

# Obesity in rural mothers in the north of Iran (southeast of caspian sea): an epidemiologic study

## Abstract

**Background:** Obesity is the main health problem in worldwide.

**Objectives:** The aim of this study is the evaluation of obesity among women in a rural area in two districts in Golestan Province (north of Iran) in 2013.

**Material and methods:** This was a cross-sectional study with 2545 (Gorgan=1106 and Aq-Qala=1439) women participated. Interviewers recorded the data using the questionnaire and subjects were weighed on scales and had their height by measure. Economic status was categorized based on 16 facility items considered necessary for modern-day life (Low  $\geq 6$ , Moderate=7-11 and Good=12-16). Obesity defined based on Body Mass Index (BMI) that classified by World Health Organization. SPSS 18.0 software was used for statistical data analysis and P.value under 0.05 included significations.

**Results:** Body Mass Index (BMI) in ranges of (25-29.9), (30-39.9) and ( $\geq 40$ ) was observed in 33.1%, 19.5% and 0.7% of the subject, respectively. The frequency of BMI over 25 among Gorgan and Aq-Qala mothers was 54.1% and 52.8%, respectively and statistical differences was not significant. The prevalence of obesity among poor, middle and good economic status was 14.1%, 19.6% and 27.9%, respectively, with significant difference ( $P=0.001$ ).

**Conclusion:** Obesity is a common health problem among women in the rural areas of Gorgan and Aq-Qala and it was positively associated with economic status.

**Keywords:** obesity, economic status, mother, Iran

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**Abbreviations:** BMI, body mass index; SD, standard deviation

## Introduction

Obesity, a cardiovascular risk factor has remained as a main health problem and substantially increased during the last decade in many countries.<sup>1</sup> Imbalance between taking food and consuming calorie leads to overweight and obesity.<sup>2</sup> Some factors are responsible for the weigh increase in body. The metabolic factors such as leptin, life style and low physical activities have been known the important factors for overweight and obesity.<sup>3</sup> In the Third National Surveillance of Risk Factors of Non-communicable Disease, the overall prevalence of obesity was reported 22.3% in Iran and in this survey obesity was much more common in females and in urban residents.<sup>4</sup> Studies in the north of Iran<sup>5,6</sup> approved the obesity as a major health problem in this area.

In regard to the rule of obesity and the changing of the life-span, it seems necessary to recognize the people at risk and the pre-existing for this abnormality. Among the various methods for the determination of obesity and overweight, BMI (body mass index) is common more than others and is used for the determination of obesity degrees.<sup>7</sup>

Of 1.7million populations in the Golestan province (north of Iran and southeast of Caspian Sea), 586640 person are living in Gorgan and Aq-Qala districts. The proportion of rural residence in two areas is 25.6% and 69.3%, respectively. The main job in rural area is agriculture and different ethnic groups such as Turkman, Fars-native and Sisstani are living in this region.<sup>8</sup>

Due to the restriction in performing of epidemiological projects, the study on obesity and its related factors is scarce in the north of Iran, up till now; therefore it was necessary to design a research project to determine the obesity status and some related factors. This idea was carried out in a study among the rural mothers in two capital districts (Gorgan and Aq-Qala) in the north of Iran.

## Material and methods

### Study designs and subjects

In a descriptive and cross-sectional study, by a component type sampling (cluster and simple sampling), 2545 mothers of under-five years children were chosen in 21 villages around Gorgan and Aq-Qala in the north of Iran. BMI was calculated as weight (kg)/height (m<sup>2</sup>). Those with a BMI of 25.0-29.9kg/m<sup>2</sup> were classified as overweight, whilst those with a BMI $\geq 30.0$ kg/m<sup>2</sup> were classified as obese and BMI $\geq 40$  classified as pathologic obese.<sup>1</sup>

### Data collection

Using a questionnaire, the data were recorded by 21 trained interviewers. Economic status was categorized based on 16 facilities possession considered necessary for modern-day life. In that way, the economic status was classified as follows: low $\geq 6$ , moderate=7-11, and good=12-16.

Weight was measured without shoes and clothing using a balance and height was measured using a tape meter while the participants were standing on their feet. Weight and height recorded nearest 0.5kg and 0.5cm, respectively.

## Data analysis

SPSS 18.0 software was used for statistical data analysis. We used the t-test and ANOVA for comparing of means and  $\chi^2$  test for comparing of quantities groups. P value under 0.05 included significations. Pregnant women and subjects, who were not interested to contribute, have been excluded from this study. This study approved by Ethical Research Committee of Golestan University of Medical Sciences (G-P-35-1112). Verbal informed consent was received from all cases.

## Results

The mean±standard deviation (SD) of age was 28.0±5.7years. The mean±SD of BMI was 27.2±5.2 and 28.4±6.1kg/m<sup>2</sup> in Gorgan and Aq-Qala districts, respectively. Poor economic status was significantly more in Gorgan than in Aq-Qala districts (P=0.001) (Table 1).

As a whole, overweight and obesity was seen in 33.1% and 20.2%, respectively. The overweight and obesity in Gorgan women (54.1%) was more than in Aq-Qala women (52.8%), but statistical differences was not significant (Table 2).

**Table 2** Distribution of BMI and obesity among mothers in Gorgan and Aq-Qala

District	N	BMI distribution					
		Mean (SD) Kg/m <sup>2</sup>	Low N (%)	Normal N (%)	Overweight N (%)	Obesity N (%)	Pathologic obesity N (%)
Gorgan	1106	26.2(5.3)	47(4.2)	461(41.7)	368(33.3)	221(20)	9(0.8)
Aq-Qala	1439	25.8(5.1)	75(5.2)	604(42.0)	474(32.9)	276(19.2)	10(0.7)
Total	2545	25.9(5.2)	122(4.8)	1065(41.8)	842(33.1)	497(19.5)	19(0.7)
P value		0.06	0.239	0.882	0.859	0.613	0.729

**Table 3** Distribution of BMI and obesity status based on economic status

Economic status	N	BMI distribution					
		Mean (SD) Kg/m <sup>2</sup>	Low N (%)	Normal N (%)	Overweight N (%)	Obesity N (%)	Pathologic obesity N (%)
Poor	594	24.9(5.2)	32(5.4)	312(52.5)	166(27.9)	78(13.1)	6(1.0)
Middle	1328	25.9(5.1)	68(5.1)	540(40.7)	460(34.6)	255(19.2)	5(0.4)
Good	612	27.1(5.2)	22(3.6)	206(33.7)	213(34.8)	163(26.6)	8(1.3)
Total	2534	25.9(5.2)	122(4.8)	1058(41.8)	839(33.1)	496(19.6)	19(0.7)
P value		0.001	0.261	0.001	0.009	0.001	0.061

11 subjects missed from the study.

## Discussion

The finding of this study showed that obesity and overweight are the main health problem among the rural women in Gorgan and Aq-Qala. Generally, one to five of women was obese and one to two hundred of them was pathologic obese, who needed to be treated. However the obesity was common more in Gorgan than Aq-Qala. Based on studies in the north of Iran the prevalence of obesity was 16.4% in rural women in Gorgan,<sup>9</sup> 28.6% in women in whole of Golestan province<sup>5</sup> and 33.3% in rural women in Golestan province.<sup>10</sup> The obesity among women in Bahrain,<sup>11</sup> Saudi Arabia,<sup>10</sup> Lebanon<sup>12</sup> and in Eastern Mediterranean region<sup>13</sup> has been prevalent 21.2%, 26.6%, 18.8% and 35-75%, respectively.

The prevalence and pattern of obesity is considerably dissimilar among countries. The prevalence rate of obesity ranges from as low as ≤5% in China, Japan, and some region in Africa to as high as ≥75% in urban Samoa. However, even in countries such as China, the prevalence of obesity is almost 20% in some cities, the overall

prevalence of obesity is relatively low.<sup>14</sup> The pattern of obesity in the family is dependant on genetic, but genetic factor required a proper and special environment. The genetic factors responsible for the obesity reveal itself when they are placed in proper situation.<sup>15</sup>

**Table 1** Characteristics of study's subjects (No=2545)

	Gorgan	Aq-Qala	P. value
Frequency N (%)	1106(43.5)	1439(56.5)	
Age –year (Mean±SD)	27.4±5.2	28.4±6.1	0.001
BMI –kg/m <sup>2</sup> (Mean±SD)	26.2±5.3	25.8±5.1	0.060
<b>Economic status N (%)</b>			
Poor	320(29)	274(19.1)	0.001
Middle	545(49.5)	783(54.7)	0.010
Good	237(21.5)	375(26.2)	0.001

Our study was indicated that the prevalence of obesity and overweight among rural women in Gorgan and Aq-Qala (north of Iran) are high. In present study a meaningful direct correlation between the economic status and obesity has been investigated. If this trend is continued in future, it is expected that we will face much more difficulty due to side- effect of obesity and overweight in the north of Iran. The association between economic status and obesity, has been approved by others,<sup>6,9,12,13</sup> as like as our study. In Iranian northern schoolchildren, the risk of obesity in good economic families was seen 2.2 times more than in poor economic families.<sup>16</sup>

The pattern of obesity in the two districts is not significant while economic status is a risk factor for obesity. Regards to constitute the dominant ethnic of these districts are different and most of people in

Aq-Qala are in Turkman ethnic group, it seems environmental more than genetic factors play effective roles in these differences. In family education, mothers play an important task in forming children's mind in how much and how many times to eat and which nutrient to choose, therefore consequently mothers are the symbols of their children in this regard.<sup>17</sup>

Although in present study, the single women and mothers who did not have children less than five years, were not covered, but the results of this research may be extended to the most of women in fertility ages in the rural area in the north of Iran. Besides we didn't have ethnicity differences and food behavior variation in our study. In addition, we did not provide a proper statistical test to consider the design effect caused by cluster sampling. They are our limiting study.

## Conclusion

Half of mothers in rural area in Gorgan and Aq-Qala (north of Iran) suffer from overweight and obesity and economic status is a risk factor for them. The prevalence of obesity is no differences between Gorgan and Aq-Qala. We recommend establishing a proper nutritional training for mothers, as anticipatory measures to combat obesity in the family, and the consequent benefit of these measures which is given to the public health in the society.

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## Conflict of interest

The author declares no conflict of interest.

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