

## Comparison of Nutritional Behaviors and Physical Activities between Overweight/Obese and Normal-Weight Adults

### Abstract

**Background:** Overweight and obesity are major problems with increasing rates among adult populations. Nutritional behaviors and physical activity are the most important influencing factors. In this article, we conducted a survey on the nutritional behaviors and physical activities among normal-weight and overweight/obese adults. **Materials and Methods:** We conducted a survey on some of the nutritional behaviors and physical activities of 729 middle-aged adults. Data regarding desirable or undesirable use of fruits, fish, dairy products, oil, fast foods, and carbonated drinks and the intensity and duration of physical activities were collected from our data bank and analyzed using the SPSS software. **Results:** Our results indicated that overweight/obese people had an improper usage of fruits, oil, fast foods, and carbonated drinks and had lower physical activity. There was also a significant increase in intensity, duration per day, and weekly days of physical activity in healthy groups. Logistic regression analysis of nutritional behaviors, physical activities, and obesity also indicated that undesirable usage of oil, fast foods, and carbonated drinks and undesirable physical activity are associated with risks for overweight/obesity (odds ratio [OR] =10.70, OR = 7.45, OR = 7.48, and OR = 2.16, respectively) ( $P < 0.05$ ). **Conclusion:** This article puts emphasis on the role of proper nutritional behaviors and higher physical activities in decreasing the risks of developing obesity, and we suggest that further interventions could be made based on the results of our study.

**Keywords:** Nutrition, obesity, overweight, physical activity

### Introduction

Overweight/obesity which is defined as body mass index (BMI) equal to or above  $25 \text{ kg/m}^2$ <sup>[1]</sup> has increasingly become a major problem among adults. The prevalence of obesity has been amazingly increased over the past three decades mostly due to changes in lifestyle. Overweight/obesity in the middle-aged population (30–59 years of age) has significant importance because most of the mentioned diseases occur in this era. This disease puts a heavy burden on the health-care system and requires great financial and social resources.<sup>[2]</sup> Lack of sufficient physical activity and inappropriate nutritional behaviors have been assumed by different lines of evidence as the most important etiologic factors for overweight and obesity among adults.<sup>[3–5]</sup> The prevalence of overweight/obesity is accounted 40% in Iranian adults, which is reported by Rashidi *et al.*<sup>[6]</sup>

Studies also proclaim that sufficient physical activity reduces the risk of early

progression of different chronic diseases such as breast or colorectal cancer. As mentioned above, nutritional behaviors also account for an important etiologic factor for overweight and obesity.<sup>[7]</sup> A recent study proved that low-calorie diet along with increased physical activity has a pivotal role in reducing obesity and obesity-related problems such as chronic cardiovascular diseases.<sup>[8]</sup> Another study<sup>[9]</sup> by Brands *et al.* puts emphasis on the role of nutrition in early ages on later risks of overweight and obesity and risks of developing other diseases. Burk *et al.*<sup>[10]</sup> also conducted a survey on the important impacts of nutrition and nutritional behaviors on obesity and its complications. Unhealthy lifestyle including lack of sufficient physical activity and unhealthy diet is well proven to have influences on developing obesity. However, the question arises of what kind of nutritional intakes are correlated with overweight/obesity. Overweight and obesity is a leading cause of different serious

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chronic diseases and is widely related to environmental factors including nutritional habits and physical activity.<sup>[11]</sup> As a result, in this study, we aimed to conduct a survey on the middle-aged population of Isfahan, in order to collect data of some of their nutritional behaviors and physical activities and compare these data among overweight and obese and normal-weight adults.

## Materials and Methods

This cross-sectional study was performed in 2017–2018 in Isfahan. Ethical approval was obtained from the Ethical Committee of Isfahan University of Medical Sciences. The study inclusion criteria were middle age (30–59 years), being under health-care surveillance for at least 1 year, and having documents in health centers. Adults in 12 health-care centers in Isfahan were included in the present study based on multistage randomized clustering method. The study population consisted of 729 adults who had been previously under health-care services such as measuring weight and height by health-care specialists and by standard methods including calibrated scales. The study populations were divided into two groups based on BMI as follows: overweight/obese people ( $n = 239$ ) ( $BMI \geq 25 \text{ kg/m}^2$ ) and normal-weight people ( $n = 490$ ) ( $18.5 \leq BMI < 24.9$ ). The study exclusion criterion was having incomplete document in health centers. Data regarding nutritional behavior and physical activities were previously filled by health-care specialists by interviewing cases.

Desirable or undesirable categories were ascertained by health-care specialists based on the following methods: daily usage of 2–3 units of dairy products, 3–5 units of fruits, and usage of fish two times a week, which were considered as desirable behaviors. Weekly usage of fast foods and carbonated drinks and consumption of animal oil accounted as undesirable behaviors. For physical activity, 3–5 days a week for at least 30 min with moderate-to-high intensity accounted as desirable physical activity. Our research team collected these data from the Isfahan Provincial Health Center data bank between 2015 and 2016 in health-care units. It should also be noted that no ethical issues were mentioned because data were collected anonymously from the data bank. At the end, data were collected and analyzed by SPSS software version 24 (Chicago: SPSS Inc. IBM Corp.) using descriptive statistics and logistic regression (using “enter” method) analysis. Model variables were included education, marriage, fruit, oil, fast foods, carbonated drinks, and physical activity.

## Results

A total of 490 normal-weight adults and 239 adults with overweight and obesity were included in this cross-sectional study. There were no statistically significant differences between overweight/obese and normal-weight population regarding age and sex ( $P > 0.05$ ) [Table 1].

The results also indicated that overweight and obese people had an improper usage of fruits, oil, fast foods, and carbonated drinks and had lower physical activity ( $P < 0.001$ ) [Table 2]. There were also statistically

**Table 1: Demographic variables between overweight/obese patients and normal-weight controls**

Variables	Normal-weight controls (%)	Overweight and obese patients (%)	P
Age	46.7±1.2	42.8±1.6	0.06
Gender			
Male	245 (50)	122 (51)	0.80
Female	245 (50)	117 (49)	
Education			
End of elementary education	54 (11)	24 (10)	<0.001*
First middle school term	118 (24.1)	53 (22.2)	
Diploma	226 (46.1)	75 (31.4)	
End of college education	92 (18.8)	87 (36.4)	
Job			
Employed	418 (85.3)	212 (88.7)	0.209
Unemployed	72 (14.7)	27 (11.3)	
Marital status			
Single	52 (10.65)	7 (2.9)	<0.001*
Married	381 (77.8)	117 (49)	
Widow/divorced	57 (11.6)	115 (48.1)	

\*Significant at 0.05 ( $\chi^2$ )

**Table 2: Nutritional behavior and physical activity of overweight/obese patients and normal-weight controls**

Nutritional behavior and physical activity	Normal-weight controls (%)	Overweight and obese patients (%)	P
Fruits			
Undesirable	147 (30)	112 (46.9)	<0.001*
Desirable	343 (70)	127 (53.1)	
Fish			
Undesirable	294 (60)	150 (62.8)	0.47
Desirable	196 (40)	89 (37.2)	
Dairy			
Undesirable	156 (31.8)	79 (33.1)	0.7
Desirable	334 (68.2)	160 (66.9)	
Oil			
Undesirable	114 (23.3)	175 (73.2)	<0.001*
Desirable	376 (76.7)	64 (26.8)	
Fast foods			
Undesirable	154 (31.4)	192 (80.3)	<0.001*
Desirable	336 (68.6)	47 (19.7)	
Carbonated drinks			
Undesirable	93 (19)	170 (71.1)	<0.001*
Desirable	397 (81)	69 (28.9)	
Physical activity			
Undesirable	171 (34.9)	102 (42.7)	0.04
Desirable	319 (65.1)	137 (57.3)	

\*Significant at 0.05 ( $\chi^2$ )

significant differences between the two groups in terms of intensity, duration per day, and weekly days of physical activity ( $P < 0.001$ ), and these items were higher in normal-weight groups [Table 3].

Based on logistic regression model, higher educational levels, i.e., diploma and end of college education and widow/divorced marital status accounted as associating factors for overweight/obesity (odds ratio [OR] =1.41 and OR = 4.36, respectively) ( $P < 0.05$ ). The logistic regression model also indicated that undesirable usage of oil, fast foods, and carbonated drinks and undesirable physical activity were associated with risks for overweight/obesity (OR = 10.70, OR = 7.45, OR = 7.48, and OR = 2.16, respectively) ( $P < 0.05$ ) [Table 4].

## Discussion

In this study, we showed that obese populations had improper nutritional habits and lower physical activity in comparison with normal populations. Overall, we indicated that higher educational levels; undesirable usage of oil, fast foods, and carbonated drinks; and improper levels of physical activity are associated with risks for overweight/obesity. The positive role of fruits in obesity has been well studied in different reports. In a study by Sharma *et al.*,<sup>[12]</sup> the authors placed an emphasis on the role of fruit consumption on diminishing obesity. This information is in line with the results of our article, in which we indicated that normal-weight populations have higher consumption of fruits. Furthermore, Burgoine *et al.*<sup>[13]</sup> suggested that efforts to control fast-food consumption in neighborhood level might be helpful to control obesity and its further associated problems. Kelishadi *et al.* also indicated that improper usage of hydrogenated fat and fast foods is observed among the Isfahan population, and this could be accounted as a great risk factor for cardiovascular diseases.<sup>[14]</sup> These studies are somehow in line with our findings. We indicated that fast-food consumption and improper usage of hydrogenated fat are more prevalent among populations with overweight/obesity, and as a result, we should think of strategies to control them. We indicated that higher educational levels are associated with an increased risk of overweight/obesity, which is in line with the findings of Mokdad *et al.* who also showed a higher prevalence of overweight/obesity among highly educated populations.<sup>[15]</sup> Such findings could be due to the prevalence of higher use of private transportation and the consequent sedentary lifestyle among educated population compared to others.<sup>[16]</sup> On the other hand, Kivimäki *et al.* indicated that widow/divorced marital status is associated with risks for overweight/obesity with OR = 1.07.<sup>[17]</sup> These data are also in line with our study, and we presume that this issue might have a relation with the higher prevalence of depression among widow/divorced people<sup>[18]</sup> and the relation of depression with overweight/obesity.<sup>[19]</sup>

Most of the studies concentrate on the preventive role of physical activity in early ages in developing obesity

**Table 3: Physical activity in overweight/obese patients and normal-weight controls**

Physical activity	Normal-weight controls (%)	Overweight and obese patients (%)	P
Type			
Walking	174 (35.5)	104 (43.5)	<0.001*
Occupation	190 (38.8)	124 (51.9)	
Occupation with physical activity	47 (9.6)	0	
Sports and others	79 (16.1)	11 (4.6)	
Intensity			
Weak	140 (28.6)	103 (43.1)	<0.001*
Medium to high	350 (71.5)	136 (56.9)	
Duration (min/day)			
<30	123 (25.1)	82 (34.3)	<0.001*
>30	367 (74.9)	157 (65.7)	
Number of days per week (days)			
<3	123 (25.1)	71 (29.7)	<0.001*
>3	367 (74.9)	168 (70.3)	

\*Significant at 0.05 ( $\chi^2$ )

**Table 4: Logistic regression model of different variables and overweight/obesity**

Variables	OR	95% CI	P**
Education	1.41	1.06-1.86	0.017**
Marriage			
Single*			
Married	0.37	0.115-1.20	0.1
Widow/divorced	4.36	1.32-14.33	0.015**
Fruit			
Desirable*	1.58	0.91-2.74	0.09
Undesirable			
Oil use			
Desirable*	10.70	6.33-18.09	<0.001**
Undesirable			
Fast foods			
Desirable*	7.45	4.48-12.39	<0.001**
Undesirable			
Carbonated drinks			
Desirable*	7.48	4.53-12.36	<0.001**
Undesirable			
Physical activity			
Desirable*	2.16	1.32-3.55	0.002**
Undesirable			

\*Reference category, \*\*Significant at 0.05. OR: Odds ratio, CI: Confidence interval

or consider physical activity as a helpful factor to control weight.<sup>[20,21]</sup> The UK Academy of Medical Royal Colleges has published a report on the importance of physical activity in 2015. They believe that performing 30 min of moderate exercise, five times a week, is more powerful than many drugs administered for prevention and management of chronic diseases.<sup>[11]</sup> In a study by Lazareva

*et al.*,<sup>[22]</sup> they indicated that increasing the physical activity and changing the dietary pattern along with some other activities are significant in decreasing obesity. Coghlan *et al.* also indicated that sports and physical activity play one of the most important roles in preventing or treating obesity and as we indicated, undesirable physical activity is associated with increased risks of developing obesity.<sup>[23]</sup> However, according to Malhotra *et al.*, physical activity alone has no distinct role in obesity, and other factors including diet must be considered.<sup>[24]</sup> According to our study results, lower physical activity is associated with higher chances of developing obesity in adults. Taken together, our findings put emphasis on the role of desirable nutritional factors and physical activity in overweight and obesity, and we indicated that healthy nutritional factors and increased physical activity are associated with lower risks of developing obesity.

### Limitations

Our limitations were accessing and collecting data from the data bank and studying the files.

### Conclusion

From this article, we conclude that a healthy diet including desirable consumption of oil, fast foods, and carbonated drinks and higher physical activities is associated with protection against overweight/obesity.

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### Conflicts of interest

There are no conflicts of interest.

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