



STRENGTH –A DRIVING QUALITY WITH AN ESSENTIAL IMPACT IN THE MILITARY ACTIVITY

Lt.Col.Sup.Instr. Marius Constantin ISTRATE, PhD Candidate*

The article analyzes synthetically the decisive contribution that the development/training of the main driving quality – strength – has within the military activity, especially through its influence on the increase of the military's capacity, obligatory condition for their adaptation and response to the physical and mental demands generated by the current operational environment, as well as for the level of combat capability of military structures.

Throughout the article, the factors that determine the value of the force, the forms of its manifestation in the military activity, as well as the development methods frequently used in the physical training activity of the military personnel are addressed.

Keywords: force; effort capacity; military activity; intensity of effort; duration of effort; physical and mental stress; training.

In order to constantly adapt to the demands of the external environment, the human being must perform motor acts and actions, in other words, using the current language, to move. All these acts, actions and activities performed by man involve physical effort and a lower or higher energy and mental consumption.

A. Dragnea (1996) defines effort as "a conative behavior of mobilization, concentration and acceleration of physical and mental forces within a system of self-regulation, both conscious and unconscious, in order to overcome an obstacle, to overcome the resistance of the environment and even the resistance of one's own body".

The capacity of effort is the body's ability to perform and sustain for as long as possible, a physical or mental activity. The capacity of effort is one of the key factors in carrying out these activities in general, and implicitly, and in activities specific to the military environment, an environment to which we will rather refer to in the following pages. Thus, this parameter directly conditions the achievement of increased performance in the training of military personnel, both individually and collectively, within the training of troops process.

"The capacity of effort is acquired, in particular, within the training process specific to the military physical education activity, which aims to develop/educate basic motor qualities – strength,

speed, endurance, thus ensuring the biological and functional substrate of the effort required by the military activity"¹.

Military conflicts generate a very high consumption of energy and human resources. The efficiency of the energy and mental consumption of the military can be achieved through the means of military physical education, by educating basic motor qualities (strength, endurance, speed, skill), by adapting physical training to potential situations, using all individual equipment from endowment and alternating working conditions².

The theaters of operations, the modern battlefield, as well as the current missions that the military personnel carry out during the training process, require very good physical training, an increased capacity for effort, with a special emphasis on endurance and physical strength. Thus, during the execution of specific activities, the military, in addition to being equipped and endowed with their own equipment, also performs a series of difficult operations such as: mounting and dismounting from fighting vehicles, handling specific equipment and techniques, transporting crates and boxes of ammunition and even, at certain moments, bearing on one's back or carrying the wounded comrades.

In support of the above, military specialists studying the war say that survival on the battlefield is largely conditioned by the strength and muscular endurance possessed by the combat forces³.

Strength is the fundamental and complex motor quality specific to the human body, all areas of activity carried out by humans involving its use.

*"Carol I" National Defence University
e-mail: mariusconstantinistrate@yahoo.com

It is also a fact proven by specialists in the field that improper evolution or insufficient development can have negative effects in the formation and consolidation of motor skills and abilities.

Given the complexity and multiple valences attributed to this quality of the body, researchers in the field have had different approaches to defining strength. Without having a single and unanimously accepted definition, we will further present some of these approaches.

A. Demeter (1977) defines strength as "the ability of the neuromuscular system to overcome resistance through movement based on muscle contraction".

E.L. Fox, D.K. Mathews (1984) defines strength as "the tension that a muscle can oppose to an external resistance, in a maximum effort", and V. M. Zațiorski (1995) as "the ability of man to overcome some external resistance or to act against it by muscular effort"⁴.

I. Sabău (1997) defines strength as "the ability of the human body or a part (segment) of it to overcome an external resistance or to act against it through physical and mental effort. It is the trait of the human organism or of a part of it, which is shown by physical and mental tension, through which it opposes or overcomes some external resistance"⁵.

From the definitions presented above, we notice that the common and fundamental element in the manifestation of strength actions is muscle contraction.

Factors that determine the value of strength

In order to choose the best means and methods in the training process for strength development, it is imperative to know the main factors that determine the value of this quality of the human body, the most important being: the number of muscle fibers engaged in contraction and muscle thickness. There are also other factors that play a role in determining the value of force, such as:

- The level of development of the other driving qualities;
- The mental condition of the individual: will, motivation, emotional states, power of concentration, attention, etc.);
- Nervous factors;
- Diet;
- Age and sex;
- Frequency of training lessons and continuity of the preparation process.

The number of muscle fibers engaged in contraction is a crucial factor in the value of the strength that a muscle can develop. The higher the number of muscle fibers, the closer the force of execution of that movement is to its maximum value.

Depending on the difficulty of the effort, at that time a certain number (smaller or larger) of muscles and muscle fibers are contracted. These muscles involved in that force movement fall into two categories:

- agonists (who act directly to achieve that effort);
- antagonists (acting in the opposite direction).

The condition for achieving muscle contractions with maximum efficiency is that, in the respective motor action, only the agonist muscles should be engaged, and the antagonist ones should enter a state of relaxation. This efficiency can be obtained only after an intense preparation process, a process oriented concretely towards the development of the strength of the respective segment or segments, in which the movement is repeated methodically, and the result is a very precise coordination of the nerve impulses and responses transmitted to different muscle groups. The value of the force largely depends on this neuro-muscular response, the nerve centers responsible for coordinating the motor action transmitting strong nerve impulses, exciting the agonist muscles and, at the same time, exerting an inhibitory action of the antagonists. In this regard, we must emphasize that a simultaneous contraction of all muscle groups in the body and all the fibers of a muscle is not possible.

Thus, in the specialized literature in the field, we find some extremely conclusive data in this direction⁶:

- in a resting state, depending on the position of the body, between 3-10% of the total number of muscle fibers in action at that moment are involved in the contraction;
- during a small strain, the number of fibers in a muscle participating in the action is increased by 10-30%;
- in a cyclic motor action (walking, easy running) the fibers of the agonist muscles are divided as follows: about 1/3 participate in the action, while the remaining 2/3 are in a state of relaxation;



- in intense physical exertion the percentage of muscle fibers involved can gradually increase up to 75%, which corresponds to an effort of maximum intensity, but in this case fatigue sets in fairly quickly.

Muscle thickness is another key factor in the development of muscle strength. The strength of a muscle depends on its thickness, being proportional to its cross section. Achieving high performance in strength efforts is performed with the help of functional muscle hypertrophy which, in turn, is increased by using high and very high intensity efforts in training. As a result of a systematic and continuous action, the muscle mass increases, implicitly determining the increase of strength.

Forms of manifestation of strength in military activity

General strength refers to the efforts in which all muscle groups are involved. In military activity this form is required by the daily activity of the military itself, by specific missions and actions (e.g. those carried out in heavy, swampy, sandy terrain, in those executed in mountainous areas and very difficult to access, walking, skiing, trekking, mountaineering and climbing, etc.).

Specific strength takes into account the force produced by motor acts typical of a certain type of activity and which involve a small number of muscle groups. In the military activity we find it in the actions carried out on the armament systems and in the combat equipment technique, gymnastic exercises, athletic tests, in sports games, etc.

Maximum or absolute strength. As the name suggests it, this form refers to the greatest force that the neuromuscular system can generate in the body through maximum voluntary contraction. In the military activity we find this form of manifestation of force in all actions that involve lifting and transporting different weights, as well as overcoming obstacles or overcoming them such as: specific exercises for weapons, crossing the runway with CISM obstacles, military-application routes, application paddling and swimming with the equipment and armament provided, etc.

Relative strength. It is a type that considers the ratio between maximum/absolute strength and body weight. Thus, the higher the body weight, the lower the relative strength. In the military activity we meet it especially in gymnastics,

contact disciplines such as hand-to-hand combat with/ without the equipped equipment, taekwondo, judo and jiu-jitsu, karate and boxing, in the applied courses, in the pentathlon test and athletic tests, such as and in some sports games, etc.

Speed force. This form of force represents, according to D. M. Ioseliani's definition, "the ability to manifest high values of force in the smallest unit of time"⁷. In military activities we find it in the military pentathlon test, in the obstacle course for soldiers of all branches, application routes, throwing hand grenades, fire duel, actions performed at objectives such as taking crew positions on weapons systems and equipment, as well as mounting and dismounting them, combat sports (judo, taekwondo, hand-to-hand combat, boxing, etc.), athletics and short distance swimming (50, 100, 200 m), applied rowing, as well as in some sports games.

Methods of developing the strength used in the activity of physical training of the military

Strength is a motor quality that can be developed both in gyms, equipped with sophisticated equipment, but, in the absence of such capabilities or in addition to them, can be educated with their own body weight and improvised devices. The specialized literature presents a series of methods for strength⁸ development, and in the following we will briefly present some of them, used successfully in the activity of physical training of military personnel.

The method involving "weights" or weightlifting – which has 4 variants:

- *Continuous increase of the load* – the military achieves this increase depending on the number of repetitions he wants to perform (more repetitions - less increase, fewer repetitions, higher increase);

- *Continuous increase and decrease of the load* - during the training session the soldier continuously increases and decreases the load he works with, the rate of increase and decrease of the load being always the same;

- *The "step-by-step" method* – the soldier performs at least two repetitions with the same weight, then climbs to the next step (e. g. 60% - 60%, 70% - 70%, 80% - 80%, etc.);

- *The "wave" method* – the military alternates the increase and decrease of the load from one

repetition to the next repetition, respecting the principle that establishes that the growth rate must be higher than the decrease rate (50% -60% -55% -65% -60% -70% etc.).

The method of the isometry procedure – it involves the military performing 4 to a maximum of 6 muscle contractions / military physical training class, on immovable objects that cannot be moved or pushed and maintaining these contractions for up to 10-12 seconds. Between contractions, he should take an active break of 100-120 seconds.

The method of fast and intense efforts – it is the main method used to increase the explosive strength and involves the military performing muscle contractions through very fast executions and with maximum amplitude.

The method of repetitions performed until break-point– it involves the execution by the military of repetitions with loads of about 50-60%. When he has reached the limit of his possibilities, he performs two or three more repetitions with the help of another soldier.

The method of the "circuit" procedure – it is one of the methods of developing muscle strength used very often in the teaching process of physical training of the military and does not require special conditions. Depending on the number of stations/exercises, the circuits are divided into short circuits (4 - 6 stations/exercises), medium (7 - 9 stations/exercises) and long circuits (10 - 12 stations/exercises). In order to be more effective, it is necessary to know the level of training of the military at that time, and the circuit should address only the development of the military strength and thus, not to contain exercises that train the other motor qualities. Also, the exercises used in the circuit must be as simple as possible and the stations arranged so that the muscles of the same segment/part of the body do not work consecutively. Other important methodological indications aim at using these circuits only at the end of the military physical training lesson, and the working time is less or at most equal to the breaks.

In conclusion, we can say that force is a motor quality with a decisive impact on military activity, being involved in absolutely all the actions that the military performs. The level of development of this quality, together with the resistance in particular, directly conditions their capacity for effort, an essential factor in the successful fulfillment of

the entrusted missions and, at certain moments, in the very survival of the combatant soldier or his comrades. In other words, given the direct link between the development of strength and the expression of other qualities and motor skills at a high level, the fact that strength increases through systematic training and decreases if it is longer neglected, it is very important that constant attention be paid to activities specific to the field of military physical education and sports.

NOTES:

1 A. Pelmuș, „Dezvoltarea calității motrice: rezistența, factor esențial în activitatea militară”, *Bulletin of "Carol I" National Defence University*, nr. 3, Bucharest, 2018, p. 67.

2 G. Ciapa, *Pregătirea fizică a militarilor din Armata României în conflictele moderne*, disertation thesis, "Carol I" National Defence Publishing House, Bucharest, 2017, p. 37.

3 I. Andrei, *Importanța pregătirii fizice în procesul de instruire militară*, "Carol I" National Defence Publishing House, Bucharest, 2015, p. 30.

4 <https://www.scribub.com/timp-liber/sport/Fora32221.php>, accessed on 07.04.2020.

5 I. Sabău, *Aspecte noi și contribuții privind dezvoltarea forței în probele de aruncări la atleții de performanță și înaltă performanță*, disertation thesis, Bucharest, 1997 apud M. Loghin, *Pregătirea fizică - condiție și premisă de creștere a capacității de luptă a armatei*, Printech Publishing House, Bucharest, 2001, p. 7.

6 D.C. Torje, *Teoria și metodică pregătirii în domeniul educației fizice a personalului M.A.I.*, Ministry for Internal Affairs Publishing House, Bucharest, 2005, p. 24.

7 V. Tudor, *Capacități condiționale, intermediare și coordinative componente ale capacității motrice*, Coresi Publishing House, Bucharest, 1999, p. 41.

8 Gh. Cârstea *Teoria și metodică educației fizice și sportului*, AN-DA Publishing House, Bucharest, 2000, pp. 62-64.

REFERENCES

Andrei I., *Importanța pregătirii fizice în procesul de instruire militară*, "Carol I" National Defence Publishing House, Bucharest, 2015.

Andrei I., Ceascai V., *Efortul fizic pe înțelesul tuturor*, "Carol I" National Defence Publishing House, Bucharest, 2017.

Cârstea Gh., *Teoria și metodică educației fizice și sportului*, Editura AN-DA, Bucharest, 2000.

Ciapa G., *Pregătirea fizică a militarilor din armata României în conflictele moderne*, teză de doctorat, "Carol I" National Defence Publishing House, Bucharest, 2017.



Ciapa G., *Orientări și oportunități pentru pregătirea fizică a militarilor*, "Carol I" National Defence Publishing House, Bucharest, 2019.

Dragnea A. și colaboratorii, *Educație fizică și sport – Teorie și metodică*, FEST Publishing House, Bucharest, 2006.

Loghin M., *Pregătirea fizică – condiție și premisă de creștere a capacității de luptă a armatei*, Printech Publishing House, Bucharest, 2001.

Matveev P.L, Novikov A.D, *Teoria și metodică educației fizice*, Sport-Tourism Publishing House, Bucharest, 1980.

Pelmuș A., „Dezvoltarea calității motrice: rezistența, factor esențial în activitatea militară”, *Bulletin of "Carol I" National Defence University*, nr. 3, Bucharest, 2018.

Sabău I., *Aspecte noi și contribuții privind dezvoltarea forței în probele de aruncări la atleții*

de performanță și înaltă performanță, disertation thesis, Bucharest, 1997.

Torje D.C., *Teoria și metodică pregătirii în domeniul educației fizice a personalului MAI*, Ministry for Internal Affairs Publishing House, Bucharest, 2005.

Tudor Virgil, *Capacitățile condiționale, coordinative și intermediare – componente ale capacității motrice*, Coresi Publishing House, Bucharest, 1999.

<https://ro.scribd.com/doc/252061058/1-Capacitatea-de-Efort-Fizic>

<https://www.scribub.com/timp-liber/sport/Forta32221.php>

<http://www.urbanwarriorgym.ro/ce-este-fortacum-o-imbunatatim/>