

Research Article**The Comparison of Central Obesity among Fars-native, Turkman and
Sisstanish Ethnic Groups in the north of Iran**

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ABSTRACT

Background and Objectives: Central obesity is a major health problem in worldwide and whether differences of it in three great ethnic groups among adults in the north of Iran are the main aim of this study. **Material and Methods:** We established a cross-sectional and analytical study with a sample of 2993 cases with equal age and sex and with three ethnic proportion (Fars-native=1627, Turkamn=974 and Sisstani=392) of urban and rural area population aged 15-65 years living in 11 districts in Golestan province in northern Iran. We conducted a multistage cluster sampling techniques by 150 clusters with equal size of 20 subjects. Central obesity was defined after WHO classification by waist circumference (WC) ≥ 102 cm and ≥ 88 cm in men and women, respectively. SPSS 18.0 software was used for the statistical analysis and P-value under 0.05 estimated significations. **Results:** The mean of WC in Fars-native, Turkman and Sisstani was 88.88 ± 15.83 cm, 89.11 ± 14.12 cm and 84.41 ± 13.74 cm, respectively. Central obesity was common in 35.1% of subjects and significantly was more in women (54.5%) than men (15.7%). (P=0.001). Also, it was prevalent 36.9%, 34.9% and 27.6% in Fars-native, Turkman and Sisstani, respectively. Statistical differences was significant among three ethnic groups (P=0.002). The logistic regression analysis showed that the risk of central obesity in Fars-native was 1.450 [1.208-1.965] and in Turkman was 1.410 [1.090-1.825] compared to Sisstanish ethnic group. (95% CI). **Conclusion:** At least one-third of adults in the north of Iran suffer from central obesity and alarming rate was shown in women. Among three ethnic groups, the highest and the lowest rates were seen in Fars-native and Sisstanish ethnic groups, respectively. Variation of central obesity among three ethnic groups should be considered in future studies.

Keywords: Central obesity, Adults, Ethnic group, Iran

INTRODUCTION

According to the World Health Organization report, the obesity is rising in the world¹ and it is well known as a health problem in Iran.^{2,3} Central obesity was common 9.7%-12.9% and 54.5%-63.7% in Iranian men and women, respectively^{4,5} and it is a major health problem in northern Iran.⁶ Waist circumference (WC) using for central obesity classification⁷ known as a risk factor for cardiovascular disease, stroke and type 2 diabetes.⁸

The body composition of individuals varies across different ethnic groups. Moreover the socio-economic background on body composition as a distinct difference in percentage fat mass, has been reported in American and European Caucasians at the same BMI level.⁹ Some studies reported that the prevalence of obesity and central obesity among ethnic groups is different^{10,11,12} and culture and tradition influence in weight management.^{13,14} The strong relationship between

socio-demographic factors and central obesity was shown in some regions.¹⁴ The role of educational level as a multifaceted concept well known in some of the social and cognitive skills that learned through formal education processes; reading and numeracy.¹⁶

Of 1.7 million people in Golestan province (north of Iran and south east of Caspian sea), 66.39% are 15-65 year old and 43.9% live in urban areas. Many ethnic groups were living in this area including Fars-native, Turkman and Sisstani. The main job in villages is agriculture.¹⁷

The aim of this study was to evaluate whether prevalence of central obesity in three major ethnic groups (Fars-native, Turkman and Sisstani) is different in Iranian northern adults in 2010.

MATERIAL AND METHODS:

We established a cross-sectional and analytical study with a sample of 2993 cases with equal age and sex and with three ethnic proportion (Fars-native=1627, Turkamn=974 and Sisstani=392) of urban and rural area population aged 15-65 years living in 11 districts in Golestan province in northern Iran. With resumption of 50% obesity rate,³ a confidence level of 95% and a maximum marginal error about 0.02, the sample size was calculated 2401 subjects. For more efficiency the sample size raised up 2993 subjects. We conducted a multistage cluster sampling techniques by 150 clusters with equal size of 20 subjects. In the first stage, the clusters were chosen randomly using systematic sampling technique based on postal code in urban areas and family health number in Primary Health Centers in rural areas. In the second stage, we randomly selected 20 subjects in each cluster. All family members in blocks (a complex of building) who were in 15-65 years were included in our study.

Waist circumference was measured to the nearest 0.5 cm at the superior border of the iliac crest. Central obesity was defined after WHO classification¹⁸: waist circumference ≥ 102 cm and ≥ 88 cm in men and women, respectively. Economic status, with regard to Iranian social-

economic, was categorized based on the six facilities item, the same as, separate freezer, separate kitchen, vacuum cleaner, computer, separate bathroom, and washing machine with equal score for each of them. According to this list, the scoring of the economic status in this study was as follows: poor ≤ 2 score; intermediate = 3-4 score; and good ≥ 5 score. Educational level classified in four groups: Uneducated (unable reading or writing a phrase); 0-12 years schooling and College.

Quantitative and qualitative data values are presented as mean \pm standard deviation and frequently (%), respectively. SPSS 18.0 software was used for the statistical analysis. ANOVA and post-hoc Tukey test were used to compare the means. Multiple logistic regression analysis was applied to estimate the odds ratio (OR) of central obesity in ethnic groups according to the gender. P-value under 0.05 estimated significations. This study approved by Ethical Research Committee and consent was received from all participants. Pregnant women and those who were unwilling to participate in this study were excluded.

RESULTS:

The characteristic of subjects present in table 1. Distribution of location area (urban/rural), economic status, educational level among three ethnic groups are statistically significant. (P=0.001). Poor economic status and uneducated level were shown in Sisstanish ethnic people more than others.

The mean of WC in Fars-native, Turkman and Sisstani was 88.88 ± 15.83 cm, 89.11 ± 14.12 cm and 84.41 ± 13.74 cm, respectively. Generally, the mean of WC was significantly in women (89.09 cm) more than in men (87.65 cm), (P=0.001). The mean of WC between genders was not significant in Fars-native (P=0.091) and in Turkman (P=0.563) while it was significant in Sisstanish ethnic group (P=0.003). Despite the mean of WC differences is not significant between Fars-native and Turkman but it was significant between Fars-native and Sisstani (P=0.001), between Turkman

and Sisstani ($P=0.001$) and in whole ($P=0.001$). Table 2.

Generally, central obesity was common in 35.1% of subjects (15.7% in men and 54.5% in women) and statistically differences was significant between genders ($P=0.001$). Central obesity was prevalent 36.9%, 34.9% and 27.6% in Fars-native, Turkman and Sisstani, respectively. Statistical differences was significant among three ethnic groups as whole ($P=0.002$) and based on men ($P=0.001$), while in women was not significant ($P=0.190$). In men, between Fars-native (17.8%) and Turkman (16.2%) was not shown a statistical significant differences. Whoever, the odds ratios were not significant when adjusted by location area, economic status, educational level and age groups. Table 3.

In generally, the results of multiple logistic regression analysis showed that the risk of central obesity in Fars-native was 1.450 [1.208-1.965] and in Turkman was 1.410 [1.090-1.825] compared to Sisstanish ethnic group. In men the risk of central obesity in Fars-native was 3.331 [1.809-6.136] and in Turkman was 1.410 [1.587-5.614] compared to Sisstanish ethnic group. In women, the risk of central obesity in Fars-native was 1.325 [0.969-1.812] and in Turkman was 0.303 [0.854-1.661] compared to Sisstanish ethnic group. (95% CI for all). Table 4.

DISCUSSION:

In present study the prevalence of central obesity was 35.1% with a more common in women and unequal among three ethnic groups.

Central obesity as a health problem was reported in some studies in Iran. The prevalence of central obesity in Gorgan (northern Iran) was 39.1%,¹⁰ in Ahvaz (south of Iran) was 21.2%,¹⁹ and in whole of Iran was 9.7%.⁵ In a comprehensive study in Iran, the prevalence of central obesity was reported 9.7%-12.9% and 54.5%-63.7% in adult men and women, respectively.⁴ The prevalence of central obesity has been observed 36% in Spanish adults,²⁰ 24.1% in Egypt,²¹ 35% in Canadian adult people²² and 31.5% and 64.4% in Omani male

and female, respectively.²³ Compared with above studies, the prevalence of central obesity in northern Iran was high and there is necessary a control program for it. We showed, the central obesity in women more than men as like as other studies.^{6,24}

In present study, besides differences among three ethnic groups, the odd ratios were the greatest and the lowest in Fars-native and Sisstani, respectively. We didn't show the differences between ethnic groups while the some socio-demographic factors inter in regression model. In conclusion, socio-demographic factors have a main role in differentiation of central obesity among ethnic groups in the north of Iran.

Nutrition is multifaceted and influenced by biological, cultural and socio-economic factors²⁵ and differences among ethnic or immigrant groups was seen in other studies. In that way, secular growth was difference among ethnic groups in United States²⁶ so non-Hispanic blacks had the greatest prevalence of obesity (35.7%), compared to Hispanics (28.7%) and non-Hispanic whites (23.7%).¹² In Latino people (38.7%), the prevalence of obesity was higher than non-Latino whites (32.8%).²⁷ In Sri Lanka Australian children was shown the role of genetic factors on the secular growth.²⁸ Rush²⁹ recommended using FFM (Free Fat Mass) instead of BMI (Body Mass Index) in filed study and Fredriks³⁰ believed that separate growth chart for Moroccan and Turkish children that living in Netherland is necessary. Differences between immigrant population and native people reported in other studies. For example, immigration have a negative impact on family unity and established meal structure.¹¹ Evidence also indicates that minority and low-income populations have less access to physical activity facilities and health foods are relatively more expensive than energy-dense foods.³¹ Environmental (high density of fast food establishments)³² and behavioral (Low rates of physical activity, high intake of energy-dense foods)³³ factors were the main causes of obesity in Southeastern people in US that has the highest

rates of obesity. Veghari³⁴ believed that nutritional status in Turkman children is better than Sisstanish ethnic group in northern Iran and the prevalence of central obesity in Sisstanish women was lower than other ethnic groups in this area.¹⁰ Sisstanish ethnic group has been immigrated from east to north of Iran during last decades and socio-economic indexes of them are low. Men mainly doing physical work and women mostly are housewife. It seems, the role of behavioral factors more than others influence on central obesity in this group because differences mostly were shown in men. More studies are necessary for considering the reasons of low prevalence of central obesity in Sisstanish ethnic groups.

In our results, the pattern of central obesity among three ethnic groups based on genders was not similar. Despite in women odds ratio was not significant as whole but, in men it was strongly in Sisstani lower than in Fars-native and in Turkman ethnic groups. Food behavior differences in genders have been reported in other studies. In Alabama, the role of culture and tradition in weight management and limited access to fresh fruits and vegetables and low level of physical activity emphasize in Latino immigrant women.¹⁴ In US, Latino women more than other affected by obesity²⁷ and non-Hispanic black women are more satisfied with their body size than non-Hispanic white women; persons who are satisfied with their body size are less likely to try to less weight.³⁵ In our study, difference in men, in contrary women and why the gender difference in Sisstani is greater than the others are not clear. Probably, environmental and behavioral factors in each of ethnic groups are different and it should be consider in future studies.

CONCLUSION: Iran is considered to be a country in nutrition transition phase and life style and food behavior have been changed in recent years³⁶ and as like as other developing countries, central obesity is a health problem in Iran. We founded that over one to three of Iranian northern

adults suffer from central obesity and alarming rate was shown in women. Among three ethnic groups, the highest and the lowest rates were seen in Fars-native and Sisstanish ethnic groups, respectively. Unlike women, the central obesity in men's three ethnic groups was significant and difference in gender in Sisstani is greater than the others.

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Table 1: Demographics distribution of subjects .

Variable		Fars-native(1627) N(%)	Turkman(974) N(%)	Sisstani(392) N(%)	Total (2993) N(%)	P. Value
Location area	Urban	830(51.0)	310(31.8)	43(11.0)	1182(39.5)	0.001
	Rural	797(49.0)	664(68.2)	349(89.0)	1811(60.5)	
Age group (year)	15-40	815(50.1)	490(50.2)	207(52.8)	1512(50.5)	0.619
	40-65	812(49.9)	484(49.7)	185(47.2)	1481(49.5)	
Economic status	Poor	257(15.9)	151(15.5)	201(51.3)	673(22.5)	0.001#
	Moderate	639(39.3)	505(51.8)	160(40.8)	1329(44.4)	
	Good	731(44.8)	318(32.7)	31(7.9)	991(33.1)	
Educational level	Uneducated	376(23.1)	310(31.8)	150(38.2)	790(26.4)	0.001##
	0-12 year schooling	730(44.9)	508(52.2)	196(50.0)	1419(47.4)	
	College	521(31.9)	156(16)	46(11.8)	784(26.2)	
Sex	Men	816(50.2)	487(50)	197(50.3)	1500(50.1)	0.995
	Women	811(49.8)	487(50)	195(49.7)	1493(49.9)	

Poor status compared among three ethnic groups.

Uneducated status has been compared among three ethnic groups.

Table 2. The mean and SD of waist circumference among three ethnic groups based on gender

Ethnicity	Gender	Mean(SD)	P-Value
Fars-native	Men(816)	88.22(15.50)	0.091
	Women(811)	89.54(16.14)	
	Total (1627)	88.88(15.83)	
Turkman	Men(487)	88.85(12.62)	0.563
	Women(487)	89.37(15.49)	
	Total (974)	89.11(14.12)	
SisstaniI	Men(197)	82.33(12.37)	0.003
	Women(195)	86.50(14.74)	
	Total (392)	84.41(13.74)	
Whole	Men(1500)	87.65(14.38)	0.001
	Women(1493)	89.09(15.77)	
	Total (2993)	88.37(15.10)	

T.test between Fars-native and Turkman in men (P=0.450), women (P=0.848) and in whole (P=0.711) is not significant.

T.test between Fars-native and Sisstani in men (P=0.001), women (P=0.016) and in whole (P=0.001) is significant.

T.test between Turkman and Sisstani in men (P=0.001), women (P=0.027) and in whole (P=0.001) is significant.

ANOVA among three ethnic groups in men (0.001), in women (0.048) and in whole (0.001) is significant.

Table 3: The comparison of central obesity among three ethnic groups based on gender

Ethnicity	Gender	Central Obesity		P. Value
		No	Yes	
Fars-native	Men(816)	671(82.2)	145(17.8)	0.001
	Women(811)	355(43.8)	456(56.2)	
	Total (1627)	1026(63.1)	601(36.9)	
Turkman	Men(487)	408(83.8)	79(16.2)	0.001
	Women(487)	226(46.4)	261(53.6)	
	Total (974)	634(65.1)	340(34.9)	
Sisstani	Men(197)	185(93.9)	12(6.1)	0.001
	Women(195)	99(50.8)	96(49.2)	
	Total (392)	284(72.4)	108(27.6)	
Whole	Men(1500)	1264(84.3)	236(15.7)	0.001
	Women(1493)	680(45.5)	813(54.5)	
	Total (2993)	1944(64.9)	1049(35.1)	

Chi-2 between Fars-native and Turkman in men (P=0.473), women (P=0.356) and in whole (P=0.158) is not significant.

Chi-2 between Fars-native and Sisstani in men (P=0.001) and in whole (P=0.001) is significant but in women is not significant (P=0.078).

Chi-2 between Turkman and Sisstani in men (P=0.001) and in whole (P=0.005) is significant but in women is not significant (P=0.303).

ANOVA among three ethnic groups in men (P=0.001) and in whole (P=0.002) is significant but in women is not (P=0.190).

Table 4: Logistic regression estimate the odds Ratio of Central obesity in the north of Iran (95% CI)

Variable	P-value	Odds Ratio (Highest -lowest)	P. value	Adjusted Odds Ratio (Highest - lowest) #	
Total	Sisstani	-	1	1	
	Turkman	0.009	1.410(1.090-1.825)	0.724	1.162(0.505-2.674)
	Fars-native	0.001	1.450(1.208-1.965)	0.230	1.652(0.728-3.748)
Men	Sisstani	-	1	1	
	Turkman	0.001	2.985(1.587-5.614)	0.333	1.789(0.349-2.288)
	Fars-native	0.001	3.331(1.809-6.136)	0.290	3.034(0.389-6.662)
Women	Sisstani	-	1	1	
	Turkman	0.303	1.191(0.854-1.661)	0.214	0.474(0.146-1.538)
	Fars-native	0.078	1.325(0.969-1.812)	0.734	0.818(0.256-2.613)

#Adjusted for location area, age, economic status and educational level.