

# Contribution of Arm Strenght, Back Strenght and 30m Sprint Towards Javelin

*by* Edy Mintarto

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## Preface

Praise be to Allah the merciful and grateful, we have finished the Proceeding book of International Conference of Sport Science. This book was a draft of an international seminar which is the final project of seminar subjects.

This activity is expected to be a learning tool in particular, as well as a platform to introduce the state university of Surabaya to the academic community. Thus, the future State University of Surabaya can be more open, and more advanced in the application of information and technology as well as the latest sport science.

We are thanks to all of keynote speaker Dr. Greg Eilson ( Australian Strength and Conditioning Association), Gunter Lange (Germany), Dr. Nining Widya K., M.Appl.Sc. (Universitas Negeri Surabaya, Indonesia), Serkan Berber (Anadolu University, Turkey), Dr. Soumendra Saha (University of Sains Malaysia) and Dr. Yusuf Fuad, M.Sc. (Universitas Negeri Surabaya, Indonesia).

We are thanks to the lecturer as well chief of department of Postgraduate Sports Education of Pascasarjana Unesa, Dr. Edy Mintarto, M.Kes. for support and guidance during we started the process of this conference.

Thanks also to all friends who have worked hard to succeed whole process of international conference. Hopefully in the future, everything we do today can be useful and be equipped very useful in sport studies and other activities of postgraduate of Sport Education of Unesa.

Surabaya, June 1st, 2016

Greetings  
Editor,

**Fattahilah**



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## CONTRIBUTION OF ARM STRENGTH, BACK STRENGTH AND 30M SPRINT TOWARDS JAVELIN

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### ABSTRACT

The aim of this research are: to determine the contribution of the arm strength, back strength and 30M sprint towards javelin throw. The population of this research is bachelor student of sport coaching education in faculty of sport science and education State University of Surabaya who have followed the course athletics javelin. The method of this research is quantitative statistical methods, while the process of data collection is done by measurements on each variable. The results of the study are as follows: (1) The amount of 30M sprint contribution towards javelin was 8.43%. (2) The contribution of back strength towards javelin is 21.34%. (3) Arm strength contribution towards javelin is 35.05%. (4) The largest contribution towards javelin by the arm strength with a percentage of 35.05%. The conclusion of this study is the arm have the greatest contribution towards javelin and followed by back strength and then 30M sprint. The main propulsive force at the time obtained from the swing of the javelin throw and the run up beginning is give supporting force to thrust the javelin.

**Keywords:** *Contribution, 30M sprint, Arm Strength, Back strength, Javelin Achievement, Male Student*

### INTRODUCTION

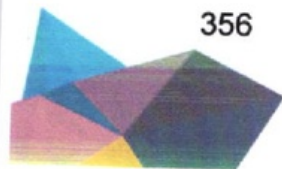
Javelin has fairly complex technique of throwing. When javelin throwing process happened, there is a driving force role to give impetus and pace of the javelin. In this case, according to Newton's law I and II, whose role providing thrust is at the time of the run up beginning and throws. In the beginning of run, implemented Newton's second law, namely the movement of objects in the direction of force (PASI, 2001). Therefore, to provide a great driving force, needed speed which is unbelievably fast. To reach top speed when running, the minimum distance required for maximum speed is 30M. "To achieve the greatest possibility of speed (80-90% maximum velocity) at the distance of 30M" (PASI, 2001). In addition, the force obtained according to Newton's law I that, things will move when there are forces reaction. In this term, the javelin can move as a result of the swing arm. The swing arm needs strong muscles so that the force reaction is also effective. When throwing, the muscles that work are the arm muscles and back muscles. Yet, we do not know exactly how much influence the arm strength, back strength and 30M sprint towards javelin achievement.

### METHOD

This study was a type of correlational research. In this study, researcher wanted to examine the effect of back strength, arm strength and 30M sprint to throw away on athletics number Javelin Throw. Based on the research that will be done, there are two kinds of variables, independent and dependent variable.

1. Independent variables are 30M sprint, back strength and arm strength.
2. Dependent variable was achievement (Distance) of Javelin Throw.

The population of this research is Male Student of Sports Coaching Education Class A, B, C, D grade 2012 Faculty of Sport Science, Universitas Negeri Surabaya who totaled 74 people. The process of measuring muscle strength tests used 30 seconds push-up test and back strength use the back and leg dynamometer. Speed tests conducted with the 30M sprint test with 2 times of opportunity and taken the best time using a stopwatch. The





distance, measured using a steel tape meter that has been calibrated. The distance of throw is measured from the closest point of the landing point to the javelin throw boundary line. Research data which have been obtained, processed using SPSS 18. Then to equate the unit of each instrument, the calculation is done by using the T-Score.

## RESULTS AND DISCUSSION

The research result shows that the amount of the contribution of 30M sprint to javelin throw achievement is 0.288 or 8.43%, back strength towards the javelin throw achievement amounted to 0,462 or 21.34%, and arm strength toward the javelin throw achievement for about 0.592 or 35.05%. Based on the data above, the largest contribution given by the arm strength, muscle strength back and 30M sprint speed refer to the characteristics of the movement. The force obtained by a thrown javelin that is the thrust of the swing arm movement (throw), and a thrust force obtained from the running speed at the time of the run up beginning. Without running or only with static throw, javelin can be thrown away. So, it can be concluded that the main force at the moment is the throw during the swing motion. While throwing, arm muscles tend to move (swing) while the back muscles static. Therefore, the arm muscles contribute more force than the back muscle and 30M sprint give supporting force to the javelin and the effect is no matter how quickly any running speed, only a small contribution of the force towards javelin.

## CONCLUSION AND SUGGESTION

The conclusion of this study is the power of the arm muscles have the greatest contribution towards javelin achievement followed by back strength and 30M sprint. The main propulsive force at the time obtained from the javelin throw swinging and the running speed at the beginning as a supporting force to thrust the javelin.

As a result, for athletes and coaches especially in the javelin, the athlete must have a strong arm, back and extraordinary running speed in order to provide a good throw achievement.

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## GRADEMARK REPORT

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GENERAL COMMENTS

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