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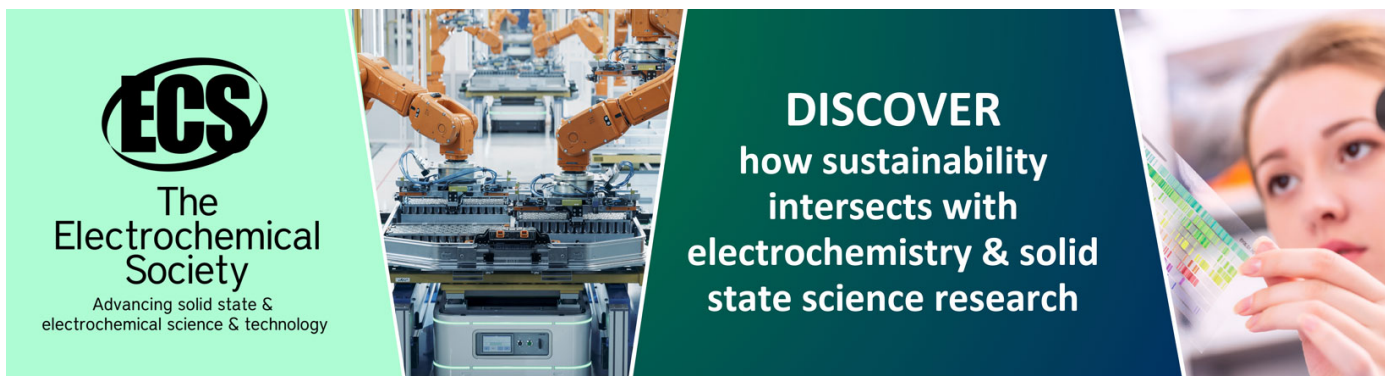
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To cite this article: Hartati *et al* 2021 *J. Phys.: Conf. Ser.* **1832** 012057

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# Uphill running exercise of speed on futsal extracurricular high schools

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**Abstract.** The purpose of this study is to determine the effect of uphill running exercises on the speed of soccer extracurricular participants in senior high school number 6 Palembang. This research is an experimental research design with Quasi Experimental Design in the Nonequivalent Control Group Design. The population in this study is 60 people, and the sample in this study is the same as the total population. The sampling technique in this study uses a systematic sampling technique with ordinal pairing system. The experimental group was the group given treatment in the form of Uphill running while the control group is the group that was not treated. The type of instrument used in this study is the 60meter run test or often called the 60meter sprint test. This form of test is used in the initial test (pre-test) and final test (post-test) which aims to determine the fastest time prediction level of students, the results obtained by the average experimental group time at pre-test of 75 and post-test 79.1, and obtained the average results the average time of the control group at the pre-test was 74.9 and the post-test was 76.4. After testing the results of the data were analyzed using statistical data analysis techniques t test with a significant level ( $\alpha = 0.05$ ). Based on the data analysis of the research results obtained tcount = 14.33, and ttable = 1.675. The findings in this study are that uphill running exercises significantly influence the speed of soccer extracurricular participants. it can be concluded that the existence of uphill running training can affect the speed of the futsal extracurricular participants.

## 1. Introduction

Sports activities are activities that teach themselves to compete in sportsmanship, learn to accept defeat in a match, cause a fair play attitude, foster a spirit of never giving up and from the other side of sports can also improve one's physical condition. One of the sports activities that are in great demand by children and adults is futsal. Lhaksana, futsal is a type of game sport that is popular in all circles from children to adults, because the game is easy to learn and not hard to play [11].

According Irawan, Futsal is a game played by two teams, each consisting of five players who play on the field, each team trying to put the ball into the opponent's goal and prevent the opponent to score. Futsal games have several basic techniques that must be mastered well. The basic techniques are divided as follows, passing (passing), receiving the ball (receiving), feeding the hull (chipping), dribbling (heading), heading (heading), and shooting the ball (shooting) [8].

Based on observations on futsal extracurricular activities at Senior High School Number 6 Palembang, students who take part in these activities have not been able to play with the ability to speed, because during the game many students are running from attack to defence and vice versa. Only 7



students can play using speed and 53 students who have not been able to play using that speed. The results of interviews with trainers were obtained by students when regional championships often won. But at the national level futsal championship did not get a champion. Futsal extracurricular activities were attended by 60 students who in each exercise only practiced playing strategies, resulting in deficiencies in the physical component, namely speed. Because it takes training with a fast intensity to increase the speed of students who take futsal extracurricular activities.

Lhaksana [11], to perform basic techniques requires very good physical conditions, the kinds of physical condition components that must be possessed during the sprint are (1) Endurance, (2) Strength, (3) Speed (speed), (4) Agility, (5) Explosive Power (power), (6) Flexibility, (7) Accuracy, (8) Coordination (coordination), (9) Balance (balance), and (10) Reaction (reaction). Based on the ten components, one component that is very influential is the speed component because in futsal players are required to run in a fast tempo and with a short time. Factors that influence the quality of futsal play are speed, according to Widiastuti [17] speed is the ability to make similar movements in a row in a short time. According to Harsono [6] speed does not only mean moving the entire body quickly, but it can also be limited to moving members of the body, such as arms, legs in the shortest possible time. Speed of limbs, such as arms or legs is very important in order to provide acceleration (acceleration) to external objects, such as soccer, futsal, discus throwing, volleyball, badminton, boxing, opponent slamming and others -other.

Factors that support a success in efforts to increase speed is the exercise factor. The purpose of speed training is to improve the ability of athletes or students to be able to move to a fast rhythm continuously in a short time intensity. Speed bio motor component is generally used as a benchmark to determine the level of physical fitness (physical fitness). The relationship between speed and performance of a person including (1) the ability to carry out activities continuously with high intensity and in a short time, (2) the ability to shorten recovery time, especially in sports and games. For the physical component of speed training there are several forms and one form of exercise that can be used to increase speed is to use uphill running exercises.

Exercise is a systematic practice process that is carried out repeatedly in the form of improvement skill ability, energy capacity, and physical uses and pay attention to educational aspects. Exercise is a human activity that aims to support their physical needs [14]. According to Apta Mysidayu and Febi Kurniawan [12] training comes from the word training, which is the process of perfecting the ability to exercise consisting of theory, practice, methods and rules of implementation so that the training objectives can be achieved. Forms of acceleration training, one of which is Uphill acceleration. Various forms of acceleration training model form: 1.) Wall drills 2.) Downhill 3.) falling start 4.) weighted start 5.) Stadium Stairs 6.) Uphill acceleration 7.) Stick Drill 8.) Partner Resisted Start 9.) Leader 10.) Quick Feet (Brown E Lee et al, Speed and Agelity, 2013: 24). Uphill Running is a practice of sprinting on a rising track or running up a hill. According to Kardiyono [9], uphill acceleration run exercises with a slope of 100-300 can increase acceleration when running on a flat track. Yoda (I Ketut Okta Pradipta Jaya, I Ketut Yoda, I Nyoman Sudarmada [8] "Run hill run on the hill to develop dynamic strenght". Trying to run as fast as possible will increase leg muscle strength and leg power. According to Kyle R. Barnes, Will G [3], Running uphill (Uphill Running) is an athlete required to run on an upward trajectory with a repetitive medium speed. Uphill or run up hill aims to develop dynamic strength. Dynamic strength can also be developed by running in shallow water, sand, snow, or soft fields Harsono [6].

Uphill training, according to Doherty 1964 in harsono, [6] climb should "not too steeply, otherwise good running from will be sacred." So if the slope is too high (steep), then the technique or form will be disrupted. When doing runners uphill exercise such as being given a heavy enough burden makes runners try to run as fast as possible on the road uphill. So when running in a flat area the steps feel lighter. According to Havid Yusuf and Rubbi Kurniawan [18] running Uphill activity can provide a blood glucose reduction effect by running on a treadmill at an angle of 5 degrees so that mice can run quickly because their blood circulation returns to normal.

The novelty in this study is the uphill running exercise which is used for speed in students who take futsal extracurricular activities. The uphill running exercise was chosen with a number of considerations

including personal considerations relating to tools, instruments, funds, available data and references as well as practical capabilities for consumers (users). That way uphill running training is very suitable as a form of training to increase speed, especially for beginner or amateur athletes.

Based on the research problem, it can be concluded that the existence of uphill running training can affect the speed of the futsal extracurricular participants in high school number 6 Palembang.

## 2. Research Methods

This type of research is quasi-experimental research (Quasi experiment research) aims to obtain information that is an estimate for information that can be obtained by actual experiments in circumstances that do not allow to control or falsify all relevant variables. This study aims to determine the effect of uphill running exercises on the speed of futsal extracurricular participants at senior high school number 6 Palembang. This research is also an experimental study with the research design used is Quasi Experiment design. The design in this study uses the Non-equivalent Control Group Design Sugiyono [15].

The population in this study were all students who took part in futsal extracurricular activities in six public high schools in Palembang total 60 people, and the sample in this study was the same as the total population of students who took futsal extracurricular activities in senior high school number 6 Palembang, amounting to 60 people, the research this is also referred to as population research. The sampling technique in this study uses a systematic sampling technique with ordinal pairing system, in which the sample is divided into two groups namely, the experimental group and the control group. The experimental group was the group that was given treatment in the form of uphill running while the control group was the group that was not treated. This study uses independent and dependent variables.

The type of instrument in this study is the 60-meter Sprint Running or commonly called the short-distance running test. This form of test is used in the initial test (pre-test) and final test (post-test) which aims to determine the results of the 60meter sprint run time for futsal extracurricular students. Data analysis techniques are the means adopted to obtain or analyse data. This data analysis aims to test the acceptance or rejection of the formulated hypothesis. The data analysis technique used in this study was the "t test" with a significance level of 95% and with a sample requirement that must be homogeneous and normal. The time of this study was 6 weeks with a frequency of 3 times a week, or in other words the research was carried out for 18 meetings, which at the first meeting carried out the initial test (pre-test) and starting from the second meeting until the seventeenth meeting was treated for the experimental group in the form of uphill running with 70-80% training intensity, then after being treated all samples do a final test (post-test).

Three activities that will be carried out include the following:

a. Initial Test (pre-test)

The initial implementation in research is conducting a pre-test which aims to obtain data before being given treatment, the implementation of this test is carried out in the field

b. Implementation of Exercises

The exercise is carried out by setting the amount of time in each meeting as much as 90 minutes with a division of 5 minutes for the opening, 10 minutes for warm-up, 60 minutes for core training, 10 minutes for cool-down and 5 minutes for the closing.

c. Final Test (Post-test)

After being given treatment for 16 meetings divided into 3 meetings in 1 week, then a final test (post-test) was carried out to obtain data from the results of the 60meter sprint after being given a treatment or training program.

## 3. Results and Discussion

### 3.1. Result

The test instrument used in this study used a 60meter running test. In this test the participant ran with a distance of 60 meters. Based on the results of the experimental group pre-test that has been carried out, the results obtained with the highest time is 84, the time yield with the lowest value is only 68 and the

average pre-test results are 75 with less categories, after the pre-test is carried out and the data has been taken then the sample is given a treatment uphill running for 6 weeks with a frequency of exercise 3 times a week, then at the last meeting post-test.

After that, the experimental group's post-test was carried out to get the post-test results of the time results with the highest value of 89, the time yield with the lowest value was 72 and the average post-test result was 79.1 with the medium category. From the results of the pre-test and post-test the experimental group shows an increase in the average time yield with a value of 4.1.

Based on the results of the pre-test control group that has been implemented, the results obtained with the highest time value is 83, the results of the time with the lowest value is only 68 and the average pre-test results are 74.9 with less categories. After the pre-test is carried out and the data has been taken then the sample is not given a treatment for 6 weeks, then at the last meeting the post-test is conducted.

The results of the control group post-test, it was found that the results of time with the highest value was 84, the time results with the lowest value were only 70 and the average post-test results were 76.4 with the medium category. From the pre-test and post-test results of the control group it was seen that the average time yield with a value of 1.5 increased.

**Table 1.** Results of the pre-test and post-test of the experimental group and the control group.

	<i>Pre-test</i>	<i>Post-test</i>	Difference
Experiment Group	75	79,1	4,1
Control Group	74,9	76,4	1,5
Difference	0,1	2,7	2,6

The results of the 60 meter pre-test and post-test run of the experimental group were 75 with less categories and 79.1 with medium categories and the control group amounted to 74.9 with less categories and 76.4 with medium categories.

### 3.2. Discussion

Training according Aryanti, is the main component for achievement. Exercise can be used to improve the skills of a sports athlete [2]. Uphill running training research is used to improve speed results. Forms of exercise running on the road or uphill track. In this study, it was assessed that the results of futsal extracurricular student speed were conducted to determine the effect of uphill running on the speed of futsal extracurricular students. This research was conducted on 60 students who participated in futsal extracurricular activities at Senior high school 6 Palembang which were then divided into 2 groups using the ordinal pairing system of 30 students as the experimental group and 30 students as the control group.

The experimental group was given treatment for 6 weeks with a frequency of 3 times a week and the intensity of exercise 70-80%. This is in accordance with the opinion of Harsono in Syamsuramel [16] that training is a systematic process in preparing athletes at the highest level of performance performed repeatedly with higher / increasing loads, and the application of training (uphill running) to speed successfully. According to Hartati et al, the general goal of training is to help coaches, coaches, sports teachers to be able to apply and have conceptual abilities and skills in helping to express the potential of athletes to reach peak performance [7].

All data from the pre-test and post-test results of the experimental group and the control group were said to be normal because, the Km of the experimental group at the time of the pre-test was 0.45 and the post-test result was 0.59 while for the Km the control group at the pre-test was 0.19 and at the post-test results is 0.55. All samples come from homogeneous samples, this is proven after homogeneity tests, obtained  $\chi^2$  count = 0.27 for pre-test and  $\chi^2$  count = 0.55 for post-test means the sample comes from a

homogeneous population (the same). After the data is known to be normal and the data comes from the same sample, then the hypothesis test is performed with the "t" test statistic and obtained  $t\text{-count} = 14.33 > t\text{-table} = 1.67$  then a significant difference between the experimental and control groups.

#### 4. Conclusion

Based on the results of research and data analysis after the hypothesis test with the t-test, the hypothesis is accepted that  $H_a$  is, there is the effect of uphill running training on the speed of futsal extracurricular participants in Senior high School number 6 Palembang, and viewed from the results obtained from the findings in the study this is the results of the average time of the experimental group on the pre-test with a value of 75 less categories, and post-test 79.1 moderate category, and the results obtained the average time of the control group on the pre-test with a value of 74.9 less categories, and post-test 76, In the medium category, there was a significant increase in the mean time in the treated group. This increase occurred due to several factors, namely, 1) uphill running exercises conducted systematically and continuously with reduced training load but increased intensity, 2) increased body functional performance caused by exercise intensity, 3) body adaptation, 4) length of time practice. This form of uphill running training is quite effective in increasing speed.

Based on the results of the data obtained that Uphill Running has a significant influence on the speed of futsal extracurricular students at senior high school number 6 Palembang. According to Doherty 1964 [6] when performing uphill runner ankle exercises. like being given a heavy enough load so that runners try to run as fast as possible on the uphill road. When running in a flat area will be easier and lighter steps.

Based on the description above it can be concluded that Uphill Running has a significant influence on the speed of this matter can be seen from the results of the hypothesis test that has been done. So that this research can be used by coaches or teachers to guide training methods for students.

#### Acknowledgment

Thanks to the physical education teachers at middle school number 6 Palembang, students, the school, and all those who have helped in this research.

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