

DETERMINATION OF THE MOTOR CONFIGURATION IN ORDER TO OBTAIN AN OPTIMUM PHYSICAL CONDITION

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ABSTRACT. Physical condition lays in the ability of the individual to make a special physical effort, reported to the constitutional type and age. A good physical condition constitutes an individual's ability to perform daily activities without the appearance of fatigue and overuse of physiological functions of the body. An optimal physical condition is obtained and maintained by the regularity of adequate physical efforts. The level of physical condition is represented by the ability of each individual to accomplish with ease activities such as: walking and riding the bike, hiking mountains, lifting weights, climbing stairs without showing any disturbing signs, pain or discomfort. **Objective.** The determination of the motor configuration has a great influence in achieving a level of individual physical conditions that are consistent with the requirements of the future profession. The choice of means and methods specific to physical education, used in the lesson of physical education, which would be consistent with the level of capacities and the state of health of every individual. **Methods.** Investigative methods used are: the methods and techniques of proper research (observation, experiment) as well as methods for processing, analysis and interpretation of data collected (mathematical, statistical and graphics). **Results.** Physical exercises are carried out rhythmically; they improve and maintain the physical condition of the body, extending life by improving the functionality of the organs and decreased risk of illness. For the students, and not only, the most effective form of activity takes place within the institutional physical education and sport, through the use of methods and means of physical education lesson. **Conclusions.** The development of physical condition in the lesson of physical education must be carried out through specific ways and means; physical condition development methodology has many specific ways and means that can be used depending on the purpose, the maximum possibilities of the body, sex, level of training, young age. The determination of motor configuration, beneficial to improve physical condition through the lesson of university physical education, is an academic requirement, whereas there is a clear delimitation; its establishing according to the professional profile characteristics can ease the binding of the instructive-educational activity of motor needs of the future profession.

Key words: *determination, configuration, physical condition*

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REZUMAT. Determinarea configurației motrice în vederea obținerii unei condiții fizice optime. Condiția fizică consta în abilitatea individului de a presta un efort fizic deosebit, raportat la tipul constituțional și vârsta acestuia. O bună condiție fizică constituie capacitatea unui individ de a-și efectua activitățile zilnice fără apariția oboselii și fără suprasolicitarea funcțiilor fiziologice ale organismului. O condiție fizică optimă este căpătată și menținută prin efectuarea regulată a unor eforturi fizice adecvate. Nivelul condiției fizice este reprezentat prin abilitatea fiecărui individ de a realiza cu ușurință activități precum: mersul pe jos și pe bicicletă, drumeții pe cărările munților, deplasarea unor greutăți, urcatul scărilor fără apariția unor semne deranjante, durerea sau disconfortul. **Obiective.** Determinarea configurației motrice are o mare influență în atingerea unui nivel de manifestare a condiției fizice individuale care să fie în concordanță cu cerințele fizice ale viitoarei profesii. Alegerea unor mijloace și metode specifice educației fizice, utilizate în lecția de educație fizică, care să fie în concordanță cu nivelul de manifestare a capacităților motrice și cu stare de sănătate a fiecărui individ. **Metode.** Metodele de investigație utilizate sunt: metodele și tehnicile de cercetare propriu-zise (observația, experimentul) dar și metode de prelucrare, analiză și interpretare a datelor recoltate (statistico-matematică, grafică). **Rezultate.** Efectuarea exercițiilor fizice în mod ritmic, îmbunătățesc și mențin condiția fizică a organismului, prelungind viața prin îmbunătățirea funcționalității organelor și scăderea riscului de îmbolnăvire. Pentru studenții, și nu numai, cea mai eficientă formă de activitate se desfășoară în cadrul instituționalizat al educației fizice și sportive, prin utilizarea metodelor și mijloacelor din lecție de educație fizică. **Concluzii.** Dezvoltarea condiției fizice în lecția de educație fizică trebuie realizată pe căi și cu mijloace specifice; metodologia dezvoltării condiției fizice dispune de numeroase metode și mijloace specifice care pot fi utilizate în funcție de scopul urmărit, de posibilitățile maxime ale organismului, de sex, de nivelul de pregătire, de vârsta tinerilor. Determinarea configurației motrice, benefică îmbunătățirii condiției fizice prin lecția de educația fizică universitară, reprezintă o cerință didactică, întrucât nu există o delimitare clară a acesteia; stabilirea ei funcție de caracteristicile profilului profesional, poate ușura legarea activității instructiv-educative de necesitățile motrice al viitoarei profesii.

Cuvinte cheie: *determinare, configurație, condiție fizică*

Introduction

The improvement of the physical condition of young people, during the lesson of physical education on the basis of specific means, shall be subject to the level of motor capacities, to the functional capabilities of each individual but also to the objectives arising from the requirements of the future profession,

by developing general motor elements: strength, stamina, endurance, muscle elasticity and joint mobility, coordination, increasing the capabilities of functional effectiveness: respiratory system, cardio-vascular system, nervous system, metabolism, immune system, developing the potential of general physical structure by decreasing body fat and body shape adjustment to current requirements. Through an optimal physical condition, an efficient report shall be created between the specific characteristics of each individual (age, sex, personality, physical structure) and the physical effort made in solving the tasks of motor lesson of physical education, and not only. The benefits are far greater than they seem at first glance, being both physiological, emotional and social. This can be confirmed by those attending a gym or who are involved in a sports activity, carried out rhythmically. Free time is the biggest problem of modern man and also the main reason why man does not work out.

Objectives. Determining the motor configuration has a great influence in achieving a level of manifestation of individual physical condition that are consistent with the requirements of the future profession. The choice of means and methods specific to physical education, used in the lesson of physical education, so that they are consistent with the level of motor capacities and with the health state of each individual.

Hypothesis. The research activity was based on the following assumption: the Does the determination of motor configuration that facilitates getting an individual an optimum physical condition lead to enhancing the quality of motor capacities, as contributory factor of improving them?

Materials and Methods

The research was carried out under the terms of the educational process within the school hours of University physical education in the academic year 2012-2013 from the education plan (14 hours/semester). The sample under study included students from the first year of study, consisting of 60 students, selecting those subjects took into account their specialization. Initial testing (ti) took place during the hours of physical training during the months of October/November 2012 and the final testing (tf) during the hours of physical education in May 2013. Investigative methods used are: the methods and techniques of proper research (observation, experiment) as well as methods for processing, analysis and interpretation of data collected (mathematical, statistical and graphics). The determination of the motor configuration was achieved by assessing competences (Finichiu, M., 2010) that have a decisive role in achieving an optimum level of manifestation of the individual physical condition and that are agreement with the requirements of the future profession, namely:

a. the abdominal muscles, the assessment tools were picking up the trunk from dorsal supine, contretemps 30" and raising the feet extended from hanging position at a fixed scale and tested the strength of the force of the muscle groups;

b. the muscles of the back, the assessment tool was an extension of the torso lying ventral contretemps 30" and tested the strength of the force of the muscle groups;

c. the muscles of the feet, the assessment tools were long jump on the place and vertical jump on the place, from the squat and tested the level of force in speed mode horizontally and vertically;

d. cardio-respiratory resistance, the assessment tool was a long run, moderate tempo, over a distance of 1000 m.

Through his formation, the field engineer can work in a wide range of specialized fields, development mostly in open air, his work representing a combination of physical effort with the psychic and intellectual ones. In this profession it is necessary a high level of development of the motor capacities, such as: resistance, strength and coordination capabilities. Along with these physical requirements, the engineer has to answer some requirements of mental and intellectual nature, whose share is particularly high in the profession exercised, such as: General Intelligence, the spirit of observation, psychological resistance, memory, imagination, intuition, quick analysis capacity of information, synthesis capacity, generalization capability of quick combining data, stable, distributive attention and focus.

Results

Analysis activity and motor configuration determination has been carried out on the basis of the scheme (Colibaba-Evuleț, d. and Bota, I., 1998) of the ranking of favorable predispositions developed by the specialists of the branch. Determination of the motor configuration had took into account the characteristics of the professional profile of the field engineer: qualities complexity, abilities and technical skills, variable working schedule, dynamic and static effort, of variable intensities, high demands of large organic functions (systems and apparatus), direct productive work, varied conditions of work in terms of the environment, climate and stress. Training program requirements, depending on the professional profile characteristics, obtained by determining the motor configuration beneficial to the improvement of the physical condition for students in technical education:

- development of optimal physical condition by increasing the level of manifestation of the skills assessed, cardio-vascular stamina, strength and local muscle resistance;

- maintaining/improving health state through the use of means and exercises specific to physical education and sports.

Knowing the importance of various phenomena studied in this research, analyzing general trends but also synthetic and expressive projection of the processes, was achieved through the use of statistical and mathematical-method. Using this method has enabled us to form an accurate and complete picture of the complex phenomena that contributes to developing, strengthening and perfecting the motor capacity. The statistical processing was based on the calculation of the following statistical indicators (Dragnea, A., 1984): the arithmetical mean (\bar{X} , expresses the central tendency of values), median (Med., the position that divides into two equal parts the data string), the upper limit (Max, the superior value of the string), the lower limit (Min, the lower value of the string), amplitude (the difference between the maximum and minimum value), the standard deviation (S, represents the dispersion indicator, the degree of scattering values) and the coefficient of variability (Cv%, the degree of homogeneity of the researched sample).

a. *Abdominal Muscles*

- According to the collected data from *lifting the torso in dorsal recumbent, contretemps 30"* (Table 1) through which we tested the manifestation level of the resistance in strength regime of the abdominal muscularity we can draw the following conclusions:

- The arithmetic mean (\bar{X}) calculated after the initial test (ti) had a value of 23,12 no. repetitions, lower with 2,37 no. of repetitions in comparison with the value of the final test (tf), arithmetic mean that was of 24,49 no.rep. The mean of the data string was at the value of 21 no. of repetitions after "ti" and at a value of 23 no. of repetitions after "tf"; it was recorded a maximum value of 28 no. of repetitions after "ti" and a value of 30 repetitions after "tf"; a minimum value of 19 repetitions after "ti" and a value of 20 repetitions after "tf". The amplitude, the standard deviation and the variability coefficient, both after the initial and the final test, show us a collective with a medium homogeneity and a normal distribution of the results.

- According to the collected data after *lifting the legs extended from hanging position at a fixed scale* (Table 1) through which we tested the manifestation level of the resistance in strength regime of the abdominal muscularity we can draw the following conclusions:

- The arithmetic mean (\bar{X}) calculated after the initial test (ti) had a value of 4,73 no. of repetitions, lower with 2,21 repetitions in comparison with the arithmetic mean value from the final test that was of 6,94 repetitions. The mean of

the data string was at a value of 4 repetitions after the initial test and at a value of 6 repetitions after the final test. The maximum measured value was of 10 repetitions after "ti" and of 14 repetitions after "tf"; the minimum recorded value was of 1 repetition after the "ti" and of 3 repetitions after the "tf". The amplitude, the standard deviation and the variability coefficient, both after the initial and the final test, show us a collective with a medium homogeneity and a normal distribution of the results.

b. Back Muscles

- According to the collected data after *the extension of the torso lying ventral, contretemps 30"* (Table 1) through which we tested the manifestation level of the resistance in strength regime of the back muscularity we can draw the following conclusions:

- The arithmetic mean (X) calculated after the initial test had a value of 18,23 no. of repetitions, lower with 3,33 repetitions in comparison with the arithmetic mean at the final test that was equal with 21,56 repetitions. The mean of the data string was at a value of 16 repetitions, after "ti" and at a value of 19 repetitions after "tf". The maximum measured value was of 21 repetitions after "ti" and of 24 repetitions after "tf"; the minimum recorded value was of 14 repetitions after "ti" and of 16 repetitions after "tf". The amplitude, the standard deviation and the variability coefficient, both after the initial and the final test, show us a collective with a medium homogeneity and a normal distribution of the results.

Table 1

Calculated statistic indicators

Evaluated competencies		Test	Statistic indicators						
			X	S	Cv	Med	Max	Min	W
Abdominal muscles	Lifting the torso in dorsal recumbent, contretemps 30" (no. rep.)	ti	22,12	11,55	13,08	21	28	19	9
		tf	24,49	10,79	14,24	23	30	20	10
	Lifting the legs extended from hanging position (no. rep.)	ti	4,73	8,17	16,74	4	10	1	9
		tf	6,94	10,13	16,01	6	14	3	11
Back muscles	the extension of the torso lying ventral, contretemps 30"	ti	18,23	12,34	16,78	16	21	14	7
		tf	21,56	14,71	15,33	19	24	16	8

Inferior limbs muscles	Length jump from standing position (cm)	ti	200,95	18,95	20,15	197	230	180	50
		tf	218,77	15,15	14,62	214	249	190	59
	Vertical jump from standing position (cm)	ti	24,22	11,52	16,31	22	33	21	12
		tf	30,38	12,21	13,01	26	37	23	14
Cardio-respiratory resistance	Long run over 1000 m (min.)	ti	5,07	6,72	20,44	4,49	4,04	5,29	1,25
		tf	4,39	7,34	16,11	4,30	3,49	5,13	1,36

c. Inferior limbs muscles

- According to the collected data after the *long jump from standing position* (Table 1), through which we tested the manifestation level of the horizontal explosive force, we can draw the following conclusions:

- The arithmetic mean (\bar{X}) calculated after the initial test had a value of 200,95 cm, lower with 17,82 cm in comparison with the arithmetic mean at the final test that was equal with 218,77 cm. The mean of the data string was at a value of 197 cm after “ti” and at a value of 214 cm after “tf”. The maximum measured value was of 230 cm after “ti” and a value of 249 after “tf”; the minimum recorded value was of 180 cm after “ti” and of 190 cm after “tf”. The amplitude and the standard deviation both after the initial and final tests show us a collective with a normal distribution of the results; the variability coefficient presents us a group with no homogeneity after the initial testing and with a medium homogeneity after the final test.

- According to the collected data after the *vertical jump from standing position* (Table 1), through which we tested the manifestation level of the vertical explosive force of the inferior limbs muscles, we can draw the following conclusions:

- The arithmetic mean (\bar{X}) calculated after the initial test had a value of 24,22 cm, lower with 6,16 cm in comparison with the arithmetic mean at the final test that was equal with 30,30 cm. The mean of the data string was at a value of 22 cm after “ti” and at a value of 24 cm after “tf”. The maximum measured value was of 33 cm after “ti” and a value of 37 after “tf”; the minimum recorded value was of 21 cm after “ti” and of 23 cm after “tf”. The amplitude, the standard deviation and the variability coefficient, both after the initial and the final tests, present us a group with a medium homogeneity and a normal distribution of the results.

d. Cardio-respiratory resistance

- Collecting the data from the *long run over 1000 m*, through which we tested the cardio-respiratory resistance, we can draw the following conclusions:

➤ The arithmetic mean calculated after the initial test presents us a value of the arithmetic mean of 5 min 7 sec., lower with 0,28 sec. in comparison with the arithmetic mean after the final test that had a value of 4 min. 39 sec. The mean of the data string was, after the initial test, at 4 min. 49 sec. and after the final test at min. 30 sec. The maximum recorded value was of 4 min. 4 sec. after the initial test and of 3 min. 49 sec. after the final test; the minimum recorded value was of 5 min. 29 sec after the initial test and of 5 min. 13 sec. after the final one. The amplitude and the standard deviation both after the initial and the final one show us a group with a normal distribution of the results; the variability coefficient presents us a collective with no homogeneity after the initial test and a collective with a medium homogeneity after the final test.

Conclusions

1. Physical education and sports activities are constant concerns for all factors responsible for educating younger generations in training, health and bio-motor capacity. That is why it is imperative to know the capacity and the level of expression of physical condition in relation to the characteristics of each professional profile trades, in order to develop effective training programs.

2. In the current economic conditions, whose effects are felt on multiple plans, society is keen to exceed and get to know the phenomena related to accommodating the human conditions and pace of work and life imposed by the development of the society, to establish the measures necessary to ensure the extension of the period of active life, prevention of degenerative processes of the body, of the involution of certain functions due to lack of strain, that is a consequence of movement limitation and physical effort from the work process.

3. The development of physical condition in the lesson of physical education must be carried out on specific ways and means; physical condition development methodology has many specific ways and means that can be used depending on the purpose, the maximum possibilities of the body, sex, training level, youth age.

4. The development of physical condition plays a special role in the achievement of the objectives of physical education undergraduate accounting for significant use of this process; there is no lower age limit for the development of physical condition, there is only appropriate ways and means, intense periods of development and of relative stagnation.

5. Training program requirements, depending on the professional profile characteristics, obtained by determining the motor configuration beneficial to physical condition improvement of students in technical education are confirmed also by the execution of the recognition scheme of the predispositions beneficial to their physical condition during the university physical condition.

6. Determining the motor configuration, beneficial to improving physical condition through the lesson of physical education, is an academic requirement, whereas there is no clear delimitation; its establishment depending on the specific professional profile can ease the binding activity of the instructive-educational motor needs of the future profession.

REFERENCES

- Colibaba-Evuleț, D. and Bota, I. (1998). *Sport games. Theory and Methodic*. Bucharest: Aldin Publishing House.
- Dragnea, A. (1984). *Measurement and evaluation during physical education and sport*. Bucharest: Sport – Tourism Publishing House.
- Finichiu, M. (2009). *Optimizing the physical condition of petroleum students by using the specific means of athleticism during the physical education class*. Bucharest: IOSUD - ANEFS, PhD thesis.
- Finichiu, M. and Deacu, M. (2010). *Physical education and sport class management*. Bucharest: University Publishing House.

