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# Association among lifestyle status and body mass index in Yasuj adolescents

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**A B S T R A C T**

Today obesity is the major public health concern that drastically rising tread worldwide. Several factors such as unhealthy lifestyle and low physical fitness may related with obesity in adolescents however, it still unclear. The aim of this study was to determine the association among lifestyle status and body mass index in Yasuj adolescents. Three hundred forty one boy students aged 15 to 17 years (mean ± SD: 15.6 ± 0.7 years) living in Yasuj participated in this study. Each subject's lifestyle status was assessed by a self-administered questionnaire. The overall prevalence of overweight and obesity was 20.5 and 6.8 percent, respectively. The results indicated that body mass index had tendency to increase as unhealthy food consumption and the time spent on watching TV increased and body mass index had tendency to decrease as healthy food consumption and exercise frequency increased. General linear regression demonstrated that the time spent on watching TV was independently associated with body mass index in adolescences. Unhealthy lifestyle, especially excess time spent on watching TV may cause obesity in Yasuj adolescents.

## Introduction

The prevalence of overweight and obesity has increased in most parts of the world during the last decades, among children, adolescence and adults alike [1]. With the increased occurrence of childhood and adolescence obesity, health problems previously considered to be associated mainly with adult obesity are now observed more frequently also in children and adolescent [2]. The most common consequences of obesity that may already during the childhood or adolescence are psychological problems [1]. On the other

hand, the potential adverse physical consequences of childhood and adolescence obesity include an increase frequency of cardiovascular risk factors, such as dyslipidemia, hypertension, hyperinsulinemia and impaired glucose tolerance [3]. These disturbances may not give any clinical signs during the childhood and adolescence but predict increased cardiovascular morbidity and mortality in adulthood [4].

In summary, the increase in childhood and adolescence obesity may lead to an increase in variety of physical and psychological problems. Therefore, childhood and adolescence obesity is now seen by many as a public health hazard and the need for effective prevention and treatment is recognized widely [5]. Potential driving factors for the worldwide increase in the prevalence of obesity over the time have been sought among changes in behavior as well as environment; however, the reasons are still incompletely understood [6]. Thus the aim of this study was to estimate the prevalence of overweight and obesity in Yasuj adolescents.

## Methods

Three hundred forty one students (boys) aged 15 to 17 years (mean ± SD: 15.6 ± 0.7 years) living in Yasuj, the capital of kohgiluyeh and boyer-ahmad in the southwestern of the Islamic Republic of Iran, participated in this study. Participants were selected through the systematic sampling technique. Invitation letters were sent to parents for passive consent to participate in the study; only those who declined participation were required to return a signed reply form. Even with parental consent, student participation was totally voluntary. The Fars Science & Research branch, Islamic Azad University Ethics Committee approved the protocols, which were fully explained to all subjects.

Height and weight of students were measured barefoot and in light clothing by trained teachers and body mass index (BMI) was calculated. Overweight and obesity were defined on the $85^{th}$ and $95^{th}$ percentiles of BMI for age and sex, respectively, as proposed by Centers for Disease Control (CDC). Physical fitness level and family conditions were collected by a standard Baecke questionnaire.

Statistical analyses were performed with SPSS program (version 17, SPSS, Inc., Chicago, IL). Values were expressed as mean ± standard deviation (SD). General linear regression analysis and Pearson correlation were performed to calculate a correlation between food consumption pattern, lifestyle status and overweight and obesity. P-values less than 0.05 were considered statistically significant.

## Results and Discussion

The sample, representing adolescences aged between 15 to 17 years, consisted of 4000 subjects. The overall prevalence of overweight and obesity was 20.5 and 6.8 percent, respectively. Anthropometric characteristics of the subjects are presented in Table 1. The results showed that the prevalence of overweight in 15, 16 and 17 years boys were 21.2%, 22.7% and 12.7% respectively and the prevalence of obesity were 7.4%, 6.2% and 5.5% respectively.

Food consumption pattern, exercise frequency and the time spent on watching TV are presented in Table 2. Results demonstrated that most of the participants have a sedentary lifestyle and few subjects (19.7 %) more than 4 hour per week participate in regulate exercise programs.

The relationship between body mass index with food consumption pattern, exercise frequency and the time spent on watching TV in the participants are shown in Table 3. As showed in table 3, body mass index had tendency to increase as fast foods, soft drink and Chips consumption and the time spent on watching TV increased and body mass index had tendency to decrease as vegetables, dairy products and fruits consumption and exercise frequency increased. General linear regression demonstrated that the time spent on watching TV was independently associated with body mass index in adolescences.

In this report, based on the available information, lifestyle and overweight and obesity were considered, with special focus on the identification of lifestyle such as dietary and physical activity habits in relation to body mass index. Our findings indicate that there is a positive relationship between less healthy foods with body mass index and an inverse relationship between healthy foods and body mass index. There have been great changes in the dietary habits of Middle Eastern populations in the past decades [7].

A wide range of epidemiological studies has implicated obesity as a significant predisposing risk factor in a variety of disabling and life-threatening medical conditions [8]. Evidence indicates that diets relatively rich in fat appear to be particularly conducive to the development of obesity [9]. Therefore, knowledge of prevalence rates of obesity and those most susceptible to become obese are of considerable importance.

Weight management and physical activity are recommended as first-line lifestyle interventions; treatment or therapy is often needed to avert or delay the progression of symptoms of obesity [10]. Lifestyle interventions such as reduced energy intake and increased physical activity can be effective [10,11]. Cortez-Pinto and Machado (2008) reported that decrease consumption of hypercaloric food and saturated fat, and weight loss through dieting and increasing energy expenditure through the practice of regular exercise has been effective in improving obesity [12]. Janiszewski *et al*. (2008) suggested that lifestyle modification consisting of exercise and/or caloric restriction are associated with improvement overweight and obesity, although the magnitude of this effect varies according to the specific component studied and additional factors such as baseline values [11]. By according Table 3, body mass index had tendency to decrease as exercise frequency increased. Unfortunately the results demonstrated that only 19.7 % of the subjects more than 4 hour per week participate in regulate exercise programs and most of them have a sedentary lifestyle.

Our results showed that body mass index had tendency to increase as the time spent on watching TV increased. General linear regression also demonstrated that the time spent on watching TV was independently associated with body mass index in adolescences. The evidence of associations between obesity and sedentary activities has been reviewed in a meta-analysis [13] as well as a several review articles [14]. Gorely *et al*. (2004) concluded that the evidence of an association between TV or video viewing and increased body fatness was inconsistent [14].

The others concluded that decreased time spent on watching TV was associated with lower prevalence of obesity or body fatness in children and adolescents. According to Rey-Lopez (2007), video games and computers seem to be less associated with

obesity than watching TV, although the evidence is quite scarce [15]. Viewing TV may lead to decreased energy expenditure by replacing more physically active behaviors [16], or to an increased energy intake as a result of food advertising, eating or between-meal snaking [17]. TV viewing has also been suggested to lower the resting metabolic rate [18].

**Table.1** Anthropometric characteristics of the participants (mean ± SD)

| age | Underweight | | Normal weight | | Overweight | | Obese | |
|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % |
| 15 years (n = 189) | 20 | 10.6 | 115 | 60.8 | 40 | 21.2 | 14 | 7.4 |
| 16 years (n = 97) | 5 | 5.2 | 64 | 66 | 22 | 22.7 | 6 | 6.2 |
| 17 years (n = 55) | 6 | 10.9 | 39 | 70.9 | 7 | 12.7 | 3 | 5.5 |

**Table.2** Food consumption pattern, exercise frequency and the time for watching TV of the participants

| | Rarely or never | Once/week | 2 – 4 times/week | > 4 times/week | |
|---|---|---|---|---|---|
| Fast foods | 39.9 % | 42.5 % | 14 % | 3.7 % | |
| Soft drink | 23.4 % | 34.2 % | 28.5 % | 14 % | |
| Chips | 18.8 % | 40.2 % | 29.3 % | 11.7 % | |
| Dairy products | 2 % | 16.8 % | 44.7 % | 36.5 % | |
| Vegetables | 14.2 % | 46.4 % | 27.9 % | 11.4 % | |
| Fruits | 2.3 % | 39 % | 37.9 % | 20.8 % | |
| | < 1 h/week | 1 – 2 h/week | 2 – 4 h/week | > 4 h/week | |
| Exercise | 22.2 % | 38.7 % | 19.4 % | 19.7 % | |
| | Rarely or never | < 1 h/week | 1 – 2 h/week | 2 – 4 h/week | > 4 h/week |
| Watching TV | 3.1 % | 13.1 % | 37.9 % | 29.9 % | 16 % |

**Table.3** The relationship between body mass index, food consumption pattern, exercise frequency and the time for watching TV of the participants

| | Body mass index | |
|---|---|---|
| | r | P |
| Fast foods | 0.01 | 0.8 |
| Soft drink | 0.02 | 0.6 |
| Chips | 0.07 | 0.1 |
| Dairy products | - 0.01 | 0.7 |
| Vegetables | - 0.09 | 0.09 |
| Fruits | - 0.1 | 0.05 |
| Exercise frequency | - 0.1 | 0.05 |
| Watching TV | 0.09 | 0.08 |

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