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Original article

IMPROVING THE STUDENTS' POSTURE THROUGH INTERACTIVE TECHNOLOGIES

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Abstract

Aim. In the context of intense training, long schedule activities, mainly sedentary, determined by attending classes and laboratories, the preparation of specific intellectual activity, the concern and care for proper maintenance of health, harmonious physical development should be on the first plan to form an optimum fitness for medicine students.

Methods. The aim of the research was to determine the impact of physical exercise on student's posture. Thus, a group of 60 students (age between 18-22years) took part weekly on physical education lessons in which the work programs applied were based on interactive technologies (HOPSport System). The subjects' postures were tested before and after the work program through the Postural Equa Pagani platform, following the deviations with respect to the body axis (in the 4 quadrants-left and right anterior and posterior).

Results. The results showed an improvement on subjects' posture, the mean differences of the anterior and posterior quadrants being significant ($p < 0.05$). Testing the posture revealed initially, an anterior posture, with the tendency to bend the head forward. The difference in positioning: the center of gravity was 8.47% more than the previous posterior initial testing, the difference decreasing to 2.74%.

Conclusions. The introduction of the interactive technologies has proven to be a success, increasing the attractiveness of physical education classes and influencing positively the subjects' posture.

Key Words: posture, physical exercise, interactive technologies.

Introduction

Physical activity can be considered a basic element of a healthy lifestyle and a condition of daily life. The Health Formula consists of mandatory daily physical activity by age, sex and activity level. "An EU report from 2010 regarding the practice of physical exercise showed that we are among the countries that do not consider this a priority, Romania's population standing at the bottom of the table. At barometer, in descending order, Romanians are surpassed only by Hungary, Greece and Bulgaria. The Nordic countries are the most active in this regard.

Unfortunately, in the report made in 2013 and published in March 2014 with regard to sport and physical activity, the situation has not changed in Romania, our country still hovering the fourth place among those who are not physically active at all before us hovering Bulgaria, Malta and Portugal. (ec.europa.eu)

In a context of intense lengthy schedule mental training activities, mainly sedentary. determined by participating in courses and laboratories, the preparation of specific intellectual activity, the concern and care for proper maintenance of health, for the harmonious physical development should be on the first plan to form an optimum physical condition in medical students.

Proscribing sports exercise is a fact in our country, putting this to a lack of culture for the movement, which should be cultivated since childhood. (Marcu, Ciobanu, 2009).

The physical condition achieved through the systematic practice of physical exercise translates individually through increased performance, self confidence, physical and psychological independence, which contributes to the perceived quality of life. (Popescu, 2009).

Trying to make physical education classes and sports more attractive, a group of Americans have created a HopSports system that combined hundreds

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of lesson plans video programs projected on a screen. Using HOPSports system means to combine a projector, a sound system and a variety of workout equipment. Lessons are conducted by athletes and celebrities or cartoons. HOPSports redefined the perception of students on participation in physical education classes by offering practitioners to choose attractive and rewarding forms of physical activity which will enable them to live sustainably healthy lifestyle throughout adulthood. (Root, 2010)

The system currently exists in 1,000 schools, after school programs, recreation and treatment, but also in US military bases worldwide, HOPSports is a bridge between home, school and community to encourage active and healthy lifestyles lifelong. (HOPSport, 2012).

The founders of this system add that the powers of the system does not replace the physical education teacher but an auxiliary instrument very useful for this. In the US, HopSports training system is currently used by more than 600,000 young people per week. HopSport system is a multimedia training tool for the 21st Century. The small deviations from normal shape and body functions, ie caught in the the early stage deficiencies are considered deficient attitudes, which may affect the whole body or only certain segments of the body and which, through the execution of corrective movement is corrected and hyper-corrected.

Detected in time to the onset of changes in the tissue structure, light physical deficiencies are corrected, in the most cases, under normal school activities. The uncorrected deficient attitudes evolve negatively in time, adding to the disturbing reflex the production mechanism.

The aim of the research is to investigate the impact of HopSport exercises on Medical Students' posture.

Methods

In order to identify the impact of interactive technologies on the subjects' posture, we used Postural Equa Electrical Pagani platform (fig.1). The equipment is in the endowment of the Research Centre of Faculty of Physical Education and Craiova, is a device that allows the evaluation of static balance and posture. The system consists of a platform with pressure sensors that take proprioceptive information related to the stimulation of the foot. The platform has a size of 40 / 40cm and is marked on its surface with the contour of the planting region where there are different foot sizes corresponding the shoe number.

The software requires entering the following data: name, existing pathology, date of birth, sex, shoe number. The evaluation protocol involves: placing the subject on the platform pressure, orthostatic posture adopted, previously projected view in the monitor must be positioned so that is set on the line of the eyeball. We choose the protocol: static balance and posture assessment, in the two situations-with your eyes open and then with eyes closed. The duration for maintaining the position of the platform varies from 10 seconds to 60 seconds. Following the evaluation of the data on the following linked to balance and posture-related parameters: deviation of the body in relation to the axis (in the 4 quadrants-2anterioare and two posterior) variation curve, variations around the center of gravity and duration of deviations, location and distribution center.

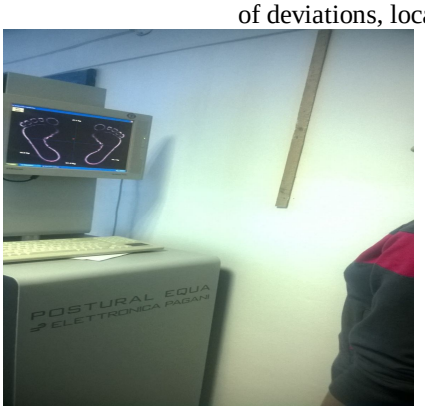

Fig.1 Postural Equa Electrical Pagani platform

In our research, we measured the body deviation relative to the axis, per 30 seconds, before and after implementing the working programe.

Even if the BrainBreaks and HopSport systems are used abroad as a means of recreation during the breaks between courses, in our research these means were introduced in the physical education class,

representing one or more themes of the lesson, the motivation is given by the impossibility to quantify those who execute movements during breaks and the difficulty of students synchronization, each group having different programs. So the HopSport system was introduced in the physical education class in medical students, Year 1, constituting an aid and is provided by the teacher as novelty for the students, being accepted and appreciated by them. The research began in November and involved placing in each physical education lesson work programs based on interactive technologies depending on lessons topics, which are used as aids in the fundamental lesson, according to themes and objectives.

The research included a sample composed of 60 subjects, aged 18 to 26 (± 1.5years), 15 of whom were male and 45 female students in the first year of General Medicine and Pharmacy Craiova, who agreed to willingly participate in this research and had an interest in new work programs that included interactive technologies to practice physical exercise.

We worked frontally, watching the teacher, explaining the exercises and correcting certain errors encountered, placing great emphasis on body posture and the proper execution depending on the model exposed by HOPSport system, so that at the end of each lesson all students left with a large baggage of knowledge regarding the form and content of the movement.

Results

The results achieved in the posture via the platform Pagani, have both initial testing earlier predominance, with an average of 54.1 percent compared to the rear, where the average was 45.63 percent, which suggests the postural imbalance. In the final testing, this difference decreases and reaches an average of 51.37% for the anterior part and 48.63% for the posterior, the posture being thus balanced. (Table 1).

Table 1. Statistical parameters - anterior-posterior quadrants Pagani Platform

The statistical parameters	anterior quadrant T1	anterior quadrant T2	posterior quadrant T1	posterior quadrant T2
average	54.1	51.37	45.63	48.63
stdev	1.18	1.50	1.48	1.50
cv	2.18	2.92	3.24	3.08
max	51.9	48.8	43.1	46.1
min	56.9	53.9	48.1	51.2
amplitude	5	5.1	5	5.1

Table 2. Mean Difference - anterior-posterior quadrants Pagani Platform

Parameters	T1	T2	D21	D21%
Anterior arithmetic mean	54.1	51.37	2.73	5.04
posterior arithmetic mean	45.63	48.63	-3	6.57%

In the final testing, we observed a change in the anteroposterior posture with a slight anterior tendency, much improved compared to the initial testing. The difference in positioning the center of gravity is 8.47% more anterior than posterior in the initial testing, the gap decreasing to 2.74% in the final testing.

Table 3. Statistical Parameters - anterior-posterior Pagani Platform

Student Test T1-T2							
	Test difference				t	df	Significance
	Mean Dif.	stdv	95% confidence Interval				
			Inferior	Superior			
	2.73	1.90	2.23	3.22	11.11	59	.001
Anter. 1 – Anter. 2							

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The Student test applied between the initial and final testing, we revealed that the difference between averages is 2.73, t value is 11.11 and the degrees of freedom 59. 95% confidence interval for the difference ranges from 2.23 to 3.22. Since the confidence interval does not pass through 0.00, the difference is statistically significant at a 5% significance bidirectional threshold being p <0.001.

Table 4. statistical parameters – left-right quadrants Pagani Platform

The statistical parameters	anterior quadrant T1	anterior quadrant T2	posterior quadrant T1	posterior quadrant T2
average	52.05	50.78	48.04	49.50
stdev	1.42	1.16	1.49	0.89
cv	2.74	2.28	3.11	1.80
max	49.5	49.1	43.3	48.3
min	55.7	53	51.2	50.9
amplitude	6.2	3.9	7.9	2.6

In the left-right quadrants, the differences are not so obvious, in the initial testing the right side laterality average value being 52.05% and the left one of 48.05%, a difference of 4.01. The coefficient of variation indicates that the group is very homogenous in the four tests.

Tabel 5. Mean difference – left-right quadrants Pagani Platform

Parameters	T1	T2	D21	D21%
Right mean	52.05	50.78	1.27	2.43%
Left mean	48.04	49.50	-1.46	3.03%

In the final testing, there is a change in posture with a slight right tendency, though improved compared to the initial testing, with a right predominance 1.28%.

Tabel 6. statistical parameters- left-right Pagani Platform

Student Test T1-T2

	Tests differences				t	Liberty degree	Level of significance
	Mean differences	std. deviation	95% confidence interval Inferior	Superior			
Stg. 1 – Stg. 2	2.73	1.90	2.23	3.22	11.11	59	.001

The Student test applying between initial and final testing for the left quadrant we obtained a mean difference of 2.73, t value is 11.11 and the degrees of freedom 59. The 95% confidence interval for the difference ranges from 2.23 to 3.22 . Since the confidence interval does not pass through 0.00, the difference is statistically significant at a 5% significance bidirectional threshold being p <0.001.

Discussion

According to a study young people who use the system HopSports are 55% more active than those who follow the classic courses of physical education and sport.

From the same study, it appears that students who are overweight or obese that use this system are 23% more active compared to those who attend traditional physical education and sport. HOPSports allows teachers to work with small groups or individual students while the entire group remains fully committed. Students improve their health and get the confidence to be active for life.

Thus the promotion of physical education is done in a fun way and attracts students to move. HOPSports redefined the perception of students to participate in physical education by empowering them to choose attractive and rewarding forms of physical activity which will enable them to live a sustainably healthy lifestyle throughout adulthood. (West&Shores, 2008).

HOPSports set targets to further explain the importance of this training educational system, namely to introduce essential skills for a wide range of physical activities, encouraging a healthy and

sustainable lifestyle; to make exercise fun by using unique digital platform that includes physical activity, educational information and for transmitting a positive social message; aligning with major groups of corporations, foundations and institutions that share the common goal of improving the health of young people and communities of America; It provides a platform for end users to combine entertainment, education and fitness, realizing "my health, my fitness room, on my time (HOPSport, 2012).

An assessment was carried out in North Carolina as a pilot study to provide information about the joy of young people to use HOPSports system, if it has achieved learning outcomes, about the ease of using HOPSports system, and how HOPSports may or may not improve quality in the students' physical education.

The purpose of additional physical activity assessment was to compare the results of students' physical activity using HOPSports with that of those who did not use HOPSports (as they participated in a more traditional physical education) during physical education classes. In essence, this information would indicate if students were more physically active in class when they were using HOPSports. (West &Shores, 2008).

On average, students have accomplished more physical activity when HOPSports was used than in the traditional physical education sessions. HOPSports was found in several cases to be more effective at improving the physical education class in density . HOPSports' most important value is that it can be in providing a variety of relatively easy to facilitate activity and due to its offerings of lessons, various programs, some physical education teachers may not feel comfortable during teaching.

The impact of exercise on the posture of subjects - the first repercussion of physical deficiencies, reflects on the correctness and harmony of physical conformation.

Further, they undermine the motor capacity, reducing it, and then they threaten the health of the individual especially if physical impairment is likely pathological and is located in one of the body segments such as the chest or abdomen forming cavities in which the vital organs of the body headquarter. Testing the posture via the platform Pagani relieved to us that subjects initially showed a change of posture, a relevant change in the anteroposterior one, with a tendency to bend the head forward, which is responsible for the emergence of kyphosis, much improved then in the final testing.

The difference in positioning the center of gravity was 8.47% more posterior than anterior in the initial testing, the gap decreasing to 2.74% in the final testing. The explanation for these changes is the inclusion of work programs that have intervened with objective stimuli on the attitude body within the dance means of HOPSport system and specific aerobic gymnastics, helping to improve posture maintenance.

Conclusion

At students' age, deviations from proper posture, can be repaired by conscious and voluntary intervention of those with detected disabilities, the primary means being exercise of the medical gymnastics.

These deficiencies detected early can be successfully remedied, ignoring postural deficiencies is leading to malfunctions in the respiratory or digestive tract.

Also among these young people can be found a number of problems related to an incorrect posture such as intervertebral cervical, dorsal or lumbar, limiting mobility and stability, hyperlordosis.

Testing the Medical Students posture was aimed at the detection of certain weaknesses or poor attitudes met in this stage of life and operating to combat them through exercise.

HOPSports' can help students become healthier by combining exercise, fun, learning, and entertainment through movement. By integrating new methods such as HOPSports' during physical education class, could increase a student's perception about the benefits of being physically active.

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