

PROCEEDING

OF

THE 3rd INTERNATIONAL SEMINAR ON SPORT AND PHYSICAL EDUCATION

"Striving For World Sport Achievements Through Sport and Physical Education"

Faculty of Sport Science, Yogyakarta State University
Yogyakarta, May 24, 2011



In Cooperation :



Yogyakarta State University



ISORI DIY



Ministry of Youth and Sports
Republic of Indonesia

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TAEKWONDO ENDURANCE EXERCISE ON FIGHT CATEGORY

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ABSTRACT

Endurance exercise in Taekwondo hold on significant role. In endurance exercise should be adjusted with the periodization. General and specific periodization, pre-competition, competition and transition has its own endurance exercise characteristics, therefore creativity and the ability to modify an exercise extremely needed for a coach to handle it.

There are diverse kinds of endurance exercise, many ways to make it done like run in the running athletic track, road or cross country. In addition, endurance exercise can be done on the Taekwondo mattress. Form of exercise to the places, like a circle, triangle, square and modifications of jump, zig-zag and others. The principles of the exercise must have clear goals and objectives.

In hence, Taekwondo always put endurance exercise in line with the periodization. General and specific endurance exercise is to improving the VO₂ Max. Pre-competition endurance exercise should led to improved the function in accordance with the actual match. This pre-competition endurance periodization tailored to the type of match, the aims is to maintain endurance and adapting with the real match climate. Endurance exercise in transition is fun, to maintain endurance condition for stay in shape with body fitness.

Keywords: taekwondo fight, endurance

INTRODUCTION

Power is one of the physical components that are very important in every sport like taekwondo. There are supporting components which are bio-motor, strength, speed, endurance, coordination and flexibility. Those things must be develop in certain manner and specific technique in order to gain the highest achievement. Durability is one of bio-motor indispensable component in achieving maximum performance in sports. Endurance is the body's ability to overcome fatigue in a relatively long time. Almost all sports require endurance, it's not the same kind of durability. Each sport has a predominant energy system, so the fact that endurance exercise can be predicted in advance. Taekwondo is a sport that places the endurance as something important to reach an achievement, with 2 minute in one rounds, taekwondo has 3 rounds, and 1 minute for take a rest. But, it will add 2 more minutes in case of equal in value called the sudden death. That means that only use a total of 8 minutes of normal time.

Pre- dominant energy system is the primary energy used by sports. The main energy in taekwondo is an-aerobic energy system without neglecting the aerobic energy system which will use in certain phase of the game. Taekwondo in particular number always use the speed and power to generate points of attack and counterattack. So we can see that the attack or replies would not be possible only by the slow movement, but definitely fast and explosive. Therefore taekwondo in every motion relating to the points will always be done with quick movement and that means an aerobic energy used. Pre-dominant energy must be understood by taekwondo coaches, so that the endurance training would be more on target. Although working time is more dominant in an aerobic taekwondo, but aerobic energy is also important. Aerobic energy must be trained well, or you will not

either perform an aerobic endurance exercise if aerobic capacity is still not good. Therefore, aerobic exercise will always be given to the general and specific periodicity.

Endurance

The definition of resilience is the ability of the equipment body to fight fatigue during ongoing activity. Classified into two types, resistance can be divided into two general endurance and specific endurance. General resistance is the ability to do work involving some of the muscle or whole muscle groups, the central nervous system, neuromuscular, and cardiorespiration in a long period. This means involving all potential organ in the body as the basis for all types of resistance, so needed by all branches of sport as a basis for developing specific resistance. Thus, prior to train special defense it must be preceded by a general resistance training first. While the specific resistance is the resistance which only involves a group of local muscle. Seen from the duration, endurance can be divided into: (1) long-term durability, (2) medium-term durability, and (3) short-term endurance (Sukadiyanto, 2002: 42). As for the characteristics of resilience in terms of length of employment is as follows:

1. Long-term endurance is a resistance which takes more than 8 minutes, so the energy needs met by the aerobic system.
2. Medium-term endurance is the resistance of the medium term which takes between 2 to 6 minutes so that the energy needs met by the lactic anaerobic and aerobic system.
3. Short-term endurance is resistance that takes between 45 seconds to 2 minutes so that the energy needs met by the anaerobic system a-lactic.

Based on the predominant energy system used can be divided into (1) aerobic endurance, and (2) resistance of anaerobic (lactic and a-lactic).

General Endurance Training

The energy required in taekwondo is the ATP-PC 73.75%, LA-O2 16.25%, and 10% O2. In taekwondo still needed long-term endurance, mid-term endurance, and short-term endurance. Aerobic energy system is still needed in taekwondo, although in an attack hit back or will always use the an-aerobic system. The aerobic system needs to be given as a foundation to train the an-aerobic system. In line with the opinion of Sharkey (1983: 97) in a pyramid exercise to get to the summit of achievement must begin from the development of aerobic capacity, anaerobic threshold excitatory (an-aerobic threshold), anaerobic exercise, and speed to reach its peak is the highest achievement. Determine methods of endurance training, training principles to develop both the aerobic endurance and anaerobic need to know. Structured training menu for taekwondo in endurance exercise program needs to refer to the following principles.

1. Warming-up and cooling-down at the beginning and the end of training
2. Taekwondo should has better endurance (good Vo2max)
3. Maximum heart-rate must known early before
4. To improve aerobic capacity, exercise intensity of 60-90% or heart rate reached 140-150/minute
5. To improve the ability of anaerobic, sub-maximum exercise intensity or heart rate reached 180/minute or more
6. For children age should not be excessive aerobic exercise
7. a minimum endurance training program conducted for 40 minutes to 1 hour, with the frequency of each periodization as follows:
 - a. 3 times per week on a transition period until the early preparation stage
 - b. 2 times per week during the period of preparation
 - c. 1 time per week in the initial period of competition
 - d. 1 time per 2 weeks in the competition period

Aerobic Training Method

Training methods which can be used to increase aerobic endurance, among which are:

1. Continuous slower
2. Continuous faster
3. Jogging
4. Interval training

An-aerobic Training Method

Training methods which can be used to improve anaerobic endurance, among which are: (1) acceleration sprint, (2) hollow sprint, (3) interval training, and (4) sprint training.

1. Acceleration sprint method

Starting from jogging more and more accelerated to a sprint by extending step. The distance is adjusted with training periodization.



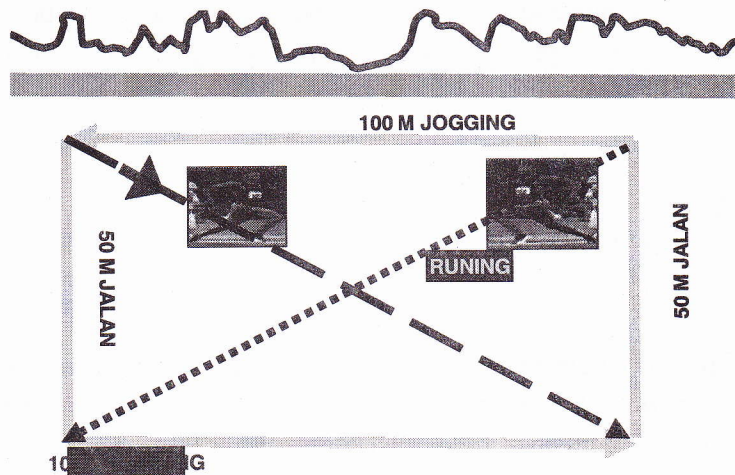
Acceleration sprint

2. Hollow sprint method

Fast sprint interspersed with jogging path and continuously: 50m sprint, 50m walking, 50m jogging and so until the target limit reached.

3. Interval training method

Actually, interval training is endurance training method that can be used to increase aerobic and anaerobic endurance. The difference is on arrangements between the time of exercise and rest periods. Method of interval training can be grouped into three, namely: long-interval training, interval training intermediate-and short-interval training.



Hollow sprint method

Interval Training for Different Energy Systems			
% of Maximum Anaerobic Power	Energy System Taxed	Interval Time	Work:Rest Ratio
90-100	Phosphogen	5-10s	1:12 to 1:20
75-90	Fast glycolysis	15-30s	1:3 to 1:5
30-75	Fast glycolysis and oxidative	1-3min	1:3 to 1:4
20-35	Oxidative	> 3min	1:1 to 1:3

From Essentials of Strength Training and Conditioning, NSCA (2000)

Interval training energy systems

A. Long-interval training

Although the long-dominant interval training to improve aerobic endurance, but the effect on improving anaerobic endurance. The menu of long-interval training is as follows:

intensity : 85-90%
t.work : 2-5 minute
t.r : 1:1 - 1:2
t.i : 2-8 minute (active)
repetition : 3-12

B. Intermediate-interval training (aerobic and an-aerobic)

In this exercise duration is shorter than the long-interval training, but exercise intensity increased so as to boost the anaerobic aerobic endurance. The menu of the intermediate-interval training is as follows:

Intensity : 90-95%
t.work : 30 second-2 minute
t. r : 1:2 – 1:3
t.i : 2-6 minute (active)
repetition : 3-12

C. Short-interval training (an-aerobic): pre competition – competition

Short-interval training is more directed at anaerobic endurance, because the purpose of this exercise is devoted to the increase in muscle power. In the short-interval training, as well as improve aerobic endurance, although relatively small. The menu of short-interval training is as follows:

Intensity : >95%
t.work : 5-30 second
t. r : 1:3 – 1:5
t.i : 15 – 150 second
repetition : 5 – 20

D. Sprint training

This method is more appropriate training periodization applied to pre competition to competition. The form of sprint training exercise was run with maximum speed, short distance (40-50m), and performed repeatedly (reps between 16-20 times). The menu of sprint training are as follows:

Intensity : 100%

Distance :40 meter (adjusted)
Volume : 4 set with 4 repetitions (16 repetitions)
t. r : complete (1:4-5)
t.i : complete (1:4-5)
frequency : 3X/weeks

E. Cross-country running

Cross-country in endurance exercise is a form of exercise variations, meaning that this exercise is an alternative to endurance exercise conducted in nature, in this case does not pass a public street or highway, but a road made by the coach. The route of this practice varies, can go up the hill, field, fields, rivers or the other.



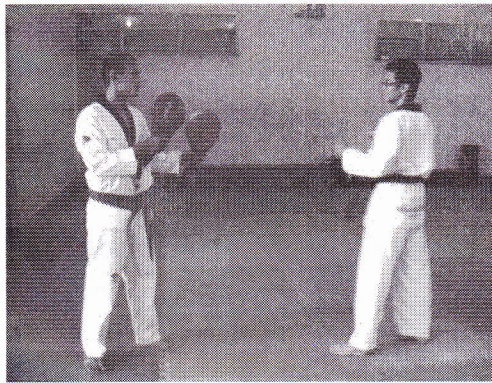
Cross-country Running

Taekwondo Specific Endurance Training

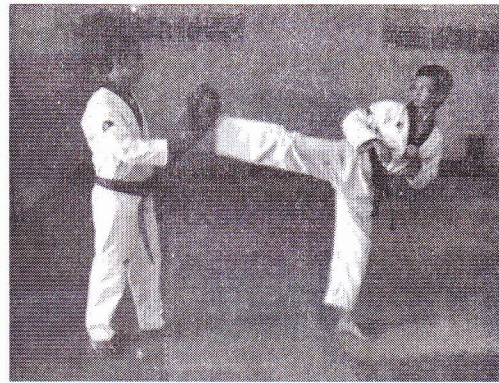
Anaerobic exercise for taekwondo can also be done with the approach of tactics and techniques. The exercise is done by using movements that are frequently used in the game, such as drill kick called "*dolyo*". But usually it is more suitable training methods during maintenance or in the pre competition and competition periods. Endurance exercise that can approach or even in accordance with the actual game will help athletes to perform duties during the game. Athletes conditions will be very familiar, so the appearance in the match will be more leverage. Here is an example of technique and tactics training approaches in an effort to maintain endurance.

1. One side kick (on-site)

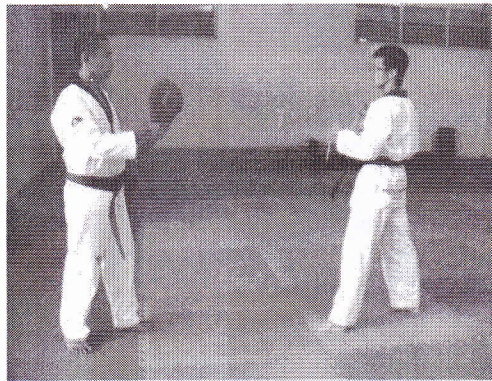
This exercise is performed on pre-periodization competition and competition dependent needs. This exercise is done with a technique with alternating leg kick. This exercise is not to be done with high intensity, but dependent for its interests if not maximal or sub maximal intensity. This exercise depends on the rhythm and length of time doing.



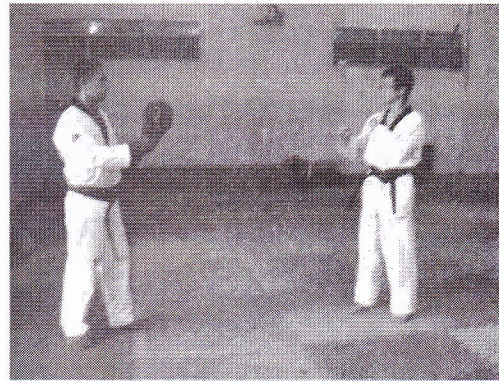
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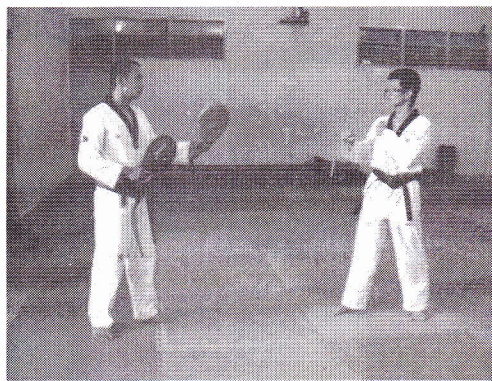
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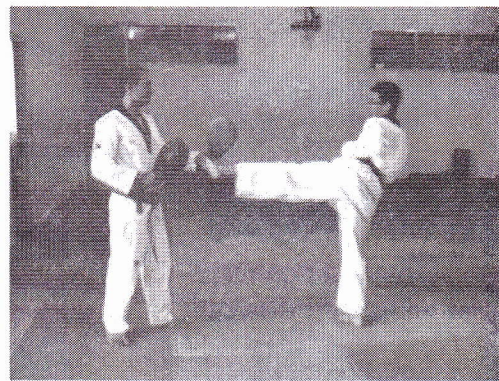
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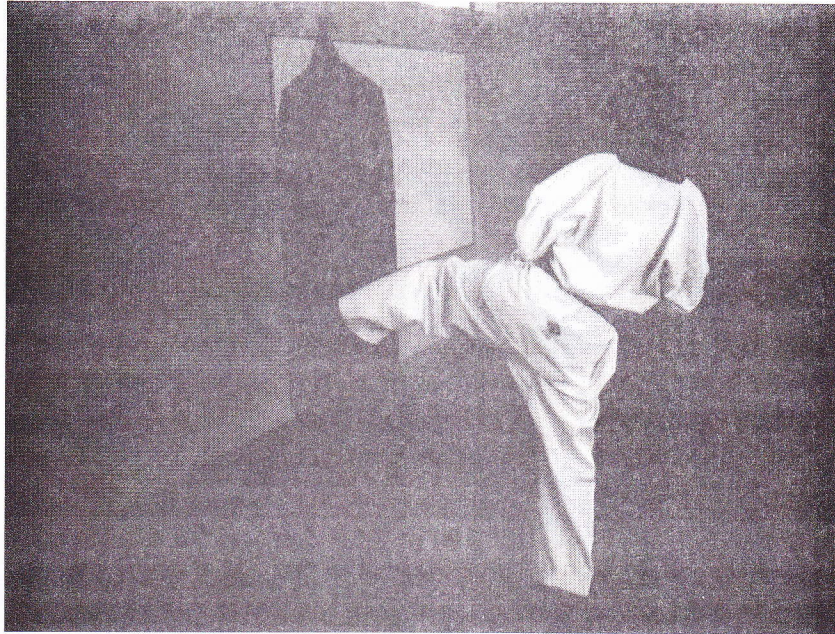


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2. On-site drill

This exercise is an exercise using the technique of repeated, either one or more techniques with a certain time depending on the specified target practice. For example, athletes must perform "dolyo chagi" right and left turns in 20 seconds.

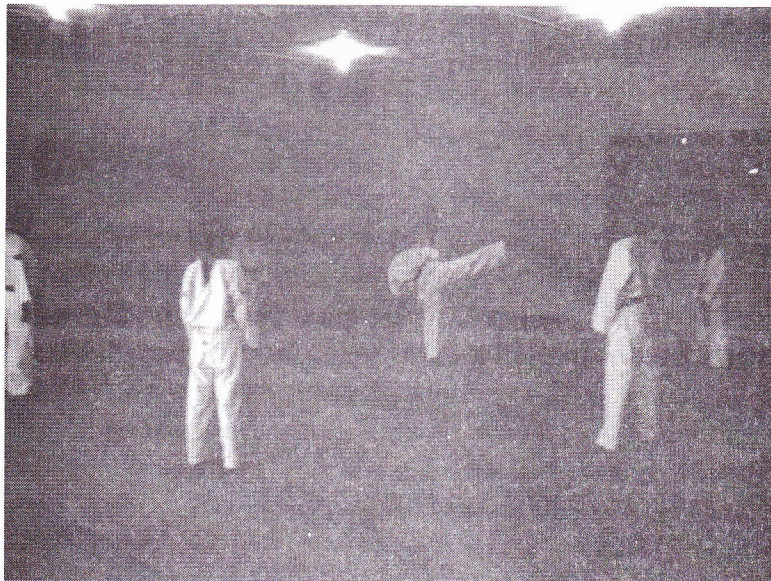
Intensity : >85%
t.work : 15-30 seconds
t. r : 1:3 – 1:5
t.i : 15 -150 seconds
repetition : 10 - 20



On-site Kick

3. Crazy wheels

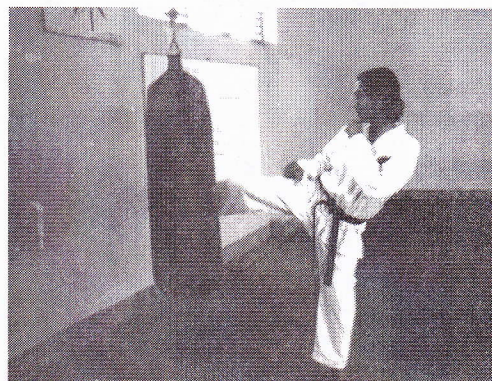
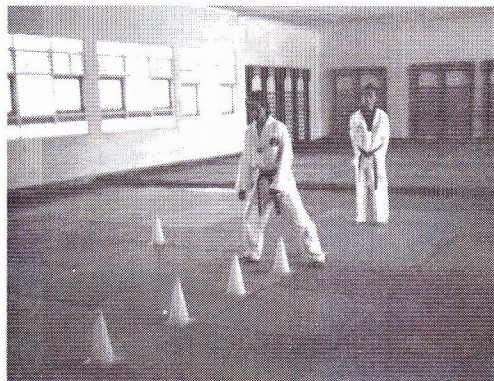
This term is a term often used by trainers in delivering the material endurance training on the maintenance period. This exercise is an endurance exercise performed by joining or using the material techniques of taekwondo. The technique used each athlete may vary according to their current habits fight. However, if you want uniform motion is also no problem. This exercise is a circle, the number of athletes involved in the loop depends on the needs, whether its intensity going high, low or moderate. More and more the number of athletes involved, of course, the lower the intensity, and vice versa. This exercise is other than circular, but its implementation while moving spins, while the athletes took turns to kick or other techniques with the direction of cutting the circle. In addition to conducting other athletes who kick move laterally without stopping until the time their turn to kick.



The training

4. Step kick

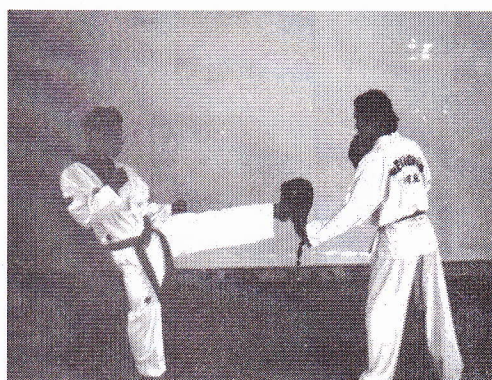
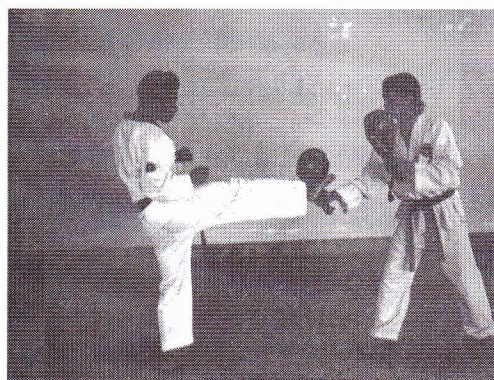
This term is also the name for ease in giving instructions. This exercise is shaped by combining step straight zig-zag with a kick at goal which was hung or held target. This exercise is also used in pre-competition and competition periods, this is because exercise has been with the engineering approach, even very dominating technique. As with any exercise with a circle, this exercise can also be made with intensity, high, medium or low, it depends a break between repetitions of each athlete.



Step Kick

5. Sparring target

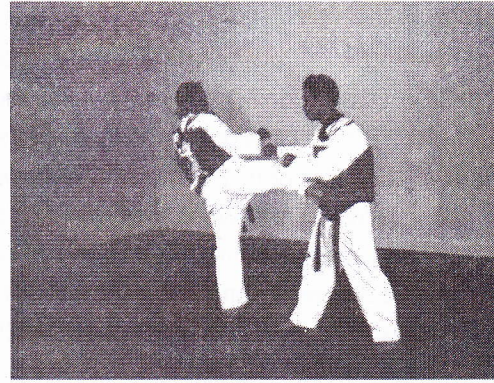
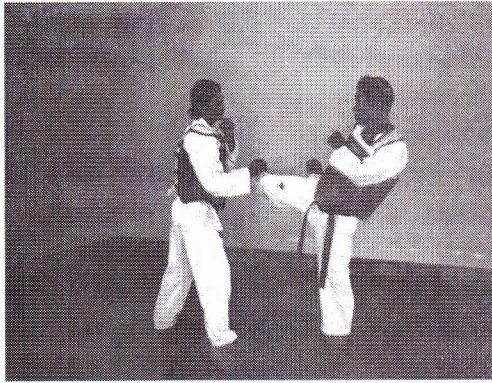
This is a common form of exercise, all members must have known taekwondo. The form of this exercise in pairs of two people, one person hold the target and the other kicks. Kick by holding up to the same target, but that in the present target of any origin should not give. Target presented tailored to the needs in the field, besides that time doing a kick and recovery time is adjusted with the aim of the exercise. Exercise endurance mean recovery time and work time is not too much different, even the same, maybe even once a half of work time. For example: 1:2; 1:1; 1:1/2. Here is shown about the sparring target.



Sparring target

6. Sparring "hugo" / Paired "hugo"

Hugo just as "paired" on a target, but they wear *hugo* or body protector. How to do it is to kick each other on the body permitted. Performed alternately kick *one-sata* with the free technique. Besides paired *hugo* is very important to train the athlete's stamina, because in this way athletes actually perform an attack or counter such as during the game.



Paired Hugo

7. Circuit kick

In practicing this process is the same with the method of circuit on a general physical exercise, except that the difference is only in the form of training. In this exercise each heading are given other forms of exercise tailored to the techniques and tactics in a taekwondo match. Exercise with models like the above done on the periodicity of competition. Endurance training with tactical approaches and techniques to maintain physical condition taekwondo in before the match. Here is the table that shown the training program regarding to the circuit levels.

Serial/ circuit I	Serial/ circuit II	Serial/ circuit III
1. Jireugi 30x	1. Jireugi 30x	1. Jireugi 30x
2. Dolyo chagi 30x	2. Dolyo chagi 30x	2. Dolyo chagi 30x
3. Naeryo chagi 30x	3. Naeryo chagi 30x	3. Naeryo chagi 30x
4. Peta chagi 30x	4. Peta chagi 30x	4. Peta chagi 30x
5. Nare chagi 15x	5. Nare chagi 15x	5. Nare chagi 15x
6. Dwi chagi 15x	6. Dwi chagi 15x	1. Dwi chagi 15x

When the first column (serial / circuit I) type of exercises 1 through 6 completed, this means doing as much as a series or a single circuit.

Transition

Transition is a training phase that is always present in the exercise program in this periodization training focused on the maintenance after undergoing a competition. At this time the athletes are given exercises to maintain fitness for his performance does not degrade. Exercises recommended during the transition period is an activity or sport other than those occupied. This means that if he is a taekwondo athlete, so in this transition period is not provided practice taekwondo, but given exercise or other physical activity fun. But a coach should also know that the goal to provide training to maintain the physical condition of athletes, and therefore such activities must be under the supervision of trainers. Long transition time depending on the needs of each sport and event that will be encountered.

CONCLUSIONS

Endurance training is important on the taekwondo, this mean during the pre-competition and competition should be done in good and correct programs. In addition, endurance exercise tailored to the periodization of the taekwondo training indirectly, the goals and kinds of training exercises will also be customized and programmed adjusted to the needs. The principle that the exercise of its durability must conform with the actual game, modification and creativity are needed to pack good aerobic endurance training or an aerobics became more interesting, not boring, and most importantly on the periodicity of competition must be in accordance with the actual game. This is different from endurance training on the transition period, in this period athletes must maintain his fitness with other sporting activities, but the exercise should be fun.

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