SOME FEATURES OF INCREASING SPECIAL FLEXIBILITY IN TAEKWONDO

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Annotation

The training of highly qualified athletes cannot be without the introduction and research of new forms of increasing the effectiveness of the training process, training athletes, which in turn affects the result of competitive activity. The purpose of the study was to identify the effect of the articular range on dynamic flexibility and myofascial activation in taekwondo athletes. A cross-sectional study was conducted on 29 athletes, the average age of 22 years old, whose weight averaged 66 kg, all are members of the Taekwondo team Unidades tecnológicas de Santander (Colombia). Research methods: analysis and generalization of literature, pedagogical observation, pedagogical experiment, physiological methods, methods of mathematical statistics. The BASELINE® CE DIGIT goniometer, BORG table and ACCUSPORT lactatometer were used to assess the level of flexibility. The results show that after a study in two groups, the best range of joint mobility is determined by the work of myofascial activity, which allows it to increase to an average angle of 164.54 °, while dynamic activity increased in the range to an angle of 159.58 °. It should be noted that the base average value of joint mobility for the two groups was 145.00º. Statistical significance was at P≤ 0.05. Statistical processing of the results was carried out using the SPSS version 2.0 software.

Glossary: Taekwondo, physical fitness, flexibility, joint mobility, myofascial activity in sports, articular range of motion (ARM).

Анотація

Підготовка спортсменів високої кваліфікації не може бути успішною без введення і дослідження нових форм підвищення ефективності тренувального процесу, підготовки спортсменів, що в свою чергу впливає на результат змагальної діяльності. **Мета дослідження** – виявити вплив суглобового діапазону на динамічну гнучкість і міофасциальну активність у спортсменів-тхеквондистів. Перехресне дослідження було проведено на 29 спортсменах, середній вік 22 роки, вага яких складала в середньому 66 кг, всі входять до складу команди тхеквондо Unidades tecnológicas de Santander (Колумбія). **Методи досліджень:** аналіз і узагальнення літературних джерел, педагогічне спостереження, педагогічний експеримент, фізіологічні методи, методи математичної статистики. Для оцінки рівня гнучкості використовувався гоніометр BASELINE® CE DIGIT, стіл BORG і лактатометр ACCUSPORT. **Результати показують,** що після дослідження в двох групах найкращий діапазон рухливості суглобів визначається роботою миофасциальной активності, що дозволяє її збільшити до середнього кута 164,54 °, в той час як динамічна активність збільшилася в діапазоні до кута 159,58º. Слід зазначити, що базове середнє значення рухливості в суглобах для двох груп склало 145,00º. Статистична значимість була при p≤ 0,05. Статистична обробка результатів здійснювалася за допомогою програми SPSS, версії 2.0.

Глосарій: тхеквондо, фізична підготовка, гнучкість, рухливість у суглобах, миофасциальная активність у спорті, суглобової діапазон рухів (СДР).

Аннотация

Подготовка спортсменов высокой квалификации не может быть успешной без введения и исследования новых форм повышения эффективности тренировочного процесса, подготовки спортсменов, что в свою очередь влияет на результат соревновательной деятельности. **Цель исследования** – выявить влияние суставного диапазона на динамическую гибкость и миофасциальную активность у спортсменов-тхэквондистов. Перекрестное исследование было проведено на 29 спортсменах, средний возраст – 22 года, вес которых составлял в среднем 66 кг, все входят в команду тхэквондо Unidades tecnológicas de Santander (Колумбия). **Методы исследований:** анализ и обобщение литературных источников, педагогическое наблюдение, педагогический эксперимент, физиологические методы, методы математической статистики. Для оценки уровня гибкости использовался гониометр BASELINE® CE DIGIT, стол BORG и лактатометр ACCUSPORT. **Результаты показывают,** что после исследования в двух группах наилучший диапазон подвижности суставов определяется работой миофасциальной активности, позволяющей ее увеличить до среднего угла 164,54°, в то время как динамическая активность увеличилась в диапазоне до угла 159,58º. Следует отметить, что базовое среднее значение подвижности в суставах для двух групп составило 145,00º. Статистическая значимость была при p≤ 0,05. Статистическая обработка результатов осуществлялась с помощью программы SPSS версии 2.0.

Глоссарий: тхэквондо, физическая подготовка, гибкость, подвижность в суставах, миофасциальная активность в спорте, суставной диапазон движений (СДД).

Introduction. Myofascial activity in sports is predominantly associated with pain suppression, which, combined with pressure techniques on tangible and narrow triggers, is associated with myofascial pain and sensitivity. This technique is designed to activate pain receptors of the skeletal muscle system in such a way that the athlete feels pain and therefore stops movement. In this context, studies of physiological factors are the key to understanding musculoskeletal relationships, accompanied by portions of fascia and pain, which logically determine a greater or lesser articular range.

Various methods of exposure associated with myofascial palpations have been developed to reduce pain, which is associated with flexibility, because an increase in the range of joint mobility is associated with an increase in pain in them. In this sense, the relationship between the amplitude of joint mobility is associated with the joints themselves, tissues, muscles, tendons, among other things, which can be stimulated and, therefore, improved, determining that the greater the stimulation, the better the amplitude response of the articular range. However, flexibility is an ability that is gradually lost over time; it is an ability that, if not used periodically and systematically, tends to decrease rapidly. In this context, in childhood, flexibility is higher than in adulthood. It follows from this that there is a close relationship between flexibility and other physical abilities such as strength, coordination, and others. Also, an increase in flexibility affects an increase in other abilities, such as aerobic resistance, and a decrease in CO^2 [1, 2].

Therefore, the expansion of knowledge and their application in sports practice is of great importance, contributing to an increase in the articular range, supported by a dynamic and other form of flexibility inherent in sports. Given that flexibility and coordination qualities, due to their connection with the articular range of motion (ARM), which is vital in sports selection and selection of athletes [3, 4].

For Kraemer and Gómez (2001), flexibility as a motor quality is important for improving physical condition and, therefore, competitive results, in addition to the relationship with athletic performance and outcome, and more importantly, more (ARM) in sports is required. Such an example can be various disciplines in gymnastics or martial arts [5]. As for the foregoing, it should be noted that along with other physical abilities, such as strength, endurance and speed, flexibility requires periodic special assessment and control [4, 6, 7, 8]. Studies by Gannon and Byrd showed that (ARM) (thigh, knee, ankle) are different for all athletes [9].

In view of the above, flexibility should be given no less attention than other physical qualities with various goals, such as reducing pain due to tolerance, taking into account the range of movements, recovering from injuries or reducing the risk of getting them, reducing the load on the tendons after training and increasing sports performance in general [10, 11].

Flexibility is mainly used for physical exercises, supported by the benefits of increasing diabetes, among which are the following: a) increase in muscle temperature [12]; b) a decrease in muscle pain [13]; c) an increase in the range of motion of the joint in healthy and injured individuals [14]; g) increased muscle elasticity [15]; d) recovery of the body after intense exertion; e) reducing the risk of injury [16]; and g) improved performance, especially in sports requiring a wide range of movements (gymnastics and martial arts) [17].

Hypothesis. It is assumed that the use of a new approach to increase the range of mobility in the joints will be able to increase the

Tab. 1

Anthropometric and sociodemographic data of the studied

	N	Min	Max	X	S
Subject ID	25	1	25	13,00	7,360
Age in years	25	17	34	22,44	4,053
Height (cm)	25	154	188	169,56	10,712
Weight, kg)	25	49	92	66,16	13,240

level of flexibility in Taekwondo players.

The aim of the research is to identify the effect of the articular range on dynamic flexibility and myofascial activity in taekwondo athletes.

Material and methods. Based on a desire to expand research on flexibility, this cross-sectional study was conducted with male Taekwondo men, all on the Taekwondo team of Unidades tecnológicas de Santander (Colombia). The study involved 29 men who trained in taekwondo for more than 12 months, with a minimum frequency of classes 3 times a week, an average age of 22 years, and an average weight of 66 kg (Table 1). All participants in the pedagogical research because of their state of health, personal desire, and also the leadership of their educational institution did not have any complaints about the party.

During the study, the necessary measures were taken to minimize pain or discomfort in the subjects. All athletes were divided into 2 groups (n: 15 and n: 14) by a random method for the purity of research. Group (A) for myofascial activation and group (B) for dynamic stretching. Both groups were evaluated by tests before and after the introduction of the author's methodology, having preliminarily performed a warm-up without preliminary heating using additional means. After that, we determined the average level of lactacidemia 2 mmol / lactate, before, during and after the assessment - which is a reliable indicator of minimal effort. For group (A), the technique consisted of using Wilson Brand tennis balls, taking into account their friction and pressure between the ball and the adductor and thigh muscles, including the ilium; and for group (B), the traditional exercises for stretching the muscles of the legs, consisting of movements of adduction and dynamic abduction with support on the hands to adjust the angle with the support of the legs on the mat. Both groups underwent a course of training effects for 7 minutes (dynamic stretching and myofascial friction with tennis balls). All athletes in the study were subjectively assessed for effort using the Borg table during both evaluations, determining the average value of 1 for pain in the Borg table, which displays pain thresholds from 1 to 10. Lactic acid was measured with a LACTATO ACCUSPORT instrument to evaluate zero stimulation during evaluation time without preheating.

Numeric markers were evaluated using a BASELINE® CE DIGIT goniometer, supported on the anterior superior iliac spine, inverted abduction, with legs apart, heels resting on the wall, their angle of inclination was checked with an additional level for measuring angles STABILA, sitting facing the wall, with an average assessment of effort compared to (ARM) according to the Borg table of 1, which means minimal effort. It should be noted that gravitational force plus joint weight generate this subjective assessment of effort through specific receptors. Two evaluations were carried out: the first without intervention, and the second with intervention. Two assessments were performed on both legs, taking into account the overall average of four assessments (two for each leg) after seven minutes of myofascial activity for group (A) and seven minutes of dynamic extension for group (B). The assessment was carried out with the participation of four specialist rehabilitologists.

Statistical research methods. Parametric tests of the normal distribution of various indicators were applied. For statistical analysis, the following indicators were used: average, maximum, minimum, standard error, sample variance. Statistical significance was adopted at P≤ 0.05. The program used was SPSS version 2.0 (https://g.co/kgs/Qi5Hur).

Research results. The results

Tab. 2

Flexibility gain indicators before and after applying the goniometer

	in		out		Total	
	N	%	N	%	N	%
Goniometer Range (Up to) * Training Type	25	86,2%	4	13,8%	29	100,0%
Goniometer Range (After) * Training Type	25	86,2%	4	13,8%	29	100,0%

Tab. 3

Comparative table of indicators of increase in flexibility before and after the experiment

Training type		Goniometer Range (up to)	Goniometer Range (After)
Myofascial activation	X	145,00	164,54
	N	13	13
	S	14,434	14,269
Medium Dynamic Stretch	X	145,00	159,58
	N	12	12
	S	17,321	13,728
Total	X	145,00	162,16
	N	25	25
	S	15,546	13,948

show that in group A with myofascial activation, the range of motion amplitude, depending on the goniometer used, was more favorable for this test than dynamic stretching (Table 2).

The results of this study show that after the introduction of various techniques in both groups, the best range of joints develops thanks to the work of myofascial activation, which allows to increase (ARM) (Table 3).

The diversity in the indicators of the technical assessment of flexibility is very diverse, which allows you to distribute more suitable methods and approaches, this gives advantages in the processes of assessing flexibility [18, 19]. Flexibility is manifested in various forms, which can be: passive, active, dynamic, static, specific and others. However, its ultimate goal is the gradual increase in diabetes, given the combination of methods that can increase its effectiveness when it comes to improving results. It should be noted that there are no better methods or techniques, therefore it is proposed to combine them [20].

Discussion. Authors such as Nelson and Bandy [21] argue that eccentric and statically-active indicators are equally effective, but with a certain significance. It is worth noting that in sports, in addition to the fact that (ARM) receives more benefits from the ballistic method, given the previous assessment of injuries and / or pain [22].

Webright et al. Came to the conclusion that the most profitable method for increasing (ARM) is the static method, due to the optimization of the execution time of the movements, which generates a more efficient transmission between movements or stretching methods.

In the same way, for Yuktasir and Kaya, the flexibility of using static stretching gives the same effective result as the PNR (proprioceptive neuromuscular relief) method [23], with the advantage that the first method does not require external interaction.

According to Sainz de Baranda and Ayala, the active statics method is superior to the passive statics method because improving the intramuscular muscle coordination of antagonists works better [24].

Basic moments. The constant loss of sports results is associated, among other things, with the lack of muscle activation, flexibility, strength, balance and functional fitness [25], which creates, in addition to a temporary loss of performance [26, 27, 28], physical inefficiency and their reduction. In this context, the inefficiency of functional fitness can be associated with neurocerebral inactivation of synergism during activation of muscle bundles, as well as with a slight activation of flexibility and activation of fascia, atrophying the skeletal muscles of the motor system and, therefore, physical dependence.

Conclusions. The results of this study show that after processing in two groups for seven minutes, the best mix range develops thanks to myofascial work, which allows increasing (ARM) and establishing static functions without taking into account the inverse myotatic reflex, since the assessment was quasi-isometric. In this sense, in a quasi-experiment, you should consider that in combat and / or in Poomsae (Taekwondo competition), movements are dynamic. Nevertheless, this treatment proposal, in particular, concerns training in which movements with the greatest amplitude are used, which allows performing optimal work in training, given that the test was quasistatic, with an increase in the gravitational weight of the limbs. It is proposed to consider a combination of myofascial activation, dynamic and ballistic stretching, which allows combining competitive realities in the demand for joint width. It should be noted that suppression of the pain threshold is essential when it comes to the amplitude of the articular range, and that the training of neuromuscular connections developed by the myotatic reflex.

In conclusion, it is appropriate to consider myofascial activation when developing flexible work before dynamic and ballistic work.

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