

The Impact of the 30-Meter Sprint Exercise on Students' Long Jump Performance Using the Squat Technique

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Abstract: This study examines the effect of 30-meter sprint exercise on the long jump performance of junior high school students using squat style techniques. Thirty students participating in sports extracurricular activities at SMPN 1 Gelumbang were divided into 2 groups, namely control and experimental groups, with the same number. The experimental group received special treatment in the form of undergoing a 30-meter sprint training program for six weeks, where face-to-face training was carried out three times per week. Pretest-posttest used in collecting data. Then the data was analyzed using normality, homogeneity, and paired sample t-tests. The results showed a statistically significant improvement in long jump performance in the experimental group. Sprint training by students has been shown to improve the repulsion and coordination that are important in squatting styles in long jump athletics.

Keywords: Extracurricular Activities, Sprint Running Exercise, Squat Style Techniques

A. Introduction

Athletics is one of the sports that is widely contested. Every agility in athletics such as running, throwing, and jumping actually becomes part of basic human movement. Therefore, Athletics is the parent of all sports (Iyakrus et al., 2022). Long jump is one of the branches of athletics. Long jump itself has been around since ancient Greece. At first this sport was a military exercise to test and train the agility of soldiers when passing obstacles; such as ravines, ditches, and others. There is a lot of evidence in the form of ancient paintings that have been found depicting jumpers needing to run with weights in both hands at that time, this is certainly different from long jumps in the current era (Haryanto & Fataha, 2021).

In the long jump there are several styles that are commonly used by jumpers, namely squat style, hanging style (better known as the flexing style), and the air walking style. The state of the jumper's body posture when hovering in the air is the differentiator of each jumping style. Meanwhile, about the beginning, the foundation

or repulsion, and the way to land from the three styles are in principle the same (Ridwan & Sumanto, 2018).

In athletics, long jump is an example of jumping learning activities that are taught at the school level. In addition to introducing students to one of the athletic competition numbers, the long jump can also play a role as a means of growth and development of students' learning and sports achievements. The long jump, in particular, integrates speed, strength, coordination, and technique. Among the various styles that can be used, the squat style emphasizes explosive leg strength and optimal timing. Despite the adequate facilities at SMPN 1 Gelumbang, the performance of long jump students remained below expectations. Therefore, the researcher proposes that targeted sprint training can overcome the lack of running speed and jumping techniques, thereby improving the results of the long jump. This study aims to see "Is there a significant effect between 30-meter sprint running training on the results of squat style long jump in grade VIII students who participate in extracurricular activities at SMP N 1 Gelumbang?"

B. Methods

This study used a quantitative-experimental design with a pretest-posttest control group. Thirty grade VIII students for the 2023/2024 school year from SMPN 1 Gelumbang were sampled deliberately and divided equally into experimental and control groups. The experimental group is a group that is given training from the researcher to find out whether or not there is an effect of the given exercise. Meanwhile, the control group is a group that is not given treatment (in this case special exercises) by the researcher (Setiadi et al., 2023). In this study, the experimental group received a 30-meter sprint training for six weeks with three sessions per week. Meanwhile, the control group continued with routine activities without special treatment. Because in this study two variables were used, the control group was not given treatment to produce a more sensitive ability test or increase the power test. The experimental design used in this study is:

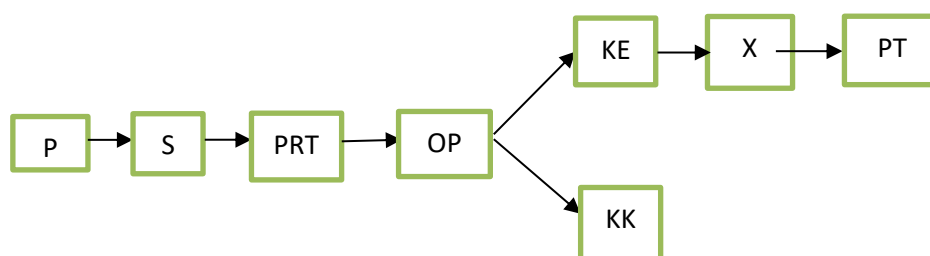


Figure 1. Research Design

Information:

P : Population

S : Sample

PRT : Pretest

OP : Ordinal Pairing

KE : Experimental Group

X : Treatment

PT : Post Test

KK : Control Group

The place of research was conducted at SMP N 1 Gelumbang, precisely on the sports field that has been available at the school. The research time will be carried out in May 2024 until it is completed, with training procedures, namely; (1) Every student is instructed to warm up; (2) Students are given an understanding and explanation of sprint running techniques, and do push-ups correctly; (3) Students are positioned ready to start a 30-meter sprint; (3) After that, students run to do a prefix for the long jump; (4) the pretest is immediately carried out with a long jump; (5) Jumps are made 3 times; and (6) The measurement result is the score or the farthest distance achieved from 3x the chance.

The steps of research data collection techniques are as follows: (1) Pretest is to provide the first test and provide instructions and directions so that there is no mistake in conducting the test. Then students start to do squat style long jumps, after the jumper lands, they are marked with a small flag then measured how far the student jumped; (2) Treatment is to provide a treatment in the form of 30-meter sprint exercises for 6 weeks where in 1 week there are 3 exercises; (3) Posttest is to do the final test after they have been treated for 6 weeks. Students get the opportunity 3 times to make a jump from the value taken is the farthest distance from the 3 times.

The normality test in this study is in the form of data analysis that is useful for obtaining evidence of the influence of 30-meter sprint training on the results of the squat style long jump, then the conclusion of the hypothesis is obtained from the results of data analysis in the normality test carried out on the pretest and posttest data of the experimental and control groups. The purpose of the normality test as a way to find out whether the data obtained is normally distributed or not with the provision that the data can be said to be normally distributed if it meets the criteria of $\text{sig} > 0.05$.

The normality test in this study is in the form of data analysis which is useful to obtain evidence of the effect of the 30-meter sprint exercise on the results of the squat style long jump, then the hypothesis conclusion is obtained from the results of data analysis in the normality test conducted on the pretest and posttest data of the experimental and control groups. The purpose of the normality test is as a way to find out whether a data obtained is normally distributed or not, provided that the data can be classified as normal distribution if it meets the criteria of $\text{sig} > 0.05$. And hypothesis testing was carried out to find out whether there was an effect of 30-meter sprint running exercises on the results of the long jump style. The data analysis used to compare the results of the pretest and posttest in this study was with the t-test for similar samples. Decision-making can also be found using the significance criterion < 0.05 , then it is stated that there is no significant influence, while if the significant value is > 0.05 , then it is stated that there is no significant influence on the test results.

C. Results and Discussion

The skill of moving from one place to another with one push forward as far as possible, is the definition of long jump according to Armanda (Armanda et al., 2020). According to him, the basic principle of long jump is to achieve the maximum initial speed while still pushing upwards with one foot in order to achieve sufficient height when hovering, so that it can produce maximum jump distance (Armanda et al., 2020).

Kumbara and Sukirno state that a jumper is said to be a good jumper if he has; excellent physical ability, fulfillment of good calorie needs, and motivation to make jumps (Kumbara & Sukirno, 2017). Permana argues that when doing long jumps there are several biomotor components needed by jumpers such as leg muscle power, endurance, flexibility, speed, and so on. However, speed is considered the most important point, because speed is the ability to shape body movements in certain situations in a short time (Permana et al., 2022). In line with Permana's opinion, according to (Akmal et al., 2021), the factor that affects the results of the squat style long jump is speed, speed has a very important role in the results of the squat style long jump. In the long jump, running speed is one of the important things to support maximum jump results. Because long jumps require speed to get a good start before pushing. Cahyo argues that speed is the ability of athletes to perform a series of movements in the shortest time to achieve the best results (Cahyo B et al., 2016). Speed is one of the components determined by one of the physical conditions. This speed refers to the speed of movement to perform a skill, not just in terms of running speed (Haryanto & Fataha, 2021).

An athlete can accelerate to increase speed from the starting position to maximum speed. In Indonesia, the average acceleration distance is between 0-25 meters, while in other countries or in athletes who have been trained, the acceleration distance is between 0-35 meters. This can be seen from several stages, including; acceleration/acceleration at distance, maximum speed, and speed endurance (Faizah, Herdyanto, 2019). A jumper when doing a pedestal starts by running first. After running, jumpers need to string together all movements that involve the ability of a group of muscles, eyes, and legs to get the maximum jump result. The eyes play a role in synergizing the gaze which will later produce body movements, while the legs work through eye commands. Therefore, long jumps must also be supported by a good eye-to-foot coordination component (Kumbara & Sukirno, 2017). Running itself is an aerobic exercise that is done regularly and continuously, using the muscles of the legs and hands. This exercise is done to encourage the heart and lungs to work large enough to improve their strength and ability (Putri & Yuliawan, 2021).

Short-distance running (sprint) is all the number of runs that are done at full/maximum speed along the distance that must be traveled (Irawan Edo, Erwandi Rudi, 2022). Rohendi, & Budiman, (2020) stated that sprint running (short running)

is an effort to run at peak speed and maintain speed for a predetermined distance, where the running speed will depend on the frequency of foot movements and swing of stairs. According to him, this training method includes various influences on the basic technique of sprint running, and this exercise can increase physical speed, responsiveness, and acceleration of students in doing jumps. While running 30 meters is running with a distance of 30 meters moving the body as fast as possible in a distance of 30 meters with the fastest time until the target has been determined (Deswanti et al., 2020).

According to (Aditya & Dewi, 2020) to achieve the main goal in training, which is to improve the performance of skill level as well as for work, athletes are directed by their coaches to achieve the general goals of training. Exercise is defined as a systematic exercise activity that is carried out repeatedly over a long period of time accompanied by a gradual and continuous increase in the load according to the ability of each individual (Nur, 2019). According to (Yulianto et al., 2023) exercise is a process of change for the better, namely to improve physical quality, functional ability of body equipment, and psychological quality of a person. Exercise is a basic process of preparation for higher performance whose process is designed to develop motor and psychological abilities that improve a person's abilities (Yulianto et al., 2023). Milyati (2009) concluded in his research entitled "The relationship between 60-meter running and squat style long jump in grade V students of SDN 2 Kedungwuni", there is a significant relationship between doing 60-meter running exercises and the results of the long jump squat style of grade V students at the school. Likewise, research by Linda Susila (2023) entitled "The effect of 50-meter running speed on the results of the squat style long jump of grade VIII male students at SMPN 30 Woja", it was concluded that the 50-meter sprint run has been proven to improve students' ability to perform squat-style long jumps.

Based on the explanation above, the provision of special treatment in the form of short-distance running exercises to improve students' jump results in long jump sports using squatting styles is considered necessary. Because the results of observations made by the researcher on students who participated in the long jump extracurricular activities at SMPN 1 Gelumbang, showed the results of the long jump pretest of the closest jump experimental group that could be achieved as far as 145 cm and the farthest jump was 310 cm. This is not in accordance with the target desired by the sports teacher, namely the nearest jump of 147 cm, and the farthest reaches a minimum of 315 cm.

After being treated with 30-meter sprint training for 6 weeks with a frequency of training 3 times a week, it turned out that there was an improvement in the experimental group with the result of the farthest jump of 325 cm and the closest jump reaching 150 cm. Analysis of students' pretest and posttest data was carried out at the hypothesis testing stage. Normality tests, homogeneity tests and t-tests

(Paired Sample tests) are part of this process. The results of the research if described using descriptive statistical analysis can be seen in the following table:

Table 1. Descriptive Statistic

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test Experimental Class	15	145	310	255,60	49,109
Pre-test Control class	15	146	315	257,93	49,678
Post-test Experimental Class	15	150	325	265,20	50,390
Post-test Control Class	15	147	317	255,40	49,461
Valid N (listwise)	15				

The normality test in this study uses the Shapiro-Wilk test with a significant level of 5%, and the criteria used to interpret the data are; If the significant value is greater than the specified alpha level of 0.05, then the data is considered not to be normally distributed. The results of the normality test for the pretest and posttest are presented as follows:

Table 2. Normality Test

	Tests of Normality			
	Class	Statistic	Df	Sig.
Long Jump Results	Control Class Pre-test	0,882	15	0,051
	Experimental Class Pre-test	0,896	15	0,082
	Control Class Post-test	0,890	15	0,066
	Post-test Experiment Class	0,888	15	0,062

Results were obtained in the form of pretest and posttest significance values in the experimental class of more than 0.05. So, the results of the normality test data analysis show that the data is normally distributed. Homogeneity testing is used to look at or prove two or more sample data groups that originate from a single population and have similarities of variation. In this study, the homogeneity test was carried out using Leven's statistical method using SPSS. The decision criteria must show that the two groups are similar or homogeneous. This means that if it is significant at the Based-on Mean < 0.05, it means that the two types of population groups are not homogeneous. However, if it is significant at the Based-on Mean > 0.05, then the two types of population groups are similar or homogeneous. The results of the homogeneity test for the pretest and posttest are presented as follows:

Table 3. Homogeneity Test

		Test of Homogeneity of Variance			
		Levene Statistic	df1	df2	Sig.
Long Jump Results	Based on Mean	0,191	3	56	0,902
	Based on Median	0,139	3	56	0,936
	Based on Median and with adjusted df	0,139	3	52,093	0,936
	Based on Trimmed Mean	0,190	3	56	0,903

The results of the homogeneous test in the table above show that the data of the two population groups are declared homogeneous, this is proven by the significance value where the value is greater than the decision criterion, which is 0.902. Hypothesis testing was carried out to find out whether or not there was an effect of 30-meter sprint training on the results of squat style long jump in grade VII students who participated in extracurricular activities at SMP Negeri 1 Gelumbang. The hypotheses tested for truth in this study are: H_a : There is a significant influence through the 30-meter sprint exercise on the results of the squat style long jump, and H_0 : There is no significant influence on the 30-meter sprint training on the results of the squat style long jump. Data analysis used to compare the results of the pretest and posttest in this study using the t-test, decision-making can also be found using a significant criterion of <0.05 , then it can be noted that there is a significant influence on the data, while if the significant value is >0.05 , then it can be noted that there is no significant influence on the result. The hypothesis test obtained the following results:

Table 4. Hypothesis Test

		Mean	St. Deviation	Paired Differences	Std. Error Mean	95% Confidence Interval of the Differences		t	df	Sig.(2-tailed)
						Lower	Upper			
Pair 1	Pre-test Experiment-Post-test Experiment	-2,333	1,952	,504	-3,414	-1,252	-4,630	15	<,001	
Pair 2	Pre-test Control-Post-test Control	6,20000	7,05286	1,82104	2,29426	10,10574	3,405	15	,004	

D. Conclusions

The results of the analysis of the Paired sample test showed a significant influence, the result was evidenced by (sig. 2- tailed) which was $0.001 < 0.05$. Which means that there is a significant influence between the experimental class and the control class. The test results showed that there was an effect of the 30-meter sprint running exercise on the results of the squat style long jump in students, so the hypothesis was accepted. Thus, the 30-meter sprint running exercise has an effect on the results of the squat style long jump. In other words, the 30-meter sprint exercise can improve the results of the squat style long jump in students who participate in the long jump extracurricular activities at SMPN 1 Gelumbang, this can be seen from the increase in jumps in the experimental group, and this study also shows that the 30-meter sprint running exercise can be used as a training method to improve the results of the long jump at the school.

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References

- Aditya, V. S., & Dewi, C. (2020). The Relationship of Leg Muscle Strength to Short Distance Running Skills (Sprint) in Grade 5 Students of Sd Negeri 62, Bengkulu City. *Journal Of Dehasen Educational Review*, 1(1), 50-55. <https://doi.org/10.33258/jder.v1i1.980>
- Akmal, Saripin, & Juita, A. (2021). The Contribution of Explosive Power Legs Muscle and 40 M Running Speed With Long Jump Result on Students At Sman 1 Kubu. *Physical Education, Health and Recreation Faculty of Teacher Training and Education* Riau University <https://ejurnal.ung.ac.id/index.php/jhsj/article/view/9890>
- Armanda, Y., Ulfah, W. A., & Walton, E. P. (2020). The Effect of Rubber Paralon Jumping Training on the Results of the Squat Style Long Jump on Extracurricular Students of SD Negeri 8 Mendobarat. *Sparta*, 1(2), 77-81. <https://doi.org/10.35438/sparta.v1i2.161>
- Cahyo B, J., Waluyo, M., & Rahayu, S. (2016). The Effect of Deer Jump Training on Running Speed. *Journal of Sport Sciences and Fitness*, 1(1), 56-61. <https://doi.org/10.31851/hon.v1i2.1974>
- Deswanti, Putra, & Janiarli. (2020). The Relationship Between 30-Mter Running Speed And Flexibility With Long Jump Ability In Students Of Extra-Curricular Athletics at SMP Negeri 2 Rambah Deswanti. *Sport Education and Health Journal*, 1(1), 9-19. <https://journal.upp.ac.id/index.php/joset/article/view/416/233>
- Faizah, A., & Herdyanto, Y. (2019). Analysis of Acceleration Motion of 100 Meter Sprint (Study on Male 100 Meter Sprint Athletes of Pelatnas B, Reviewed from Biomechanics Aspect). 282.
- Haryanto, A. I., & Fataha, I. (2021). Correlation of Leg Length, Leg Muscle Power and Running Speed with Long Jump Results. *Jambura Health and Sport Journal*, 3(1), 42-50. <https://doi.org/10.37311/jhsj.v3i1.9890>
- Irawan Edo, Erwandi Rudi, D. H. (2022). The Effect of Leg Muscle Training on 50 Meter Running Speed in Extracurricular Activities of Students of SMP Negeri 6, Lubuklinggau City. *Binagogik Journal*, 9(2), 34-38. [208](http://j-</p></div><div data-bbox=)

- innovative.org/index.php/Innovative/article/view/3024
- Iyakrus, I., Reno, R., Usra, M., Hartati, H., Yusfi, H., & Bayu, W. I. (2022). Development of a Training Program Model to Improve Physical Fitness of Athletic Athletes. *Bravo's: Journal of Physical Education and Health Study Program*, 10(2), 89. <https://doi.org/10.32682/bravos.v10i2.2426>
- Kumbara, H., & Sukirno, S. (2017). Correlation of Calorie Needs, Leg Muscle Power and Eye-Foot Coordination with Long Jump Results in South Sumatra Student Athletes. *Journal of Physical Education, Health and Recreation*, 2(1), 57. <https://doi.org/10.24114/pjkr.v2i1.7840>
- Mulyati, S. (2009). The Relationship of Long Jump Squat Style in Grade V Students of SD Negeri 02 Kedungwuni in the Academic Year.
- Nur, A. (2019). The Effect of Obstacle Jump Training on the Ability of Long Jump Squat Style in Male Students of SMP Negeri 1 Luwuk. *Journal of Sports Education*, 9(1), 1-8. <https://ejournal.tsb.ac.id/index.php/jpo/article/view/200>
- Permana, M. Y. I., Suratmin, & Gede Eka Budi Darmawan. (2022). Leg Muscle Speed and Power in Squat Style Long Jump Ability in Athletics Extracurricular. *Indonesian Journal of Sport & Tourism*, 4(2), 92-101. <https://doi.org/10.23887/ijst.v4i2.49180>
- Putri, M., & Yuliawan, E. (2021). Relationship between Leg Power and 50 Meter Sprint Speed in Grade VIII Male Students of SMP Negeri 1 Muaro Jambi. *Score Journal*, 1(1), 1-13. <https://www.online-journal.unja.ac.id/score>
- Rohendi, A., & Budiman, A. (2020). The effect of barrier hops plyometric methods, knee tuck jump plyometrics, and explosive power on the results of the squat style long jump. *Journal of Physical and Outdoor Education*, 2(1), 86-96.
- Ridwan, M., & Sumanto, A. (2018). Leg Muscle Explosive Power, Speed and Flexibility with Long Jump Ability. *Journal of Sports Performance*, 2(01), 69-81. <https://doi.org/10.24036/jpo67019>
- Setiadi, T. H., Pandean, F., & Haryanto, Y. J. (2023). Introduction To Muscle Strength Training For Physical Fitness In West Jakarta. 1(3), 1164-1167.
- Yulianto, R., Santoso, A. B., & Yulianto, P. F. (2023). The effect of frog jump training on long jump ability Introduction. 6(2), 900-909. <https://doi.org/10.29408/porkes.v6i2.24224>