

Body Mass Index And Alcohol Consumption Influences (Physical Education)



Physical Education

KEYWORDS : alcoholic beverages, diet, body mass index, obesity

Dumitrescu Remus

Department of Physical Education and Sport, University of Bucharest,
M. Kogălniceanu Av. No. 36-46, sector 5, Bucharest, Romania,

ABSTRACT

The aim of the present study was to investigate the relations between obesity, and alcohol consumption in students. In this study participated 319 students, 151 men and 168 women from the University of Bucharest in 2011-2012 academic year.

BMI was used for the evaluation of the degree of total obesity, accordingly to the values for adults set by World Health Organisation. For the statistical analysis the statistic packet SPSS/PC version 15.0 for windows was used.

Data analysis showed that the most subjects of the whole sample were drinking alcoholic beverages, while the ¼ of them were drinking many times per week. However, only a 14.8% of the subjects, in total, didn't drink alcoholic beverages at all.

Finally, significant positive correlations between BMI and the times men and women were consuming alcohol are observed, indicating that as much the alcohol consumption is increased, BMI is, also, increased.

INTRODUCTION

Weight gain has been found to be associated with poor quality of life, reduced well being and vitality Rumpel, C. et al. (1994). More specifically, obesity leads to multiple co-morbidities, such as diabetes, hypertension, stroke, hypercholesterolemia, coronary heart diseases, peripheral arterial disease, abdominal aortic aneurysm, symptomatic carotid artery disease, sleep apnea, kidney stones, gallstones and their complications, gynaecological abnormalities (polycystic ovary syndrome), osteoarthritis, and some cancers, that increase the overall risk of dying Chakravathy, V.,M., Booth, W.F. (2003)

Method

During the study, questionnaires were shared in the students. All the participants answered to the questionnaires and denoted their age, weight and height, as well as the department in which they studied. Data on demographic, socio-economic and lifestyle variables were assessed by means of a comprehensive questionnaire, completed from the students. The subjects were classified according to alcohol consumption as drinking alcoholic beverages corresponding to many times per week, approximately once per week, approximately once per month, or not drinking alcoholic beverages at all. Moreover, the subjects were classified according to how many times they take care about their diet corresponding to all the times, most times, or not taking care at all. Questions on physical activity covered leisure time: subjects were classified as practicing physical activity corresponding to more than three times per week, three times per week, two times per week, one time per week or not practicing physical activity at all. Participants were categorized as smoking corresponding to more than 21 cigarettes per day, 11-20 cigarettes per day, 4-10 cigarettes per day, 1-3 cigarettes per day, or not smoking cigarette at all.

Total obesity evaluation. BMI was used for the evaluation of overweight and obesity, accordingly to the values for adults set by World Health Organisation (WHO). BMI was calculated as weight/height^2 ($\text{kg}\cdot\text{m}^{-2}$). BMI is objective, highly reliable, and has a high correlation $r=0.7-0.8$ with the body fat content in adults Corbin C.,B. et al.(2001).

Statistical Analysis. For the statistical analysis the statistic packet SPSS/PC Version 15.0 for windows was used. Descriptive analysis, crosstabulations, Analysis of Variance[ANOVA], t-tests, χ^2 tests, as well as correlations were used. The level of significance was set to $p<0.05$.

Results

In table 1 the mean M and standard deviation SD of men' and women' anthropomorphological characteristics, as well as the frequency according to the diet, physical activity, smoking and monthly family income are presented. As it is shown, there was a greater proportion of women taking care for their diet, and not smoking than of men, while there was a greater proportion of men participating in physical activity three times and more per week (Table no. 1).

Table no. 1. General characteristics of the study population according to sex*

	Men (n=151)	Women (n=168)
Age (years)	21.29 (2.15)	20.38 (1.71)
Height (m)	1.81 (0.07)	1.68 (0.06)
Height (kg)	79.27 (12.53)	58.59 (8.02)
BMI ($\text{kg}\cdot\text{m}^{-2}$)	24.26 (3.07)	20.94 (2.45)
Take care about the diet		
No	40 (26.49)	28 (16.66)
Some times	68 (45.03)	84 (50.00)
Most times	33 (21.85)	45 (26.78)
All the times	10 (6.62)	11 (6.54)
Regular physical activity		
No	32 (21.19)	58 (34.52)
Once/week	44 (29.13)	53 (31.54)
Twice/week	30 (19.86)	29 (17.26)
Three times/week	23 (15.23)	17 (10.11)
More than three times/week	22 (14.56)	11 (6.54)
Smoking		
No	70 (46.35)	91 (54.16)
1-3 cigarettes /day	15 (9.93)	14 (8.33)
4-10 cigarettes/day	19 (12.58)	22 (13.09)
11-20 cigarettes/day	26 (17.21)	29 (17.26)
More than 21 cigarettes/day	21 (13.90)	12 (7.14)

*Values are means (standard deviation) for quantitative variables and frequency (%) for qualitative variables.

**As for monthly family income there were not answers from all the subjects.

In regard to alcohol consumption, the most subjects of the whole sample were drinking alcoholic beverages, while the ¼ of them were drinking many times per week. However, only a 14.8% of the subjects, in total, didn't drink alcoholic beverages at all (Table no. 2).

Table no. 2. Alcohol consumption

Drinking alcoholic beverages	Frequency (n = 319)	Percent (%)
No	47	14.73
1 x/month	58	18.18
1 x/week	138	43.26
Many times/week	76	23.82

According to sex, there was a greater proportion of non-drinkers among women than among men, while there was a greater proportion of subjects consuming alcoholic beverages many times per week among men than among women (Table no. 3).

Table no. 3. Alcohol consumption according to sex

Drinking alcoholic beverages	Men (n=151)	Women (n=168)
No	17 (11.25)	31 (18.45)
1 x/month	22 (14.56)	36 (21.42)
1 x/week	60 (39.73)	78 (46.42)
Many times/week	52 (34.43)	23 (13.69)

Values represent frequencies (%).

Men drinking less than one time per month had a lower BMI than non-drinkers or men drinking more than one time per month. As for women, the lowest BMI was seen in non-abstaining women consuming alcohol one time per week, while the differences between the women consuming alcohol less or more than one time per week were not big.

Alcohol consumption

In Table no. 4 the percentages of underweight, normal weight, overweight and obese men and women, according the alcohol consumption are presented. As it can be shown there were greater percentages of underweight and normal weight women than of underweight and normal weight men and in contrast greater percentages of overweight and obese men than of overweight and obese women (Table no. 4).

As for the men, it can be seen that as the alcohol consumption increases the percentage of underweight, men decreases, the percentage of normal weight men increases, following a J-shaped variation, the percentage of overweight men increases and the percentage of obese men increases, following a J-shaped variation. However the findings for the women are inconsistent.

Table no. 4. Percentages of underweight, normal weight, overweight and obese men and women, according to the alcohol consumption and differences between the two sexes

Alcohol Consumption	Sex	Underweight (%)	Normal Weight (%)	Overweight (%)	Obese (%)	X ² & p
No	♂	1.3	67.5	26.8	4.4	54.695
	♀	14.2	78.3	7.1	0.4	<0.001
1x/month	♂	0.5	71.9	27.1	0.5	69.625
	♀	15.1	77.0	6.4	1.5	<0.001
1x/week	♂	0.4	67.6	28.4	3.6	228.338
	♀	11.5	84.7	3.2	0.6	<0.001
Many times/week	♂	0.4	64.3	31.3	4.0	90.363
	♀	11.2	80.4	7.4	1.0	<0.001

Moreover, in the Table no 5 the correlations coefficients between the studied variables for men and women are presented.

Table no. 5. Correlations of the variables in men and women

Variables	BMI	Alcohol consumption
BMI	1	.139**
Alcohol consumption	.139**	1

*:p<0.05

**:p<0.01

As it can be shown in Table 5, significant positive correlations between BMI and the times men and women were consuming

alcohol are observed, indicating that as much the alcohol consumption is increased, BMI is, also, increased.

Discussion

The results of the present study, overall, indicated high percentages of alcohol consumption. More specifically, the most subjects of the whole sample (85.2%) were drinking alcoholic beverages, while the ¼ (23.4%) were drinking many times per week. However, only a 14.8% of the subjects, in total, didn't drink alcoholic beverages at all.

Of course this fact doesn't, just, concern the alcohol consumption but it, also, concerns obesity, as alcohol favours the fat storage, suppressing its oxidation Prentice, A.M. (1995). Alcohol is the second most energy-dense macronutrient and has an appetite-enhancing effect, which may lead to an increase in energy intake, inducing an increase in BMI, Colditz, G.A. et al. (1991).

In agreement, in the present study, a J-shaped relationship was found between the alcohol consumption and BMI, but in men only, with the highest level of alcohol intake associated with an increase in BMI. This relationship shows that men drinking many times per week had the bigger values of BMI than non-drinkers or men drinking one time per week. As for women, the biggest BMI was seen in non-abstaining women consuming alcohol one time per month, while the differences between the women consuming alcohol less or more than one time per week were not big.

However, the epidemiological evidence relating alcohol and obesity is controversial and in many instances paradoxical Jequier, E. (1999). Overall the evidence suggests that light to moderate drinking is not associated with weight gain in women but that heavier levels may enhance weight gain Wannamethee, G. et al., (2004).

In agreement to our findings, Lukasiewicz, E. Et al. (2005), indicated that total alcohol intake seems to be related to BMI and WHR. Thus, alcohol is a significant source of calories, and drinking may stimulate eating, particularly in social setting. However, calories in liquids may fail to trigger the physiologic mechanism that produces the feeling of fullness. It is possible that, in the long-term, frequent drinkers may compensate for energy derived from alcohol by eating less, but even infrequent alcohol-related overeating could lead to weight gain over time Breslow, R.A. Smothers, B.A. (2005). Thus, total alcohol intake seems to be related to BMI, which is reflected in relationship between BMI and alcohol consumption.

Conclusions

Alcohol is a significant source of calories, and drinking may stimulate eating, particularly in social settings. However, calories in liquids may fail to trigger the physiologic mechanism that produces the feeling of fullness. Besides, the inconsistencies among studies may be caused by incomplete control for many significant confounders. In conclusion, the consumption of alcoholic beverages may be a risk factor for obesity, but this has to be confirmed in longitudinal studies which have to control the above significant points.

REFERENCE

- [1] Breslow, R.A., Smothers, B.A. (2005). Drinking Patterns and Body Mass Index in Never Smokers (National Health Interview Survey, 1997/2001). In: American Journal of Epidemiology, 16(4), pp 368-376. | [2] Chakravarthy, V.M. Booth, W.F. (2003). Exercise: Hot topics. Philadelphia: Hanley & Belfus pp. 129- 147. | [3] Colditz, G.A., Giovannucci, E., Rimm, E.B., Stampfer, M.J., Rosner, B., Speyer, F.E., Gordis, E., Willett, W.C. (1991). Alcohol intake in relation to diet and obesity in women and men. In: American Journal of Clinical Nutrition, no 54, pp 49-55. | [4] Corbin, C.B., Lindsey, R., Welk, G., (2001). Exercise-Robustness & Health pp 338-356. | [5] Jequier, E. (1999). Alcohol intake and body weight: a paradox. In: American Journal of Clinical Nutrition, no. 69, pp 173-174. | [6] Lukasiewicz, E., Mennen, L., Bertrains, S., Arnault, N., Preziosi, P., Galan, P., Hercberg, S. (2005). Alcohol intake in relation to body mass index and waist-to-hip ratio: the importance of type of alcoholic beverage. In Public Health Nutrition, no 8(3), pp 315-320. | [7] Prentice, A.M. (1995). Alcohol and obesity. In: International Journal of Obesity, no 19 (suppl. 5), S44-S50. | [8] Rumpel, C., Ingram, D.D., Harris, T.B., Madans, J. (1994). The association between weight changes and psychological well-being in women. In: International Journal of Obesity, no 18(3), pp 179-183. | [9] Wannamethee, G., Field, A., Colditz, G. & Rimm, E. (2004). Alcohol intake and 8-year weight in women: A prospective study. In: Obesity research, no. 12, pp 1386-1396. |