

## Efficiency of Stretching to Prevent Injury in Military Police Runners

Leonardo Gomes Ferreira\*

University Veiga de Almeida, Physical Education Teacher Post graduate in Training, Military Police of the State of Rio de Janeiro-PMERJ, Brazil

\*Corresponding author: Leonardo Gomes Ferreira, University Veiga de Almeida/Physical Education Teacher Graduate Sports Training, Military Police of the State of Rio de Janeiro, Fitness program-PMERJ, Brazil, Tel: (21) 97646-2600; E-mail: [leoespecialista@hotmail.com](mailto:leoespecialista@hotmail.com)

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### Abstract

The objective of this study was to verify if there have been changes in the indices of injury of corridors of State military police of Rio de Janeiro, crowded in, which combined sessions 7Bpm undertake dynamic stretching. The sample consists of 92 officers, aged 23 and 45 years. Measure the anthropometric data regarding (weight and height) time in practicing physical activity, food and sex. Each exercise session will be held in a progressive intensity of 60 to 85% of maximum heart rate (HR), in the first two weeks (pre-test) and in the last two weeks (post-test). Activities were held 4 times per week for 1 month, within 45 minutes controlled by FC volume 10 (1980). Descriptive statistics was used, through the Chi-square test for independent samples. Based on the results there was significance ( $p < 0.05$ ), and relationship between the practice of stretching and injury prevention 0.1% (0.001).

### Keywords:

Stretching; Injuries; Physical conditioning.

### Introduction

Historically have always been made inquiries about the scientific activity that involves muscle stretching [1] these exercises often are updated before and after the physical, be they recreational or targeting endurance. One realizes that, in different places of the world, individuals perform stretching and heating with preparation for the main physical exercises. Over the years, such exercises were put as a practice that improves performance and reduces the risk of injury. Although this argument, is controversial, since recent publications question conventional use proceeding exercises [2-4].

Besides the injury reduction capacity questioned, a chance to improve physical performance is also very used to support the practice of stretching. Although studies find no relationship and performance loss. Hobara et al., several studies have shown that muscle initiative update seems to bring negative results to performance, especially when activity requires high demand of energy and force [5-7].

There are three types of stretching to increase flexibility: ballistic stretching and proprioceptive neuromuscular facilitation, static (FNP). The static stretching, also called passive, is the method by which the muscle is stretched slowly, until you get a slight tension (comfortable and pain-free), where this position is maintained for a few seconds. Stretching should be slow and extended in order to avoid the stimulation of neuromuscular spindle, thus avoiding the reflex contraction, and, in addition, exercise stress on the Golgi Tendon Organ that produces inhibitory stimuli to the elongated muscle contraction [8,9].

The understanding of the effects of an acute session of stretching in other physical capacities is fundamental to fitness training prescription with complex sessions, as well as in rehabilitation programs, preventing possible negative effects on subsequent capacity [10]. The acute stretching may influence on the production of force on different

tasks and sports performance. This phenomenon is called elongation-induced strength deficit (DFIA) [11,12]. The DFIA may be related to dose-response by training, like stretching (static, dynamic or FNP) [13] or special muscle characteristics (types of fibres) and may last between 6 to 90 minutes [14].

There are two evidence to explain this phenomenon: (1) Neural factors with decreased muscle activation, change of motor control strategies, inhibition effect of the central nervous system and decrease sensitivity of the articular proprioceptors [15] (2) mechanical factors such as decreased stiffness-muscle tendon that can affect the length-tension curve and/or speed rate of shortening of sarcômeros [16,17].

Evidence in studies has shown that stretching before exercise or sports practice reduces the isometric strength or dynamic, electromyographic (EMG) activity or mecanomiográfica (MMG) [18].

The peak torque concentric, besides reducing the heel height, rate of force development and Sprint spike in athletes [2]. However, some studies do not indicate these reductions of strength, EMG or MMG [19].

Therefore, the objective of the present study was to examine whether the dynamic stretching presented changes in indices of injury of military police runners who effected the stretching sessions.

### Materials and Methods

For carrying out this research was requested from the Comandante of 7BPM (seventh battalion of military police of the State of Rio de Janeiro), Colonel Fernando Salema, via trade, data for field research. The survey was composed of 92 military police; within the requested inquiries were: what interests to make the practice of the activity; questionnaire prepared by the author and validated by teachers, to check the reflection of the subjects in the study, in relation to the practice of physical activity referenced health. The survey was

conducted in 04 weeks, often 04 days a week and approximate duration of 45 minutes. Each exercise session was performed in a progressive intensity of 60 to 85% of maximum heart rate (HR) in accordance with the suggestions of the American College of sports medicine (1987). The intensity will be controlled by verifying the FC training, as the proposition [20].

Each phase of training was composed with the following parts: muscle activation of 5 minutes, with position offsets in cones, stretching the main muscle groups, dynamic type 15 to 20 minutes, consisting of global elements, on track and plans front, sides, DV (prone position), DD (dorsal decubitus), regeneration pós-aeróbico about 5 to 10 minutes, using regenerative exercises back calm (test group) the (control group), will not stretch.

The anthropometric data as (height and weight), time in that practice physical activity, food, sex, will be collected in 7BPM/PMERJ, on the premises of the fitness program, in the first two weeks (pre-test) and in the last two weeks (post-test). So measure the body mass (MC, kg) using a balmak scale accurate to 100 g; stature (cm), through wall stadiometers with precision of 0, 1 cm, according to the procedures of [21].

To achieve the proposed objective, the statistical treatment by means of descriptive statistics Qui equation. Square to the treatment with the significance level  $p < 0.05$ . The data will be computed via Microsoft Excel 2010.

## Results and Discussions

The test result between pre to post-test and discussion concerning definitions focus on practice of stretching before exercise and preventions of lesions are presented in Table 1.

Group	Injuries		All
	Yes	In	
Stretching	7	39	46
Not stretch	20	26	46
All	27	65	92

**Table 1:** Sum of the ratio of individuals of the test group and control group.

FORMULA QUI. QUADRADO	
$X^2 = N(ad-bc)^2$	
$m_1 \ m_2 \ n_2 \ n_2$	

**Table 3:** Table calculation Qui. Square

The present study showed that the effect of power loss and injury prevention, had effects on acute lengthening in mio changes, electrical studies show fall of muscle strength, but without changes in EMG signal or mecanomiográfico of the muscles studied, suggesting changes in the muscle-tendon units corroborating with the study of [26]. However, few studies involving treatment and injury prevention in military police discuss these practices of stretching. The implications from study, in front of a fitness program, based on the

It was found through the Table 1 that, subject to the rates of injuries, a significant difference, with the probability of this event have occurred just by chance  $p < 0.05$ , corroborating the findings of [22] that passive stretching in groupement of isquiotibial provided greater muscle stabilization. Upon the dichotomous responses of independent samples the occurrence of dry events. Square  $x^2$  and absolute formula parameters (Table 2).

Group	Occurrence Events		All
	Yes	In	
I	The	(b)	$A + b = n_1$
II	(c)	(d)	$C + d = n_2$
ALL	$M_1 = a + c$	$M_2 = b + d$	$N_1 + n_2 = N$

**Table 2:** Table of occurrence of events between groups.

According to the statistical probability, the degrees of freedom that corresponds: degrees of freedom: (number of rows-1) (number of columns-1), the p-value was between 0.01 and 0.01 corresponds, therefore, the probability of this result happen just due to chance is less than 0.1% (0.01).

These occurrences of events, and the distribution of the individual subject of the survey, covering a wide range of evidence that multifaceted patterns of stretching, can be translated in a way less complex, with a view to the practical efficiency of calculations that show descriptive, even with an against evidence, where the subjects of the research were submitted to stretch effort for 4 weeks they met the primary objective. Effect modifiers in elastic components in series or even in the neural control of subjects evaluated [23]. Another possible fact could have influenced the results presented would be the joint positioning during the stretching Protocol, because studies show that the fall of other force is specific angle [24,25] (Table 3).

muscle-building and prevention show that positively influences prior lengthening muscle balance for joint articulation [27].

## Conclusions

It is concluded that the effects of dynamic stretching by grouping articulate significantly influenced in the indices of injury of provosts corridors and in maximum force production.

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