	1.04 (0.54 to 2.06)
Others [b]	46 (21.5)	9 (14.5)			0.66(0.29- 1.49)	0.61(0.38-1.76)
Occupation						
Not employed outside home	131 (61.2)	39 (62.9)	0.212	0.899	Ref	Ref
Business or Service	68 (31.8)	18 (29.0)			0.88(0.47- 1.67)	0.81(0.27-1.98)
Others	15 (7.0)	5 (8.1)			1.11(0.38- 3.27)	1.91(0.21-3.69)

[b]*DisadvantageJanajati, Terai caste group,Dalit and religious minorities Fig in parenthesis shows percentage; *Statistically significant at 95% confidence level with p value<0.05*

Table 4: Association between dietary practices, physical activity, reproductive factors and abdominal obesity

Variables	Abdominal obesity (WHR >0.85) Yes (%)	No (%)	χ2 statistics	p value	UOR(At 95% CI	AOR(At 95% CI)
Fruits consumption/ week						
5 or less days/ week	123 (57.5)	25 (40.3)	5.688	0.017	Ref	Ref
6 or more days /week	91 (42.5)	37 (59.7)			0.50 (0.28-0.88) *	0.48 (0.25-0.95) **
Physical activity level						
Low and Moderate	108 (50.5)	20 (32.3)	6.410	0.011	2.14.(1.17-3.88) *	2.15(1.11-4.14) **
High	106 (49.5)	42 (67.7)			Ref	Ref
Age at first menstruation						
<14 years	128 (59.8)	37 (59.7)	0.48	0.985	Ref	Ref
≥14 years	86 (40.2)	25 (40.3)			1.01(0.56- 1.78)	1.29(0.38-1.96)
Age at first childbirth						

≤21 years	122 (65.6)	26 (59.1)	0.655	0.481	Ref	Ref
>21 years	64 (34.4)	18 (40.9)			1.31(0.67 - 2.58)	1.56(0.98-2.87)
Parity						
Nulliparity	28 (13.1)	18 (29.0)	11.086	0.004*	Ref	Ref
1 parity	53 (24.8)	18 (29.0)			1.89(0.85-4.20)	1.76 (0.68-4.51)
≥ 2 Parity	133 (62.1)	26 (41.9)			3.28 (1.59-6.79)	1.66 (0.60-4.61)
Ever used any contraceptive						
Yes	108 (50.5)	37 (59.7)	1.635	0.201	0.66(0.37 - 1.17)	0.81 (0.58-1.39)
No	106 (49.5)	25 (40.3)			Ref	Ref

, Statistically significant at 95% confidence level with p value<0.05*

DISCUSSION

This study revealed overall prevalence of abdominal obesity given by WHR as 77.5% with mean WHR of 0.89 ± 0.054.This study finding was akin to NCD Step Survey 2013 as well as to another study conducted in Bangladesh.[16] This study finding on the prevalence of abdominal obesity is inconsistent with the findings of study conducted at Dharan and STEPS Survey 2003 and which reported 89.8% and 70.68% and respectively.[17] These differences might be because both studies included both married and unmarried women whereas this study included married women only. Beside this, it could be assumed that abdominal obesity could have increased in this last one and half decade. According to Nepal Steps survey 2019,higher proportion of women of Nepal had high WC (Waist Circumference) and Waist to Hip Ratio (WHR) than men (WC:3.3% in men vs 19.5% in women and WHR:56.3% in men vs 70.25% in women) .[18] Similarly, a study conducted in Dharan, Nepal showed 89% prevalence of abdominal obesity among reproductive age women.[19] A study was conducted to find out the abdominal obesity among men and women in Sunsari and Morang districts of Nepal. The study revealed that more than half (51%) of women were abdominally obese. Similarly, it also showed a significant association between WC and BMI in females.[20] This kind of study should be expanded so that the prevalence of risk factors can be compared and necessary interventions can be taken.

The findings of this study showed that age was significantly associated with abdominal obesity.With reference to women aged less than 30 years (18-30 years), the odds of being abdominal obesity were 2.8 times among women age 30-39 years (AOR =2.882, 95% CI: 1.249-6.650).The highest proportion (48.6%) of abdominal obesity was found in 30-39 years age group women which is supported by the study conducted in Brazil .[21]Thus the age-related effect on adiposity has also been described in the literature.[22]However, all of the variables may not have practical significance as the predictor (age) is not modifiable

The findings from this study suggested that consumption of fruits adequate fruits and vegetables is a protective factor for abdominal obesity.Fruits consumption for six or more days per week were associated with the lower odds of abdominal obesity. (AOR=0.488; 95%CI: 0.251-0.950) This finding is in line with the various studies.[23,24]Thus, increasing intake of fruits and vegetables reduce long-term risk of obesity and weight gain among middle-aged women.[25] Our observation that compared to women who had high physical activity level, women performing low or moderate level of physical activity level were more likely (AOR=2.154; 95%CI: 1.118-4.149) to had abdominal obesity is in line with the previous study findings.[26] This shows that prevention and control program to more focus on strategies to increase physical activity

This study finding showed that higher parity was significantly associated with abdominal obesity.Similar findings were reported by other studies.[27-30] In comparison to nulliparous women, women who had given birth to two or more child (multiparous) were nearly 2 times more likely to be abdominally obese (AOR=1.66; 95%CI:0.60-4.61). Biologically, childbearing is associated with higher body weight among women.[31] A woman's risk of obesity increases by 7% per child.[36] During pregnancy, women gain weight so that their babies get proper nourishment and develop normally. After giving birth, some women find it hard to lose the weight gained. This may lead to overweight or obesity.[32] In addition, the established cultural or social values with respect to care

and diet given during and after pregnancy help women to gain more weight than ever.[33]

The findings of this study are based on reproductive-aged women and may not be generalizable to younger adolescents and older women. The analyses of the study were based on self-reported behaviors of the respondent and the findings might be inaccurately reported by them.

CONCLUSION

The study demonstrates that abdominal obesity among reproductive-age women is of prime importance in Kaski district of Nepal calling for an action to educate them for lifestyle modifications. Also the concerned authorities of Pokhara metropolitan should consider this issues focusing on nutritional interventions while framing the nutritional programs.

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