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RESEARCH ARTICLE

The factors influencing the prevalence of overweight and the obesity among adolescents schooled in the city of Temara; Morocco

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Abstract

Introduction: The objective of this work is to study the prevalence of overweight and obesity among secondary school students college, living in the city of Temara in Morocco, and to identify the factors that influence overweight.

Methods: This is a survey conducted in 2013 on a sample of students of a public secondary school. Data on sociodemographic characteristics, food habits and sedentary behavior for each student were collected by using a questionnaire.

Results: 465 college students aged 12-18 years of age whose 201 boys and 264 girls. According to the reference thresholds, the frequency of obesity was 6.67% and 15.27% overweight. Obesity was significantly associated with a higher socioeconomic level, sedentary lifestyle and having more than two snacks per day.

Conclusion: The prevalence of overweight and obesity is low, but it exists. The continuous observation, recognition of risk factors and the use of preventive measures are necessary to prevent future proliferation. These preventive measures should include not only individual approaches, but also the social environment of the child.

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INTRODUCTION

In Morocco, as in most countries, overweight and obesity have become in recent years a real public health problem. Indeed, the frequency of overweight and obesity are increasing both in adolescents than in adults. The number of people affected by this scourge is becoming more (1). Obesity may be due genetic, nutritional or social factors (2). In France, obesity has tripled in 15 years, from 5.1% in 1985 to 16% in 2000 (3). In Morocco, the recorded data show that obesity has increased steadily in recent years. It rose from 4.1% in 1984/1985 to 10.3% in 1998 / 1999. In 2000, more than 13% of individuals older than 20 years are obese (4).

Obesity has some unfavorable consequences on physical and mental health. Indeed, several symptomatic diseases in association with obesity have been described. In some cases, obesity is not regarded as physical, but also psychosocial problems (5). Similarly, in children and adolescents, obesity causes a significant risk of persistence in adulthood (6).

This study was conducted so as to evaluate the prevalence and risk factors associated with overweight and obesity in the secondary school students of public in the city of Temara in Morocco.

Study method:

The objectives of this study are:

- Measuring the prevalence of obesity and overweight among adolescents colleges of the city of Temara.
- Analysis of the links between factors of socioeconomic status (diet, exercise and lifestyle)
- A survey was conducted among a sample of 465 adolescent of the 1st, 2nd, and 3th grade at secondary school called ‘‘ Abou Firas Al Hamadani ‘‘ in Temara Morocco .

The survey involved:

- The weight measurements by a balance close to 100 grams.
- Measurements of the size and around the trunk to the centimeter.
- A questionnaire on the daily life of the adolescent, depending on gender of the students.

For each student, BMI (Body Mass Index) was calculated and the value transferred to the BMI curve. Each student was classified according to his BMI, his age and his sex in one of the following categories: Overweight (BMI greater than the 97th percentile), Normal (BMI between the 3rd and 97th percentile) and lean (BMI lower than the 3rd percentile).

The statistical treatment of results was performed by analysis of variance.

Results and discussion:

Sample characterization:

A total of 504 students in 18 classes of Abou Firas Al Hamadani college, 465 participated in the survey. The average age of college students is 14.34 ± 1.48 years, sex ratio (Girl / Boy) is 1.31. Table I summarizes anthropometric indices measured.

| | Effective | Age (Year) $\pm \sigma$ | Size (cm) $\pm \sigma$ | Weight (kg) $\pm \sigma$ | BMI (kg / m ²) $\pm \sigma$ |
|-------|-----------|-------------------------|------------------------|--------------------------|---|
| girls | 264 | $14,14 \pm 1,42$ | $158,96 \pm 6,14$ | $54 \pm 11,9$ | $21,29 \pm 4,04$ |
| boys | 201 | $14,60 \pm 1,53$ | $162,18 \pm 10,5$ | $54,09 \pm 15,27$ | $20,33 \pm 4,36$ |
| Total | 465 | $14,34 \pm 1,48$ | $160,35 \pm 8,45$ | $54,03 \pm 13,42$ | $20,87 \pm 4,2$ |

Table I: anthropometric characteristics of the study population

Obesity prevalence by age and sex:

The analysis of the results obtained for the BMI shows that 21.84% of college students are obese, of which 15.27% are overweight and 6.67% has severe obesity.

| | Effective | Not overweight% | Moderate overweight% | Obesity % |
|-------|-----------|-----------------|----------------------|-----------|
| girls | 264 | 76,01 | 16,42 | 7,6 |
| boys | 201 | 80,17 | 13,71 | 6,12 |
| Total | 465 | 78,07 | 15,27 | 6,67 |

Table II: Prevalence of overweight and obesity by sex

The note that the moderately overweight prevalence is 1.19 times higher among girls than boys, whereas obesity is 1.24 times higher among girls.

The prevalence of total obesity (overweight + obesity) are far enough between the two sexes. Similar results have been reported for a population of children aged 5-15 years from the city of Marrakech (7), the prevalence of overweight was 12,2% and obesity and 5.4%. Among college students of 12-18 years of the city of Settat, the prevalence of overweight is 13.74% (8). In North Africa, the prevalence of overweight and obesity was 23.1% in elderly Algerian children 6 to 12 years (9). In Egypt, it is 14% in children aged 10-19 years. In the countries of southern Europe, the prevalence of overweight among elderly Spanish children aged 6 to 7 years is 35% (10). In Portugal, it exceeds 30% (11). In Italy it is estimated at 36% (12) and Greece, it is of the order of 30% (13).

Obesity prevalence by socio-economic factors:

Several factors in behavior and lifestyle influence the occurrence of obesity. It's basically a sedentary lifestyle and an unbalanced diet (14).

The daily feed intake generally consists of three main meals (breakfast, lunch and dinner) with a snack in the morning and a snack in the afternoon.

In the studied population, the table III summarizes the distribution of some lifestyle characteristics depending on the weight status (obese or not).

| | Students overweight + obesity (%) | Students of normal weight (not overweight + obesity) (%) | p |
|---|-----------------------------------|--|---------|
| Taking a snack in the morning | 16,3 | 26,6 | <0,02 |
| Taking a snack in the afternoon | 76,6 | 87,8 | < 0,001 |
| Compliance with 3 daily food intake | 52,8 | 66,4 | <0,001 |
| Sports Activities less than 2 times a week | 51,7 | 49,6 | 0,1 |
| Follow TV programs usually afternoon rest days | 69,1 | 47,6 | <0,04 |
| Follow TV programs more than 2 times per day on days school | 49,5 | 35,6 | <0,03 |

Table III: Socio-economic according to corpulence

We see that on the whole sample, 46.7% of students reported two food intakes per day against 53.3% who said three.

The students overweight and obesity are less likely to take taste the morning as students with a normal weight (16.3% vs 26.6% $p < 0.02$) and take the afternoon snack (76, 6% vs 87.8% $p < 0.001$) and to respect the three daily food outlets (52.8% vs 66.4% $p < 0.001$).

Some results similar to those obtained in this study have been extensively described by several authors. This is the case of the Canadian children and adolescents (2-17 years) (15). And in the college students (12-18 years) of the city of Settat in Morocco (8).

Our study shows that, sedentary lifestyle measured by the average time spent watching television or computer, is associated with overweight and obesity. Indeed, the frequency of overweight and obesity are higher among college students who watch television usually the afternoon, rest days (69.1% vs. 47% $p < 0.04$) and in the evening of the day school (49.5% vs 35.6% $p < 0.03$).

These results are superior to those described in France (16), but close enough to those reported in studies conducted in Settat in Morocco (8) and in Algeria (17).

No association was found between overweight and obesity and the frequency of the practice of sport per week ($p = 0.1$).

Conclusion:

In our study sample, we found that the prevalence of overweight including obesity among college students is significantly important. This prevalence increases with socioeconomic status and living conditions. Some settings may explain this prevalence ; these are sedentary lifestyle, expressed as hours spent watching television or the computer, snacking and no physical activity.

This study shows the need for planning and implementation of a monitoring program and awareness campaigns for healthy and balanced diet.

The strategies must be developed by involving the pedagogical and administrative staff, and the association of parents.

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