



PROCEEDINGS

THE 1ST YOGYAKARTA INTERNATIONAL SEMINAR ON HEALTH, PHYSICAL EDUCATION, AND SPORTS SCIENCE.

Evidence-Based Practice of Sports Science in Education, Performance, and Health.

October 14th, 2017. Eastparc Yogyakarta, Indonesia



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YISHPESS PROCEEDINGS

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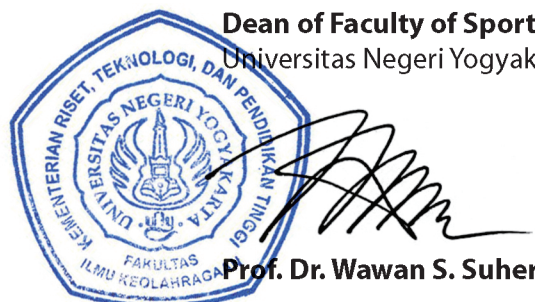
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October 14th, 2017

OPENING SPEECH

As the Dean of Faculty of Sport Sciences Universitas Negeri Yogyakarta, I would like to welcome and congratulate to all speakers and participants of the First Yogyakarta International Seminar on Health, Physical Education, and Sport Science (YISHPESS) 2017 entitled "Evidence-Based Practice of Sport Science in Education, Performance, and Health".

This international seminar is actually an implementation in the framework of the assessment of the achievements and sports culture in society that can support the achievements of the Indonesian people, so that there will be a significant role of practitioners, academicians, sport people, and sports observers from Universities, Institutions and Sports Organizations to help actively facilitate in the development, assessment of innovative sports science development so as to achieve sport achievements at the National and International level.

Finally, we thank all the committee of YISHPESS for their hard work in organizing this activity, and congratulate the invited speakers and all participants. Hopefully, this seminar is significant for the development of physical education, health, and sports sciences.

**Dean of Faculty of Sport Sciences,
Universitas Negeri Yogyakarta**
Prof. Dr. Wawan S. Suherman, M.Ed.


PREFACE

Alhamdulillahirobilalamin, thank Allah the First Yogyakarta International Seminar on Health, Physical Education, and Sport Science (YISHPESS) has been prepared well and on time. With all humility, we welcome and congratulate the speakers and participants of Yogyakarta International Seminar on Health, Physical Education, and Sport Science (YISHPESS) organized by the Faculty of Sport Sciences, Universitas Negeri Yogyakarta.

The YISHPESS 2017 is designed to updating and applying evidence-based practice in sports science aspects, including: education, performance and health. We hope that the invited speakers of this seminar can reduce the gaps between academic and field to get best output in the daily sport and health practices.

We would like to thank to Rector and the board of Universitas Negeri Yogyakarta for supporting this seminar come true. Praise and be grateful to the Lord, so that this proceeding can be issued. Hopefully, the publication of this proceeding can bring benefits to the participants in particular and readers in general.

Yogyakarta, October 14th, 2017
Chairperson of the Committee



Dr. Or. Mansur, M.S.

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THE EFFECT OF PROTEIN SUPPLEMENT ON MAXIMUM STRENGTH TOWARD THE MEMBERS OF ONE GYM FITNESS CENTER PADANG

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Abstract

Objectives : The problem in this research was late maximum strength increase experienced by members of fitness at the moment doing weight training. This was caused by a lack of knowledge of fitness members about nutrition. The grant protein supplements manufacturer can be used as an alternative to increase the maximum power which is owned by the fitness members. The purpose of this research is to know the effect of protein supplement on maximum strength toward the members of One Gym Fitness Center Padang

Methods: The type of this research is quasi experiment. The population is all of the active members of *One Gym Fitness Center Padang*. The sample of this study is 26 people selected by using *purposive random sampling*, who are listed at *One Gym* less than a month. They were divided into two groups, 13 members in experimental group and 13 members in control group. For experimental group, the members were given the protein supplement after doing the exercise at One Gym Fitness during 16 times which each of the members consumed 1.5 gr/weight/day proteins. For control group, the members were not allowed to consume protein exaggeratedly. They also were not given the protein supplement during conducting the research. The instrument used in this research was the maximum power test using one repetition maximum method. The data analyzed by using t-test with $\alpha = 0.05$.

Results: The research results showed that the mean of the maximum strength of the arm muscles of experimental group is 28.46 (*Pretest*) and 52.31 (*Posttest*) ($t_{16,98} > t_t 1.782$); the mean of leg muscles is 60.77 (*Pretest*) and 83.85 (*Posttest*) ($t_{14,85} > t_t 1.782$). The mean of the maximum strength of the arm muscles of control group is 30.00 (*Pretest*) and 41.15 (*Posttest*) ($t_{7,94} > t_t 1.782$) and the mean of leg muscles is 61.92 (*Pretest*) and 71.15 (*Posttest*) ($t_{5,48} > t_t 1.782$).

Conclusions: It can be concluded that there was a significant effect of manufacture protein supplement on maximum strength toward the member one Gym Fitness.

Keywords: protein supplement, maximum strength

INTRODUCTION

Health and fitness are the most valuable treasure and cannot be exchanged for any human use. Therefore, each person has a desire and craves for the healthy body, fit, and an amazing look. In order to achieve it, running healthy living pattern and exercise regularly are required. Basically, every kind of sport gives healthy and fitness toward a person's body. In addition, the other function of sport for a person's body is, it can improve and beautify the posture or the shape of a person's body. In the human body, there are several muscles that need to be trained to support performance in doing daily life activities, including the arm muscles, chest muscles, abdominal muscles, and leg muscles. These muscles have functions and respective roles which are very important in the body to perform daily activities such as refusing, hitting, lifting, running and so on. Thus, it needs to be trained to function as it should.

Weight training is the most appropriate way to train existing muscles in the body to function perfectly. The main function of doing weight training is to increase strength. Strength is the ability of the muscles to lift and resolve the maximum given load, thus if the strength of a muscle is trained regularly and surely programmed, then the muscles will be able to cope with and also withstand loads given in

daily activities without feeling exhausted. Consequently, regular and programmed weight training will improve the maximum strength of the muscles.

Weight training can be done independently by using the body as a burden, like: push-ups, sit-ups, and pull-ups. In addition, weight training can also be carried out at fitness centers (Fitness Center). A Fitness Center is a special place that is available to perform sports activities. Fitness Center provides a variety of tools to do weight training.

In order to get a maximum exercise and increasing strength, weight training needs to be done on an ongoing basis and programmed. Therefore, in doing weight training, it needs to be arranged a workout program, so the aim of weight training can be achieved perfectly. In addition to exercising regularly and programmed, consuming nutrients are also highly influential on muscles growth. Actually, in daily life, humans consume a wide variety of nutrients. According to [1] Welis & Syafrizar (2009:6-33) In general, nutrients can be classified into two: 1) Macro Nutrients such as carbohydrates, proteins, and fats. 2) Micro-Nutrients such as vitamins and minerals, water, and electrolytes.

One Gym is one of Fitness Center in Padang which provides the tools and offers a variety of training programs to its members. In practice, the members often have difficulty to get the maximum strength at the time doing weight training, whereas the members has done the exercise program that is recommended by the instructor of *One Gym* fitness center.

Granting the manufacturer supplements can be used as an alternative for members of *One Gym* fitness center to support the increasing the maximum power. So, the goal of the exercise which is done can be achieved maximally.

METHOD

The method used in this research was quasi experiment (Quasy-Experimental Design). Based on [2] Yusuf (2013:81), "methods of alphabets experiment is to find out whether or not there is a result of something that is imposed on the research subject .

The experimental design used in this study is a Two-Group Pre test – Post test Design, in line with [3] Sugiyono (2011:74) that said, "on the design, there are Pre-test before being given treatment", the results of the treatment can be accurately known, because it can be compared to the situation before the treatment is given. One group (the independent) were given preferential treatment by administering weight training manufacturers supplement who were also given preferential treatment as much as 16 times and then measured again (Post-test), meanwhile for the comparison group was the control group who were given weight training the same treatment without the use of supplements in any form.

This research was conducted in *One Gym* Fitness Center, on April 11th until May 6th, 2017. The population of this research was all the fitness member registered in *One Gym* Padang, there were 561 people as the population. A sample of these studies amounted to 26 people, and then divided into two groups, a total numbers of samples of the experimental group (the group given manufacturer supplements) were 13 people and so as control group that also had 13 people. The way of taking samples in this research was purposive sampling technique, then, in determining the Group, it was chosen randomly.

Protein supplement which was used in this research was high-protein milk powder. It was provided as 168 gr (25 grams protein). This measure has been adjusted by the sample's average protein requirement per day through a Food Recall 2 X 24 hrs. A measurement of arm muscles strength was done by using maximal strength test method of One Repetition Maximum with the movement of the Barbell Arm Curl, meanwhile Squat was used for measuring the leg muscles strength.

In order to test the hypothesis of the research the researcher used the t Test with $\alpha = 0.05$.

RESULTS

The research shows that there is increase of the maximum strength toward both of the groups. It can be seen from the table below:

Table 1 Hypothesis' analysis of Maximum Strength of Control and Experimental Group

Group	Maximum Strength	Mean		t_h	t_t $\alpha=0.05$	conclusion
		Pre-Test	Post -Test			
Control	Arm Muscle	30	41,15	$t_h7,94$	1.78	Significant
	Leg Muscle	61,92	71,15	$t_h5, 48$	1.78	Significant
Experimental	Arm Muscle	28,46	52,31	$t_h16,98$	1.78	Significant
	Leg Muscle	60,77	83,85	$t_h14,85$	1.78	Significant

As the table of the result above, it can be seen that there was a difference at the mean of pre- and Post test of maximum arms muscle strength in control group. This control group did not consume protein supplements and natural supplements in weight training to increase maximum strength, it was evidenced by the obtained $t_h = 7,94 > t_t = 1.78$. It is proven that weight training affects the maximum strength that is owned by a person's muscles. If it is seen from the average count of Pre-test and Post-test, the control group experienced a maximum increasing arm muscles strength 11.15 kg or 37.17% of the average of the initial tests.

[4] Chandler & Brown (2008:98-99) state that weight training can maintain muscle strength and endurance, improve coordination of muscle nerves and bone density. Furthermore he stated that weight training can lead to dramatic changes to the body. A lot of people doing weight training said that by having a well-built body not only make people feel good, but it also affects the way relate or interact with others, increasing the strength and endurance of muscles, and increasing coordination of muscles and nerves.

From the opinion that stated above, it can be concluded that by doing regularly, programmed and sustainability weight training, a person's maximum strength can be improved. It happens because the influence of the physiological process during the weight training, the muscles trained experienced an increasing in maximum strength enhancement functions.

Next for the results of the analysis of the second hypothesis testing, it was found the differences between the mean of pre test and Post test- of maximum leg muscles strength in control group. This control group did not consume protein supplements and natural supplements in weight training to increase maximum strength, evidenced by the obtained $t_h = 5.48 > t_t = 1.78$. Based on the hypothesis test results proved that the weight training affects the maximum strength of the leg muscles of a person. If it was seen from the mean count between Pre-test with Post-test, the control group experienced an increasing in the maximum strength of the leg muscles 9.23 Kg or 14.97% of the mean pre-test. It was proven that weight training which was done by the samples that were in the control group had physiological effects against her body. So the maximum strength of leg muscles were experiencing increased after giving trained.

A study of [5] Mancuso and Howley (1993) show that he conducted research on the effect of weight training toward the 10 students in the United Kingdom got the results that by doing weight training on a regular basis for 8 weeks, it can increase a strength on someone on mean 20% of the initial load. It means that if it is associated with this research that had been done over the last 4 weeks, the samples had increased load of a mean 14.91%.

Based on the opinion above, it can be concluded that by doing weight training regularly, programmed and sustaining maximal can increase a person's legs muscle strength. It happens because the effect of the physiological process during the weight training, the muscles trained experienced increasing in maximum strength enhancement functions.

For the analysis of the third hypothesis testing, it was found that there was a difference mean of pre-and Post test-for arm muscles experimental group . Experimental group in this research was a group that consumes the protein supplement in weight training to increase the maximum power of the arm muscles, this was evidenced by $t_h = 16,98 > t_t = 1.78$. If it was viewed from the difference in the mean, the maximum strength of the arm muscles of this experiment group had increased 23.85 kg. It means that the maximum strength of the arm muscles on this experimental group experienced an increasing from the mean pre-test 83.80%.

An increasing of maximum strength of the arm muscles occurred in experimental group in this study caused by exercise factor which was done regularly, programmed and continuously. In addition, other factors which also determined the maximum arm muscles increasing strength in this experimental group was the effect of supplements that consumed by the sample in this group. [6] Coulman (2014) argues that "*the Muscles need protein to get big and strong, when you're working on building them, you'll have to fuel them with a lot of protein-heavy food*". From this opinion, it can be concluded that muscle requires protein for a big and powerful body, by doing exercise regularly basis then we should give the intake of nutrients in the form of protein. It means that along with increasing of the size of the muscle, the function of the muscle will also grow. With the increasing of size of a muscle, then the strength of it will also increase.

Based on the explanation above, it can be concluded that the muscle function increases if trained regularly, programmed, and sustainable. To support a better improvement, a person needs a sufficient nutritional intake to his or her muscles. In this case the use or consuming supplements of protein with high-protein milk type is one of the alternatives to maximize the increase in maximum strength possessed by a person.

The results of the fourth hypothesis analysis showed that there was a difference of mean between Pre-test and Post-test of maximal strength of leg muscle of experimental group. This group consumed a protein supplement of weight training to increase maximal leg muscle strength, this is evidenced by $t_h = 14,85 > t_t = 1.78$. When viewed from the average difference, the maximal strength of the experimental group's leg muscles had increased by 27.08 kg. This means that the maximum strength of arm muscle in this experimental group experienced an increase of 44.57%.

Increased maximum strength of leg muscles that occurred in the experimental group in this study was caused by exercise factors that were done regularly, programmed and sustainable. In addition, another factor that also greatly determines the increase in maximal strength of the leg muscles in this experimental group was the effect of the supplements consumed by the samples in this group. [7] Zabalada and Naclerio (2016) argue "*Whey protein as upper and lower body strength*". Consuming high-protein milk will increase upper and lower body strength. This means whey protein influence on the power possessed by someone. If seen from the content of its function supplement manufacturer (Whey Protein) is high milk protein for muscle. As has been well known that muscle requires adequate intake of protein as a staple food for a person, with the fulfillment of nutritional intake required by the muscle coupled with the exercises performed then the function of the muscle will also increase. In this case, the relation was the increase in the maximal strength of the leg muscles experienced by the samples. As further, the result of the fifth and sixth hypothesis analysis can be seen from the data below:

Table 2. Hypothesis Analysis of Maximum Strength for Fifth and Sixth Hypothesis

Maximum Strength	Mean		t_h	t_t $\alpha=0.05$	conclusion
	Control (Post-Test)	Experiment (Post-Test)			
Arm Muscle	41,15	52,31	4,67	1,71	Significant
Leg Muscle	71,15	83,85	5,55	1,71	Significant

Based on the table above, the results of the fifth and sixth hypothesis testing results proved that there were differences in the effect of the protein supplement to the maximal strength of the arm muscle and leg muscle of the study sample. Groups that consumed protein supplement had maximal arm muscle and leg muscle strength when compared to the control group. This could be seen from the results of the fifth hypothesis testing that said that the protein supplements give a better effect on the increase of the maximal arm muscle strength than the weight training without provision of this supplement was evident from $t_h = 4.67 > t_t = 1.71$. Along with that protein supplement also gave a better effect on the maximal strength increase of the leg muscles. This could be seen at $t_h = 5.55 > t_t = 1.71$ for the sixth hypothesis

If seen from the increase in the average count between two research groups, experiment group had increased the average that was better than the control group. An increase of the average maximum arm muscles strength count for group experiment was 23.25 kg. Meanwhile, for the control group only experienced an increase 11.15 kg. It means the supplement protein give better effect than the weight training without consuming supplements to increase maximum strength of arm muscle on weight training. For the maximum strength of leg muscle of experimental group, it also improved the average higher than control group that was 27,08 kg. While the control group only increased as 9.3 kg.

[8] Zabalada and Naclerio (2016) state that "Whey protein alone or as a part of a multi-ingredient appears to maximize lean body mass or fat-free mass gain, as well as upper and lower body strength." From the above opinion concluded that the protein supplement in the form of high-protein milk will maximize body mass without fat and increase fat-free muscle mass. This means that when consuming high-protein milk, then the muscle growth will occur maximally because the addition of mass is not derived from fat, but from fat-free muscle. Furthermore, the journal also explained that consuming supplements manufacturer of high-protein milk will also increase the upper and lower body strength. This can be interpreted that by consuming high-protein milk will increase overall muscle strength (a person's body)

According to [9] Cribb PJ, et al (2007) "Whey Protein seems to promote greater strength of gains and muscle morphology during RE training, the hypertrophy responses within the groups varied". They say that whey protein or high-protein milk will provide an increase in strength and muscle hypertrophy, but the increase varied. The increase can be interpreted variations caused by factors exercise. This means that when consuming high-protein milk, then the muscle growth will occur maximally.

Based on the above opinion, it can be concluded that the protein supplement can increase the maximum strength of the muscles of the arm and leg muscles of a person. However, the increase in maximum strength and arm muscles of the leg muscle varies. This is due to the exercise factor performed by that person. In addition to regular exercise, the body desperately needs a sufficient nutritional intake to improve physiological function, in short with regular and programmed load training, and consuming protein supplements of high-protein milk can increase a person's maximum strength.

CONCLUSIONS

As the result of the research above, it can be concluded that:

1. Weight training gives a significant effect on increasing the maximum strength of the arm muscles of the control group.
2. Weight training gives a significant effect on increasing the maximal strength of the thigh muscles of the control group.
3. Protein supplement gives an effect to the maximum arm muscle of the member of One Gym Fitness Center Padang

4. Protein supplement gives an effect to the maximum arm muscle strength of members of One Gym Fitness Center Padang.
5. There is a difference in the maximum muscle strength of the arm between the experimental group and the control group.
6. There is a difference in maximal thigh muscle strength between the experimental group and the control group.

In short, there was an increase of maximum strength toward both of the groups. However, the experimental group experienced higher increase of maximum strength than the control group. It demonstrated that the protein supplement, given to experimental group, gave a significant effect toward the increase of individual's maximum strength. Hence, it is concluded that nutrition influences the result of an individual's treatment. Moreover, consuming protein supplement can be as an alternative way to fulfill the need of muscle. With the sufficient protein requirement needed by muscle then the function of the muscle is also increase.

As a final remark, since this research focused on the increase of maximum strength of muscle, it is hoped that other researchers can find other effect of the protein supplement manufacturers which increase one's maximum strength, it is related to the innovation and development of science in the science of sport.

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