

Comparison Plyometric rope jumping with different work interval 10, 20, 30 second toward agility

by Gadis Meinar Sari

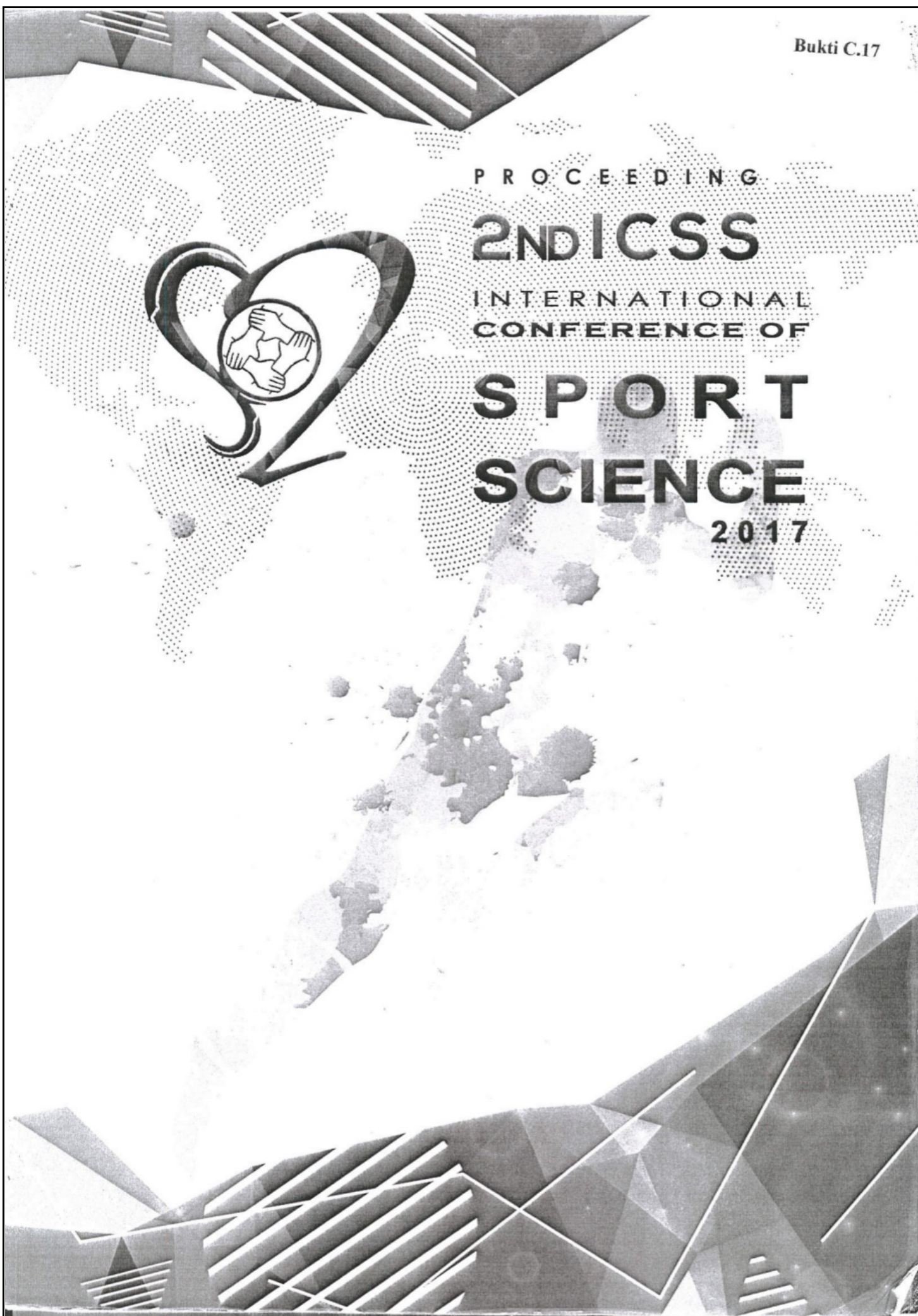
Submission date: 29-Feb-2020 03:59PM (UTC+0800)

Submission ID: 1266472191

File name: ith_different_work_interval_10,_20,_30_second_toward_agility.pdf (3.89M)

Word count: 0

PROCEEDING
2NDICSS
INTERNATIONAL
CONFERENCE OF
**SPORT
SCIENCE**
2017



2nd INTERNATIONAL CONFERENCE of SPORT SCIENCE

Team Editor:

Penanggung Jawab

Dr. Edy Mintarto, M.Kes

Dr. Oce Wiriawan, M.Kes

Si Putu Pandit Dharma, S.E.

Editor

Dr. Amrozi Khamidi, S.Pd., M.Pd.

Moh. Ridho Wahyudi, S.Pd

Dimas Dananjaya, S.Pd

Muhammad Nashirudin, S.Pd

Erwan Prasetyo Utomo, S.Pd.

Cover Design : Hary Septianwari, S.Pd.

ISBN : 978-602-449-208-7

Sport Education Master Program of Universitas Negeri Surabaya
Alamat: Jl. Kampus Unesa Ketintang, Kec. Jambangan, Surabaya

copyright © 2017, Unesa University Press

All right reserved

Hak cipta dilindungi oleh undang-undang dilarang mengutip atau memperbanyak sebagian atau seluruh isi buku ini dengan cara apapun baik cetak, fo toprint, microfilm, dan sebagainya, tanpa izin tertulis dari penerbit.

Table of Content

Sport Coaching

No	Name	Materi	Page
1	Ade Satria Bagus Suwadi, Damayanti Tinduh, Edy Mintarto (Indonesia)	The Difference of Submaximal Physical Activity's Effect In The Morning, Afternoon, and Evening Sessions In A Room With Modified Temperature Through The Level Of Oxidative Stress	192
2	Adi Sucipto (Indonesia)	Evaluation of Football School Coach Competences In Malang Raya	197
3	Agni Herarta Anindya Satria, Sugiyanto, Agus Kristiyanto (Indonesia)	The Difference Effect of Anaerobic Interval Training Methods on Underbasket Shooting Results Viewed from Ratio of Body Height and Legs Length	203
4	Agus Himawan, Achmad Widodo, Gigih Siantoro (Indonesia)	The Effect of Game Approach with Workouts 3 Minutes, 5 Minutes Against VO ₂ Max and Agility at Futsal Players	208
5	Ahmad Burhanuddin Kusuma Nugraha, Bambang Purwanto, Harjanto JM (Indonesia)	Effect of Electro Muscle Stimulation Warming Up on Leg Muscle Strength	213
6	Ahmad Syauqi, Hari Setijono, Agus Hariyanto (Indonesia)	The Effect of A-Movement and X-Pattern Multiskill Exercises on Increasing Speed and Agility (Study on Male Players Futsal SMA N 1 Sidayu Gresik)	220
7	Arifah Kaharina, Gadis Meinar Sari, Damayanti Tinduh (Indonesia)	Effect of Far Infrared Radiation with Bag Infrared on Recovery After Submaximal Physical Activity	225
8	Awang Firmansyah, Gadis Meinar Sari, Ahmad Widodo (Indonesia)	Comparison Plyometric Rope Jumping With Different Work Interval 10, 20, 30 Second Toward Agility	230
9	Banyu Biru Kurniawan, Agus Hariyanto, Amrozi Khamidi (Indonesia)	Effect Of Exercise Rope Jump And Reactive Jump Over Hurdles To Leg Power Muscle And Speed	233
10	Bujang, Apta Mylsidayu (Indonesia)	Analysis of Physical Condition of Athletes PORDA Bekasi City In 2016	239
11	Dewiyati Sri Suprawanti, Oce Wiriawan, Soetanto Hartono (Indonesia)	Effect of Leg Press and Leg Extension Ascending and Descending Pyramids Exercises to Leg Muscles Vitality and Power as A Study on Male Extracurricular Students of SMKN Kabuh, Jombang District	245

12	Ebta Heri Susanto, Suroto, Amrozi Khamidi (Indonesia)	Application Software Development Preparation Learning Implementation Plan (RPP) Class VII For Physical Education Junior High School Teachers In Bojonegoro	250
13	Fajar Eka Samudra, Harjanto JM, Damayanti Tinduh (Indonesia)	Acute Effect Of The Crossfit With High Intensity Interval Training (HIIT) And Circuit Training Method On Blood Lactic Acid And Heart Rate	255
14	Faris Pamungkas Wicaksono, Sugiharto, Rias Gesang Kinanti (Indonesia)	Effect of Exercise with Rapi Music Tempo Intervention Toward Increasing The Thickness of Left Ventricle Heart in Wistar Rats	259
15	Hamdani (Indonesia)	The Effect of Visual Audio on The Result of Single Pencak Silat Motion	264
16	Hariadi, Sri Winarni (Indonesia)	Developing A Model Of Karate Basic Motion Exercise Through The Modification Of Tradisional Game For Binginers	272
17	Havid Yusuf, Dini Safitri (Indonesia)	Comparative Analysis of Concentric Exercise Types with Eccentric Exercise to Delta Blood Glucose in Diabetes Mice	280
18	Hernowo, Suroto, Amrozi Khamidi (Indonesia)	Developing Software Application for Lesson Plan (RPP) of Penjasorkes SMA Grade X (Ten) in Bojonegoro	284
19	Heryanto Nur Muhammad (Indonesia)	Evaluation of Athlete Development Program In Field Hockey	289
20	I Kadek Dwi Dian Devayana, Tiassari Janjang Suminar (Indonesia)	Effect of Plyometric Exercise on Shooting Skill of Football School Students Gajayana Malang City	294
21	Johan Nur Cahyo, Tatok Sugiarto, Agung Kurniawan (Indonesia)	The Development of Speed Training Models For PSSI Malang Football Referee.	299
22	Kartika Septianingrum, Setya Rahayu (Indonesia)	Influence Exercise Approach Still Ball Flick And Moving Ball Flick Hockey Shoot Result At Beginners Hockey Player	303
23	Kurnia Dwi Aisyah, Gadis Meinar Sari, Ahmad Widodo (Indonesia)	The Influence of Plyometric Rope Jumping Training Using Interval Training Method with 10, 20 and 30 Second – Working Interval on Strength and Power OF Leg Muscles	308
24	Mahfuz, Nining Widyah Kusnanik, Oce Wiriawan (Indonesia)	The Influence of The Exercise Squat Jump and Standing Jump and Reach Against The Power Leg of Muscle	311
25	Moch. Yunus (Indonesia)	Effect of an Interval Training Program Versus a Continuous Training Program on Antioxidant Enzyme Activities and Oxidative Stress Level in Healthy Young Men	322

COMPARISON PLYOMETRIC ROPE JUMPING WITH DIFFERENT WORK INTERVAL 10, 20, 30 SECOND TOWARD AGILITY

Awang Firmansyah¹, Gadis Meinar Sari², Achmad Widodo³

¹Sport Health Science, Master Graduate Airlangga University, ²Physiology Departement Airlangga University, ³Mayor Sport Science, Satate University of Surabaya

Abstract

Introduction: Plyometric rope jumping is an easy and cheap training, and it can be done anywhere, also have an effect of physical performance. The goal of this research is to compare the effectiveness of plyometric rope jumping training with 10, 20 and 30 second – work interval toward speed and agility. **Method:** The total of subjects in this research was 33 students (trained) which would be divided into 3 groups of 10 second – work interval (n=11), 20 second – work interval (n=11), and 30 second – work interval (n=11). The measurement of agility's time was by using AFL test. This research used consecutive sampling method with pre-test – post-test control group design. **Results:** Research has shown mean of age 19,30±0,91 years old, body mass index 22,05±2,46 kg/cm², leg 85,09±4,98 cm. There were significant differences (p>0,05) in agility with 10 second – work interval group (0,001) while there were no significant different in work interval 20 and 30 seconds. In the ANOVA test there were significant differences in agility (0,000). **Conclusion:** Plyometric rope jumping increase agility with work interval 10 second while work interval 20 and 30 second can not increase agility.

Keywords: Plyometric rope jumping, agility

INTRODUCTION

The training of plyometric can increase performance. Plyometric training, a well-established tool used to improve sports performance and prevent injury, has recently been adapted for lower extremity rehabilitation (Chmielewski et al. 2006). The plyometric training increase speed, strength and power (Chu & Myer, 2013). Plyometric refers to those activities that enable a muscle to reach maximal force in the shorten possible time (Haff & Tripplet, 2016). The rope jumping is one of plyometric trainings that is easy to do. The plyometric training can improve neuromuscular function. Plyometric exercise is a quick, powerful movement using a prestretch, or countermovement, that involve the stretch shortening cycle (SSC). Rope jumping exercise can increase agility and reaction time (Hariyanto, 2010). Using a rope and measuring tape, this rope jumping training can be done whether it is individual or collective. A key factor for agility task in particular is the use of visual input when executing and coordinator movement (Gamble, 2012). The training of plyometric uses ATP-PC and as energy system.

This research aimed to know the comparison of plyometric rope jumping training using 10, 20 and 30 second – work interval increase of agility.

METHOD

The type of research that was used was experimental field using a research plan of pre test and post test control group design in three groups. The samples of this research were sport science students in FIK UNESA mayor sport science two semester which were chosen

through consecutive sampling. The number of samples was 33 students in total where were divided into three groups randomly. The first group used a training using 10 second – work interval, the second group used a training using 20 second – work interval, and the third group used a training using 30 second – work interval. The plyometric rope jumping training was done by jumping a rope as high as 40 cm medial and lateral. This research was done as long as six weeks and measuring an agility used AFL test.

RESULTS AND DISCUSSION

There were many data which were gained from this research then they were analysed and matched with research's aim. The results of research which were gained : the mean of ages of all groups $19,30 \pm 0,9$ years old, BMI $22,59 \pm 6,7$ kg/cm^2 , leg $85,09 \pm 4,9$ cm. The age data, BMI(body mass index) and leg were homogeneity due to $p > 0,05$. The mean and standard deviation of plyometric rope jumping were $4,82 \pm 0,3$ seconds. On the other hand, the value of homogeneity test using Bartlett test produced homogeneous data due to $p > 0,05$. The results of homogeneity test on agility before the training of plyometric rope jumping were 0,09. On the mean of pre – test and post – test on agility, the first group using 10 second – work interval experienced a increase from $4,93 \pm 0,44$ seconds to $4,66 \pm 0,22$ seconds, the second group using 20 second – work interval experienced a increase from $4,73 \pm 0,14$ seconds to $4,70 \pm 0,13$ seconds, and the third group using 30 second – work interval experienced a decrease from $4,80 \pm 0,24$ seconds to $4,85 \pm 0,25$ seconds. However, the agility variable revealed where the first group using 10 second – work interval showed a significant different ($p=0,001$), the second group using 20 second – work interval showed there are no significant different ($p=0,569$), the third group using 30 second – work interval showed there are no significant different ($p=0,508$). The anova test results of plyometric rope jumping training groups using 10, 20 and 30 second – work interval on agility indicated that significant different (0,000). The increasing of work interval 10 second because maximum recruitment muscle fiber and then the stretch reflex shape from neural adaptation in six weeks. While work interval 20 second and 30 second can not increase because fatigue and stretch reflex is impossible.

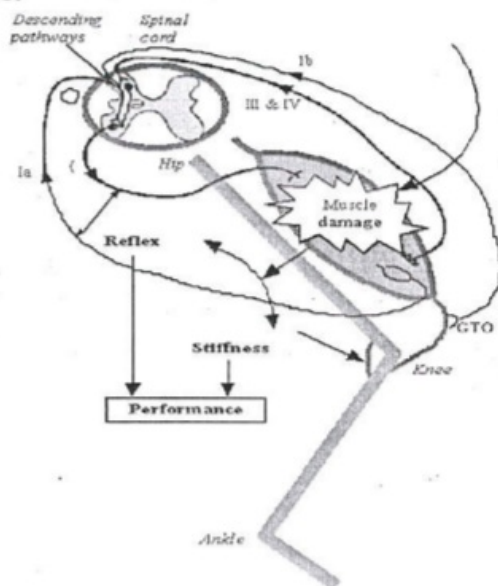


Figure 1 Propose with SSC exercise, induced muscle damaged and performance reduction (Zatsiorsky, 2000).

Figure 1 summarizes our current view of the possible interactions between muscle damage, reduced stretch-reflex sensitivity, reduce stiffness regulation and deterioration in SSC performance (Zatsiorsky, 2000). As regards the latter process, our current data rule out the possibility of any significant influence of reduced fusimotor support to the muscle (Zatsiorsky, 2000). The work interval 20 second and 30 second reduce performance because fatigue. Instead, however they strongly suggest that the muscle spindle could be directly or indirectly influenced by exhaustive SSC fatigue. (Avela et al. 2000).

Conclusion and Suggestion: The first group using 10 second – work interval can increase an agility. The second group with work interval 20 second and the third group with work interval 30 second can not increase agility. Results obtained here may help in develop guide to fixed careful work interval to enhance performance in sport with agility like rugby, football and martial art.

References

- Avela, J., Kyröläinen, H. & Komi, P.V. (2000) Neuromuscular changes after long-lasting mechanically and electrically elicited fatigue (submitted for publication).
- Chmielewski, T.L., Myer, G.D., Kauffman, D., Tillman, S.M., 2006. Plyometric exercise in the rehabilitation of athletes: physiological response and clinical application. *J. Orthop. Sports Phys. Ther.* 36, 308-319.
- Chu, Donald A., Myer, Gregory D. 2013. *Plyometrics*. Human Kinetics. United States.
- Foss, I Merle., Kateyian, J Steven, . 1998. *Fox's Physiological Basis for Exercise and Sport*. The Mc-Graw Hill Companies, Inc. United States America.
- Gamble, Paul. 2012. *Training for sport speed and agility*. Third Avenue, Routledge. New York.
- Haff, G Gregory., Triplett, N Travis. 2016. *Essential Strength Training and Conditioning*. Human Kinetics. US.
- Hariyanto, Agus. 2010. "The effects training Box Jump, Squat Thrust, and Rope Jump, with Interval Training Method Towards Power, Agility, and Reaction time". Dissertation. Surabaya : Universitas Negeri Surabaya.
- Köklü, Y., Alemdaro, U., Özkan, A., Koz, M., & Ersöz, G. (2015). *The relationship between sprint ability , agility and vertical jump performance in young soccer players Relation entre la performance de l ' habilité de sprint , l ' agilité*. <http://doi.org/10.1016/j.scispo.2013.04.006>
- McArdle, William D. Frank I. Katch, Victor L. Katch. 2010. *Exercise Physiology: Nutrition, Energy, and Human Performance 7th*. Lippincott William & Wilkins. Philadelphia.
- Zatsiorsky, Vladimir M. 2000. *Biomechanics in Sport*. International Olympic Committee. Blackwell Science.

Comparison Plyometric rope jumping with different work interval 10, 20, 30 second toward agility

GRADEMARK REPORT

FINAL GRADE

/100

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7
