



International Seminar of
Sport Culture and Achievement

ISSCA 2014 PROCEEDINGS

*"Global Issues of Sport Science &
Sport Technology Development"*



Diterbitkan Oleh:
Rakusandiman Rochandiman
Universitas Negeri, Yogyakarta.





International Seminar of
Sport Culture and Achievement

ISSCA 2014 PROCEEDINGS

*“Global Issues of Sport Science &
Sport Technology Development”*



Diterbitkan Oleh:
Fakultas Ilmu Keolahragaan
Universitas Negeri Yogyakarta
24 April 2014

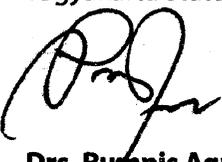
Preface

Salam Olahraga!

Praise and be grateful to the Lord, so that this proceeding can be issued. The International Seminar of Sport Culture and Achievement with "Global issues of Sport Science & Technology Sport Development" theme is held on 23rd- 24th April 2014 at Yogyakarta State University Hotel. The seminar is conducted by Faculty of Sport Science, Yogyakarta State University.

The seminar was conducted in order to enliven the 50th anniversary of Yogyakarta State University. The Seminar aims at revealing any growing sport potentials and recent worldwide research results. There are three pillars of sport: recreational sports, physical education/ sports pedagogy, and elite sport that in common have one goal to form characters and support achievement.

Hopefully, the publication of this proceeding can bring benefits to the participants in particular and readers in general. Final words for all those who have helped this seminar, we thank you.

The seal of Universitas Negeri Yogyakarta, Faculty of Sport Science, is a circular emblem. It features a central figure of a person holding a torch, surrounded by the text "KEMENTERIAN PENDIDIKAN DAN KEBUDAYAAN" at the top, "UNIVERSITAS NEGERI YOGYAKARTA" in the middle, and "FAKULTAS ILMU KEOLAHRAGAAN" at the bottom.
Dean of Faculty of Sport Science
Yogyakarta State University,

Drs. Rumpis Agus Sudarko, M.S.

Preface

Assalamualaikum Warrah Matullahi Wabarakatuh

The honorable speakers, Prof. Dr. Djoko Pekik Irianto, M.Kes. AIFO (Deputy of Achievement Improvement of Sport and Youth Ministry), Dr. Wayne Cotton (Australia), Dr. Jose Vicente Garcia Jimenez (Spain), Dr. Achara Soachalerm (Thailand), Dr. Lim Peng Han (Singapore), and Dr. Gunathevan A/L Elmulai (Malaysia). The distinguished guests.

First of all, on behalf of the committee of the International Seminar of Sport Culture and Achievement, let me express great thank to God Allah SWT who gives us opportunity and health, so that we can join this international seminar on sport culture and achievement. It is my pleasure to welcome you to the International Seminar of Sport Culture and Achievement in Faculty of Sport Science Yogyakarta State University.

The international seminar is in order to celebrate the 50th anniversary of Yogyakarta State University. In this opportunity, we invite five speakers from five countries; they are from Spain, Australia, Thailand, Singapore, and Malaysia. The participants of the seminar are 250 participants.

Finally, allow me to express my gratitude to all audiences, especially the honorable speakers and the distinguished guests for paying attention to this seminar. I hope that the seminar will run well and be successful.

Thank you very much.

Wassalamualaikum Warrahmatullahi Wabarakatuh

Yogyakarta, 24th April 2014
Chairman of ISSCA,



Dr. Panggung Sutapa, M.S.

CONTENTS

| | |
|---|-----|
| Cover | i |
| Preface | ii |
| Content | iii |
| Keynote Speaker | iv |
| Guest Speakers | V |
| | |
| Manipulative Motions of 2010 Academic Year PJKR Students Ability of Net Teaching Lecturing Amat Komari, Yogyakarta State University, Indonesia | 1 |
| | |
| Ability of Physical Education Teachers in Implementing Learning Outdoor Education (Studies in Outdoor Education Trainees) Aris Fajar Pambudi, Yogyakarta State University, Indonesia | 9 |
| | |
| Designing Physical Education (PE) Learning Using Scientific Approach Aris Priyanto, Sport and Youth Department Yogyakarta, Indonesia | 15 |
| | |
| A Comparative Study on Sport Education Concept and Movement Education Concept in Physical Education Teacher Education: an Over View on Existencial Phenomenology Bambang Abduldjabar, Indonesia University of Education, Indonesia | 22 |
| | |
| Playing Aids and Early Childhood Motor Skill in Kindergarten Banu Setyo Adi, Yogyakarta State University, Indonesia | 33 |
| | |
| The Effect of Traditional Games Toward Physical Fitness Elementary School Students Dewi Septaliza, Bina Darma University, Indonesia | 40 |
| | |
| The Human Resource Profile of Early Childhood Education (PAUD) Teacher for Motoric Aspect of Early Childhood Children Endang Rini Sukanti, Yogyakarta State University, Indonesia | 46 |
| | |
| Big Ball Game Modification for Learning Physical Education A Erlina Listyarini, Yogyakarta State University, Indonesia | 53 |
| | |
| School as Sport Health Promotion Place to Improve Students Health Level Erwin Setyo Kriswanto, Yogyakarta State University, Indonesia | 60 |
| | |
| The Influence of Learning Pattern and Adversity Quotient towards the Achievement of Javelin-Throw Lesson after Controlling Student Previous Knowledge Ishak Aziz, Padang State University, Indonesia | 68 |
| | |
| Knowledge Level Students PJKR C Forces 2011 about Violations and Penalties in Football Game Nurhadi Santoso, Yogyakarta State University, Indonesia | 76 |

| | |
|--|-----|
| Physical Exercise for Early Childhood Taekwondo Devi Tirtawirya, Yogyakarta State University, Indonesia | 184 |
| Correlation Between Protein, Fat and Carbohydrate with Arm Power and Leg Power in Pencak Silat Combative Pelatda DIY Athlete Dwi Wahyuningsih ¹ , B.M Wara Kushartanti ² , Arta Farmawati ³ , B.J. Istiti Kandarina ⁴ , and Mirza Hapsari Sakti Titis Penggalih ⁵ Gadjah Mada University ¹ , Yogyakarta State University ² ; GadjahMada University ^{3,4,5} ; Indonesia | 194 |
| Comparasion of Body Composition and Somatotype Characteristics of Sprinter Athletes at AUE and YSU Eddy Purnomo ¹ , Norikatsu Kasuga ² , and Hideki Suzuki ³ ¹ Yogyakarta State University, Indonesia; ^{2,3} Aichi University of Education, Japan | 202 |
| Identification of Management Standards Infrastructure and Facilities Management Fencing Organization in Yogyakarta Faidillah Kurniawan, Yogyakarta State University, Indonesia | 208 |
| ACTN3 R577X Polymorphism and Body Composition Profile of Indonesian Karate Athletes Rachmah Laksmi Ambardini, Yogyakarta State University, Indonesia | 223 |
| Development of Learning Media Movement Rhythmic Activity Model for Students SD Form VCD Siti Nurrochmah ¹ , Tatok Sugianto ² , and Sri Purnami ³ , State University of Malang, Indonesia | 228 |
| Revitalizing Sepaktakraw Ninja Smash Using Hanging Ball and Mattress I Ketut Semarayasa, Education University of Ganesha, Indonesia | 239 |
| Menstruation and Female Athlete's Performance Indah Prasetyawati Tri Purnama Sari, Yogyakarta State University, Indonesia | 246 |
| Identification of Hydration Status with Urine Profile Measurement and Drink Consumption in PencakSilat Athlete in Yogyakarta State University Inna Rachmawati ¹ , Neni Trilusiana Rahmawati ² , Mirza Hapsari Sakti Titis Penggalih ³ , and B.J. Istiti Kandarina ⁴ GadjahMada University, Indonesia | 254 |
| Model of Mental Training for Swimming Athletes Juriana, Jakarta State University, Indonesia | 266 |
| The Implementation of Physical and Health Education in School Kamal Firdaus, State University of Padang, Indonesia | 273 |

| | |
|--|-----|
| The Factor That Affects Participants of Kasetsart University's Thai-Sword Competition Kanlapruk Polsorn ¹ and Dr. Achara Soachalerm ² , Kasetsart University ^{1,2} , Thailand | 279 |
| Measuring Service Satisfaction in Tirta Kirana's Swimming Pool Kurnia Tahki ¹ and Juriana ² , Jakarta States University, Indonesia | 284 |
| The Effects of Isotonic Drink, Coconut Water, and Plain Water on Hydration Status of Football Athlete by Urine Profile Viewing Mirza Hapsari Sakti Titis Penggalih ¹ , Arta Farmawati ² , Retno Sutomo ³ , Muhammad Nurhadi ⁴ , Wiryatun Lestariana ⁵ , Muhammad Juffrie ⁶ , Lisandra Maria Goretti ⁷ , and Hamam Hadi ⁸ , Gadjah Mada University, Indonesia | 291 |
| Relationship Between Percentage of Body Fat and Somatotype Athletes of Pencak Silat Combative Class Regional Training (PELATDA) Daerah Istimewa Yogyakarta Nadia Hanun Narruti ¹ , B.J. Istiti Kandarina ² , Arta Farmawati ³ , and Mirza Hapsari Sakti Titis Penggalih ⁴ , Gadjahmada University, Indonesia | 297 |
| The Analysis of the Physical Condition, Will Pencak Silat Construction Training Center Students (PPLP) of West Sumatra Nurul Ihsan, Padang State University, Indonesia | 307 |
| Understanding "Sports Hernia" (Athletic Pubalgia) as A Chronic Groin Injury in Athletes Sendhi Trisanti Puspitasari State University of Malang, Indonesia | 312 |
| A Study on Achievement Motivation by Gymnastics Floor Athlete's in Sijunjung Regency Sri Gusti Handayani, Padang State University, Indonesia | 323 |
| Effect of Stress and Anxiety Swimming Performance Athletes Sungkowo, Semarang State University, Indonesia | 334 |
| Effect of Sensitivity Proprioceptive and Plyometric Training for Jump Serve Success on Volleyball Syarif Hidayat, Ganesha Education University, Indonesia | 341 |
| Analysis of the Grand Strategy of National Sport Performance Development of 2014 - 2024 Wawan S. Suherman, Yogyakarta State University, Indonesia | 348 |
| "No Practice, Watch Only": Sport in Consumer Society Anirotul Qoriah, Semarang State University, Indonesia | 355 |
| The Field of Lecturers Expertise Based on Sport Science Development Bambang Priyonoadi ¹ , Saryono ² , and Soni Nopembri ³ , State University Of Yogyakarta ^{1,2,3} , Indonesia | 364 |

| | |
|---|-----|
| Correlation of Nutrition Status and Dysmenorrhea Painful to Female Students Sports Science Departemet Faculty of Sport Science Yogyakarta State University Cerika Rismayanthi, Yogyakarta State University, Indonesia | 370 |
| Warming-Up Exercises for Mini-Volleyball Danang Wicaksono, Yogyakarta State University, Indonesia | 381 |
| Gateball as An Alternative Sport to Maintain Physical Fitness of Elderly Fatkurahman Arjuna, Yogyakarta State University, Indonesia | 390 |
| Survey of the Understanding Level of Physical Education Teachers to Design Games in Elemantary Schools in Malang Febrita P. Heynoek ¹ , Sri Purnami ² , and Dona Sandy Y ³ , State University Of Malang, Indonesia ^{1,2,3} | 399 |
| Changes in Blood Lactic Acid Levels after Active, Corstability, and Passive Recovery Hajar Danardono, Tunas Pembangunan University Surakarta, Indonesia | 405 |
| The Role of Branched Chain Amino Acids as Dietary Sports Supplements I Made Satyawan ¹ and I Wayan Artanayasa ² , Ganesha Education University, Indonesia ^{1,2} | 415 |
| The Effect of Side Jump Sprint Training with 1:3 and 1:5 Work: Rest Relief Ratio on Leg Muscle Power I Nyoman Sudarmada, Ganesha Education University, Indonesia | 422 |
| Marketing Strategies of Tubing Sports to Increased Tourist to Visit Bali I Wayan Muliarta ¹ and Kadek Yogi Parta Lesmana ² , Ganesha Education University, Indonesia | 429 |
| The Importance of Emotional Maturity and the Ability on Think Positive for Athletes Komarudin, Yogyakarta State University, Indonesia | 437 |
| The Effects of Training and Achivement Motivation on Vertical Jumping Ability Muslimin, Bina Darma University Palembang, Indonesia | 443 |
| Integrated Physical Education in The Context of 2013 Indonesian Primary School Curriculum Soni Nopembri ¹ , Saryono ² , and Ahmad Rithaudin ³ , Yogyakarta State University, Indonesia ^{1,2,3} | 451 |
| The Effect of Aerobic and Anaerobic Exercises on Premenstrual Syndrome (PMS) (Experimental Study On Students FikUnp) Umar Padang State University, Indonesia | 460 |

| | |
|---|-----|
| Learning Model of Physical Education Using Multiple Intelegenscies Approaches and Influence on Creativity Development Roesdiyanto, State University of Malang, Indonesia | 466 |
| Neutrophils Percentage after Consuming Red Guava Juice (PsidiumGuajava L. Red Cultivar) During Aerobic Exercise Yuliana Noor Setiawati Ulvie ¹ and Sugiarto ² , ¹ Nutrition Study Program, University of Muhammadiyah Semarang ² Faculty Of Sport Science, Semarang State University | 473 |

PHYSICAL EXERCISE FOR TENNIS ATHLETE WITH WEIGHT TRAINING

Ahmad Nasrulloh

Yogyakarta State University, Indonesia

Abstract

Tennis is one of game sports that is popular in today's society. Tennis sport achievement in Indonesia still needs to be improved because it has not shown an outstanding achievement in the international arena. The athlete performance while competing is strongly influenced by physical ability, technique, tactics and mentally. Physical ability will be obtained only by practice. Exercise that should be carried out must be in accordance with the principles of exercise. One example is the principle of overload, where each athlete during training should be given more exercise load that training can be meaningful. Excess weight will be more effective if done using external load with the help of weight training equipment. Therefore we need a method of physical exercise using the loading system in the form of weight training to help improving athlete performance when competing. Weight training is importantly needed by a tennis athlete to help improving his or her physical abilities to perform the best when competing. Tennis athletes require weight training to train the muscles that have contributed significantly to the performance. The muscles that contribute while playing tennis are leg muscles, chest muscles, and arm muscles. One of the training methods to train these muscles is with weight training method. The weight training program was conducted by the method of circuit weight training with a fast rhythm, the intensity is 40-80% RM and the frequency of exercise is 3 times / week. This exercise uses 6-12 posts with recovery post between 0-30 seconds. This exercise should be done 2-5 sets with 10-25 reps and <60 seconds recovery among sets.

Keywords: physical exercise, tennis athlete, and weight training

INTRODUCTION

Tennis is one game sport that is popular in today's society. Most people have started to recognize this and made the sport as a hobby. The number of children who joined in a tennis coaching club shows that tennis is favored by children. From among adolescents and adults who are often do tennis are done as a competition to get the achievement. It is also often used as a means of interacting with the environment. Some people who are elderly use tennis as one alternative to be able to maintain physical fitness and as a means of recreation, so their health quality is always maintained.

The tennis sports achievements in Indonesia still needs to be improved because it has not shown outstanding achievement in international level. Indonesian athlete performance when playing is still not maximum in results. This can be seen when athletes who compete tennis championship at the international level is still not able to achieve remarkable achievements. The athlete performance while competing is strongly influenced by the physical ability, technique, tactics, and mental. The physical ability can affect athlete performance because if the physical quality of an athlete is lower than the opposite, he or she will lose the game, as well as technical ability, tactical and mental rigidity. If the abilities can be controlled by Indonesian athletes, they will be able to offset other athletes from other countries and even can defeat them. Therefore, Indonesian tennis athletes still need proper, regular, scalable and programmed exercise coaching according to the right exercise dosage in order to improve performance during when competing so that they can get achievement in international competition.

The process of athlete development should be adjusted to the principles of exercise. According Sukadiyanto (2002: 14), the exercise principles include: (1) individual, (2) adaptation, (3) overload, (4) progressive load, (5) specificity, (6) varies, (7) warm-up and

cooling down, (8) periodicity, (9) reversible, (10) a moderate load (not excessive), and (11) should be a systematic exercise. The basic principles of the exercise should always be adhered to and implemented in order to achieve target practice. Athletes and coaches often forget the basic principles of the practice. One example is the principle of overload, where each athlete during training should be given the excess load that can exercise meaningful. Imposition of the excess would be more effective if done using external load with the help of weight training equipment.

Weight training is a physical activity that can be done by each human individual being. There are many objectives to be gained in doing weight training, such as to build muscles, make their body more ideal, athletic body shape, improve fitness, train strength and power training. Today, there are many people use weight training facilities as a means to train physique. However, some tennis athletes have not realized the importance of strength training for physical training. There is some notion that tennis athletes do not need to do weight training because it will damage the technique that has been mastered. This assumption is actually incorrect, because weight training, if done properly and correctly in accordance with the proper dose of exercise, will make a positive contribution to the physical condition of an athlete.

In tennis game sport, specifically, it is that weight training can be used as an exercise to train power. Once weight training given to athletes excessive and done quickly, then the power will be trained, so it can increase the athlete performance. Weight training is one alternative that is appropriate for a variety of exercises to build physical abilities in order to balance the composition of technique and physique. In fact, the training process of developing athletes that has been performed so far does not much pay attention on the balance between training technique training and physical training. Therefore, it needs a method of physical training by using a loading system to help improving athlete performance on competition.

DISCUSSION

According Arma (1981: 502) tennis is one sport form using a small ball and every player wears a racket as the beater. The basic principle of playing tennis is hitting the ball before or after bouncing on the floor across over the net and into the opponent's game area (Sukadiyanto, 2002: 29). Tennis game sport is a sport that is performed on a rectangular field by using a small ball using a racquet to hit up over the net and into the opponent's court area.

According Sukadiyanto (2002: 29-30), to complicate the opponent when hitting the ball, there are some basic techniques, namely: (a) groundstrokes consisting of forehand and backhand, (b) volley also consists of forehand and backhand, (c) service, (d) lob and smash. Meanwhile, according to Strand (1993: 88) tennis skills typically taught in a physical education unit include serves, ground strokes, lobs, drop shots, and overhead smashes. From above, it can be concluded that the opinion that every athlete must master the technique of tennis basic skills, namely: (a) forehand and backhand groundstrokes, (b) freshly prepared, (c) volley forehand and backhand, (d) lob, (e) smash overhaed, and (f) drop shots.

In addition to technical ability, in playing tennis, there should be supported by physical ability. The physical ability can be obtained only by physical training in appropriate training portion. There are some expert opinions about training: "training is usually defined as the systematic process of repetitive, progressive exercises, having the ultimate goal of improving athletic performance" (Bompa, 1999: 1). According Nossek (1982: 10), training is a process or, in other words expressed, a period of time lasting several years, until the sportsman Achieves a high standard of performance. Principally, the exercise is to provide regular, systematic, continuous physical pressure in such a way, so as to improve the ability to perform physical activity (Fox et al., 1993: 69).

Training is an implementation of a structured plan to improve the ability of sport exercising that contains the theory and practice materials consisting of methods, and implementation rules in accordance with the goals and objectives of the exercise to be achieved. In addition, training is the main device in the process of daily exercise to improve the quality of the human organ system function during exercise, so that it can facilitate the improvement of an

athlete in motion during exercise. As an example of the arrangement of training material in a single face-to-face meeting in general containing materials, such as: opening / introductory of exercise, warming-up, core exercises, additional exercises (supplement), and cooling down / closing. Training is done according to the dosage by combining three factors consisting of intensity, frequency, and duration of the training.

The meaningful training should be done in accordance with the appropriate dosage. The dosage of training consists of intensity, frequency, duration, and type of training (Siswantoyo, 2008: 127). The following is an explanation of the dose of exercise:

a. Training Intensity

The quality that indicates the severity of the exercise referred to as intensity. The amount depends on the type and intensity of exercise goals. Aerobic exercise uses heart rate according to Djoko (2000: 14) in general fitness the exercise intensity is 60% - 90% of maximum heart rate, and in particular the amount of exercise intensity depends on the purpose of the exercise. The intensity of exercise to improve cardiorespiratory endurance is between 75% - 85% maximum heart rate, while for the process of fat burning between 65% - 75% maximum heart rate.

b. Training Duration

Duration is a measure of the exercise length that can be performed each time. Duration can be expressed in terms of time, distance or calories (Sharkey, 2003: 111). Proper training is expected to give a good effect on improving the cardiorespiratory system. According to Djoko (2000: 17) to improve pulmonary, cardiac fitness and weight loss training, it takes 20-60 minutes. So it can be said that the duration of exercise to improve cardiorespiratory are 20-60 minutes in every training session.

c. Training Frequency

In doing the training to improve cardiorespiratory ability, there should be training frequency performed at least three times in one week. According to Giam (1993: 16), the frequency of exercise is 3 to 5 times a week (once in two days, if the training is done three times a week). To improve fitness takes exercise 3-5 times per week (Djoko, 2000: 13).

d. The Kinds of Training Activity

Training involving the whole body, such as walking, jogging, running, swimming, cycling, and aerobics can improve cardiorespiratory capability. According Sadoso (1992: 150) a body that is anaerobic activity (such as sprinting) is also not improving cardiorespiratory ability.

The proper exercise should apply the basic principles of physical training in order to achieve maximum performance of someone. The basic principles of effective practice are as follows:

a. Overload Training Principle

Overload refers to the observation that a system or tissue must be exercised at a level beyond which it is accustomed in order for a training effect to occur (Power, 2007: 621). Suharjana (2007: 88) states that the principle of overload training basically emphasizes workload undertaken which must exceed the capabilities, thus, the training should reach the threshold stimuli. It is intended that the physiological function system can adjust to the intended demands to improve. So, in creating and implementing a training program should be adhered to the principle of overload that can enhance the ability periodically.

b. Specificity Principle

Good exercise program should be selected specifically according to the needs of sports and games that will be done. According Sukarman (1986: 60) to be proficient in skills in certain sports, one must practice the sport. Special training for a sport or a game is for intended performance, leads to morphologic and functional changes related to the specifications with the sport in question (Bompa, 1994: 9).

c. Individual Principle

According to Bompa (1994: 13) individualization in training is a primary requirement of a training establishment for every athlete in less attention to the implementation process of the exercise, the training should be fun for every individual to his or her ability, potential, and in particular to study the properties of each sport branch. Every individual has different abilities, so that in determining training load, it must be adapted to each individual's ability.

d. Progressive Weight Training Principle

According Sukadiyanto (2002: 16) progressive training should be steadily, developed and sustained performed. A person who performs the training, the given load should be increased gradually, regularly and steadily until it reaches the maximum load (Bompa, 1994: 30). So it can be said that the process should be done continuously and increased following the preceding exercise before continuing.

e. Reversible Principle

According to Djoko (2000: 11), someone's fitness that has been achieved will gradually decline even disappear at all, if you do not exercise regularly with proper dosing. Muscles' ability that have been achieved will gradually decline even disappear altogether if there is no exercise done (Suharjana, 2007: 89). So it can be said that the adaptations that occur as a result of the exercise will gradually decrease and even disappear if the exercises are not done regularly with the proper amount of training.

A professional tennis athlete should be able to master the all basic techniques of playing tennis. In addition, physical factors may also affect the performance or appearance when competing. Therefore it is very necessary a training method that can give a meaning to the physical and technical capabilities. One of the proper training is by with weight training methods that help to provide muscle strengthening on certain muscle parts. According to Djoko (2000: 59) weight training is a form of training that uses weight equipment media to support the weight training with the goals to improve fitness, muscle strength, speed, muscle toning, muscle hypertrophy, rehabilitation, as well as weight increase and decrease. Weight training variation can be done using inner weight in the form of the body weight and external weight in the form of weight tools. At the time of physical training for tennis athletes, athletes often exercise using weights in which they are push-ups, sit-ups, or back-up. It also needs to be done using external load training to enhance the ability of the other physical components. This external loading process from can be used to improve the physical condition of tennis athletes, especially power.

This weight training is necessarily needed by tennis athletes to help improving their physical abilities while competing. The ability to hit the ball while playing tennis, both forehand and backhand groundstroke, serves, and smash overhead that must be supported by the strength of a group of muscles that in order to get high power hit. Therefore, it is very necessary that proper weight training methods to train the related muscles is required for tennis. As stated by Faigenbaum (2009: 206), although most leg muscle contribute to this explosive action, the midsection, chest, and triceps are key players

The proper exercise to train leg muscles can be done with square method jumps, 90 degree jumps, lunge pass madical ball, ball medical side pass, back squats, leg press, dumbbell lunge, hip abduction, and hip adduction. With these trainings, all leg muscles can be trained, so that it is to contribute to the explosive movements in tennis game. To train the chest muscles can be done with a chest press exercise, butterfly, dumble chest press, pull over, bench press, push-ups, cross-over, and dumbbell fly. For the bicep curls, the training can be done by methods triceps kickback, triceps dips, push-down reverse, triceps extension, wrist curt, reverse curl and reverse wrist curls.

Weight training can be done with multiple systems or different methods. One of them with circuit training or better known as circuit weight training. This exercise is basically exercise performed by combining the principles of weight training and circuit training principles. This exercise is designed to increase muscular strength and endurance while training the aerobic system. Besides, these exercises can also be used to train the power, if done with a combination of speed and strength. Circuit weight training workout consists of several kinds of weight training that is structured into several stations with a light weight, given short break or no break between posts, done with a lot of repetition repetition, and some sets with break longer between sets.

According to Corbin and Lindsey quoted by Djoko (2009: 69) the character of circuit weight training includes: consisting of several types of drills, series, little rest between exercises, many reps, light weights, lifting weights repeatedly, starting exercise from small muscles to large muscles, done alternating between upper and lower limbs. In general, the portion of training can be presented in tabular form as follows:

Table 1. Components and Portion of Training

| Components | Portion |
|----------------------------|----------------------------|
| Weight (intensity) | 40%-80% Kemampuan maksimal |
| Amount of Training or Post | 6-12 |
| Every Set Repetition | 10-25 |
| Circuit | 2-5 |
| Break between Post | Tanpa istirahat-30 dt |
| Break between Circuit | < 1 mnt |
| Training Duration | 8-16 Mg |

Reference: Djoko (2009: 69).

The training program can be run optimally with satisfactory results if done in accordance with the appropriate dose of exercise. This program can be applied to the sport of tennis athletes with targeted exercises for the leg muscles, chest muscles, and arm muscles. The method of circuit weight training exercise with the intensity of loading at 80% done with the fast rhythm power will be able to train groundstrokes during a blow for tennis athletes. It also will train explosive movement capabilities so as to enhance the performance when competing. The training program for tennis athletes can be presented as follows:

**Table 2
Weight Training Program for Tennis Athlete**

| Kind of Training | Training Portion | Explanation |
|---|--|---|
| Main Training: Weight Training | Frequency: 3 times /week Intensity: 40-80 % RM Set: 2-5 Sets Rep: 10-25 times Recov: no break-30 seconds between posts Recov: < 60 seconds between sets | Continous Training Total Posts: 6-12 Rhtym: fast/ explosive Method: <i>circuit training system</i> |
| Complementary Training: Aerobic with medium intensity | Frequency: 3 times a week Intensity: 65-75 % MHR Duration: 20-60 minutes | Training to improve cardiorespiration ability |

CONCLUSION

Tennis athletes need physical and technical abilities when competing in order to obtain maximum performance results. A good technical ability is not enough to be a provision in a game, but it must be balanced by physical ability. Tennis athletes also require weight training to train the muscles that contribute significantly to the current play. The muscles that contribute while playing tennis are leg muscles, chest muscles, and arm muscles. One of the training methods to train these muscles is with weight training method. The weight training program was conducted by the method of circuit weight training with a fast rhythm, the intensity is 40-80 % RM and the frequency of exercise is 3 times / week . This exercise uses 6-12 recovery posts between 0-30 seconds. This exercise should be done 2-5 sets with 10-25 reps and recovery between sets which is < 60 seconds. In these exercises, it can also be added as an additional aerobic exercise to improve the cardiorespiration fitness. As a complementary exercise or training, aerobic exercise can be performed with 3 times / week frequency, 65-75 % MHR intensity and duration of 20-60 minutes.

REFERENCES

- Arma Abdoellah. (1981). *Olahraga untuk perguruan tinggi*. IKIP Yogyakarta.
- Bompa, T.O. (1999). *Periodization of strenght the new wave in strenght training*. Canada: Copywell.
- _____. (1994). *Theory and methodology of training*. (Terjemahan). Bandung: Program Pascasarjana Universitas Padjadjaran Bandung. Buku asli diterbitkan tahun 1994.
- Djoko, P. I. (2000). *Panduan latihan kebugaran (yang efektif dan aman)*. Yogyakarta: Lukman Offset.
- (2009). *Peranan jogging dan circuit weight training pada profil lemak tubuh dan kebugaran aerobik penyandang overweight*. Makalah, tidak diterbitkan, Universitas Negeri Surabaya. Surabaya.
- Faigenbaum A.D., Wescott W.L. (2009). *Youth Strength Trainig*. United State: Human Kinetics.
- Fox Edward, ect. (1993). *Sport physiology, (third edition), bowling green*. Ohio: Wm. C. Browan Pulhishers.
- Giam, C. K. (1993). *Sport medicine, exercise and fitness* (Hartono Satmoko. Terjemahan). Jakarta: Binarupa Aksara. Buku asli diterbitkan tahun 1992.
- Power, S. & Howlen, E. (2007). *Exercise physiology*. United States: McGraw-Hill Companies, Inc.
- Sadoso Sumosardjuno. (1992). *Pengetahuan praktis kesehatan dalam olahraga*. Jakarta: PT Gramedia Pustaka Utama.
- Sharkay, J.B. (2003). *Fitness and health*. (Eri Desnarini Nasution. Terjemahan). Jakarta:PT. Rajagrafindo Persada. Buku asli diterbitkan tahun 2003.
- Siswantoyo. (2008). *Sport medicine dan permasalahannya*. Proceiding. (Seminar Olahraga Nasional Ke II). Halaman. 127-137.

- Soekarman. (1986). *Dasar olahraga untuk pembina, pelatih, dan atlet*. Jakarta: CV. Haji Masagung.
- Suharjana. (2007). *Latihan Beban: Sebuah Metode Latihan Kekuatan*. *Jurnal Ilmiah Kesehatan Olahraga, MEDIKORA*, Vol. III, No.1, 80-101.
- Strand, B.N & Wilson Rolayne. (1993). *Assesing sport skils*. Campain: Human Kinetics Publishers.
- Sukadiyanto. (2002). *Teori dan metodologi melatih fisik petenis*. Yogyakarta: Fakultas Ilmu Keolahragaan UNY.



FACULTY OF SPORT SCIENCE YOGYAKARTA STATE UNIVERSITY

417/UN34.16/TU/2014



grants this

CERTIFICATE

to

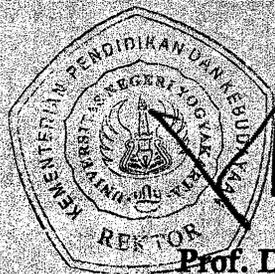
Ahmad Nasrulloh
as A Presenter

in the International Seminar of Sport Culture and Achievement 2014

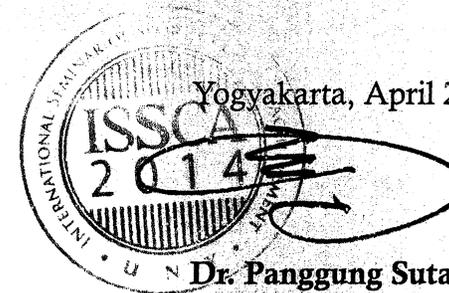
entitle

“Global Issues of Sport Science & Sport Technology Development”

conducted by Faculty of Sport Science, Yogyakarta State University
Yogyakarta, Indonesia, on April 23- 24, 2014



[Signature]
Prof. Dr. Rochmat Wahab, M.Pd., M.A.
Rector of Yogyakarta State University



Yogyakarta, April 24, 2014

[Signature]
Dr. Pangung Sutapa, M.S
Chairperson of the Committee



ISSCA
2014

**International Seminar
of Sport Culture and Achievement**
"The Global Issues of Sport Science &
Sport Technology Development"

UNY Hotel, Yogyakarta State University, April 23rd & 24th, 2014

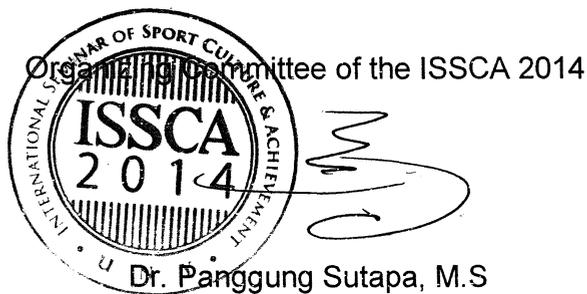
This is to certify that

Ahmad Nasrulloh

has presented the paper entitled

PHYSICAL EXERCISE FOR TENNIS ATHLETE WITH WEIGHT TRAINING

in International Seminar of Sport Culture And Achievement 2014 (ISSCA 2014)
held by Sport Science Faculty, Yogyakarta State University, Yogyakarta, Indonesia
23rd – 24th April 2014



Organizing Committee of the ISSCA 2014

Dr. Panggung Sutapa, M.S
Chairperson of the committee

Secretariat :

Yogyakarta State University, Indonesia Telp: +62274 550307, Mobile: +6281 804 268 361 (Mr.
YudiSutama, M.Pd.)

Email: issca_2014@uny.ac.id Website: seminar.uny.ac.id/issca2014