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**STUDY ON THE EFFECTS OF AEROBIC GYMNASTICS
AND BALLET EXERCISES, AT STUDENTS WITH
PARTIAL MEDICAL EXEMPTION**

PHD THESIS SUMMARY

The effects of physical activity on strengthening and improving health are unanimously acknowledged. Numerous studies have highlighted the fact that subjects with various minor medical conditions can also benefit from exercising, especially aerobic and muscle toning.

We considered it appropriate and necessary for students with partial medical exemptions to be included in personalized physical activity programs, adapted to their motor structure, volume, intensity and complexity, so that they can safely enjoy the benefits of exercise.

The inclusion of students with partial medical exemption in adapted exercise structures did not particularly aim at optimizing physical parameters and obtaining motor performance, but first of all the awareness of the benefits of exercising in the direction of improving medical conditions and strengthening health.

In the case of these students, self-improvement, the desire to practice organized physical exercise, in a group or individually, is more important than the performance quantified in numbers.

Documenting the situation of medical exemptions from UMF "Carol Davila" Bucharest, we found that one of the most common diagnoses, especially in recent years, was asthma. For this reason, we focused our research on this category of subjects.

Research hypotheses

1. By practicing the Aerobics and ballet exercise structures proposed by us, a series of motor and functional parameters of the subjects will be significantly improved.
2. The inclusion of students with partial medical exemptions in organized physical education lessons, using Aerobics and ballet exercise structures, adapted to students needs and particularities, will increase the ability to withstand daily demands and maintain health.

Subjects, place and duration of the research

The entire research approach was proposed to take place over two academic years, 2018-2019 and 2019-2020, respectively, with the following chronological landmarks:

- In the academic year 2018-2019 we started the research project with three preliminary studies, one for doctors and two for students. A number of 30 students with partial medical exemptions, from years I and II, were involved in the first study, and in the second, only 25 of them, from year I.
- At the beginning of the 2019 academic year, the 25 students involved in the preliminary study from the previous year, now in the second year of study, were joined by another 15 students from the first year, resulting in a number of 40 students, with partial medical exemptions. Of these, 2 did not have the consent of the doctor to perform physical exercises and consequently we did not include them in the study sample.
- Of the remaining 38, 8 withdrew along the way, so that in the end the operational approach was carried out with a number of 30 subjects.
- Between October 2019 and March 2020, the actual operational approach took place. This experiment was designed to take place between October 2019 and June 2020. Due to the exceptional conditions caused by the Pandemic, which stopped the teaching

activity in the school, it could not be completed within the parameters initially proposed.

- The analysis and interpretation of statistical data was carried out between May and June 2020.

The doctoral thesis is structured in *three parts*.

The first part, comprising 4 chapters, represented the theoretical substantiation of the thesis, recording the opinions of specialists in the field of human motor skills and health on the topic addressed in the research.

The second part of the thesis consisted of a preliminary study meant to elucidate us on the opportunity of the researched topic, to validate the battery of tests and measurements used for evaluation and to outline the methodological substantiation of the operational approach itself. In this part of the thesis, which included three chapters, two questionnaire-based surveys were conducted, one addressed to physicians, the other to the subjects in the study sample.

The third part of the thesis was represented by the research process itself, in which we developed and applied *eight projects* based on exercise structures in aerobic gymnastics and ballet, adapted to the particularities of the subjects.

The subjects were tested at the beginning and at the end of the operational approach, on somatic, motor and psycho-motor parameters. The following parameters were targeted: Height, Weight, Body Mass Index (BMI), Relaxation, Thoracic Perimeter in Relaxation, Inspiration and Expiration, Chest Elasticity, Speed-Endurance Skill (determined with the Shuttle with Object Transport), Balance (assessed with the Flamingo Test) and Vital Capacity (determined by Spirometry). The data collected were statistically analyzed and interpreted.

Conclusions

- Doctors unanimously recognize the role and importance of sports activities, in full synergy with the medical act, for maintaining and / or improving health.
- The inclusion of medical students with partial medical exemptions in the organized activity of physical education, by designing and using exercise structures adapted to their needs and possibilities, is of great importance, not only for their health but also preparation for the future profession.
- The importance that doctors give to physical exercise also materializes on a personal level, a significant percentage of them (47%) finding time, despite considerable professional demand, to include in their daily schedule, constantly, various forms of activities sports (individual, or group, indoor or outdoor, aerobic, anaerobic or mixed).
- Almost all the doctors interviewed (97%) recommend practicing adapted sports activities for the benefit of subjects with minor medical conditions.
- The vast majority of physicians (86%) also believe that a well-designed aerobic exercise program could be an optimal solution for meeting the exercise needs of students with partial medical exemption.
- There is a need to organize during the Physical Education lesson some exercises and structures of physical exercises, performed on level groups. This is important for engaging these students, throughout the academic year, in physical activities adapted to their needs and possibilities, in order to get them used to an active and healthy lifestyle.
- There is also awareness and motivation for involvement in group motor activities, in which socialization and self-knowledge are obtained spontaneously.

- The adapted exercise structures chosen from Aerobics and ballet, proved not only their efficiency but also their attractiveness, managing to arouse the interest of the subjects.
- Following the investigations, we found that, in the years before the project start, although the number of medical exemptions was high, the participation in physical education lessons of partially exempted students was partially reduced.
- After conducting the preliminary stage of this research, we found the subjects in this category more interested to participate in the project.
- The subjects' interest in group activities increased significantly as a result of participating in our project.
- By engaging in collective physical activity based on exercises adapted from Aerobics and ballet, the ability of subjects to relate to others and to integrate into social groups has significantly increased.
- Participation in physical activities within our project had a positive effect on the subjects' self-image.
- Following the involvement of the subjects in the physical education lessons with exercises adapted from Aerobics and Ballet, designed and led by us, there is a significant improvement in their quality of social life.
- Students involved in the study, with medical exemptions, have mostly (86%) the recommendation of doctors for individual and / or group physical activities, such as: trips, hiking, swimming, medical gymnastics, aerobics, etc.
- Following the processing and interpretation of the data recorded in the applied tests, by checking the statistical hypotheses using the t test, the null hypothesis was rejected and implicitly the research hypothesis was accepted at 9 parameters out of 10, the calculated significance threshold (p) being higher. of 0.05.

- Thus, the data processing resulted in statistically significant differences between the initial and the final test for the following parameters: Weight (which decreased on average by 1.03 kg, representing a percentage of 1.8%), Body mass index (with an average decrease of 0.37 kg / m², representing 1.8%), Relaxation Chest circumference (mean increase of 0.50 cm, ie 0.6%), Inspiration Chest circumference (mean increase of 1.10 cm, or 1 , 3%), Expiratory Chest circumference (average decrease of 0.30 cm, meaning 0.4%), Chest elasticity (increase of 0.80 cm or 20.7%), Shuttle (decrease of 1.39 sec., representing 6.8%), Flamingo Test (average decrease of 1.03 imbalances, ie 16.1%), Spirometry (average increase of 246 ml or 9.7%).

These results led to the rejection of the null hypotheses and the acceptance of the research hypotheses for the respective parameters.

- From the above we can draw the following **conclusions**:

- Taking into account the significant progress recorded in the Shuttle and Flamingo tests, the physical education lessons with adapted exercise structures, inspired by Aerobics and ballet, designed and led by us, have proven their ***effectiveness in improving motor and functional parameters***, which ***confirms research hypothesis number 1***.

- Significant improvement of the results recorded at the parameters directly related to the respiratory activity, relevant in asthma disorders (Thoracic perimeter in relaxation, inspiration and expiration, Chest elasticity and Spirometry), creates the premises for ***increased resistance to the demands of socio-professional life and helps maintaining the health***, which ***confirms research hypothesis number 2***.

Elements of originality and recommendations

- The opportunity to enroll students with partial medical exemptions, who have the doctor's recommendation to perform a certain type of effort in physical education lessons, specially organized and conducted according to the specifics of the condition;
- The use in these lessons of the adapted exercise structures from Aerobics and especially from ballet, starting from the premise that this art brings special benefits in educating the correct body posture in motion, giving it stability, balance, functionality and last but not least grace and elegance.
- The transmission by the teacher, simultaneously with the teaching of physical exercises, of some information related to the direct connection between the active lifestyle and health (physical, mental, social).
- The need for permanent connection to the unprecedented influx of information characteristic to the reality contemporary society.
- The appropriate adaptation of the strategies for teaching physical exercise to all categories of subjects in the new conditions created by the digitalization of all fields of activity.