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THE INFLUENCE OF PROFESSIONAL KICKBOXING ON THE MUSCULOSKETAL SYSTEM OF HIGHLY QUALIFIED ATHLETES

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Introduction. Kickboxing is often known as the toughest and most violent combat sport, a combat discipline that can be considered a martial art. It belongs to the group of foot-fist boxes (BPP), which developed in the early 1960s in the United States with «American kickboxing» and his low-line circular kick. While at the same time, the Japanese added the knee kick to shape «Japanese kickboxing», allows familiarizing with self-defense techniques to take care of body, but also to learn how to channel energy. Depending on the sport practiced, certain areas of the body will be used more than others.

Muscles and muscle groups strengthened and sculpted by kick-boxing:

The key to undergoing consistent kickboxing training is understanding the usefulness of each muscle and being able to choose the appropriate strength training to target them. Learned athletes know very well that certain muscles should be given priority over others.

Upper limbs (shoulders, arms, and forearms):

Shoulders (Arm Endurance):

Shoulders play a major role in endurance, they are also used to increase the power of the punches, but shoulders play a more significant role in terms of endurance. Typically, when a kickboxer's arms become too exhausted to deliver punches or to keep his guard high, When the arms become tired, signs of exhaustion initially come from one area of the shoulders. This can be explained by the fact that it is a small muscle at the end of the arm that supports the entire arm. Faced with this, we can understand why the shoulders get tired so quickly.

Arms (Power delivered and speed):

Arms are directly related to the power delivered, the most important function of the arms of any athlete is to release the power displayed by the body on the opponent. Arms are therefore not responsible for generating power, unlike the legs. To a large extent, the role of the arms is to unleash the power of the body on the opponents. Arms are used to externalize the force produced by the body and not to generate power, so it must be conceived that it is more important to have arms that are faster than strong ones. Fast arms give speed and a good impact on its target [4, 5].

Biceps: These muscles located on the anterior aspect of the arm are surrounded by two joints (scapulohumeral, elbow). The biceps consist of two muscles (long biceps and short biceps) that promote flexion and rotation of the arms.

Triceps: Located on the inner side of the arm, they cover three muscles (the vastus lateralis, the internal vase, and the long head of the triceps) which complete the flexor role of the biceps brachii. The triceps allow the extension of the forearm.

Pectorals (Upper body): The pectoral muscles are muscles of the upper body. Their most important functions are to connect the shoulders, arms, and lateral muscles into a single combined force. For the upper part of the body, the muscles of the torso are, in large part, responsible for the punching power.

Lower limbs (Glutes, thighs, and calves):

Quadriceps: They are located at the front of the thigh. the quadriceps are each made up of 4 muscles (The vastus femoris or rectus femur, the vastus lateralis, the vastus medialis, the vast intermediary). These muscles facilitate flexion of the thigh on the hip as well as the extension of the leg on the thigh.

Hamstring muscles: Located on the back side of the thigh, these muscles are four in number (femoral, semi-tendinous, and semi-membranous biceps). They ensure the flexion of the leg and the extension of the thigh.

Calf muscles: Also called triceps sural, the calf muscles include 3 muscle bundles including soleus and twins (or gastrocnemius). These muscles promote the extension of the foot on the leg.

Small muscles: The muscles of the forearms are used to harden the fists with each strike. And a well-reinforced fist ensures that the impact of strikes on the target will be significantly amplified.

The neck is used to absorb strikes. many fighters tighten their necks so that their heads do not end up in a vulnerable position when hit with punches.

Kickboxing is a relatively complete sport that uses almost all the muscles of the body. Elbow, punch, kick, knee kick, the quick and powerful movements work the arms, shoulders, abs, back, glutes and thighs [1].

Muscles drawn in a short time :

Kickboxing is one of the most popular martial art today. Intense and rich in many benefits for person's body and soul, is a cardio sport that strengthens endurance and releases every day tensions. Through stretching exercises and sequences of movements combining boxing techniques and martial arts, this discipline guarantees a firmer and toned body.

Conclusions:

Kickboxing is a complete sport that works all the muscles of the body, tone, explosiveness, surpassing oneself and can have a positive effect on the whole body, from head to toe. It has got the potential not only to burn up to 700 calories per workout (depending on weight and fitness level), but to continue shedding calories after training due to its very intense nature. Kickboxing encourages fat loss, which leads to a healthier lifestyle, but it also encourages building and strengthening muscles. Being in a toned and muscle-building state, the body gains weight that is not harmful to the general condition of the body. Kickboxing requires the combined strength and power of the upper and lower body muscles to deliver a fast and efficient punch. This means that when a kickboxer attacks the bag or the opponent, part of his muscles uses explosive force which helps to improve muscle strength. Muscle endurance also increases, which will allow athletes to train harder for longer and ultimately burn more calories [2].

The professional kickboxer has one or more workouts per day and knows the defensive moves. He knows in particular that it is necessary to maintain the guard

with each movement and that it is necessary to be able to dodge the punches and kicks of his adversary. However, careless mistakes happen to everyone. Even with all the most common boxing equipment - mouth guards, shin guards, shells, mittens, bands, and boxing gloves - injuries in pro kickboxing are therefore not uncommon. A blow to the head, a kick to the liver, for example, can knock out (KO) any boxer. Hematomas are often related to inattention or positioning errors during training. This is the reason why certain weight categories wear helmets during fights [1, 2].

Kickboxing is a sport that brings many benefits both physically and mentally. However, we should not forget that it remains a real dynamic and intense contact sport.

-Spine and trunk trauma : chondrocostal contusions and 1st and 2nd rib fractures, fracture liver, and spleen, tearing of the pecs and chest.

- Upper limb trauma : acromioclavicular sprain and dislocation, tendonitis of the long biceps (repeated punches in a vacuum), direct shock or fall with clavicle fracture, and shoulder dislocation.

- Trauma to the lower limbs: knee sprain, quadriceps contusion, head fracture.

Multidisciplinary work between trainer, preparer, the medical and paramedical sphere is necessary to reduce the damage.

Kickboxing has multiple benefits, and acts on two levels, on the physical and mental health of the kickboxer: to feel good in his body and mind, to have self-confidence, and to be able to move in space with agility. The professional kickboxer often has a muscular, firm, and toned body.

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