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Original article

MAINTENANCE OF MOTOR CAPACITY DURING THE COLD SEASON OF MILITARY PUMPS IN ADDITIONAL MEANS

CHIRAZI MARIN¹, LOLUȚĂ ADRIAN-GABRIEL²

Abstract

Objective. The purpose of this research was to identify new ways to maintain the physical effort of operative personnel in emergency professional structures (military firefighters) during the cold season (winter) and adverse weather conditions that do not allow a good deployment of the specialized physical training within the subunit.

Methods. The study was conducted over a period of 4 months (November 2018-February 2019) and had a staff shift (about 40 military cadres) to which a set of means adapted from the force drills, specific to bodybuilding. The military personnel involved worked fully equipped with individual protection equipment (nomex waterproof suit, boots / intervention boots, safety belt, helmet, protective gloves and Dräger compressed breathing apparatus). Methods of research used during the above-mentioned period are: the study of the specialized literature, the direct observation, the experimental, the comparison, the statistical-mathematical analysis.

Results. During the experiment, an increase in motor potential and an improvement in some physiological parameters (cardiac rhythm, reduction in air consumption of cylinders of compressed air breathing apparatus from 120 atm. to 80 atm.) was observed during the experiment.

Conclusions. Following the motor cycle conducted and carried out in the unit's powerhouse during the cold season as well as when the weather conditions are unfavorable, we can say that the staff in the shift does keep the driving capacity at the normal parameters for carrying the end of the missions entrusted. In this case we can say that the exercises and the designed circuits, as well as the conditions in which they were performed, can maintain / realize the optimal level of physical training of the military firefighters.

Key Words: firefighting, motorized capacity, powerhouse, equipment, appliances.

Introduction

Physical education and sport in the Ministry of Administration and Interior are components of the continuous training and education process of the staff and are executed in order to orient the physical activity towards the formation and development of the motor capacity and psychological qualities of the cognitive, missions entrusted. (O.M.A.I 154/2004)

Physical education is one of the main activities to support the accomplishment of the tasks and missions of the ministry staff. (Torje, 2005).

The physical training of military personnel within the emergency services structures and subunits subordinated to the "Nicolae Iorga" Emergency Situations Inspectorate of Botoșani County is planned, organized and carried out in order to ensure the fulfillment of the tasks and missions according to the competences conferred by the law.

One of the basic factors for many driving actions is physical exercise capacity, which generally means the

body's ability to provide the highest possible mechanic and maintain it as long as possible.

The physical capacity testing methods, a type of effort (aerobic, anaerobic) in one or more driving actions are numerous and identical, very demanding, requiring special equipment.

The cardiac frequency gives us very valuable indications for the qualitative assessment of the quantitative effort as follows:

- a heart rate below 130 pulses per minute indicates a pure aerobic effort;
- a heart rate of between 130-170 pulses per minute marks an aerobic predominant effort with a corresponding increase in the anaerobic rate approaching 170 pulses per minute;
- a heart rate above 185 pulses per minute indicates a predominantly anaerobic effort

Although this method is simple, it provides us with near-truth results, on the basis of which we can establish concrete measures to ensure the intensity of

¹Alexandru Ioan Cuza" University of Iași, Romania

²State University of Physical Education and Sport, Chișinău, Republic of Moldova

E-mail address: lolutaadrian@yahoo.com

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the effort at all the main moments of the physical training sessions.

Hypothesis:

We assume that performing exercises of force in equipment specific to operative interventions is an alternative to accomplishing the physical training of specialty in the cold season.

Methods

The study was conducted over a period of 4 months (November 2018-February 2019) and had a staff shift, about 40 military cadres (*Law 80/1995*) from the Botoşani Fire Department of the Emergency Situations Inspectorate " Nicolae Iorga " of Botoşani County to which a set of means adapted from the force drills , specific to bodybuilding. The military personnel involved worked fully equipped with individual protection equipment (nomex waterproof suit, boots / intervention boots, safety belt, helmet, protective gloves and Dragger compressed breathing apparatus).

Methods of research used during the above-mentioned period are: the study of the specialized literature, the direct observation, the experimental, the comparison, the statistical-mathematical analysis. (*Chirazi, 2002*).

In order to maintain the capacity of the personnel, it is necessary to carry out training sessions in conditions as close as possible to the specifics of the interventions, involving all the operative personnel who have the obligation to go through the motorized trails.

Illustrations

A. Conditions for conducting a training and evaluation circuit:

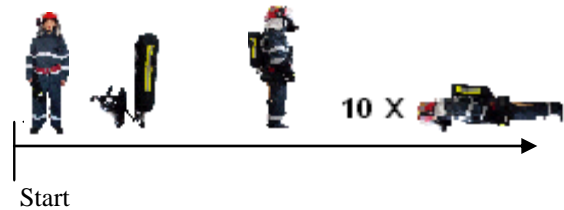
The circuit consists of passing 8 samples, which must be continuously and consecutively performed in

To achieve the circuit, the performers wear and use all the equipment: nomex waterproof suit, boots / protective boots, protective gloves, safety belt and compressed air breathing apparatus.

Before the circuit starts, the sports instructor checks the equipment of the personnel as well as the air reserve.

Moments of deployment circuit:

1. Equipment with apparatus and the air mask and makes a number of 10 flotations on the ground.



2. The firefighter runs on the treadmill 100 meters.



3. Makes 5 tractions on the fixed bar or multifunction device



4. Riding on a bicycle 30 sec.



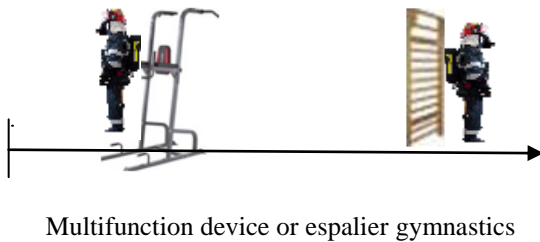
5. The fireman makes a series of 10 dumbbells of 5 kg or set disc bar 10 kg.



6. Driving and roll 2 medicinal balls of 7 kg among the stakes over a distance of 10 meters.



7. From hung up with knees to chest 10 repetitions.



8. Transportation of a manechin on the stairs of gym.



B. Running the training and evaluation circuit

- at the "start" command, the evaluator starts the timer and the firefighter begins the execution of the tests in the order shown below;
- during the performance of the tests, the evaluator may encourage the fire brigade to complete the circuit, emphasizing that the 5 m walking between the samples is introduced into the circuit to allow the performer to rest;
- after completion of all circuit tests and as soon as the firefighter has reached the end line, stop the

stopwatch and record the final time of the examination;

- the assessment consists in reporting the final time of the examination at the following scales according to the table.

Results:

During the experiment, an increase in motor potential and an improvement in some physiological parameters (cardiac rhythm, reduction in air consumption of cylinders of compressed air breathing apparatus from 120 atm. to 80 atm.) was observed during the experiment.

To illustrate the efficiency of the motor cycle during the cold winter season in the gym we can show that, following this systematic exercise program, the state of the systems and devices involved in the effort is improved as follows:

- heart rate restraints and blood pressure are low;
- the heart of a trained firefighter pushes the blood into the arteries, at each beat, in an amount of 80-100 cm³, while the untrained one only 50-60 cm³
- at an equal effort, the heart rate of those trained is lower than the non-trained;
- the period of return of cardiac frequencies to a normal physical exercise is shorter for the trainees than for the non-trained.

Conclusions.

Following the motor cycle conducted and carried out in the unit's powerhouse during the cold season as well as when the weather conditions are unfavorable, we can say that the staff in the shift does keep the driving capacity at the normal parameters for carrying the end of the missions entrusted. In this case we can say that the exercises and the designed circuits, as well as the conditions in which they were performed, can maintain / realize the optimal level of physical training of the military firefighters.

Table 1. Scales for verification the level of motor capacity of military firefighters

Performance / time - min.	Basic note	Note / Qualification / Pulse		
		10 / Ex. / < 170	9.75 / B / 170 - 180	8.75 / B / > 180
- 5.00	10	10 / Ex. / < 170	9.75 / B / 170 - 180	8.75 / B / > 180
5.00 – 5.10	9,75	9,75 / B / < 170	8,75 / B / 170 - 180	7,75 / B / > 180
5.11 – 5.20	9,50	9,50 / B / < 170	8,50 / B / 170 - 180	7,50 / B / > 180
5.21 – 5.30	9,25	9,25 / B / < 170	8,25 / B / 170 - 180	7,25 / B / > 180
5.31 – 5.40	9,00	9,00 / B / < 170	8,00 / B / 170 - 180	7,00 / B / > 180
5.41 – 5.50	8,75	8,75 / B / < 170	7,75 / B / 170 - 180	6,75 / C / > 180
5.51 – 6.00	8,50	8,50 / B / < 170	7,50 / B / 170 - 180	6,50 / C / > 180
6.01 – 6.10	8,25	8,25 / B / < 170	7,25 / B / 170 - 180	6,25 / C / > 180
6.11 – 6.20	8,00	8,00 / B / < 170	7,00 / B / 170 - 180	6,00 / C / > 180

6.21 – 6.30	7,75	7,75 / B / < 170	6,75 / C / 170 - 180	5,75 / M / > 180
6.31 – 6.40	7,50	7,50 / B / < 170	6,50 / C / 170 - 180	5,50 / M / > 180
6.41 – 6.50	7,25	7,25 / B / < 170	6,25 / C / 170 - 180	5,25 / M / > 180
6.51 – 7.00	7,00	7,00 / B / < 170	6,00 / C / 170 - 180	5,00 / M / > 180
7.01 – 7.10	6,75	6,75 / C / < 170	5,75 / M / 170 - 180	4,75 / NC / > 180
7.11 – 7.20	6,50	6,50 / C / < 170	5,50 / M / 170 - 180	4,50 / NC / > 180
7.21 – 7.30	6,25	6,25 / C / < 170	5,25 / M / 170 - 180	4,25 / NC / > 180
7.31 – 7.40	6,00	6,00 / C / < 170	5,00 / M / 170 - 180	4,00 / NC / > 180
7.41 – 7.50	5,75	5,75 / M / < 170	4,75 / NC / 170 - 180	3,75 / NC / > 180
7.51 – 8.00	5,50	5,50 / M / < 170	4,50 / NC / 170 - 180	3,50 / NC / > 180
8.01 – 8.10	5,25	5,25 / M / < 170	4,25 / NC / 170 - 180	3,25 / NC / > 180
8.11 – 8.20	5,00	5,00 / M / < 170	4,00 / NC / 170 - 180	3,00 / NC / > 180
8.21 -	1,00 – 4,99	4,75 / NC / < 170	3,75 / NC / 170 - 180	2,75 / NC / > 180

Grille for transformation notes in the ratings:

- Exceptional - E = 10
- Very good - FB = 9,00 - 9,99
- Good - B = 7,00 - 8,99
- Suitable - C = 6,00 - 6,99
- Mediocre - M = 5,00 - 5,99
- Incorrect - NC = 1,00 - 4,99

Indices Ruffier:

- Very Good (FB) < 1;
- Good (B) 1-5;
- Medium (M) 5 - 10;
- Satisfactory (S) 10 - 15;
- Unsatisfactory (NS) > 15.

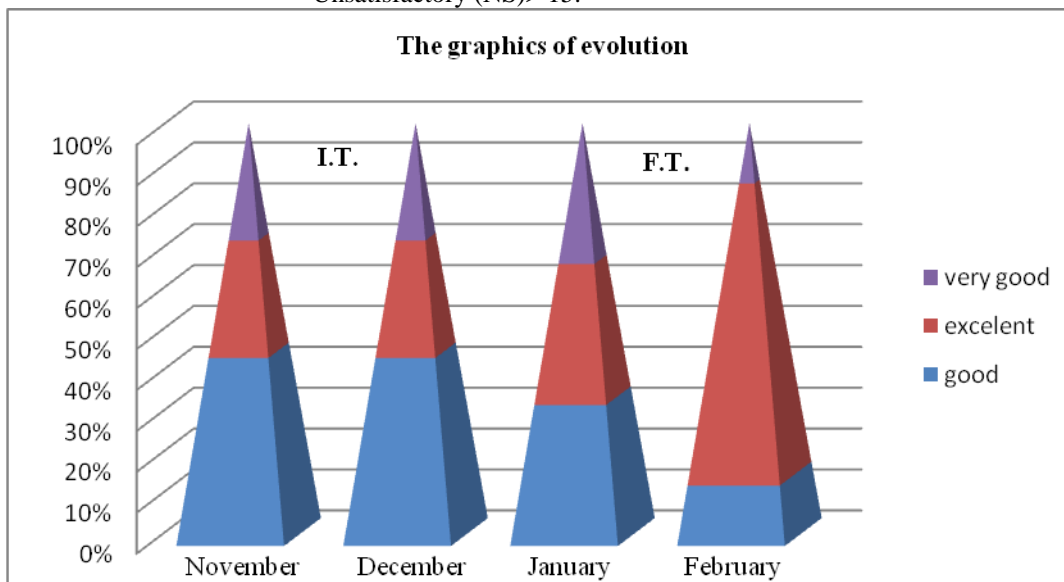


Figure 1. The evolution of results on firefighters IT, initial testing; FT, final testing in 4 month (November 2018 - December 2018- January 2019 - February 2019).



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