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## STUDY ON IMPROVING FORCE INDICES BY USING APPLICATIVE PATHWAYS AT FIREFIGHTERS LEVEL

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### Abstract

**Objective.** The aim is to elaborate the strategy for assessing the force indices at the level of firefighters, following the implementation of the various applicative pathways contributing to the strengthening of health, the appropriation of skills and the useful driving skills in physical activity as well as those necessary for carrying out the specific intervention activity.

**Methods.** In the actual research, 28 subjects participated in the Emergency Inspectorate Country of Bârsei Brasov, group I-up to 30 years and group II-from 31 to 35 years, mixed groups. The study took place for a period of six months, being of experimental type, with two tests (initial and final).

**Results.** Motor quality of the force knows a significant increase in the values recorded during the two tests carried out. The differences between the results achieved have significant values in most items.

**Conclusions.** The results have shown that the applicative pathways used for force development are effective.

**Key Words:** force, applicative pathways, firefighters.

### Introduction

The basic concept of physical education is to initiate and guide permanently in order to form a well-correlated system of knowledge, motivations, skills and abilities to use systematically, consciously and independently the means of physical education as well as to lead a healthy way of life throughout their lives.

In essence, physical education consists of a set of actions that contribute to the development of the personality of man by enhancing his psychophysical qualities and by ensuring a balance between them (Călin, 1996 și Epuran, 1994)

Dragnea and Bota, 1999, states that a good physical condition can mean more things, it can mean the ability to perform various physical activities, or it can mean the right amount of strength and energy, being a synthesis of the ability to move. Assessing the physical condition of each individual is important through its components that can be of great

The different studies present the physical condition as a capacity of the whole body and its systems to respond efficiently all the time (Corbin and Lindsey, 1985). Physiological synonym with physical condition (Epuran, 2005), and Ulrich, 2000 the capacity of the human body to worked with force and liveliness, without exaggerated fatigue, with enough energy to engage in leisure activities and to prevent physical stress.

Being in shape means a state of maximum exercise capacity of the body, achieved through training, discipline, sports life, etc.

To be a good firefighter in the workplace, candidates are required to carry out a series of events that simulate fire-fighting activities that depend on the physical abilities required.

These activities include response time, hand-arm firmness, manual dexterity, limb coordination, response orientation, rate control, static resistance, precision control, strength, near vision, dynamic strength, trunk strength, flexibility, depth of perception, auditory attention, gross body coordination, gross balance, and vision away.

The physical fitness program provides candidates with the information they need to improve the level of physical condition by conditioning the individual muscles involved in tasks performed by firefighters.

The actuality of the study was based on the investigation of the prophylactic effects outlined in the application paths, which are beneficial to the improvement of the physical condition at the level of the firefighters.

The research issue was varied the scientific demonstration allows to know the favorable effects of physical exercises in developing the most effective applicative pathways that engage all the individual qualities and practical utilitarian skills of the individual.

At the firefighters' level, physical condition has been and remains one of the most important

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segments of training without which the formation of military cadres can not be conceived.

Being a complex profession, requiring professional skills supported by well-defined performance and well-defined human qualities where the level of training in physical education is determinant the firefighter obliged to maintain its physical condition at the highest level for to successfully carry out the tasks entrusted to them and to have a constant and efficient return for a long time.

Starting from the firefighter's professional obligations, it is supposed that its performance is conditioned by a very good state of health, great mobility and much willingness to overcome various obstacles, a strong resistance to stress, and to their strengthening physical education brings substantial input. Therefore, the physical education of the firefighter becomes as important, indispensable as.

This explains why, from the moment of the selection of cadres, the level of physical fitness is required as one of the basic criteria that be fulfilled by any person who has the right to become a firefighter.

#### **General objectives of physical condition**

The fundamental objective is to create a good physical condition, a well-being for the human organism.

The state of well-being is be determined by several factors: health, physical condition, quality of life, degree of adaptation to the physical and social environment.

The general objectives of the physical condition are:

- optimizing physical condition by developing strength, speed, power, joint mobility and muscle elasticity, strength, balance, coordination, suppleness;
- Optimization of functional support of the physical condition: respiratory system, cardiovascular system, metabolic processes, central nervous system, immune system;
- Optimizing body structure and shape: lowering body fat relative to body weight, adapting body shape to personal requirements;
- Spiritual optimization: self-image and positive thinking trust in one's own, inter-human relationship according to social requirements.

#### **The benefits of the physical condition on the body.**

Physical exercise and sport are permanent means of preserving health, increasing work capacity, and extending lifespan. Regular exercise regularly obliges the body to move.

The movement in turn intensifies all the activities in the body: blood circulation in the lungs and other organs, breathing, nutritional changes in the tissues, excretion processes, bleeding cleansing harmful substances resulting from cellular combustion etc.

Lack of movement hampers the normal course of biological processes, which negatively affects the body's health and resistance to pathogens. Movement improves the nutrition of tissues and cells, which leads to the growth and development of organs, to increasing their.

First, it improves heart activity. The heart muscle trained by regular exercise and increasing intensity expels more blood than the uncharged heart to each systole. He does not get tired during higher physical effort so quickly as the unshaven muscle and returns to the normal state sooner after the effort

Secondly, the activity of the lungs is improved. During physical exercise, the lungs breathe more frequently and more widely to cover the increased oxygen requirements in the muscle. It is known that at rest, the lungs dial about 16 times per minute, during which they pass through them about 8 liters of air. In the case of intense physical efforts (heavy work, fast running, swimming, etc.), the amount of air that passes through the lungs in one minute is much higher.

As the heart has to be trained to cope with excessive efforts, by increasing the cardiac muscle contraction power and the lungs must trained to breathe more vigorously, allowing for greater ventilation over that unit of time.

Without this workout, heavy physical activities can not be performed, because the lungs can not provide increased oxygen. Exercise in the open air, as well as special training sessions for athletes, are effective means of preparing the respiratory device for the new tasks subjected to the body.

The applicative pathways are part of the category of means of action on motricity with the aim of developing/educating skills and driving qualities.

They are effective in forming and developing motor skills, educating/developing motor skills, and understanding their importance, usefulness and necessity in building the ability to use motor skills in unforeseen day-to-day situations in general work.

One of the objectives of physical education is the development - the education of the motoring qualities that can accomplished by using as a means of education in the specific training lesson of the applied paths.

This means that the teacher can choose the exercises, the forms and the time allocated to the execution, the appliances used, etc., the levers

necessary for the development of the motoring qualities. The content of the application path offers the possibility to act on the proposed indices to improve selectively and efficiently.

Improving the fire-fighting ability of motorists by systematically repeating paths and application-utility courses in the specific training course creates a close link between the formations of as much baggage as possible with motor skills combined with the most advanced driving skills (Cioroiu, 2013).

„The applicative pathways are combinations of specific, non-specific and acrobatic application exercises arranged in a logical order. In the elaboration of the application paths, the particularities of the age and the level of training of the performers are respected and the elements that make up them must be known, allowing the choice of the most appropriate method of solving the concrete task imposed by the" (Niculescu, 2012, p. 111).

„The applicative pathways consist of trails with and without obstacles made up of practical application exercises, specific and non-specific gymnastics, combined and applied in very varied forms.

These exercises aim at educating basic motor skills, motor skills, but also judgment, presence, spirit, courage, spatial orientation, etc. They are accessible to different age groups, sex and level of training” (Damian, 2002, p. 116).

### Methods

The research, was carried out between 15.09.2016 and 31.04.2017 at the Emergency Situations Inspectorate Barsa, Braşov and included two tests: initial testing and final testing. Initial testing was performed on September 15, 2016, and final testing on April 31, 2017.

The tests were be done over a year, and the comparison was be made between the two groups of the experiment, namely the experimental group and the control group.

By implementing the planned training program, the evolution of the subjects over time on the development of the force indices and motor skills useful in the physical activity, as well as those necessary for carrying out the specific activity of intervention.

The practical application specific intervention includes the following workshops:

Workshop 1. Running speed 10m (fig.1)

Figure 1. Workshop 1



Workshop 2. Movement on beam with two type B hoses



Figure 2. Workshop 2

Workshop 3. Bypassing the two B-type hoses



Figure 3. Workshop 3

Workshop 4. The rolling of the rubber (females 2 executions, males 4 executions);



Figure 4. Workshop 4

Workshop 5. Crawling through the tunnel



Figure

5.

Workshop 5

Workshop 6. The fence escalation;



Figure 6. Workshop 6

Workshop 7. Harnessing the victim;



Figure 7. Workshop 7

Workshop 8. Climbing on the rescue scale;



Figure 8. Workshop 8

There are many useful variants, some interesting and even beautiful, but their application requires first of all a perfect understanding and knowledge of them, to select what is needed, taking into account the objectives and collectively.

Application exercises are characterized by their special importance, besides the formation of the skills of applicative character they also have a multilateral influence on the whole body, contributing to the development of force, speed of reaction execution, resistance, skill and spirit of competition (Nechita, 2017).

### Results

Starting from the idea that the prepared training program is a complex system, consisting of a large number of operational systems, we have to come to the conclusion that, in order to achieve the expected effects in the increase of the indices of force, we must pay special attention to the objectification.

The information used in the training was multiple and diverse with methodological essentials, using training programs from initial testing to final.

**Table 1.** Statistical values recorded at initial and final testing - to analyze the application pathways

Group	X		SD	
	Ti	Tf	Ti	Tf
Group II males(sec)	3,62	3,22	0,57	1,35
Group I males(sec)	3,41	3,11	0,51	1,22
Group II females(sec)	3,57	3,19	0,55	1,29
Group I females(sec)	3,33°	3,14	0,49	1,21

**Table notes:** Ti- initial test, Tf – final test, X - arithmetic mean, SD - standard deviation

In Table 1, group I scored an average of 3"41 in males and 3"33 in females at baseline testing, and in final testing of 3"11 in males and 3"14 in females, compared with the results of the 2nd group. At the second group where the Ti., results were 3"62 in males and 3"57 in females and in Tf. only 3"22 meters in males and 3"19 meters in females.

These values present a relevant approach in the specialized training, an approach that allows us to reach or even exceed the set goals.

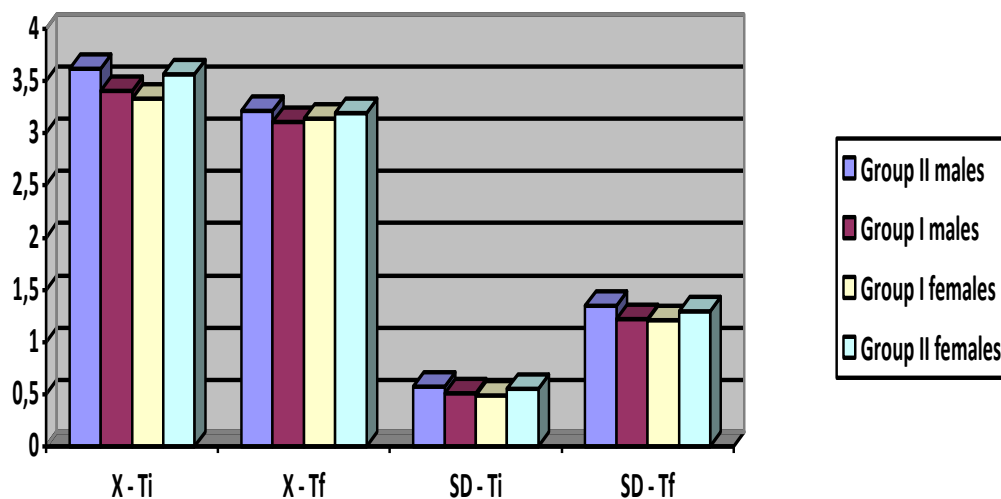


Figure 8. Test statistic values and their difference in males-females



### Discussion

The documentation made for the scientific substantiation of the research approach highlighted the existence of some methods and techniques for assessing the motor quality - the force aimed at improving the physical condition of this category - the fire

Objective of the specialized training makes it possible to optimize the didactic strategy at all its components: methods, means, materials, organizational forms, etc. The recording of the values of force indices during the training year favored the correct methodological guidance of specialized training on this component.

The results obtained by the subjects of the experimental research in the required samples constitute arguments in favor of the use of this training and their analysis, of this key element in the specific action of the firefighter.

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