

EDUCATION PROGRAMME AND ITS INFLUENCE ON REDUCING ANTHROPOMETRIC PARAMETERS IN OVERWEIGHT ADOLESCENTS

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Abstract: *The paper deals with the influence of education programme on reduction of the monitored parameters (body weight, waist circumference, hip circumference and body fat mass). In total, 197 secondary school students a university students aged 15-20 from East Bohemia region were included in the education programme. Even if the average reduction of all the monitored anthropometric parameters took place, statistically significant difference was taken only in body weight reduction. The group of adolescents aged 18-20 ($p=0,0377$) reacted to the education in a better way. The data was evaluated by azygous T-test.*

Key words: *education programme - reduction of overweight - adolescence - anthropometric parameters*

Theoretical starting points

Overweigh is presently one of the most spread malnutrition problem in today's youth in economically advanced countries. It is a very grave society wide problem that must be dealt with as the impacts of being overweight, and in particular, being obese, have a negative impact on the general health of the youth. Most adolescents usually take in more energy than they really need. On the contrary, physical activities that may to a certain extent reduce the increased energy intake are not too many. A major part of adolescents spend their leisure time watching TV, playing computer games, hanging around or loafing around in the streets. To cover even short distance, cars or other means of transport are used. If there is no major positive change in the style of living, overweight kids face a real risk of becoming obese in adulthood. According to the results of the survey Lifestyle and Obesity from 2005, a total of 20 % of children aged 6-12 and 11 % of adolescents aged 13-17 suffer from obesity. If we want to change something about this trend, we need to take certain measures based on education programmes focusing

on healthy style of living or reducing weight and promoting physical activities. At present, there is a number of programmes under the auspices of e.g. the State Health Care Institute, the organisation Stop obezité dealing with these issues.

Objective of the survey

The objective of the survey is to analyse the effects of preventive education programme on reducing the selected anthropometric parameters (body weight, body height, body mass index, waist circumference, hip circumference, proportion of waist/hips and volume of body fat) in adolescents with BMI above 90th percentile. The sub-target was to identify the preference of the ways of reducing body weight in dependence on the gender of the interviewed adolescents.

Methodology of the survey

During the survey we analyzed the effects of education on reducing the selected body parameters. Of the total number of 1,020 adolescents (835 girls and 185 boys) a total of 197 (146 girls and 51 boys) had BMI above 90th percentile. We kept working with these adolescents via education focusing on reducing the selected anthropometric parameters. Selected adolescents attended these education lessons after a week consisting of a lecture and hands-on exercises. The first lesson focused on obesity prevention and related complications; the second lessons concerned proper nutrition (principles of healthy nutrition, work with the glycaemic index, nutrition pyramid, diet diary) and the last lesson was related to physical activities (importance of movement for the human organism, suitable physical activities). A check measurement was performed one month after the completed education.

Interpretation of the results

Tab. no. 1 Classification of adolescents according to age and percentile values

	15 years	16 years	17 years	18 years	19 years	20 years
90-97th percentile	27	29	36	39	30	22
above 97th percentile	2	0	4	2	2	4
total	29	29	39	51	32	26

Relation between the adolescent age and education focused on weight reduction

Adolescents with BMI above 90th percentile were divided into two groups: 15-17 years and 18-20 years. Non-pair t-test (type 2, page 2) was used to calculate the weight difference of individuals with BMI above 90th percentile before and after the education. Given the fact that the resulting value at importance level $p < 0.05$ is $p = 0.037771874$, it may be confirmed that adolescents aged 18-20 years responded better to the education. One month after the education, the body weight changed as per Fig. 1.

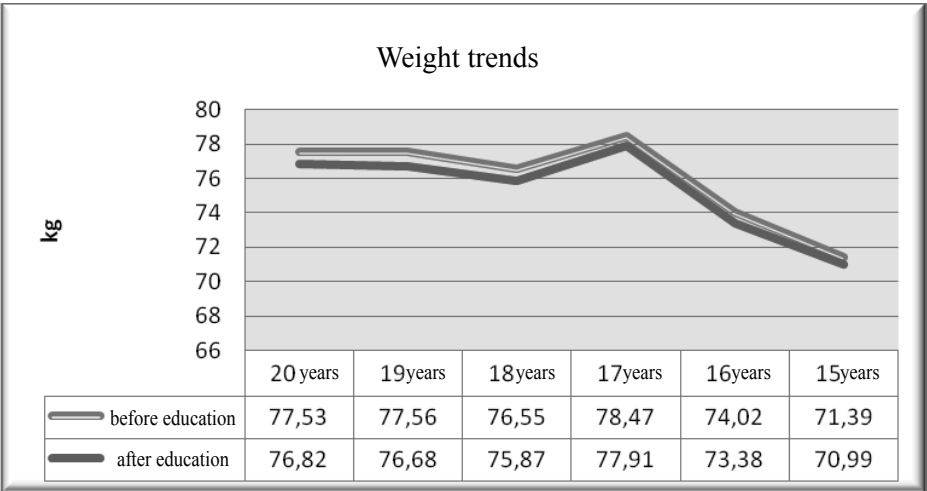


Fig. 1 Body weight trends before and after the education

Relation between the adolescent gender and their response to the weight reduction education

The non-pair t-test (type 2, page 2) was used to calculate the weight difference between girls and boys with BMI above 90th percentile before and after the education. As the resulting value at importance level $p < 0,05$ is $p = 0,634426895$, the relation between the gender and weight reduction through the education cannot be confirmed.

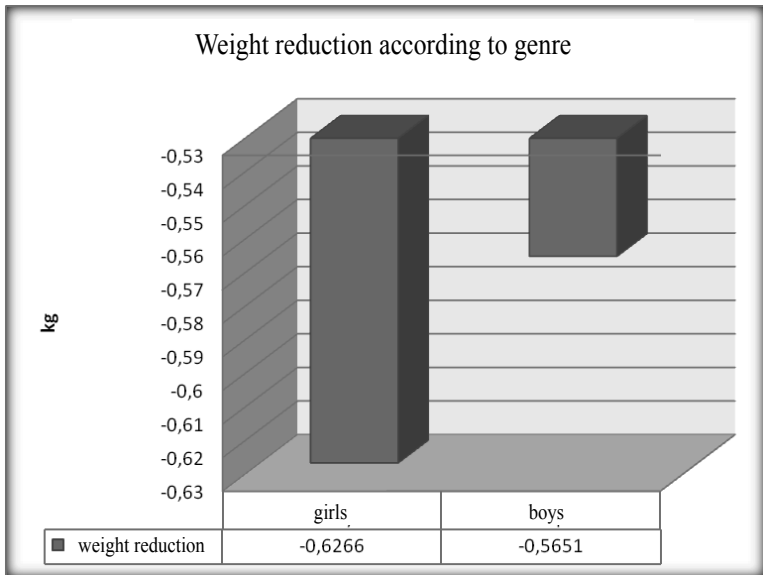


Fig. 2 Weight change after the education according to gender

Relation between the adolescent gender and their response to the hip circumference reduction education

Adolescents with BMI above 90th percentile were divided into two groups: 15-17 years and 18-20 years of age. The non-pair t-test (type 2, page 2) was used to calculate the difference in hip circumference of the individual with BMI above 90th percentile before and after the education. Given the fact that the resulting value at importance level $p < 0,05$ is $p = 0,1215$, the relation between the hip circumference reduction and education of both age groups cannot be confirmed.

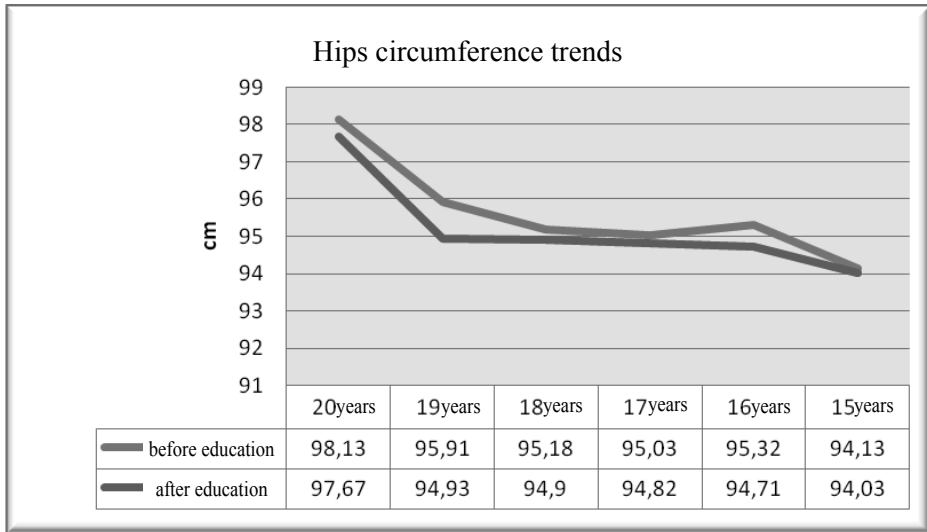


Fig. 3 Graphic presentation of the hips circumference trends before and after the education

Relation between the adolescent gender and their response to the waist circumference reduction education

Adolescents with BMI above 90th percentile were divided into two groups: 15-17 years and 18-20 years of age. The non-pair t-test (type 2, page 2) was used to calculate the difference in waist circumference of the individuals with BMI above 90th percentile before and after the education. As the resulting value at importance level $p < 0,05$ is $p = 0,0901$, the relation between the waist circumference reduction and education of both age groups cannot be confirmed.

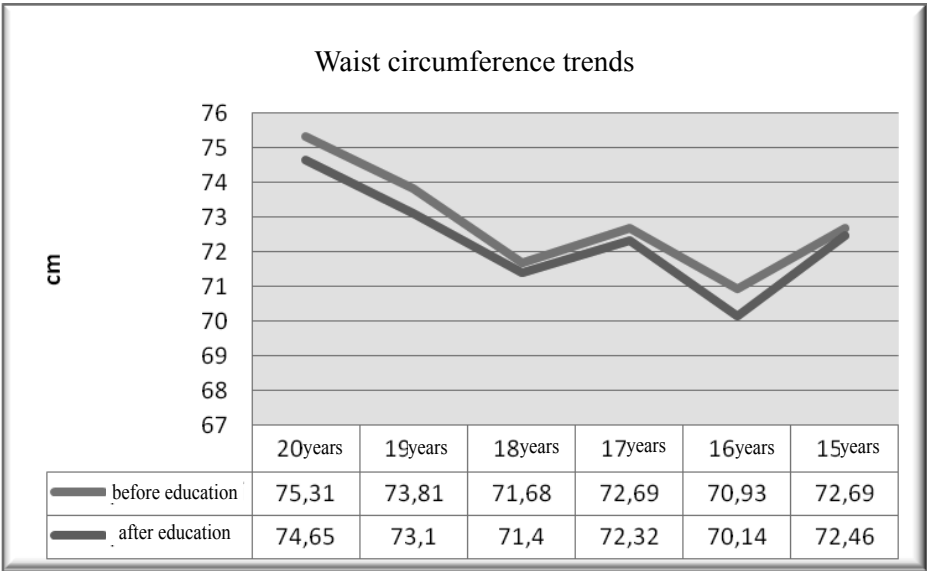


Fig. 4 Graphic presentation of the waist circumference trends before and after the education

Relation between the age of adolescents and their response to education focusing on reducing the body mass

The non-pair t-test (type 2, page 2) was used to calculate the difference in the amount of fat in individuals with BMI above 90th percentile before and after the education. As the resulting value at importance level $p < 0,05$ is $p = 0,93891$, the relation between the reduced amount of fat and the age group through education cannot be confirmed.

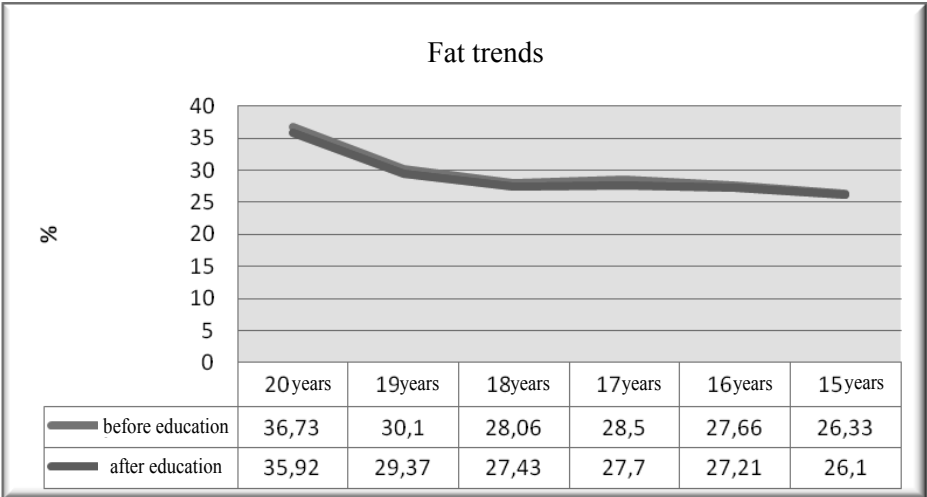


Fig. 5 Graphic presentation of the fat trends before and after the education

Discussion and conclusion

If we are to evaluate the effects of education on reducing the selected anthropometric parameters in the period of one month after the education, I may state that there has been an average drop in all the monitored parameters both when comparing the individual age groups and genders. However, a statistically important difference was only confirmed when comparing age groups of 15-17 years and 18-20 years in favour of the age category of 18-20 years. Although the average weight reduction did not exceed 1kg a month, this was a good result given the fact that the students attended only an illustrative-demonstration education in a duration of 3 x 90 minutes. The cooperation with the students was good as the survey and follow-up educating were attended only by those adolescents who were interested. We also noticed elements of competitiveness amongst the adolescents. One of the reasons why it is so may be that at this age the adolescents have a will to work on themselves, they are more mature and more cautious when addressing the obesity, they seek more steady relationships, they are interested in their appearance. A certain role may also be played by health concerns as they are more aware of the risks brought about by obesity.

Although the positive effect of education notably on weight reduction was established, the question remains what it would look like after a longer period of time. Whether the weight would keep dropping or whether the weight would return to the original value or increase. Besides improving health, another motivation factor was that the students knew that they would be weighed and measured in a month's time and therefore they were trying to reduce their weight.

It may generally be stated that the intervention programmes are successful. For example, the overview of preventive programmes focused on school-age children developed by the Institute of Health Sciences in Amsterdam, Netherlands, indicates that 68 % of the programmes (17 out of 25) were successful as there was a statistically significant drop in BMI or reduction in the skinfold thickness (Doak, 2006). In four studies, BMI as well as the skinfold thickness were reduced. Two of these studies included a programme focusing on educating in the field of physical activities and nutrition (Pařízková, Lisá, 2007).

Inefficient interventions have usually tried to capture more items playing its parts when becoming obese. Less efficient studies also called more often for more active involvement of the children as well as the parents and wider community. Inefficient interventions are often those that focus on circumstances at the family level. Inefficient studies have a higher average attendance rate (83 %) compared to the efficient ones (71 %), although the difference is not statistically significant. Efficient studies were shorter on average and include a larger number of individuals and a lower number of participating schools. (Pařízková, Lisá, 2007).

The overview of preventive measures focusing on children and adolescents obesity developed by Flodmark et al. (2006) indicates a positive influence of prevention focusing on intervention at schools in 41 % of studies covering 40 % of the total of 33,800 children (Pařízková, Lisá, 2007).

Clinical studies indicate that changes are more difficult to induce in adolescents and the risk of continuing overweight in adulthood is significantly higher than in youn-

ger children. Swinburn et al. assessed the overweight treatment and prevention projects from the point of view of efficiency and the most optimally evaluated methods were, e.g. reduced TV advertising aimed at children and advertising foodstuffs and beverages with a high sugar or fat content, multilayered school programmes oriented at physical activities etc. (Haby, 2006).

Literature

- PAŘÍZKOVÁ, J; LISÁ, J. Obezita v dětství a dospívání. 1. Vyd. Praha : Galen, 2007. ISBN 978-80-7262-466-9.
- FLODMARK,C.; MARCUS, C.; BRITTON,M. Interventions to prevent obesity in children and adolescents: a systematic literature review. *Int Journal Obesity*, London, 2006, p. 579-589.
- DOAK, C.M.; VISSCHER, T.L.S et al. The preventive of overweight and obesity in children and adolescents a review of interventions and programmes. *Obesity Reviews*, 2006, 7,p. 111-136.
- HABY, M.; VOS, I.; CARTER, R. A new approach to assessing the health benefit from obesity interventions in children and adolescents: the assessing cost-effectiveness in obesity project. *Int Journal Obesity*, 2006.30,p.1463-1475.

EDUKAČNÍ PROGRAM A JEHO VLIV NA SNIŽOVÁNÍ ANTROPOMETRICKÝCH PARAMETRŮ U ADOLESCENTŮ S NADVÁHOU

Abstrakt: Příspěvek se zabývá vlivem edukačního programu na redukci sledovaných antropometrických parametrů (tělesná hmotnost, obvod pasu, obvod boků a množství tělesného tuku). Celkem 197 studentů středních a vysokých škol ve věku 15-20 years z Východočeského regionu bylo zahrnuto do edukační lekce. I když došlo k průměrnému snížení všech sledovaných parametrů, tak statisticky významný rozdíl byl potvrzen pouze u snížené tělesné hmotnosti, kde na edukaci lépe reagovala skupina adolescentů ve věku 18-20 years ($p=0,0377$). Tato data byla hodnocena prostřednictvím t-testu.

Klíčová slova: edukační programme, snižování nadváhy, dospívání, tělesné parametry