

## The Effect of Plyometric Exercise on Running Ability in Elementary School Students



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**ABSTRACT:** This study aims to determine the effect of plyometric training on the running ability of 5th grade elementary school students. This research is included in the quantitative research type of experimental research. The quantitative method was chosen because the data were in the form of numbers and were analyzed based on statistics (Sugiyono). This study used a group pretest-posttest design. The research subjects were 5th graders at Padas Elementary School, Ngawi Regency with a population of 60 students. The sampling technique was random sampling with a sample of 20 students. The sample selection is based on students who have weaknesses in running, lack of understanding of basic running techniques. The data collection technique was carried out with a running test and then a score assessment was carried out. The test technique was carried out by giving a pretest before being treated and a posttest after being given plyometric treatment. The results showed that there was an effect of plyometric training on the running ability of the fifth grade elementary school students of Padas with a hypothesis test result of 1.08. The results of the pretest and posttest obtained significant results after plyometric exercises were applied. So it can be concluded that there is a significant effect between plyometric training on running ability.

**KEYWORDS:** plyometric exercise, running ability, elementary school

### INTRODUCTION

Sport is a physical activity that is carried out with certain goals to be achieved and carried out using certain rules in a systematic and structured manner, such as with rules, target pulse rate when doing physical exercise, and the number of repetitions of motion in the form of repetitions, sets, etc (Jansson et al., 2019). Physical activity that is planned and structured to improve or maintain a person's physical fitness (Marini et al., 2021). Changes due to exercise exercises that are carried out regularly, structured and consistently provide beneficial changes for physical fitness. Sport is a form of activity to improve body freshness, namely physical and spiritual (Tarigan et al., 2021). Sports activities can form physically fit, disciplined and sporty people who form quality humans (Sinaga et al., 2022).

One of the sports taught in elementary school is running. Running is included in physical education learning (Librianty et al., 2021). Running is a forward movement to move the body as quickly as possible, from both feet when flying and not sticking to the ground or floor (Nopiyanto & Raibowo, 2019). Running is more dominant in requiring movement in the use of the legs. Physical education is a process that involves physical activity to improve the quality of individuals both physically and mentally (Stiyapranomo et al., 2022). Physical education has one branch, namely athletics. Athletics has several numbers including walking, running, throwing and jumping. Athletic learning begins at an early age which is summarized in the physical education curriculum. Athletic learning, especially running, is taught since children aged 6 years. The running numbers in the branch consist of short distance running, middle distance, long distance running or marathon, hurdles, and cross country running (Afrizal et al., 2017). Short distance running is done at full speed along the distance to be covered up to a distance of 400 meters. Running requires balance stability with both arms and legs (Widodo & Lumintuarso, 2017). Specifically, each arm counterbalances the leg, so that when the right leg swings forward, the left arm swings forward as well, and vice versa. In addition, the arms balance each other, to help maintain a stable balance in a good position and ensure that the arm swing moves back and forth from the side of the movement.

One of the running numbers taught in elementary schools is the 60 meter running number (Zikrur Rahmat, 2015). The 60 meter run is included in the short distance running that prioritizes maximum speed from start to finish which is divided into 3 parts, namely start, sprint movement and finish movement. The sport of running has been contested at the regional, national, and

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international levels. To get achievements in running competitions, it is necessary to have planned, tiered and programmed training, so that the results achieved are maximized. Running speed is influenced by flexibility, running technique skills and strength (Ayu Reza Adzalika, Soegiyanto, 2019). Short distance runners are known as sprinters. In order to record the smallest possible time, sprinters or short distance runners must master the basic movements of sprinting. Basic techniques in running such as leg movements, arm swing movements and posture (Sukendro & Ely Yuliawan, 2019). One of the achievements of running requires various considerations, calculations and careful analysis of the above factors that support running performance. The factors that determine and support running success can be used as the basis for developing an exercise program (Sumarsono, 2017).

The type of exercise that can increase strength and speed is the plyometrics method. Plyometric is one of the training methods that are often used by trainers to increase explosive power (Yukarda et al., 2019). Plyometrics are exercises that are done intentionally to improve the performance of an athlete, combining speed and strength training to create strength (Kobal et al., 2016). Plyometric exercises have been shown to be effective in increasing strength and running speed (Hansen & Steve, 2017). Plyometric exercises are more effective than resistance training and static stretching in improving upper and lower body performance. The potential value of combined fitness training in a conditioning program aimed at maximizing strength performance in the short term (Nugroho et al., 2021). Strong plyometric abilities can improve cardiovascular and neuromuscular fitness in inducing strength, sprint running speed, kicking, endurance and agility, in addition to improving muscle and tendon strengthening so as to avoid injury (Wang & Zhang, 2016).

### METHOD

This research is included in the quantitative research type of experimental research. The quantitative method was chosen because the data were in the form of numbers and were analyzed based on statistics. This study used a group pretest-posttest design. The research subjects were 5th graders at Padas Elementary School, Ngawi Regency with a population of 60 students. The sampling technique was random sampling with a sample of 20 students. The sample selection is based on students who have weaknesses in running, lack of understanding of basic running techniques. The data collection technique was carried out with a running test and then a score assessment was carried out. The test technique was carried out by giving a pretest before being treated and a posttest after being given plyometric treatment.

### RESULTS AND DISCUSSION

The description of the research data obtained that the data of students who were given a pretest and posttest were grade 5 students at SDN Padas, Ngawi Regency. The pretest was carried out at the beginning of learning sports, especially running. After the pretest was carried out, treatment was carried out in the pretest class to determine the effect of plyometrics on running speed. Treatment is carried out 5 times so that it can produce valid data. Posttest results were measured by statistical tests. Data analysis was carried out by normality test using chi squared ( $X^2$ ). The results of the normality test are as follows.

**Table 1. Normality test results**

Test	N	Mean	$X^2$ Count	$X^2$ table 0,05	description
pretest	20	6,55	3,46	5,991	normal
posttest	20	13,80	3,80	5,991	normal

The table of normality test results shows that the results of the pretest and posttest have calculated values of 3.46 and 3.80, respectively, so it is stated that the data are normally distributed. The results of the homogeneity test stated that a significant value of 3.21 had a value greater than 0.05 so it was stated that the data had the same or homogeneous variance. Hypothesis testing to determine the effect of plyometric exercise on running. Based on calculations through the t-test application, the t-test value of 1.08 is smaller than the value of 2.06, then the hypothesis is accepted, so that it is stated that there is an effect of plyometric training on the running ability of 5th grade elementary school students at Padas.

This research was conducted in grade 5 by conducting a pretest on students before being given plyometric treatment to see their running ability. In the class before being given treatment, students were given a running test which was seen from the ability to run short distances. The test results were scored to determine the students' abilities and weaknesses in running. Based on the results of the pretest, it was obtained data that students who had the ability to run with low scores were due to the lack of exercise and the lack of long steps.

The learning process using the plyometric method was carried out for four meetings, with the first meeting being a basic ability test to determine treatment. The next meeting by giving direct plyometric treatment and teacher guidance. The treatment

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was carried out continuously in the next meeting with plyometric exercises to train strength and running ability. The results of posttest scores after being given treatment showed an increase before being given treatment.

Based on the results of the data obtained then analyzed statistically after comparing the results of the pretest and posttest obtained different results. The posttest result is higher than the pretest. This is inseparable from the use of the plyometric method in athletic learning, especially running. The use of the plyometric method is proven to be effective in improving running ability as seen from the posttest results of high students.

### CONCLUSION

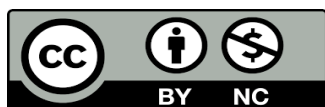
Based on research conducted for one month for four meetings, an increase was obtained before and after being given plyometric exercises. The results of the study showed that the students looked active while participating in the running training. The results of the pretest and posttest obtained significant results after plyometric exercises were applied. So it can be concluded that there is a significant effect between plyometric training on running ability.

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