

## ADAPTIVE PHYSICAL ACTIVITY AND VOLLEYBALL FOR OVERWEIGHT GIRL PUPILS

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### Abstract

*Obesity and the overweight are socially important problems affecting countries of various standard and culture. The unpleasant consequences directly reflect on the health and self esteem of the people, requiring also a solid financial resource. That is the reason why the prevention and reduction of the weight stay in the agenda of the spheres related to the health of the people of all ages. Object of the study are 10 overweight girl pupils (BMI 25 – 29,9 kg/m<sup>2</sup>) at the age of 17-18 years, entered into the adaptive physical activity and sport programme. Tested are the weight, five anthropometric indicators, BMI is calculated and six tests are made defining the physical qualities. Under the impact of the implemented experiment aiming at the improvement of the physical activity of overweight pupils, a visible decrease of the body mass has been achieved. At the end of the experiment, a growth has been established of the following qualities: strength, speed, endurance, flexibility, jumping up and agility, which proves the increased physical fitness of the girls having participated in the experiment.*

**Keywords:** *anthropometric measures, motor abilities, body mass indexes, experiment in kinesiology, adaptive physical activity and sport, volleyball training*

### INTRODUCTION

Obesity and overweight are a socially important problem affecting both highly developed countries and those of lower standard.

The dramatic increase of people having grown fat records rather high percentage of these people and the prognosis is that more and more people will be affected by that illness.

The consequences of the „obesity” are: diabetics, hypertension, coronary illness of the heart, strokes, cancer, hemorrhoids, etc. cover people (75-80%) having at least one

of the above cited illnesses, and around 40% have got two and more accompanying ones. Growing fat costs enormous financial resource additionally to affecting the health, self confidence and welfare of the people.

That is the reason why the prevention and reduction of overweighted children, young and grown up people is an actual and important problem.

The objective of the study is to establish the effectiveness of an adaptive physical activity (APA) programme for overweighted girl pupils, combining gymnastic complex and volleyball training.

*The tasks of the study are:*

1. Development of APA complex covering analytical isotonic and isometric gymnastic exercises.

2. Make up and approbation of a complex programme covering two volleyball training sessions per week.

*Methodology*

The study is implemented during the period October 2010 – March 2011 at Likio Verginas, town of Larnaka – Cyprus.

*Subject of the study* are the body mass indexes (BMI), some anthropometric indicators, characterizing the form and structure of the body as well as the physical fitness tests.

*Object of the study* are 10 overweight girl pupils (BMI 25 – 29,9 kg/m<sup>2</sup>) at the age of 17-18 years, entered into the adaptive physical activity and sport (APAS) programme.

*Characteristic of the contingent*

According to Sherman's overweight table we have compared our contingent under study for the following indicators: age, height, normal weight and overweight.

*Methods of the study and indicators*

For solving the objective and the tasks of the study, the pupils have undergone the test twice (at the beginning and at the end of the impact). Tested are the weight, five anthropometric indicators, BMI is calculated and six tests are made defining the physical qualities.

Indicators characterizing the form and structure of the body:

- \* weight
- \* height
- \* girdle of the brachium (relaxed and tense state)
- \* thigh girdle
- \* waist girdle
- \* haunch girdle
- \* body-mass-index – BMI

The latter reads the degree of obesity and is calculated by the following formula:

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2}$$

*The indicators characterizing the physical*

*fitness are the following:*

- 50 m distance run from low start – executed along a track, two pairs at the same time, time measured by a chronometer up to 1/10 of sec. standing long jump. Two trials are made, the better result is taken. Exactness up to 1 cm.

- standing upward jump. Performed while the result is recorded after a preliminary measurement of the vertical stretch. Then the jump follows where the person under study tries to touch the divided scale of the apparatus reading the jump. Exactness up to 1 cm.

- presses up until refusal. The trials made are recorded in number.

- deepness of the inclination (flexibility). Standard methodology used, two trials, the better result read.

- maximum number of squats for 20 sec. Number of times recorded.

*Adapted physical activity (APA) methodology*

For the implementation of the experiment, a group of 10 overweight girl pupils at the age of 17-18 years has been formed, the latter being in good health. The weekly programme covers the following adapted physical activity:

- one hour volleyball training sessions – twice per week

- gymnastic complex of adapted isometric and isotonic exercises – three times per week.

The exercises of the gymnastic complex for the APA are directed towards reduction of the weight and smoothing the celluloid. They consider the most problematic places of the abdomen, hips, waist, haunch and breeches where celluloid and fat are found.

The volleyball sessions cover:

- runs: → forward – backward; side (by added and cross step) - 5min.

- jumps – vertical, horizontal and horizontal-vertical - 3 min.

- passing from upward with both arms (forwards and above the head) - 5min.

- passing downward with both arms (forward, sideward and backward) - 5min.
- combined passing from the above-cited variants - 5min.
- executing of low facial and side outside service and meeting it - 10 min.
- five people playing by the net, arranged in corridors while the setter passes from one field to the other and organizes the game - 10 min.
- five people playing two-side game - 15min.
- recovering exercises – 2 min.
  - breathing
  - quite, smoothing game
  - stretching

One of the variants has been used for the various training sessions according to the leading teacher.

## RESULTS

The average value of the body mass after the experiment is reduced by 6,2 kg (9,64%), and at the end of the study it is 58,8 kg.

Enjoying is the fact that according to Sherman's criteria (according to the height and age) a decrease by 13,1 kg. is observed. This is explained by the fact that the APA and volleyball sessions make lipolysis active, lavage is improved and hypoxia is eliminated. In that way the difference be-

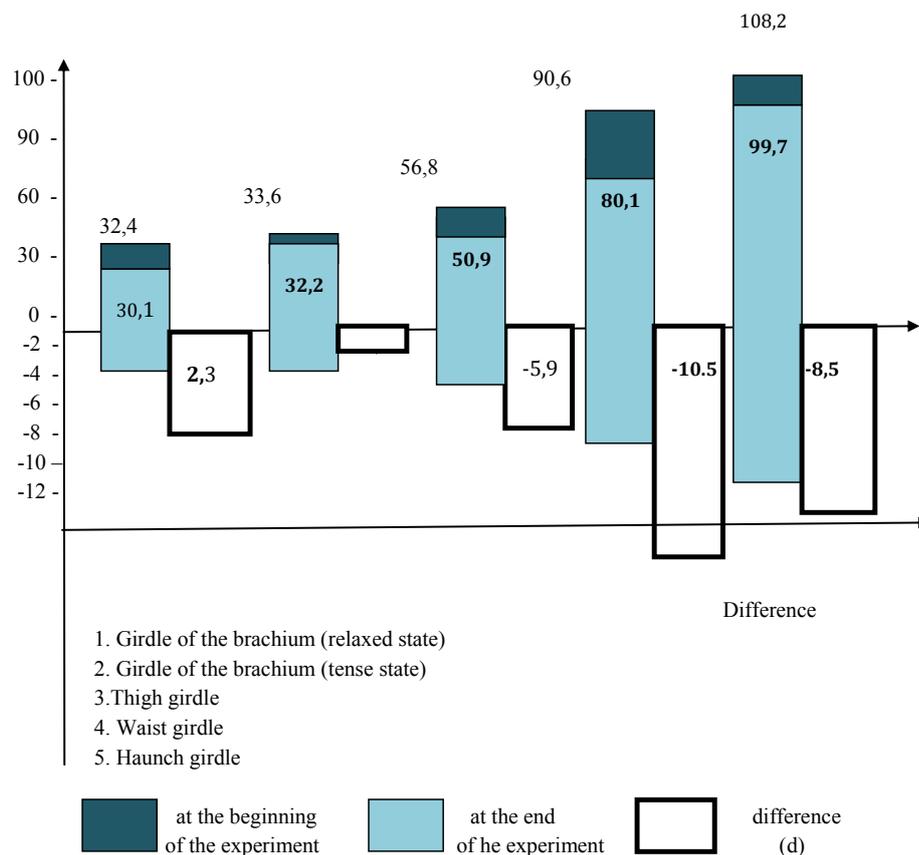


Fig. 1. Results of the anthropometric indicators

tween the real and ideal weight is reduced by 13,2% and reaches an average value of 6,9 kg.

The body mass index is also changed. While at the beginning of the experiment all

the pupils surpass the normal degree of obesity, after the experiment the indexes vary from 22,6 - 24,3 as compared to the obesity norm of 20-24,9.

These results prove that the system

motive activity improves the physical development and stimulates the reduction of the body mass.

The results of the anthropometric measurements are presented in figure 1.

It could be seen from the figure that improvement is observed for absolutely all anthropometric indicators.

The difference of 2,3 cm of the brachium girdle shows that the normalization of weight favorably impacts the celluloid and volume of the brachium (in relaxed position) is decreasing.

On the other side, the favorable impact

of the sports sessions on the quantitative and qualitative state of the muscles is confirmed.

The adaptive physical activity and the sports activities /gymnastics and volleyball/ decrease the fatty tissue on the thighs. While at the beginning the girdle is 56,8 cm, at the end of the study it has been reduced to 50,9 cm /difference of 5,9 cm/.

The girdle of the haunch and the waist are also decreased. The reduction of the waist with 10,5 cm is attributed to dehydration, loss of body weight and decrease of fatty tissue.

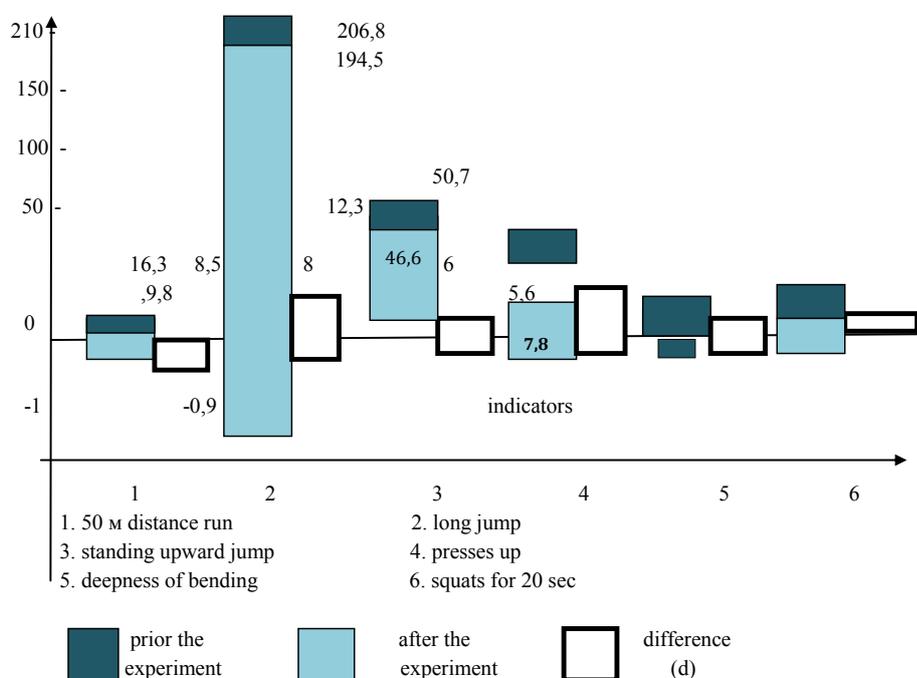


Fig. 2. Results from the physical fitness test

The specially adapted gymnastic and volleyball exercises improve the use of the fat in the respective depots with subsequent reduction. The sufficient duration of the exercises activates the oxidative processes and the assimilation of fatty acids.

Absolutely all the physical qualities tests have been improved. The value of the run at the end of the experiment is lower, which is a positive tendency.

Increased values are observed for the

tests related to the jumps up too. Thus the horizontal jump up is increased by 12,3 cm and reaches the average value of 206,8 cm.

The vertical jump up is also improved which is rather due to the special volleyball sessions and the complex development of the qualities.

Presses up require good physical state as well as specific strength of the upper limbs and the shoulder field. The considerable improvement (a difference of 8,5 num-

bers) proves the stimulating impact of the adaptive gymnastic and the volleyball sessions, putting accent on the muscle strength and endurance.

Improvement is also observed for the spinal column flexibility test which reflects the purposeful methodology.

The increased number of squats and stand ups is attributed to the greater velocity and explosive strength of the lower limbs; these qualities are developed under the impact of the volleyball training sessions.

## CONCLUSIONS

On the basis of the study related to the reduction of the body weight of girl pupils by the application of adapted physical activity and volleyball sport, the following conclusions can be made:

1. Under the impact of the implemented experiment aiming toward the improvement of the physical activity of overweight pupils, a visible decrease of the body mass, harmonization of the physic frame and impact on its problematic zones is observed. By that approach hypoxia is locally impact-

ed, hypoderm elasticity is improved and the girdles are decreased.

2. The adaptive physical activity exercised independently at home and under the leadership of an expert and combined with volleyball practice stimulates the development of the physical qualities.

At the end of the experiment, a growth has been established of the following qualities: strength, speed, endurance, flexibility, jumping up and agility, which proves the increased physical fitness of the girls having participated in the experiment.

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# АДАПТИРАНА ФИЗИЧКА АКТИВНОСТ И ОДБОЈКА ЗА УЧЕНИЧКИТЕ СО ПРЕКУМЕРНА ТЕЛЕСНА ТЕЖИНА

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(Прейходно соопштение)

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## Апстракт

Телесното здебелување и прекумерната телесна тежина е забележителен социјален проблем кој ги засегнуваа земјите со различен стандард и култура. Непријатните последици директно се одразуваат врз здравјето и самодовербата на луѓето, како и на обезбедувањето на поволни финансиски извори. Поради тоа, превенцијата и редуцирањето на телесната тежина претставуваат актуелни прашања кои се поврзани со здравјето на луѓето од сите возрасти.

Истражувањето е реализирано на примерок од 10 ученички со прекумерна телесна маса, чиј индекс (ИТМ) изнесуваше 25 – 29,9 кг/м<sup>2</sup>. Нивната возраст беше од 17-18 години. Тие беа вклучени во соодветна програма за адаптирана физичка активност и спорт. Кај нив се измерени телесната тежина, пет антропометриски мерки, пресметан е ИТМ, додека се применети и шест тестови за проценување на моторните способности. Дејството на применетата програма за адаптирана физичка активност и спорт, доведе до намалување на телесната маса. На крајот на експериментот е утврден прираст на силата, брзината, издржливоста, флексибилноста и експлозивната сила на испитаниците.

**Клучни зборови:** *антропометриски мерки, моторни способности, индекс на телесната маса, кинезиолошки експеримент, адаптирана физичка активност и спорт, одбојкарски тренинг*

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