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Physical and Health Education for a Resilient Future Workforce

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Physical and Health Education for a Resilient Future Workforce

Cristiana Lucretia POP¹

Abstract

The present study was undertaken on the supposition that in the past 15 years, the weight of young women has increased, implicitly influencing the body mass index values of women and having consequences for the health of the younger generation as they age. Consequently, I assessed some anthropometrical parameters in successive independent samples of Romanian young women. The study goals, beside hypothesis validation, are to estimate the average BMI for the 19-21 year old female population, and to analyse the possible causes and effects of its evolution. The study sample consisted of female students presuming to enter the work market in a few years. There were 121 subjects, with an equivalent number in a control group. The study participants were randomly selected from the female student population who attend physical education classes. Collected data were quantitatively analysed and statistically compared with reference data collected during 1999 and 2000.

Discussions about the study's findings focus on the trends in terms of the measured parameters, and the possible implications and consequences for the health and vigour of the younger generation. The results indicate an increased number of overweight and obese young women in the present sample, compared with the previous data. Considering the study's conclusions, corroborated with other medical and anthropological results on similar topics, a set of practical recommendations for the education domain have been put forward.

Keywords: *overweight, health, life style, well-being, physical activity.*

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1. Introduction

According to the a Romanian Public Health Institute report published in 2008, between 2000 and 2008 the number of obese children starting primary school has doubled (from 1,8% to 3,6%). The overweight children are unlikely to have a normal BMI in the future, with 80% of them becoming overweight and obese teenagers and adults. Romania has one of the lowest levels of obesity in Europe, but it seems the percentage of overweight and obese persons is growing year by year, keeping up with the trend in European developed countries.

A report from the Organisation for Economic Cooperation and Development (OECD) entitled 'Health at a Glance: Europe 2012' reports more than half (52%) of the total adult population across the European Union are now overweight or obese. In addition, the prevalence of obesity varies from less than 10% in Romania, Switzerland and Italy to over 20% in the United Kingdom, Ireland, Hungary and Island. On average across EU countries, 17% of the adult population is obese (in 2010 the reported percentage was 15,5%). According to the OECD document, obesity in Europe has more than doubled over the past 20 years in most EU countries for which data are available (OECD, 2010). In addition, the report explains that physical activity among European children tends to drop significantly between the ages of 11 and 15 years. Only 20% of children exercise regularly (OECD, 2012).

The explanation consists of the balance between sedentary behaviour and physical activity, and the changes in people's nutritional habits in the second half of the Twentieth Century. Technology development has increased the output of the human workforce, with machines gradually reducing the amount of physical effort needed. Nurturing habits and customs do change, and they are influenced in many different ways by urbanization, technological progress and globalization. These three factors have often led to diets in which an important percentage of energy intake comes from industrially-processed foodstuffs, associated with an increased consumption of sugar, fats and salt.

Poor nutrition leads to a range of physical health problems and has some psychological consequences as well. The problems of overweight children and young people are associated with asthma, type 2 diabetes, depression, being bullied, learning difficulties, low self-confidence and social reluctance, while a greater body mass index increases the risk to health. Physical education is an important and essential component of general

education, which aims mainly to develop an individual's physical, mental, social and cultural features in a positive and ethical manner.

Public health can be part of the solution because investment in prevention can reduce health costs and amend welfare benefits. Promoting health and well-being enhances vigour, resilience, employment and social outcomes for the future work force. Education is obviously another part of the solution, being the main social instrument used to transmit culture, spreading knowledge and incorporating citizenship training. Health and physical education, as part of general education, might play an important role in delivering a healthy, resilient and valuable workforce for society.

2. Methods

The present study was undertaken to assess some anthropometrical parameters in successive independent samples of Romanian young women. The study sample had 121 subjects, with an equivalent number within the control group. The individuals were selected randomly from female students who take physical education classes in the faculties of the Bucharest Economic Studies Academy. They are educated, healthy, with an urban life style and range between 19 and 21 years of age.

The collected data were quantitatively analysed and statistically compared with reference data collected during 1999 and 2000. The reference group also consisted of 121 young female students in various faculties from Bucharest, Ploiesti, Galati and Iasi (Popescu et al, 2001).

The measured anthropometric parameters were the basic ones of height and weight for the body mass index (BMI) calculation. The materials used were similar to those used in the previous studies: a measurement bar for height and an electronic weighing scale. The subjects were measured and weighed in light sports equipment with shoes off.

BMI is a calculation of height to weight, and the normal range is usually considered to be 18.5 to 25 kg/cm², with a score of more than 25 considered overweight and above 30 obese. The values under 18.5 kg/cm² are related to thin bodies or being underweight, but slimness is seen as the desirable standard and as the beauty pattern, especially for young women nowadays.

The measurements were taken in February – March 2014, initially for 160 subjects and then randomly selected with data analysis application. The study context was related to physical activities, fitness, health and body shape improvement.

3. Study purpose

The study was undertaken on the supposition that in the past 15 years, the weight of young women has increased, implicitly influencing the body mass index values.

The study goals, beside the hypothesis validation, are to estimate the average BMI for the 19-21 year old female student population, to compare the preponderance of different sub-groups in the study samples, and to analyse the possible causes of their evolution.

The statistical analysis tools used to achieve the study's objectives are the t-Test for two sample and the ANOVA single factor.

4. Findings

Comparing the means of the reference data with the means of those collected in 2014, we observe a positive evolution in terms of body weight and BMI and a slight decrease in height (see table 1).

Table 1. Sample means

| Parameter | Sample 1999 | Sample 2014 | Dif. |
|-----------|-------------------------|-------------------------|--------------------------|
| Weight | 56,25kg | 57,27kg | + \approx 1kg |
| Height | 1,66m | 1,65m | - 1 cm |
| BMI | 20,36kg/cm ² | 21,05kg/cm ² | + 0,69kg/cm ² |

Through the notable anthropometrical parameters evolution, the t-Test returns a value of 0,017, smaller than the critical values of t distribution for the study sample. The consequence is the alternative hypothesis rejection and the null hypothesis (H_0) acceptance. There was no statistically significant difference between the 2 samples compared in this study.

The next study step was the analysis of the BMI values distribution in classes:

- 1 - underweight $>18,5$ kg/cm²
- 2 - normal weight 18,5 – 24,9 kg/cm²
- 3 - overweight 25 – 29,9 kg/cm²
- 4 - obese < 30 kg/cm² (see fig. 1):

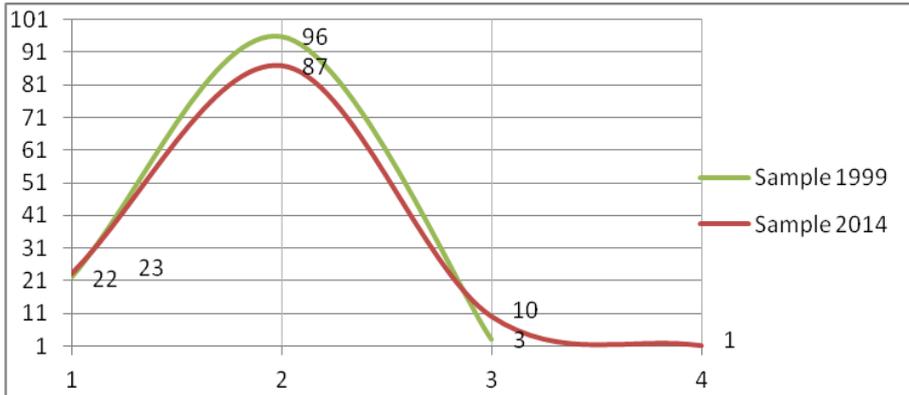


Fig. 1. BMI frequency in 2 samples

Because there was only one case of obesity in our sample, it was included within the overweight class. Applying analysis of variance (ANOVA) for the 2 samples divided into 3 classes (underweight, normal weight and overweight) it returned a significant difference between the groups (see Table 2). The most important difference was computed for the overweight category.

Table 2. ANOVA results between groups

| Source of Variation | SS | df | MS | F | P-value | F crit. |
|---------------------|----------|----|----------|--------|---------|---------|
| Between Groups | 1051,159 | 5 | 210,2318 | 84,946 | p< 0.01 | 2,2522 |

5. Discussion

From the data displayed, it appears that the young girls' weight is growing and, consequently, the BMI values are increasing. The weight and BMI value increases are explained firstly in terms of the percentage of overweight and obese persons, which in the recently measured sample is 9.1%. Compared with the 1999 results, when the percentage of overweight persons was nearly 2.5%, this group is 3.67 times bigger in 2014.

It seems that Romania is following the trend in western European countries regarding prevalence of overweight individuals. In most countries, the rise in obesity has affected all population groups regardless of sex, age, race, income or education level, but to varying extents. Evidence from a number of countries, including Austria, England, France, Italy and Spain,

indicates that obesity trend is more common among individuals in disadvantaged socio-economic groups, this relationship being particularly strong among women (Devaux, Sassi, 2013). There is also a relationship between the number of years spent in full-time education and obesity, with the most educated individuals displaying lower rates, with the gradient in obesity being stronger in women than in men (OECD, 2012). “Educational achievement is correlated with higher earnings through access to better job opportunities and social networks, which in the long term is expected to translate into higher health expenditure and thus better health” (Suhrccke, de Paz Nieves, 2011).

The young women in the research sample are still engaged in education, but right before the working age and before the stage of starting a family. Also they are in a sensitive period of time when temptations with regard to an unhealthy life style (screen activities, fast foods, tobacco, alcohol and drug use) are a daily risk. This new digital generation is using new patterns of learning, communicating and behaving more and more in terms of modern forms of communication and information technology. Screen activities include watching television, communicating and surfing on line or playing video games, all associated with sedentary behaviour. In a study undertaken in Canada, the authors demonstrated that children and teenagers (8-18 years) spend an average of 42 hours per week with media, and just 8.75 hours per week with physical activities (Epstein, 2008).

In the last years mounting research has shown how lifestyle changes, including exercise, stress management, and diet can prevent almost ninety percent (90%) of chronic illnesses in our society (Chopra, 2014).

6. Conclusions and recommendations

A conclusion in the form of a warning may be drawn: a sedentary life, in conjunction with an increased calories income has a negative influence over the new generation’s body weight. Overweight and obesity is growing to global proportions, and requires urgent and coordinated prevention measures. Education and healthcare systems are attempting a weak counterattack to this aggressive epidemic and to a consumption culture which pushes the younger generation towards a greedy lethargy (Pop, 2013). An increased number of adequate physical activities, spending time outdoors, healthy lifestyle programs, or cutting out unhealthy food in children’s meals are a few examples of remedial measures taken in schools and at home.

Enjoyment of exercise is positively associated with motivation with regard to physical effort. Physical education teachers can enhance enjoyment by creating a good working climate, by adding variety to workouts, and by ensuring that any fitness programs are physically challenging and respect the subject's preferences and personal goals. Besides encouraging the students to set realistic goals, it is important to motivate them to keep weight under control by combining diet and physical activities.

The accumulation of positive and negative effects on health and well-being is for over the life-course and investing in prevention reduces health costs. Therefore, in our classes we, as teachers, might provide all young people, of all sizes, with meaningful, relevant and positive physical education and physical experiences and eventually deliver a healthy, valuable workforce for society.

7. Limitations

The non-significant results related to the differences between groups (t Test) are probably because of the small sample size. Data from such samples should be used to design larger confirmatory studies.

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