

Abstract

Doctoral thesis abstract worked by Ms Hangu Simona Stefania

Thesis presented at the National University of Physical Education and Sports of Bucharest

Doctoral advisor: Prof. Corina Tifrea, Ph.D.

Thesis title: Efficacy of movement games in improving body composition and improving overall motor function in ante-pubertal children

Keywords: motion games, ante-pubertal children, motility, obesity

Effects generated by the modern life, due to urbanization and interdictions that limit the children's need for movement, lack of logical motivation for physical activity in clubs and schools, the children's health condition, are all issues that, in order to be resolved, involves intensive and constant efforts in the field of scientific research.

The current challenge of prevention and combating child obesity addressed to the professionals in the social, medical, psychological, etc. field is addressed also to the specialists in the field of physical education and sport.

The paper is divided into three parts, each of them containing several chapters:

- Part I - theoretical foundation regarding the overweight and motor skills of low age pupil and contains 4 chapters related to: research issues, peculiarities of obesity, bio-psycho-motor scanning of small school-age children, management of the process of physical education in primary school in the light of the age-specific peculiarities .
- Part II: preliminary research on overweight and motor skills of ante-pubertal child.
- Part III: experimental approach regarding the efficiency of motion games and improvement of body composition and motility of low-age pupil and contains 4 chapters: the operational methodology of the research, the organization of the research and the sample subject to research, conclusions, elements of originality and dissemination of results.

The chosen theme is topical and fits within the area of health policies promoted by the European Union, in Romania implicitly.

The study of the specialty literature, but also the practice at the department of physical education in primary and secondary education cycle led me to choose this subject, considering that I can help to ensure a better life for these children.

In order to combat and prevent the overweight and obesity since the primary cycle, between 6-11 years, a program would have to exist in every school, through which the pupils, the parents, but also the teachers to be informed with respect to the risks this “disease” entails.

A major cause of the occurrence of overweight since such a young age is the lack of exercise, associated with an unhealthy diet.

Within both the theoretical and practical dimension of this research, we want to find the comparison results between traditional programs and the programs of physical exercises and games of movement applied to the child in the primary education cycle with a view to returning and improving the body weight and not at least improving the motion capability.

The approach in choosing this theme is consistent with my experience over the years, namely to teach physical education to ante-pubertal children, to investigate their movement ability and to maintain a balance between physical and mental activity.

At the low age pupil it was proved the applicability of the spirit of the game in the children's motion activities based on physical exercise, or in dynamic motion games and pleasure that it creates in the participants.

This paper addresses in a very clear manner the aspects of this major public health issue, which makes many people sick, unhappy both with respect to themselves and to their entourage, which creates so much disruption in the midst of labor, in everyday life and the social life.

This phenomenon, which already makes 50% of the American population to be obese, must not conquer also Europe and we must prevent this "epidemic", which is not at all impossible to be achieved!

We believe that a coach is indispensable for the one who decided to regain his/her normal weight to guide him/her, and the physical exercise accompanying weight loss must be strengthened, adapted and encouraged in order to succeed.

Underestimated for a long time, obesity is a real scourge, recognized and classified by the World Health Organization (WHO) as a "global epidemic". This problem is worldwide: 1.6 billion overweight people in the world in 2005 (from - 6.671 billion people in total), of which at least 400 million are obese, and WHO estimates in 2015 - 2.3 billion overweight people in the 700 million of obese people.

Overweight affects both industrialized countries and the emergent countries. China and India, where the growth is thundering, are about to make all the statistics to explode.

Every year, more than 3 million people in the world have an excess of sugar in the blood, according to the famous British medical journal *The Lancet*¹.

¹ *The Lancet*, 2006 and 368, p.1651 - 1659

The doctors pull the alarm signal regarding this disease, otherwise non-infectious and non-communicable, because they are the first to observe this phenomenon. They find and treat directly the devastation that an advanced obesity can cause: diabetes, biliary disorders, hypertension, dyslipidemia, insulin dependency, shortness of breath, sleep apnea, osteoarthritis, osteoporosis, high levels of cholesterol, back pain and joint pain, goiter, various cancers (colon, prostate, blood, uterus, liver, stomach, pancreas).

These diseases are not systematic obesity diseases, but the risks to contract them are greatly increased in this case.

Eighty per cent of diabetics are overweight or obese (according to International Diabetes Federation).

Today it is frequently acknowledged that health problems are caused both by a sedentary lifestyle and by the diet. And as the risk of suffering from cardiovascular disease, diabetes and cancer increases as we take in weight, the sedentary nature of our modern existence is equally regarded as a triggering factor for these diseases. Regular physical activity is therefore recommended as an essential means of prevention against all these chronic diseases of our time (except, of course, joint and muscle disease resulting from an excessive workout).

Our culture must adopt the most elegant simplicity of the concept; "Burn calories, lose calories and prevent diseases." There are excellent reasons to promote a regular physical activity.

It allows us to improve our physical condition. It possibly contributes, in any case this is stated by the specialists, in increasing life expectancy and reducing the risk of cardiovascular diseases and diabetes.

In childhood, the game is a core activity, but with the entry into school, the game goes into the background, and in the youth age to become energy consumption and in adulthood (working age), an activity of comfort.

In the game, the child is a human model, selects, reproduce, create, imitate and reproduce in small scale, the specific relationship between people and activity.

The game plays an important role in shaping the child's personality, giving him the possibility of continuous defining his/her cognitive, affective and moral-volitional traits. For the child, the game becomes a serious activity, where the assimilation of the reality is produced according to precise rules, even if they are self-imposed.

This fund of seriousness and total involvement in the game's content, must be taken into account in building the training situations.

Conclusions of Part I

1. The unity of the psychomotor development lies in the manner in which the central nervous system - the brain - and the sense organs create a certain system of responses as part of the requirements manifested with

respect to the body – in the series of external and internal adaptation events. The mental growth is inextricably linked also to the physical growth, to the maturation of the endocrine system.

2. The transition from one stage to another is preparing gradually through growth and maturation, which may occur slowly or as a leap.
3. The growth process is highlighted by following up the development - growth and maturation of nine major anatomical and functional systems and apparatuses, namely: skeletal, muscular, circulatory, respiratory, digestive, excretory, glandular, sexual and nervous system. Of these, it is especially of concern the nervous system, which is responsible, to the largest extent, for the development process, while being the natural - functional basis of mental activity.
4. Amid a better biological development, the new conditions created by the social scientific-technical revolution of today hasten and impose new conditions for the mental development and educational and instructional methods and means.
5. We must not neglect at all the careful and continuous concern for the use of all factors contributors to somatic development, because the intellectual yield is the more effective when the pupil gained a good somatic, biological development and an increased physical strength.

PART II Preliminary Research on pre-pubertal child's overweight and motor skills

Research premises

The research that we propose is based on the premises that in order to combat this huge problem of obesity in low school age special programs designed at interdisciplinary level are need, and the physical activity, reflected in our program by means of athletics and team sports is one of the best solutions.

Research purposes

The purpose of the preliminary research is to identify children with weight problems for formation of working groups and to highlight the physical development level of these pupils.

The *purpose of the pilot experiment* is the verification of the working techniques, of the means and methods used in the pilot experiment, with a view to preparing the experiment itself.

The **objectives** of the preliminary research aim at:

- collecting the anthropometric data of the pupils in the experimental group and control group;
- checking the level of physical development of these pupils.

Research tasks

- Identifying the activities included in the preliminary investigation.
- Delimitation of the moments (periods) to carry out tests.
- Selection of the lot subject to research.
- Establishing the followed up reference parameters and the statistical indicators.
- Analysis, processing and interpreting the data of the preliminary research.
- Statistical and mathematical processing of the results.
- Formulation of preliminary research findings.

Preliminary research hypotheses

- ❖ Application to primary education cycle of dynamic games and the athletics means can determine the decrease of body weight excess.
- ❖ Integration of ante-pubertal children into an organized system to practice movement makes both themselves and their families more responsible, accustoming them to independent practice of exercises and to the control of nutrition and of the health condition.

Research methods

In the pilot experiment there were used the following research methods: teaching experiment, the method of testing, statistical and mathematical method, graphical method, comparative analysis.

Conclusions of Part II

- Agonist practice of physical exercises and diet control make both the children and their families more responsible, having beneficial effects on weight loss in overweight people.
- It is imperative to know the stage of growth and development of children of the primary education cycle, such information having favorable connotations on the choice of the means accessible to age peculiarities.
- Limiting to the improvement of the physical skills would be insufficient because the child development is a complex area in terms of motivation, emotional, social conditions as well as the cognitive processes.
- In the anthropometric measurements the following are noticed: weight indicator decreased by 3,07kg, the height increased by 2,30cm, body mass index decreased at a rate of 0.11% (a decrease of 2 86). Regarding the motion tests it is found that: speed has decreased by 0,32sec, long jump from standstill has an increase of 8 cm, vertical jump has an increase of 3,12cm, the value of the running resistance indicator decreased by 5,43sec, the indicator of throwing the baseball ball increased by 1.5m and the trunk lifting from dorsal lying position has an increase by 3.7 repetitions. The handiness test has also values increased

by 0,96% (absolute increase of 3.1). Mobility was marked by an increase of 1,15cm.

Part III Experimental approach regarding the efficiency of motion games and improvement of body composition and motor skills of low-aged pupil

Research purposes

The purpose of this paper is to make contributions in projects to prevent overweight and obesity in primary school by using of athletics and movement games.

Our goal is that by practicing physical exercises regularly, three times a week, outside of physical education classes and through collaboration with specialists (doctors, counselors, nutritionists) we to be able to offer to these children a healthier and a better life, both through weight loss and through their habituation to independently and regularly practices physical exercises.

Their integration into society, into the group of friends and colleagues is a priority for us, and this scientific approach is intended to come into the support of the professionals.

In developing this program I will take into account some principles and rules such as:

- Making an analysis of the state of health, of the system of life through medical examination or cardiologic investigation followed by my own investigation related to body mass index (BMI), adiposity, index of physical activity (IPA), the earlier motor experience, as well as to the FC drive area (ZFCA).
- Adapting the program content to the available material basis, to the subject's daily and weekly schedule and medical history.
- Structuring by stages, with each stage long enough, so that the passages to be made slowly, based on the accumulation of the previous step.

Research objectives

This research is intended to be applicative (Epuran, M., 2005, p. 54) descriptive and experimental, the results of which will be possible to be implemented in practice in order to improve the quality of life in children of primary education cycle by implementing a program of physical exercise from athletics and games of movement in order to prevent and combat obesity.

We want to offer through our scientific approach a plus of knowledge that to contribute to the development of the field of physical education and sport.

The sought objectives can be grouped as follows:

- *General objectives*
- ✓ Development of a model of program of prevention and combating obesity in children of primary education cycle by the means of athleticism and dynamic games in order to improve the lifestyle and weight loss.

- *Theoretical objectives*
- ✓ Analysis and interpretation of theoretical and methodological fundamentals that to support to the scientific approach of the theme.
- ✓ Highlighting the priorities that to substantiate practical application.
- *Practical and applicative objectives*
- ✓ Establishing the working group and the control group by selecting the overweight children of the primary cycle from School no. 190.
- ✓ Analysis, recording and following up the anthropometric parameters.
- ✓ Development and implementation of a program to prevent and combat obesity in low-age schoolchildren through dynamic games and athletics means in order to improve the lifestyle and weight loss.
- ✓ Assessment of the program results in children of low school age, at 2 years after initiation, the goal being the increasing of the quality of their lives.

Research tasks

- Staggering the activities included in the research.
- Setting up the research purpose, objectives, tasks and hypotheses.
- Studying the specialty literature on the chosen topic.
- Making the initial tests
- Designing the training programs and lesson planning.
- Implementation of movement program
- Analysis, processing and interpretation of data obtained after final testing.
- Drawing the final conclusions.

Research hypotheses

1. Applying a systematic exercise program in athletics and dynamic games 2 times / week in children of primary cycle with overweight problems lead to weight loss and increase of the body resistance to exercise.

2. Practicing dynamic games, independent sporting activities, supported by family members, can prevent "excess body weight", promoting an active and healthy lifestyle in children.

Research methods

In the experiment the following research methods were used: pedagogic experiment, the method of testing, statistical and mathematical method, graphical method, comparative analysis.

The **pedagogic experiment** was conducted over a period of 2 years, during which the pupils of the I-IV grades within the School no. 190 of Bucharest were tested, with a view to selecting the target group of the pedagogical experiment.

The target population was represented by a total of 741 children aged between 6-11 years of Secondary School no. 190, Sector 4, of Bucharest. From this, we selected the accessible population - 123 overweight children and 618 children with normal weight.

The variables and the sampling mode

From the accessible population we selected the study group; the process was at random, following both the inclusion and exclusion criteria.

Inclusion criteria:

- Children aged 6-11 years
- obesity
- overweight
- normal weight
- the possibility of results tracing and evaluation
- signing the consent to participate in the study by children's parents.

Exclusion criteria:

- monitoring impossibility
- refuse by children and / or parents to participate in the study
- secondary obesity confirmed by specialists

The test method

The testing included: anthropometric measurements; general motor skills tests.

For each child we completed an evaluation data sheet with tracking the parameters: history, anthropometric, motor skills.

The parameters followed up in the study:

- **Age and sex of the child**
- **Anamnesis data:**
 - ✓ physiological and pathological personal history;
 - ✓ nutrition;
 - ✓ age upon the onset of obesity;
 - ✓ obesity associated with some social factors.
- **Anthropometric parameters:**
 - ✓ measurement of body weight (G) with scales;
 - ✓ waist measurement (T) using a waist measurement gauge;
 - ✓ determining body mass index BMI.

Motor skill tests:

- ✓ 30 m speed running;
- ✓ Long Jump from standstill;
- ✓ Vertical jump;
- ✓ Resistance running 300 m;
- ✓ Throwing the baseball ball;
- ✓ Trunk lifting from dorsal lying position with knees bent during 30 sec;
- ✓ Handiness (throws the handball ball to target);
- ✓ Mobility

CHAPTER VIII - Conclusions

- With regard to the control group which followed the traditional methodological route following the statistical interpretations of the anthropometric data, the height does not show significant differences between the mean values of the two tests - *the null hypothesis is accepted* unlike the weight and BMI where the differences are significant.
- Analyzing the parameters of the general motor skills of the control group in the speed running, long jump from standstill, vertical jump, resistance running, throwing the baseball ball, lifting the torso in the 30s, handiness, mobility, no significant differences between the mean values exist - *the null hypothesis is not accepted*.
- Regarding the statistic data in the experiment group within the program to prevent and combat overweight and obesity in anthropometric measurements (initial and final) in waist - *the null hypothesis is accepted*, the value being 4.15 cm, therefore there is no difference.
- The values of body weight and BMI indicates significant statistical differences between the two tests (-4,46kg or 3.86 units), therefore *the null hypothesis is not accepted*.
- The evolution of the measured parameters of the overall motor skills in the experiment group: in the speed running a decrease of 1.01 sec was noted between the mean values of the two testing, there are significant differences - *the null hypothesis is not accepted*.
- In the long jump from standstill an absolute increase of 18,7cm was noticed, from where it appears that *the null hypothesis is accepted*.
- In the vertical jump a progress of 8,95cm was registered as a result of significant differences, *the null hypothesis is accepted*.
- Due to a decrease of 13.35 sec between the two test in resistance running *the null hypothesis is rejected*.
- The test of throwing the baseball ball shows us the distinction of 5,33m of the mean values, therefore no significant differences, *the null hypothesis is accepted*.
- After analyzing the values of the test of lifting the trunk in 30 seconds, it was found an absolute increase of 7.75 repetitions, which indicated no significant differences between the mean values, *the null hypothesis being accepted*.

- In the handiness test (achieving the target), the number of successful throws increased by 4.25, therefore *the null hypothesis is not accepted*.
- As regards the mobility (ground distance) is of 0.35cm, which demonstrates that there are no significant differences between the mean values and *the null hypothesis is not accepted*.
- Comparing the results obtained from the initial testing and the final testing I have found that progresses were recorded from a testing to the other one. Thus, except the indicator HEIGHT, where there are no significant differences between the mean values of the two tests, the null hypothesis being accepted, in the other characteristics (weight, BMI, speed running, vertical jump, resistance running, baseball ball throwing, lifting the trunk in 30 seconds, handiness, mobility) there are significant differences that lead to accepting the alternative hypothesis.
- The overweight rate was of 16.59% (123 children between 6-11 years age - out of A total of 741 children) in the target population.
- With respect to the harmonious social and one affective development of the child and primary school, a balance is necessary between the need of movement, play and mental exertion.
- The games have an interactive dimension and are entertaining within the group, they being used also for skills of movement.
- The competitive games do not help to the learning of new movement skills, but accentuates the existing skills and offer new methods to practice them in an enjoyable manner and without constraints.
- We note the great value of the dynamic games in preventing the monotony through their emulative / entertaining character and the approach of the constant practice of physical exercise to prevent obesity.
- The final conclusion is that the program to prevent and combat overweight and obesity in low-age school children consisting in practicing 3 times a week for 1 h of exercises based on the means athletics and dynamic games had a positive impact both on the composition of their body and on their motor skills, which greatly improved, on the confidence in their own person, some of the pupils being directed in the final even to practice a performance sport.
- Feed-back from the parents has been very positive, they unreservedly supporting all the proposed actions.

- At the suggestions of the doctor, of the school's psychologist with whom we worked, the pupils changed their attitudes both towards the diet, which is more balanced, and on the attitude towards the practice of physical exercise in the leisure-time.
- We want to continue this program also in the future with the participation of as many as possible pupils, both overweight and with normal weight in order to instill them the love of movement.

Chapter IX Elements of originality and dissemination of results

9.1. personal contributions

- The novelty is quite the overweight in low-aged school children. It is known that information regarding this subject matter is extremely limited, and the work brings a synthesis of the data from the international and national specialty literature, but also a synthesis of the latest topical data - data completed with personal opinions.
- Highlighting some physiological aspects by conducting physical and motor skill tests aimed to investigate the possible changes occurring in the overweight children after the programs carried out.
- Designing a training program with means associated to athleticism and movement games, which involved the selecting and adapting of the most efficient means of physical training, used under the form of games, relays, for the purpose of studying its impact on development of the motor skills potential of children, which helps in maintaining a healthy life.
- The accomplishment of exercise programs in the primary school pupils involved the selecting and adapting of specific means of physical training under the form of game, in order to highlight their impact on the motor abilities and skills on the one hand and on the other hand on the body composition.
- The exercise program proposed and realized as part of our scientific approach at the level of the primary grades have developed a range of capabilities and skills very important for future development of the overweight pupils.