

THE PSYCHOPHYSICAL ROLE OF ATHLETIC PREPARATION FOR FIREFIGHTERS

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ABSTRACT

Have a good fitness is important in many workplaces, it is essential in a firefighter, and in order to do your job properly, and in order to avoid a risk to your life and the lives of others.

Found that Italian law does not provide for the daily working hours of the firefighter, hours of sports activities but leaves the choice up to the individual whether or not to maintain a good physical fitness, our work suggests as a physical preparation of the firefighter to achieve collectively and to provide for mandatory barracks may have a role in psycho-social imperative.

Key words: Fitness, firefighter, physical training, training, aerobic workout

INTRODUCTION

The activities carried out by the Fire Department is atypical, very dangerous and generally considered an arduous profession.

The scenario of the interventions is never the same even if they are called for apparently same reasons. The blaze up of a fire elicits physiological and behavioral reactions in the operator, since the operator is not able to know a priori the gravity of the situation that he will face. Most of the interventions require the use of aerial ladders with which firefighter can reach considerable heights, situations where its attention and concentration must be at maximum ⁽¹⁾.

For firefighters, these situations involve a commitment on the physical plane that can be both of aerobic and anaerobic type.

In 2011, was published a review on cardiovascular risk in firefighters, with the behalf of the Health Service of several Fire Departments ⁽²⁾.

From the results is a discrepancy between the risk of ischemic phenomena, due to sudden efforts in adverse environmental conditions, and the type of screening they undergo during regular medical visits at the Fire Department ⁽²⁻⁷⁾.

Must be borne in mind that the type of physical performance carried out by firefighters can also affect cognitive domains, primarily attention ⁽⁸⁻¹¹⁾.

The physical efficiency of the firefighters is strongly considered when determining their recruitment, but becomes a not primary factor after their admission ⁽¹²⁾. The practice of motor activity in constant and adequate form by firefighters allows the maintenance of an effective and efficient fitness, so to ensure the maintenance the prestational levels present at the moment of their entrance into the Fire Department ⁽¹³⁻¹⁵⁾.

Unfortunately, the Italian laws do not provide for firefighters in service programs of physical activity adequate to maintain an optimal fitness. The preservation of efficient physical performances is entrusted to the single firefighter, who should devote himself to working extra hours in the maintenance of its fitness.

This study is intended to suggest an annual program of physical training for a FD with the aim 1) to improve the physical fitness of subjects and 2) to ameliorate the mood disturbances of the firefighters.

MATERIALS AND METHODS

Participants

Twenty-five adult male firefighters, aged between 27 and 42 years, agreed to participate in the study, of which 14 have carefully followed the training protocol proposed (experimental group) and 11 chose not to run any specific training protocol (control group).

These individuals were chosen through a random selection process carried out within Fire Departments of Sicily.

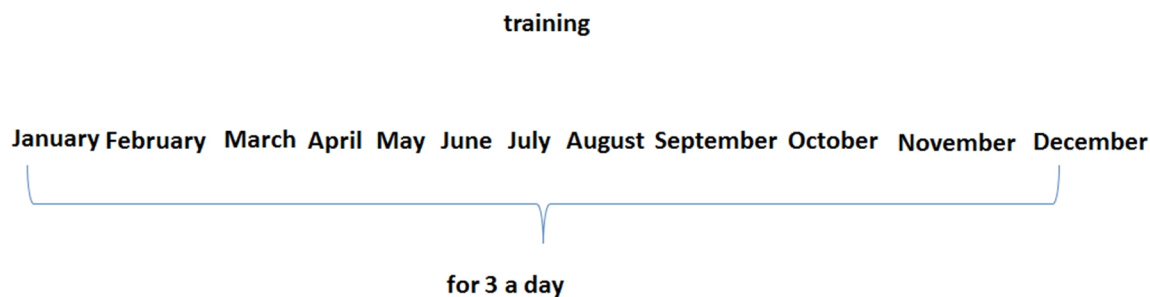
Table 1 shows the anthropometric characteristics of firefighters belonging to the two groups at beginning of the study.

	Age (years)	Weight (kg)	Height (cm)	BMI	VO ₂ max mlO ₂ /min/kg
Experimental Group	35.57 ± 4.57	79.29 ± 4.43	174.57 ± 4.83	26.00 ± 0.34	51.07 ± 4.29
Control Group	35.36 ± 4.37	80.82 ± 5.34	175.09 ± 4.89	26.33 ± 0.58	51.45 ± 3.88

Training Protocol

The training protocol provides bodyweight exercises, without the use of any equipment, to be practiced according to the season both outdoors and indoors, in order to increase the efficiency of muscles and joints, but does not require a disproportionate effort.

We provide three weekly meetings for a period of 9 months, to be distributed over the year (see Figure 1).



The annual plan provides three meetings a week, for a period of nine months, as follows:

- I ° PERIOD: two months
- II PERIOD: four months
- III PERIOD: three months

I ° PERIOD (two months), PHYSICAL TRAINING:

- **10 minutes** joint exercises for shoulders, neck, hips, knees and ankles;

- **20 minutes** with hops and without change of pace (slow - fast - slow), followed by several series of impulses of the upper and lower limbs;

- **15 minutes** of walking and running;

- **10 minutes** to return to calm through relaxation exercises (supine, breathing exercises with simultaneous measurement of the heart rate).

to devote to physical rehabilitation with relaxation exercises: starting from the supine position (the lower limbs placed on a raised floor) deep breathing exercises are performed by checking their heartbeat through the radial artery (wrist) or carotid (neck). The time taken to return to normal determines the physical condition of the subject.

- II PERIOD (four months), PHYSICAL TRAINING:

- **5 minutes** exercises for the upper and lower limbs, combined with exercises for the maintenance of joint mobility;

- **15 minute** ride continued on an individual basis;

- **5 minutes** of relaxation technique that you get with respiratory activity driven;

- **30 minutes** of exercises to strengthen the muscles of the lower limbs and trunk using all the equipment supplied (stage edge, small weights back).

- III PERIOD (three months), PHYSICAL TRAINING:

The training must be individualized, considering the morphological characteristics, the age and the actual tasks that plays the VF and to be performed within the administration.

Shall be deemed an integral part of physical training on food hygiene issue.

In summary:

All training takes about an hour can be done, even individually, in respect of the technical program:

5 ' - exercises flexing of a general nature;

20 ' - to devote to ride individualized form;

5 ' - to devote to the "relaxation technique";

20 ' - mixed between joint mobility exercises and strength training according to individual needs.

It is also advisable to perform physical activity during the early hours of the morning, if not possible, even in the afternoon at a distance of a few hours from the main meal.

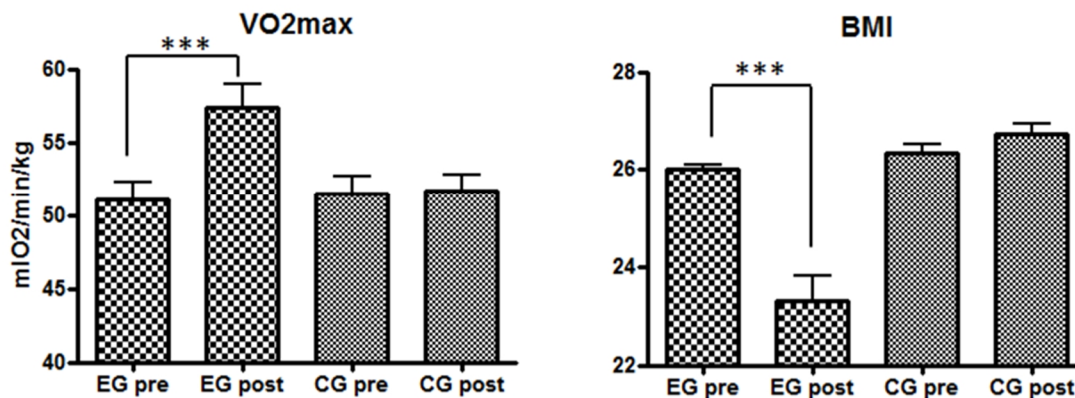
Mood Measurement

Overall mood disturbance was evaluated by using the Profile of Mood States (POMS); in the present study we used an abbreviated 30-item version of the POMS developed by McNair et al²⁶. Respondents rate each

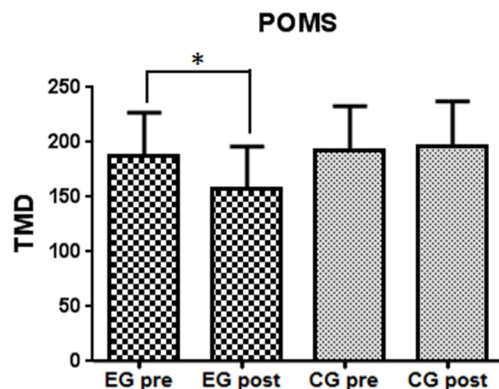
item on a 5 point Likert scale with anchors ranging between “Not at all” to “Extremely”. Different items are combined to form six separate subscales: tension-anxiety (T), depression-dejection (D), anger-hostility (A), vigor-activity (V), fatigue-inertia (F), and confusion-bewilderment (C). For each subscale, raw scores were subjected to T-score transformations using the following formula: $T = 50 + 10 (n - m) / s$, where n = raw score; m = mean; s = standard deviation. This transformation converts raw scores to scores on a standard scale with a mean value for the single subscale of 50 ± 10 ²⁷. The subscale T-scores can be combined to form an overall measure of affect, the Total Mood Disturbance ($TMD = T+D+A-V+F+C$), useful for a global estimation of affective states.

RESULTS

The main results on body mass and aerobic power are summarized in Figure 2 showing, on the left the changes in VO_{2max} and on the right of BMI, before and after the training program, for firefighters belonging to experimental group (EG) or control group (CG).



As can be seen, whereas the firefighters of the experimental group exhibit a significant increase ($p < 0.001$) of VO_{2max} and a significant reduction ($p < 0.001$) of BMI, those of control group do not show any significant change for both parameters.



Concerning the measure of mood disturbances with POMS, Figure 3 shows that the firefighters of the experimental group exhibit a significant reduction of Total Mood Disturbance (TMD), whereas those of control group do not show any significant change.

CONCLUSION

The present study has demonstrated that a specific training protocol, proposed and tried for almost a year on a group of firefighters, has proved to be capable of improving the BMI and, above all, the maximum aerobic power (VO_{2max}) of the subjects. Furthermore, this training protocol was capable to ameliorate del mood disturbance of the studied firefighters.

It is therefore clear that, if in the future we want to select the operating personnel which, in addition to being free from pathologies in progress, has as main requirement a level of physical efficiency over time adapted to the tasks required to a modern firefighter, it is necessary to pay special attention, quantitatively and qualitatively, to the physical activities carried out during the years of service⁽¹⁶⁻²⁰⁾.

It would be desirable, in the Fire Departments, that the guarantee of ensuring an adequate level of physical activity become a priority. This will be achieved not only through constant guided physical activity, but also through periodic assessments of the efficiency's level of individual firefighters. The final goal should be the acquisition of an important feedback for monitoring the physical conditions of the operating staff.

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