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Original article

EFFECTS OF CORE STRENGTH TRAINING ON KARATE SPINNING WHEEL KICK AND CERTAIN PHYSICAL VARIABLES FOR YOUNG FEMALE

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Abstract

Purpose. The term core strength refers to the strength of these core muscles. Either core muscle strength is usually operationally defined by a measurement of the strength of core muscles, in terms of how much weight/resistance a muscle can lift, how many repetitions a muscle can perform, or how long a muscle can hold a neutral stable position. The purpose of this study was to explore the effects of core strength training on spinning wheel kick and certain physical variables for young female athletes.

Methods. Participants were 20 karate young female athletes (M age = 12.54 years, SD = 1.23) who all regularly participated in Karate training in Egypt. Divided into two groups. The experimental group (n = 10) performed core strength exercise training and control group (n = 10) performed traditional exercise. All participants completed the spinning wheel kick test and certain physical variables (balance- core strength- power- reaction speed). Subjects were required to read and complete a health questionnaire and informed consent document; there was no history of injuries, diabetes or recent surgery.

Results. The results revealed that a significant difference between the experimental group and control group in spinning wheel kick test and certain physical variables (balance- core strength- power- reaction speed).

Conclusion. The findings indicated that the implication of this research for coaches working with core strength exercises (10) weeks is that to match athlete preferences.

Keywords: core strength, Ura Ushiro Mawashi Geri, karate

Introduction

Sports experts seek to use scientific findings to prepare the professional athletes for the national and, international competitions. In this regard, it seems crucial in championships to take advantage of the best exercise methods chosen by knowledgeable and experienced coaches for professional athletes (Kordi, 2005).

Karate is a martial art that requires high fitness. High degree of physical capabilities with defensive and offensive tactics as well as the movements of the feet. This sport is dependent on maximum levels of strength, speed, power, and change and rapid sudden the different trends.

Karate can be practiced as an art, as a sport, as a combat sport, or as self-defense training. Traditional karate places emphasis on self-development. (Bishop, 1999)

The core is the most imperative segment of the body in regards to human movement. Most functional movements within the body originate at the core; therefore, most movements of the ankle and lower leg begin at the core.

If the core is efficient, it may allow for optimal performance at all peripheral joints of the body, including the ankle mortise. (Delecluse, 1997). The core is defined as the limbo-pelvic hip

complex. It is where our center of gravity is located and where the movements of the body originate. An efficient core allows for optimal acceleration, deceleration and stabilization of the entire kinetic chain during functional exercise. The core needs to be trained appropriately in order to efficiently distribute weight, absorb force, and transfer ground reaction forces during functional movements.

Classic literature classified the musculature of the core as being controlled by "local" and "global" muscular systems (Bergmark, 1989). The "local" system consists of all the muscles that originate and insert at the vertebrae, with the exception of the psoas muscles that flex the hip joints (Sale, 1991). The role of the "local" system is to control the curvature of the lumbar spine, aid in the coordination and control of motion segments, and provide sagittal and lateral stiffness to maintain mechanical spinal stability (Delecluse, 1997). On the other hand, the "global" system acts to transfer forces from the thoracic cage and the pelvis out to the extremities (Bergmark, 1989). The muscles of the "global" system have longer moment arms of force, as well as larger cross-sectional areas than the muscles of the "local" system, making them ideal for force production (Arokoski, et al., 1999).

Core training programs include processes

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that target muscular strengthening and motor control of the core musculature. (Nadler, et al. 2002). Core strengthening exercises are very popular in rehabilitation programs despite little scientific evidence existing as to their efficacy on improving subsequent performance (Stanton, et al., 2004; Cosio-Lima, et al. 2003; Tse, et al. 2005). Although some research has suggested that, a number of methods can enhance neuromuscular control. These include joint stability exercises, (Behm, et al. 2002) contraction exercises (concentric, eccentric and isometric), (Pollock et al. 1989). Balance training, (Cosio-Lima, et al. 2003). Perturbation (proprioceptive) training, (Lewis & Hawke, 1983; Carrier, 1999) Plyometric (jump) exercises (plyometric training emphasizes loading of joints and muscles eccentrically before the unloading concentric activity) (Axler & McGill, 1997) and sport-specific skill training. (Lehman, 2006). In the field of physiotherapy, proprioceptive training is believed to be important and, consequently, programs use methods and exercises that challenge proprioception-using equipment such as wobble boards, roller boards, discs and Swiss balls.

Comerford (2007) believes that to train core stability and strength it is important to perform both low- and high-load threshold training.

Comerford (2008) identified the following sub-areas of core training that all need to be included when training core stability and strength:

1. Motor control stability: low-threshold stability where the CNS modulates the efficient integration and low-threshold recruitment of local and global muscle systems.

2. Core strength training: high-threshold and overload training of the global stabilizer muscle system and leads to hypertrophy as an adaptation to overload training. (Cotton, 2005)

3. Systematic strength training: traditional high threshold or overload strength training of the global mobilize muscle system.

Some Karate coaches does not care about the development of muscle strength, tribunals and the belief that strength training may negatively affect the speed performance. In addition, in this context refers (Maryam, 2014) that muscle strength maximum no place in sport Karate, and that the use of strength training muscle may lead to muscle hypertrophy and thus adversely affect the flexibility of the armed wing. (Mittle, 2004) indicated that strength training for Karate players must be applied, especially among young people with extreme caution, in order to avoid a negative impact on the elements of flexibility, agility and considered as two of the important physical elements in the sport of Karate.

In addition, some Karate coaches pay attention to the development of the physical demands of the sport of Karate alongside the development of skills; the researcher has noted the frequent use of coaches Karate at the international level and local level to the argument that the best training for Karate is Karate itself. In addition, thinking in to if we noticed the feet movements, we find it similar exercises Plyometrics.

The researcher believes that some right tainted this aspect and wrong, the incidence of performance may improve memory muscular Karate players. which may in turn lead to improved motor skills, but may result in a feeling of the players are bored to repeat the daily performance where the focus is on muscle groups specific may lack integration muscular performance, hence the importance of diversity in the use of forms and types of training used and the Force career. which is a key requirement for the performance of motor skills in both movements, advances and retreats, challenge, since the performance of these motor skills requires a performance strength and speed without disruption in the balance, to change the status of the weight of the body down while diversity in the performance of these skills

The purpose of this study was to explore the effects of core strength training on spinning wheel kick and certain physical variables for young female athletes.

Methods

Participants were 20 karate young female athletes (M age = 12.54 years, SD = 1.23) who all regularly participated in Karate training in Egypt. Divided into two groups. The experimental group (n = 10) performed core strength exercises training and control group (n = 10) performed traditional exercise. All participants completed the spinning wheel kick test and certain physical variables (balance- core strength-power-reaction speed). Subjects were required to read and complete a health questionnaire and informed consent document; there was no history of injuries, diabetes or recent surgery. All participants were fully informed about the aims of the study, the procedures and the training, and gave their voluntary consent before participation. The experimental procedures were in agreement with the ethical human experimentation.

The Core Muscle Strength & Stability Test (CST)

The objective of this evaluation is to monitor the development and improvements of an athlete's core strength and endurance over time.

- Flat surface
- Mat
- Watch or clock with second counter

Conducting the Test

- Position the watch or clock where you can easily see it
- Start in the Plank Exercise Position (elbows on the ground). Hold for 60 seconds
- Lift your right arm off the ground. Hold for 15 seconds
- Return your right arm to the ground and lift the left arm off the ground. Hold for 15 seconds
- Return your left arm to the ground and lift the right leg off the ground. Hold for 15 seconds
- Return your right leg to the ground and lift the left leg off the ground. Hold for 15 seconds
- Lift your left leg and right arm off the ground. Hold for 15 seconds
- Return you left leg and right arm to the ground.
- Lift your right leg and left arm off the ground. Hold for 15 seconds
- Return to the Plank Exercise Position (elbows on the ground). Hold this position for 30 seconds

Static strength test (LS) (BS)

A back dynamometer was used to measure the static leg strength. The subjects stood on the dynamometer platform and crouched to the desired leg bend position, while strapped around the waist to the dynamometer. At a prescribed time, they exerted a maximum force straight upward by extending their legs. They kept their backs straight, head erect and chest high. Three trials were allowed to the subjects and the best score was taken. Subjects had a rest between the trials.

Standing Long Jump Test (SLJ):

The subject stands behind a line marked on the ground with feet slightly apart. A two-foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards. Three attempts are allowed.

Seated Medicine Ball Throw (SMBT):

The subject stand with their back to a wall, on a mat facing the area to which the ball is to be thrown, and with the feet extended and slightly apart. The ball is held with the hands (two hands) on the side and slightly behind the center. The ball is brought to the chest, and then thrown vigorously out as far as possible. The back should remain in contact with the wall at all times. Three attempts are allowed. The distance from the wall to where the ball lands are recorded. The measurement is

recorded to the nearest 10 cm. The best result of three throws is used.

Dynamic balance test (DBT):

Tools used

- A belt of rubber introduced 3 cm from the plastic clip is installed on the middle of the back of a piece of sponge square 10×10 , thickness 3 cm.
- Powder "Badra" magnesium bicarbonate "Manezia."
- Roll of adhesive plaster Showing 2 cm.
- A rectangular piece of 20×20 cm from the carpet pile with a medium.
- Meters measure the "bar."

Performance specifications

- Turn around 360 on the submitted one foot (10 - consecutive sessions) at a rate r / w, from a standing position opened, arms aside, followed by stability 2s - and then walk in a straight line a length of 4 meters, fixed on the ground with a strip of plaster display 2 cm.
- Turning around "360 degrees" to an author one foot (10 - consecutive sessions) at the session / s from a standing position opened, arms aside, followed by stability 2s then worked 5 handspring forward in quick succession on a selected line tape Blaster 2 cm on the ground long 4 meters, ending the development stand.

Instruction of the test

- The deviation is measured on a straight line 4 meters to the right or left hand while walking to end, so that the distance is measured in centimeters from a straight line to the middle of the distance between the two editions of "thumb" feet on the ground.
- Deviation measured during five consecutive handspring front and ended the rapid development of stand on the straight line, and along the "4-meter" so that the distance is measured in centimeters from a straight line to the middle edition of "fingerprint" square piece of sponge on the ground during handspring.
- Evaluation is the extent of deviation from the straight line during the walk as well as during handspring as an indicator of dynamic balance.

Core Strengthening Protocol

Exercise of the core musculature is more than trunk strengthening. In fact, motor relearning of inhibited muscles may be more important than strengthening in patients with LBP. In athletic endeavors, muscle endurance appears to be more

important than pure muscle strength. (Bergmark, 1989) the overload principle advocated in sports medicine is a nemesis in the back. In other words, the progressive resistance strengthening of some core muscles, particularly the lumbar extensors, may be unsafe to the back.

Functional progression is the most important stage in the core-strengthening program. A thorough history of functional activities should be taken to individualize this part of the program.

The researcher adopted the application of core strength training on the following:

- That the focus is on strengthening the muscles and the stability of the center
- At the end of the module extend the training given for muscle relaxation in order to return to normal.

- Training method used, you see a high intensity training system using a ring.

- Loads within the circuit training is through the change between the time of performance and comfort between the exercise and between groups.

- Circuit includes (6) exercises in the (3-5) groups

Statistical analysis

All statistical analyses were calculated by the SPSS statistical package. The results are reported as means and standard deviations (SD). Differences between two groups were reported as mean difference $\pm 95\%$ confidence intervals (meandiff $\pm 95\%$ CI). Student's t-test for independent samples was used to determine the differences in fitness parameters between the two groups. The $p < 0.05$ was considered as statistically significant.

Result

Table 1. Age, Anthropometric Characteristics and physical variables of the Groups (Mean \pm SD)

Variables	Mean	Standard Deviation	coefficient of skewness
Age (years)	12.55	1.65	0.34
Height (cm)	144.76	2.54	0.45
Weight (kg)	42.44	3.28	1.11
Training experience (years)	5.22	1.43	0.65

Table 1 shows the age, anthropometric characteristics and physical variables of the subjects. There were no significant differences were observed in the anthropometric characteristics and for the subjects in the groups.

Table 2. Mean \pm SD and "T" sign. Between two Groups (experimental and control) in SLJ, SMBT, DBT, CST (LS), (BS) and Performance level of Ura Ushiro Mawashi Geri

Variables	Experimental group		Control group		T sign.
	Before	After	Before	After	
SLJ (cm)	169.25 ± 4.77	176.11 ± 4.44	169.22 \pm 3.97	172.56 ± 4.24	Sign.
SMBT (meter)	6.16 ± 0.14	7.21 ± 0.24	6.22 ± 0.39	6.81 ± 0.47	Sign.
DBT (cm)	9.27 ± 1.65	7.41 ± 1.43	9.34 ± 1.43	8.32 ± 1.75	Sign.
Deviation to the right (A)	10.88 ± 1.91	6.68 ± 1.33	10.21 ± 1.56	9.11 ± 1.48	Sign.
Deviation to the left (A)	11.34 ± 1.76	7.98 ± 1.65	11.11 ± 1.82	9.65 ± 1.54	Sign.
Deviation to the right (B)	11.65 ± 1.91	7.92 ± 1.93	11.36 ± 1.78	10.64 ± 1.65	Sign.
Deviation to the left (B)	5.42 ± 0.12	7.32 ± 0.15	5.21 ± 0.31	6.11 ± 0.2 2	Sign.
CST (Degree)	59.42 ± 3.84	62.22 ± 4.89	59.25 ± 4.26	60.74 ± 4.38	Sign.
LS (KG)	37.51 $\pm 4.26^*$	45.22 ± 3.79	38.05 ± 4.37	40.31 ± 3.28	Sign.
BS (KG)	4.61 ± 0.08	6.50 ± 0.05	4.62 ± 0.08	5.59 ± 0.06	Sign.
Performance Level (Degree)					

The t-test showed statistically significant differences between the post measurements for the experimental and control groups in all variables of physical and Performance Level of Ura Ushiro Mawashi Geri for the experimental group.



Discussion

Based on the results of this study the t-test showed a statistically significant differences between the post measurements for the experimental and control groups in all variables of physical and Performance Level of Ura Ushiro Mawashi Geri for the experimental group.

The improvement attributed to the core-training program with good planning of the program and regulate training loads for the age group. In addition, to use exercise Swiss ball, and seats Swedish as a key part in strength training career in order to develop muscle strength. Which took into account the researcher training loads gradually during the application of the program by training different muscle groups, especially the muscles of the center, arms and legs and the concentration of a researcher working on the muscle groups during the bout and the accuracy of selection, where functional strength training led to improved strength and balance as soon as distinctive.

In this regard, Dave, (2003) see that the most important attributes of strength training is to focus on the center emphasizes the core, where the muscles of the center strong connecting the lower end party top, in addition to strength training career includes movements multi-directional. And multi-directional exercises lead by focusing on one side. Making it the single limb of the best exercises used to improve the strength of the muscles of the center (middle of the body), balance.

In addition, confirms Fabio, (2004) the balance is the key element in the Karate training, not only the balance between strength and flexibility or muscle working and non-working, but it also may believe that the means used, for example, stand on one foot and be able to move without the other members of the body to fall, a feature important in interactive training career.

The researcher believes that the balance plays a significant role in the achievement of sporting achievement in the sport of Karate, where the ultimate goal of total Karate is to score a touch, striker fencer is the best time for him to register a touch when the opponent in the case of return to the standby mode of appeal. in order to exploit the imbalance resulting from the fulcrum fencer at the foot of the background, on the other side, we find that the best timing for the striker also to register a touch before set foot in the front ground of appeal, and here we note the importance of dynamic balance skills of offensive and defensive. Player who high level is the one who has the power functional (capacity - balance), and its ability to perform offensive and defensive skills in situations of imbalance.

Improved strength and distinctive as soon as Adams, et al. (1992) confirms of the activity of reflection rubber allows for excellent power transfer speed to the same distinctive movements similar biomechanics that require a high capacity of the trunk, legs and show results when performing the broad jump.

The results of this study agree with the study of both Yasumura, et al. (2000), Marijke, et al. (2004), Cymara, et al. (2004) that contribute to core strength training was improved strength and balance as soon as distinctive.

The relationship between basic skills for the sport of Karate and requirements of various physical (General, Specific) is a close relationship must be taken into account when preparing the players, and that there is no separation between the two settings skill and physical but on the contrary should be the development of elements of physical conformity with the requirements of skill. That success in the training process and thus improving the level of the players, when the player has the physical attributes are highly capable of performing all the skills well.

Conclusion

Physical ingredient is one of Staff training in the development of a reliable player, one of the important bases, which shares with the motor skills in the composition of the player physically.

Therefore, the components of the physical is one of the most important performance requirements in the sport of Karate. Which may be the decisive factor in winning games, especially when equal or nearly level skills to rival, given that the level of the physical condition of the player is one of the important reasons that contribute to many victories high level of fitness. physical player can perform a successful sports season, in addition to the high fitness of the player increases the confidence of the coach in the player, but trying to coach in most cases to benefit and maintain.

The researcher believes that the Ura Ushiro Mawashi Geri is equity of basic skills in Karate, commonly used in competitive matches and it is highly dependent on the availability of a set of elements of physical fitness, which comes in the forefront of Core distinguished as soon as.

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