



## EFFECT OF FLEXI-BAR EXERCISES ON DYNAMIC BALANCE, POSTURAL FUNCTION AND PERFORMANCE LEVEL OF POOMSAE TAEGEUK IL JANGIN TAEKWONDO

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### Abstract

**Objective.** The flexi-bar is a different gym accessory, because it is vibrating. So, it acts on the bodybuilding of body in depth. If you do not see what a flexi-bar is, here is a description that can help you. Imagine a thin bar with a double foam handle in the middle and a small block at each end. His movement: a vibration from left to right that turns our bar into an arc. It is simply by retaining the movement of this vibration that muscular work operates. The aim of this investigation was to explore the effect of flexi-bar exercises on dynamic balance, Postural function and performance level of poomsae taegeuk IL jang in taekwondo.

**Methods.** The sample of the research was randomly selected from the Faculty of Physical Education for girls-Zagazig University. The total number of the research sample was (40) female college students, was conducted in two groups: one experimental group (20) female college students, and the other control group (20) female college students. The researcher conducted the average in High, weight and age

**Results.** The results showed statistically significant differences:

1. between post-test for experimental group and control group in performance level of poomsae taegeuk IL jang, the difference for the experimental group
2. between post-test for experimental group and control group in Postural function variables, the difference for the experimental group
3. between post-test for experimental group and control group in dynamic balance, the difference for the experimental group

**Conclusion.** In conclusion, our data suggest that (8) weeks of training with the Flexi-Bar could improvement of dynamic balance, Postural function and performance level of poomsae taegeuk IL jang in taekwondo in female university students.

**Keywords:** dynamic balance, postural function, poomsae, taekwondo.

### Introduction

Taekwondo is a term that comes from Korean and refers to a martial art of the same origin. This sport combines techniques of kung Fu, karate and other older disciplines. In recent decades there has been a considerable increase in the number of people who proceed to practice the sports discipline. because it has been made public that brings with it a remarkable series of advantages.

Taekwondo was included as an exhibition sport at the Olympic Games in Seoul 1988. This event involved 183 athletes (120 men and 63 women) from 34 countries in 8 different weight divisions (4 for men and 4 for women).

In the Olympic Games of Barcelona 1992 it returned to have presence as exhibition. It is at the

2000 Sydney Olympics that taekwondo (WTF style) became an official Olympic sport. On September 4, the International Taekwondo Day was declared in commemoration of the date on which it began to be recognized as an Olympic sport, on September 4, 1994. (W. Pieter & J. Heijmans, 2000; YH. Park, et al. 1989).

The poomsae are sequences of defense and attack movements that simulate an imaginary combat with one or several adversaries. They are known as pumses in the WTF style. They are the equivalent in Karate to the katas. These forms are directly related to the degrees (Gup or Dan), and are memorized and repeated in order to increase the balance, elasticity, speed, concentration and mastery of the different movements. (R. L. Cromwell, et al. 2007)

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In the realization of the forms is very important the correct technical execution, power and strength, balance, aesthetics of the movements, concentration and coordination of the movements, position of the whole body when performing each technique and finish in the same place where you started.

The forms usually have a great weight in the examinations of promotion of degrees in addition that already comprise of the competitions.

Taeguekpoomsae are the basic poomsae of the WTF style. In the past, the attack and defense forms were performed for long distances. The Taegeuk are a group of eight poomsae designed for the average distances ordered according to the level of difficulty. These poomsae have appeared in the wake of the attackpoomsae, the first to appear in the practice of Taekwondo. These poomsae not only appeared as a form of martial art practice, but also had a great philosophical and cultural influence. (SSM. Fong, et al. 2012)

The WTF style, added several changes to establish what is now known as Taeguekpoomsae. They are associated with the GUP grades and are those that are requested to be able to advance to a higher GUP grade (they are also included in the DAN grades exams). Taegeuk means equilibrium in Korean, since the balance between the opposing dual concepts of the universe is considered something very important in Eastern culture.

(L. Mohamed, 2006) noted that physical variables of different types are one of the specific conditions for athletic achievement and are mixed with each other and vary in importance and the nature of their interdependence in Taekwondo.

Raising the level of physical condition is one of the most important goals that sports training programs seek to achieve and which are based on the possibilities of practicing sports activities, which in turn affect the improvement of the level of performance of the individual, so it has become an important field of research for many researchers.

The flexi-bar is a different gym accessory, because it is vibrating. So, it acts on the bodybuilding of body in depth. If you do not see what a flexi-bar is, here is a description that can help you. Imagine a thin bar with a double foam handle in the middle and a small block at each end. His movement: a vibration from left to right that turns our bar into an arc. It is simply by retaining the movement of this vibration that muscular work operates.

The flexi-bar exists in 3 versions (Standard, Intensive or Athletic), to choose according to your sport condition. It is not for nothing that all the press

speaks about it, that all the best coaches and fitness professionals use it. The flexi-bar is used at home and is for those who want tools that are accessible, original and effective.

It is a fiberglass rod 1.50 m in length. It is equipped with a wide handle in the middle and weighted at both ends of the weight natural rubber whose cylindrical shape allows precise execution movements.

This device has been used for over 20 years by German physiotherapists. The Flexi-Bar activates the deep muscles of the back and abdomen that are usually little stressed and mostly weakened by inactivity or by repetitive movements but of little amplitude.

Working with the Flexi-Bar not only solicits the musculature back and abdomen, thus anticipating a certain number of pathologies but also the intermediate muscles, not to mention the superficial muscles, responsible for all voluntary movements, like straightening the torso.

the Flexi-Bar improves blood circulation and tissue irrigation around the vertebrae .

the Flexi-Bar work in motion of the bar generates oscillatory vibrations which, perceived by the body as a state of equilibrium-imbalance, will immediately compensated by the musculature. The exercises thus make it possible to bring support the spine and ensure proper alignment of the vertebrae.

The Flexi-Bar is nothing more and nothing less than that, a flexible rod 150 cm long made of plastic reinforced with fiberglass and at each end has a cylinder-shaped weight.

The user must start swinging and once the bar is set in motion, it produces a vibration that generates a reaction in the deepest part of the musculature. (L. Seong-Jin et al. 2016).

the musculature of the back, the abdominal area and the pelvic area work against the rolling or vibrations of the flexible bar.

The balance and speed of the same not only tone and develop strength but increases metabolism and heart rate.

By allowing the training of the torso through the joint work of the muscles of the back and the abdominal, oblique and transverse abdominals, significantly improves body posture and with it, prevents pain and discomfort.

During the constant swing of the Flexi-Bar the body must be stable although it can adopt different positions. That is why we say that just by shaking and moving the bar you already get great results.

With the active rocking of the bar, the deep musculature is toned, the one in charge of holding the

spine and, above all, preparing the vertebral joints for the intervertebral disc.

Thus, tone the muscles and develop strength, is accompanied by caloric expenditure and improvements in posture that undoubtedly cause great benefits to alleviate or prevent multiple ailments.

Therefore, the researchers saw that the use of Flex Bar program can improve the physical condition and postural function for female college students, and be the basis for raising the level of performance in Taekwondo, especially to the knowledge of the researcher and through the available theoretical readings and previous studies and scientific references specialized in the field noted that This study has not been discussed previously in the Egyptian environment and Taekwondo field in particular.(KN. Mileva, et al. 2010).

Postural function is crucial for taekwondo practitioners due to its dynamickicking nature (W. Pieter & J. Heijmans, 2000; H.T. Leong, et al. 2011).

The aim of this investigation was to explore the effect of flexi-bar exercises on dynamic balance, Postural function and performance level of poomsae taegeuk IL jang in taekwondo

#### Methods

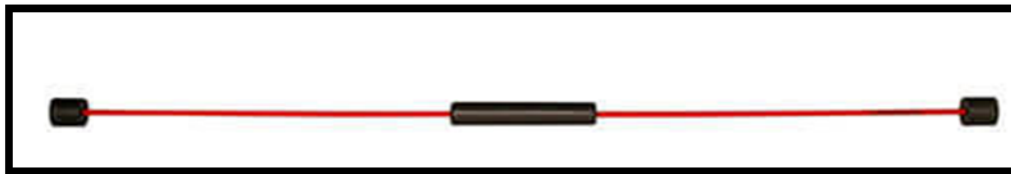


Figure 1. show the Flexi-bar tool.

#### Procedures.

After determining the basic variables and tools used, the researchers performed the following:

- Conducting pre- measurements. Measurements included height and weight, identification of the age for each female student.
- Application of the test of performance level of poomsae taegeuk IL jang and before the test to explain the concept of testing and its purpose.
- Start the implementation of instructionscaffolding program for (8) weeks and consists of (16) training sessions (2) weekly session.

#### Results.

Table 1 the High, weight and age of the subjects.

Groups	N.	High	Weight	Age
Experimental group	20	171.24±5.33	66.36±6.69	17.54±0.64
Control group	30	168.55±6.41	68.47±5.87	17.68±0.78

Table 1 shows no significant differences were observed in the all characteristics of the subjects.

The sample of the research was randomly selected from the Faculty of Physical Education for girls- Zagazig University. The total number of the research sample was (40) female college students, was conducted in two groups: one experimental group (20) female college students, and the other control group (20) female college students. The researcher conducted the average in High, weight andage.

#### Tools

##### mobile application for posture analysis.

To measure.

Head anterior translation, Head right lateral translation, Head posterior translation, Head left lateral translation, Shoulder anterior translation, Shoulder right lateral translation, Shoulder posterior translation, Shoulder left lateral translation, Rib anterior translation, Rib posterior translation, Hip anterior translation, Hip right lateral translation and Hip posterior translation.

#### Static Balance

Single limb stance test, which measures the time in seconds onecould stand on one leg (Rikli and Edwards, 1991; Hong et al. 2000).

#### Flexi-bar

- The post-tests were carried out in the same previous sequence and compared with pre-tests using the necessary statistical methods.

#### Statistical analysis

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

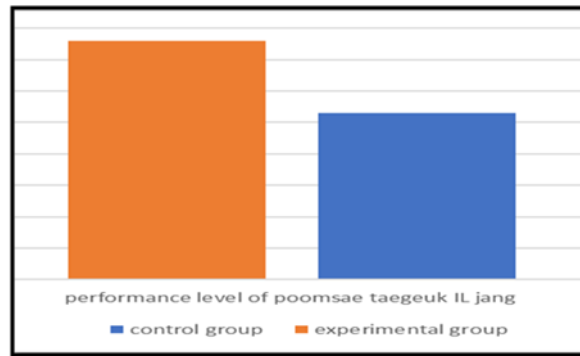


Figure 2. show the differences between post-test for experimental group and control group in performance level of poomsae taegeuk IL jang, the difference for the experimental group.

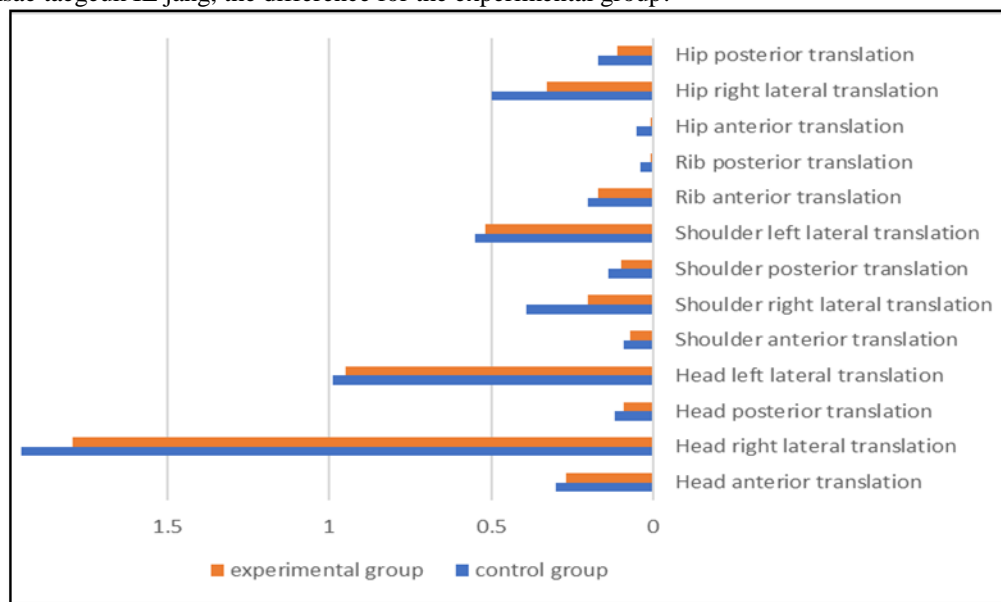


Figure 3. show the differences between post-test for experimental group and control group in Postural function variables, the difference for the experimental group

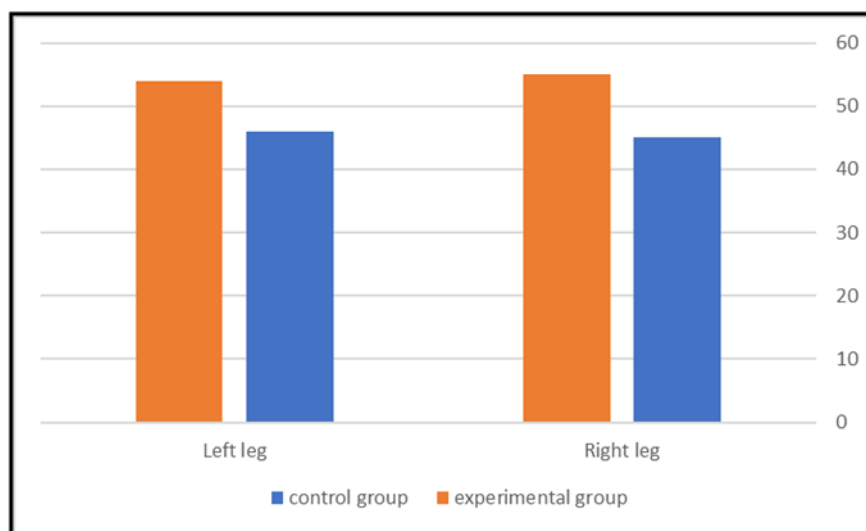


Figure 4. show the differences between post-test for experimental group and control group in dynamic balance, the difference for the experimental group

### Discussion

The purpose of this article was to determine the effect of the Flexi-Bar exercise on dynamic balance, Postural function and performance level of poomsae taegeuk IL jang in taekwondo in female university students. After (8) weeks of training with the Flexi-Bar, the dynamic balance, Postural function and performance level of poomsae taegeuk IL jang showed a significant increase for the experimental group relative to the control group.

The flexible bar is a very simple element, but its functionality is immense, and its effects are remarkable. It allows to exercise in an easy, but complete way and, at the same time, its use can be adapted to different spinal or postural problems. The Flexi-Bar is adapted to adults or athletes. It is a very useful tool to easily exercise our body and improve body posture while toning muscles. (J.S. Chung, et al. 2015)

The researcher attributed this improvement to the Flexi-Bar program because it contains vibration training that helped improve the physical changes and improve the performance level in poomsae taegeuk IL jang.

The results of this study constant with (W.J. Armstrong et al. 2010) has pointed out, that vibration training is one of the most effective and effective alternative training methods to improve muscle performance, muscle strength and flexibility as vibration training has an effective effect on muscle strength Where muscle fibers contract and spread at

high speeds, which affects muscle efficiency and some physiological characteristic

In the development of the coordination capacity of balance plays an important role, the functioning of the vestibular apparatus, anatomical structure that is at the level of the inner ear and consists of three fundamental elements involved in the development of balance such as the utricle, the saccule and the semicircular ducts, essentially the first two structures mainly responsible for the development of static equilibrium and the semicircular ducts responsible for dynamic equilibrium. (L. Nasher, 1997)

(W. Pieter & J. Heijmans, 2000) stated that success depends not only on the technical preparation but also physical, tactical and psychological of the athlete.

(R.E. Rikli, & D. J. Edwards, 1991). stressed that in taekwondo is decisive the level of development of a series of motor skills in proportions and convenient combinations to respond to the high physiological demands involved in combat.

The development of the coordination capacity of balance in taekwondo athletes creates the necessary bases for a better coordination when executing kicks at the height of the head, those that are executed with rotation, technical combinations of high level of complexity that require sudden changes of position and even the tolerance to strong impacts on the head, common elements in the current taekwondo considering that the rules in function of raising the quality of the show rewards the previous



performances with a greater number of technical points.

Maintaining of the body stability during turning and stepping is crucial, for maximizing Taekwondo

performance (SSM. Fong, et al. 2012; NeuroCom, 2008).

In conclusion, our data suggest that (8) weeks of training with the Flexi-Bar could improvement of dynamic balance, Postural function and performance level of poomsae taegeuk IL jang in taekwondo in female university students.

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