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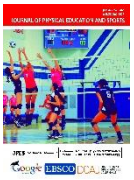

The Influence of Chining-Up and Push-Up Training with Arm Length to Shooting Free Throw Result on Female Basketball Athletes at PGRI University of Palembang

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Abstract

This study was aimed at analyzing (1) the difference of influence between *chinning-up* and push-up training to *shooting free throw* result on female basketball athletes in PGRI University of Palembang; (2) the difference of influence bettween athlete with long arm and athlete with short arm to *shooting free throw* result on female basketball athlete in PGRI University of Palembang; (3) the interaction between training method and arm length to *shooting free throw* result on female basketball athlete in PGRI University of Palembang. The research used quantitavive experimental method by using two factorial design. The treatments were arranged in such a way that each individual can be a simultaneous subject in two different factors in which each factor consists of several levels. Based on hypothesis testing result of the previous researches, resulted three analysis: (1) There is a difference of influence of *chinning-up* and *push-up* training method to *shooting free throw* result. (2) There is no difference of influence between the long arm category and the short arm category on female basketball athletes at PGRI University of Palembang. (3) There is an interaction effect between *chinning-up* training methods and arm length to *shooting free throw* result on female basketball athletes at PGRI University of Palembang.

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INTRODUCTION

According to Jon Oliver (cited in Prabowo, 2015), basketball is one of the most populer sports in the world. The fans are of all ages whom believe that basketball is a fun, competitive, educational, entertaining, and healty sport. PERBASI (2006) defined basketball as a game played by two teams of each consists of five players. Each team tries to insert the ball into the opponent's basket, prevents the opponent from getting score, passes the ball, rolls the ball, or tossess the ball to all directions based on certain regulations.

In basketball game, shooting is an attempt to insert a ball into a basket with one hand or two hands in which the ball is shot to the basket with a push help, the arm (elbow), the body, and the knee are straightened out simultaneously (Pranata, 2016). Kosasi, as cited in Nurdian Ahmad, (2016), also asserted that shooting is a basic skill of basketball which is well-known and fancied by every player whose instinct to get score.

Roestiyah in Novri Asri (2017) suggested that training method is a way of training in which the athlete carries out the training activities so that the athlete has a higher dexterity or skill than what has been obtained. In addition, Djamarah and Zain in Nurul Huda (2016) revealed that training method is a good way to practice certain habits to obtain dexterity, accuracy, opportunity, and skill.

One of the methods to train arm muscle strength is chinning-up. According to Vision Adiwidya et al, (2015), chinning-up is a movement by standing in front of a horizontal pole with feet keep stepping on the ground, then pull the body forward until it touches the horizontal pole and push back the body back to the position of the arm equal to the shoulder. Aligned with Adiwidya's idea regarding chinning-up, Garuda eduka team (2017) also believed that chinning-up is a movement by standing in front of the horizontal pole with your feet keep stepping on the ground, then pull the body back.

Enha Punjabi (2017) defined push-up as an effective way to strengthen the chest muscles and arm, and the benefits can be increased easily as you grow stronger. Ratih Putri Pratiwi (cited Hasbuna Rawe, 2017), also claimed that push-up is a movement starting from the beginning position of sleeping on his/her stomach with his/her hands on the right and left side of the body.

A good basketball player is commonly characterized by a high body, long arms, strong hand muscle, and strong leg power. Height, arm length, arm strength, and leg power are the basic form of body shape and a major tool in playing basketball to support the ability of shooting techniques especially free throw shot in basketball game. A good shot requires a power impulse that is suitable to the range of the shot. For close proximity, the arms, wrists and fingers provide a great boost, while for long distance it requires power or a foot push, back and shoulders.

According to Yusuf and Aip in Nurul Huda (2016), the length of arm is the distance from the upper bone of the arm (humerus) to the bone of the hasta (ulna). Basketball is a sport activity that requires long arms and high reach. Since the basketball target is above the head, people with long arms will get high reach. As Asri Trisnawati (2015) stated that in basketball, the target addressed is above the head, so people with long arms will have some advantages. Firstly, the distance of the ball off the target becomes closer than the people with short arms. Secondly, regardless of the factors such as technique, physical, and mental, people who have relatively longer arms in basketball games will have better performance.

Regarding the explanation above, the researcher is interested to conduct a research entitled "The influnce of Chining-Up and Push-up training with length arm to shooting free throw result on female basketball athletes at PGRI University of Palembang. The research questions of this study are described as follows:

1. Is there a difference of influence between chinning-up and push-up training methods to shooting free throw result on female

basketball athletes at PGRI University of Palembang?

2. Is there a difference of influence between the long arm category and the short arm category to shooting free throw result on female basketball athletes at PGRI University of Palembang?
3. Is there an interaction effect between chinning-up training methods and arm length to shooting free throw result on female basketball athletes at PGRI University of Palembang?

This study was aimed at analyzing (1) the difference of influence bettween chinning-up and push-up training to shooting free throw result on female basketball athletes in PGRI University of Palembang; (2) the difference of influence bettween athlete with long arm and athlete with short arm to shooting free throw result on female basketball athlete in PGRI University of Palembang; (3) the interaction between training method and arm length to shooting free throw result on female basketball athlete in PGRI University of Palembang.

METHODS

This study used quantitative method by applying quasi experiment that functions to compare two different treatments to the research subjects with factorial design techniques. According to sudjana in Didi Yudha Pranata (2015), factorial experiment is experiment that almost or all levels of a factor are combined or crossed with all levels of each other factor in the experiment.

The research design was pre-experimental, true experimental, and quasi experimental (Sugiyono, 2013). Since this study used two factorial design, the treatments are arranged in such a way that each individual can be a simultaneous subject in two different factors in which each factor consists of several levels (Dantes, 2012). The data in this study is arranged in a research design framework with 2x2 factorial design described as follows:

Arm length (A)	Shooting free throw training (B)	
	Chinning-up training (B_1)	Push-up training (B_2)
Long arms (A_1)	A_1 B_1	A_1 B_2
Short arms (A_2)	A_2 B_1	A_2 B_2

Explanation:

$A_1 B_1$ = a group of players who have long arms category were given shooting free throw treatment using a chinning-up training.

$A_1 B_2$ = a group of players who have long arms category were given shooting free throw treatment using a push-up training.

A_2B_1 = a group of players who have short arms category were given shooting free throw treatment using a chinning-up training.

A_2B_2 = a group of players who have short arms category were given shooting free throw treatment using a push-up training.

The respondents involved in this research were all female basketball athletes at PGRI University of Palembang consisting of 24 female basketball players which chosen by using purposive sampling. Dantes (2012) perceived purposive sampling technique as the sampling technique which is based on the characteristics or objectives set by the previous researchers.

Independent variable consisted of two treatments of which manipulative variable, chinning up and push-up training method, and attribute variable, the arm length which was divided into two; long arm and short arm. While, the dependent variable is the result of shooting free throw of how many balls entered into the basket performed by the athletes during the shooting free throw training.

The research instrument used was administration technique, done through test and sport measurement, long arm test and training program. First, the researcher asked the permission from basketball club of PGRI University Palembang, vice rector and the place where the research took place including contacted people involved in the research, especially the head of study program, the coaches, and the chief of basketball club at PGRI University Palembang.

In analyzing the data, to test the hypothesis, the technique used is two-way variance analysis (two way ANOVA). According to Arikunto in Agam (2015), two-way variance

analysis (ANOVA) is a technique of data analysis with factorial design with two factors. Whether or not H_o is accepted, it is proven from the significance value interpretation in the table test of between subject effect from the analysis results through SPSS 23.0 program for windows. The criteria used is when the probability chance of error is $p < 0.05$, H_0 is rejected while H_1 is accepted.

To test the hypothesis, it needs arrange null hypothesis (H_0) and alternative hypothesis (H_1), as follows:

1. H_0 : There is no difference of influence of chinning-up and push-up training method to shooting free throw result on female basketball athletes at PGRI University of Palembang.
   H_1 : There is a difference of influence of chinning-up and push-up training method to shooting free throw result on female basketball athletes at PGRI University of Palembang.
2. H_0 : There is no difference of influence of between the long arm category and the short arm category to shooting free throw result on female basketball athletes at PGRI University of Palembang.
   H_1 : There is a difference of influence of between the long arm category and the short arm category to shooting free throw result on female basketball athletes at PGRI University of Palembang.
3. H_0 : There is no interaction between the training methods and the arm length to shooting free throw result on female basketball athletes at PGRI University of Palembang.
   H_1 : There is no interaction between the training methods and the arm length to shooting free throw result on female basketball athletes at PGRI University of Palembang.

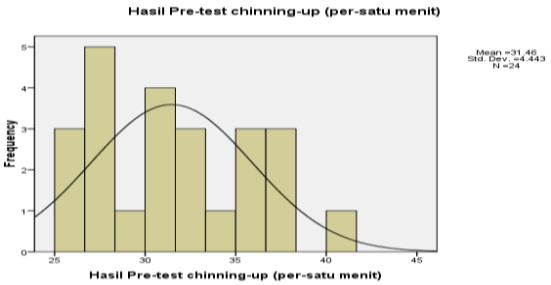
RESULTS AND DISCUSSION

This study was aimed to discover the shooting free throw result on female basketball athletes in PGRI University of Palembang, the influence between chinning-up and push-up training method to shooting free throw result on female basketball athlete in PGRI University of Palembang,and the influence between long arm and short arms category to shooting free throw result on female basketball athlete in PGRI University of Palembang.

The research provides benefits and scientific information in an exercise or training, match or exercise in the field of science, especially sport science which is related to the influence of chinning-up and push-up training to PGRI University of Palembang athletes.

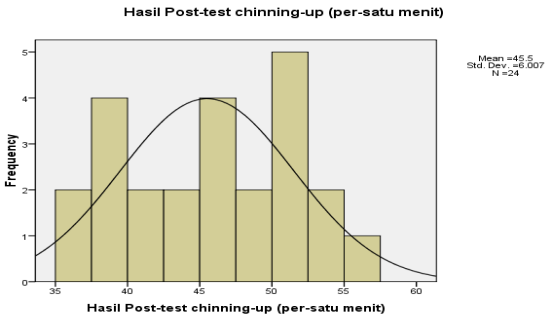
The data in the study are grouped into seven: (1) The result of chinning-up pre-test (per-minute); (2) Post-test result of chinning-up (per-minute); (3) Pre-test result of push-up (per-minute); (4) Post-test result of push-up (per-minute); (5) Pre-test result of shooting free throw (15 times chance); (6) Post-test result of shooting free throw (15 times chance); (7) Arm length.

The pre-test result of chinning-up (per-minute) is as follows: many respondents (n) = 24, minimum score = 25, maximum score = 40, average = 31.46, variance = 19.737 and standard deviation = 4.443. The above data are displayed in Graph 1.



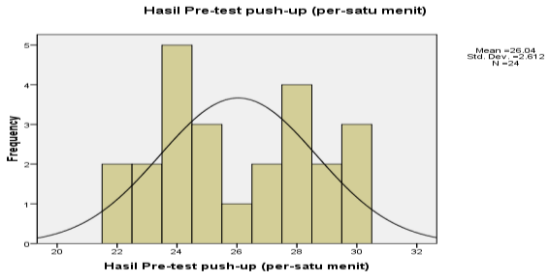
Graph 1. Pre-Test Result of Chinning-Up (per-minute)

The post-test result of chinning-up (per-minute) is as follows: many respondents (n) = 24, minimum score = 35, maximum score = 55, average = 45.50, variance = 36,087, standard deviation = 6,007. The above data are shown in Graph 2.



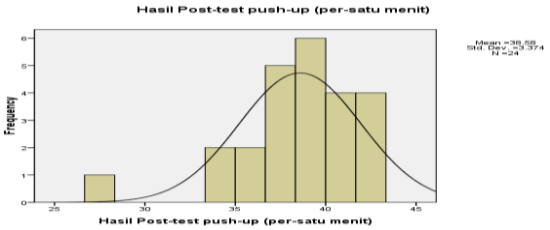
Graph 2. Post-Test Result of Chinning-Up (per-minute)

The pre-test result of push-up (per-minute) is as follows: many respondents (n) = 24, minimum score = 22, maximum score = 30, average = 26.04, variance = 6.824, standard deviation = 2.612. The above data are shown in Graph 3 as follows.



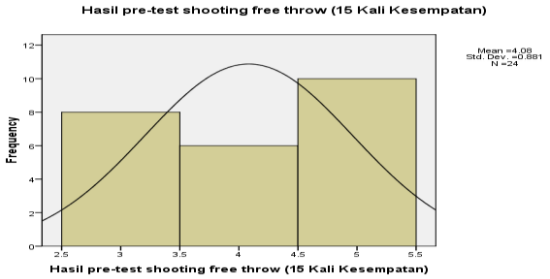
Graph 3. Pre-Test Result of Push-Up (per-minute)

The post-test result of push-up (per-minute) is as follows: many respondents (n) = 24, minimum score = 27, maximum score = 43, average = 38.58, variance = 11.384, standard deviation = 3.374. The above data are displayed in Graph 4 as follows.



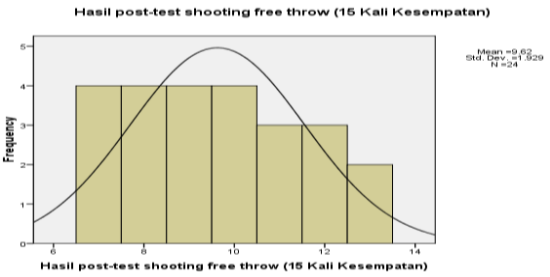
Graph 4. Post-Test Result of Push-Up (per-minute)

The pre-test result of shooting free throw is as follows: many respondents (n) = 24, minimum score = 3, maximum score = 5, average = 4.08, variance = 0.775, standard deviation = 0.881. The above data are displayed in Graph 5 as follows.



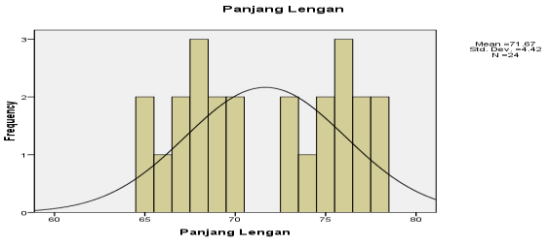
Graph 5. Pre-Test Result of Shooting Free Throw (15 times chance)

The post-test result of shooting free throw (15 times chance) is as follows: many respondents (n) = 24, minimum score = 7, maximum score = 13, average = 9.62, variance = 3.722, standard deviation = 1.929. The above data are shown in Graph 6 as follows.



Graph 6. Post-Test Result of Shooting Free Throw (15 times chance)

The result data of arms length is as follows: many respondents (n) = 24, minimum score = 65, maximum score = 78, average = 71.67, variance = 19.536, standard deviation = 4.420. The above data are displayed in Graph 7 as follows.



Graph 7. Arms length

Based on the graph 1 to 7, it can be seen that the study is grouped into seven: (1) The pre-test result of chinning-up (per minute); (2) Post-test result of chinning-up (per-minute); (3) Pre-test result of push-up (per-minute); (4) Post-test result of push-up (per-one minute); (5) Pre-test result of shooting free throw (15 times chance); (6) Post-test result of shooting free throw (15 times chance); (7) Arm length. Then, it can be continued to the assumption of normality test data.

For data normality test, it is stated that the data can be considered normal if it meets the criteria in which if the level of significance is greater than $\alpha = 0.05$, the data is considered as normal distributed data. Based on the calculation results, it is obtained Asymp value. Sig. (2-tailed) as follows:

1. The pre-test result of chinning-up (per-minute) is $0.908 > \alpha = 0.05$.
2. The post-test result of chinning-up (per-minute) is $0.925 > \alpha = 0.05$.
3. The pre-test result of push-up (per minute) is $0.589 > \alpha = 0.05$
4. The post-test result of push-up (per-minute) is $0.737 > \alpha = 0.05$
5. The pre-test result of shooting free throw (15 times chance) is $0.064 > \alpha = 0.05$
6. Post-test results shooting free throw (15 times chance) is $0.786 > \alpha = 0.05$
7. The arm length is $0.656 > \alpha = 0.05$

After all data were proven to be normal distribution, the research was proceded to further activity by testing homogeneity of variance.

Homogeneity test is used to show two or more groups of sample data come from populations having the same variance. In the regression analysis, the required analytical requirement is that the regression error for each group based on the dependent variable has the same variance. Data homogeneity test uses statistics based on the average (based on mean) The data can be concluded to be normal if it meets the following criteria:

1. The level of significance (α) is usually $\alpha = 0.05$ or 0.01
2. If the significance obtained is $> \alpha$, the variance of each sample is the same (homogeneous).
3. If the significance obtained $< \alpha$, the variance of each sample is not equal (not homogeneous).

The following is the homogeneity of the pre-test and post-test chinning-up, push-up, shooting free throw and arm lengths. In this case, the interpretation was made by choosing one statistic, which is based on the mean (based on mean).

The homogeneity test with based on mean statistics on pre-test results of chinning-up (per-minute) it was obtained significance of $0.117 > \alpha = 0.05$. which means the variant of the data is homogeneous. For, the test with based on mean statistics on the pre-test result of push-up (per minute) it was obtained significance of $0.113 > \alpha = 0.05$. which means that the variant of the data is homogeneous. While, the test with based on mean statistics on the pre-test result of shooting free throw (15 times chance) it was obtained significance $0.128 > \alpha = 0.05$. which means the variant of the data is homogeneous.

Meanwhile, the homogeneity test with based on mean statistics on post-test result of chinning-up (per minute) it was obtained significance of $0.678 > \alpha = 0.05$. which means the variant of the data is homogeneous. For test with based on mean statistics on post-test result of push-up (per-minute) it was obtained significance of $0.238 > \alpha = 0.05$. which means the variant of the data is homogeneous. For test with based on mean statistics on post-test result of shooting free throw (15 times chance) it was obtained significance $0.648 > \alpha = 0.05$. which means the variant of the data is homogeneous. While, homogeneity test of arm length showed significance of $0.222 > \alpha = 0.05$. which means the variant of the data is homogeneous.

Meanwhile, the influence between chinning-up and push-up method on shooting free throw result at female basketball athletes at PGRI University of Palembang was obtained. The test result of Between-Subjects Effects showed that pre-test of chinning-up and push-up to the shooting free throw result showed the

significance value (Sig = 0.02 < α = 0.05). It can be concluded that H_a is accepted and H_0 is rejected. This means that there is an influence of pre-test method of chinning-up and push-up practice to shooting free throw result. While, the variable on the post-test appeared that the significance value is (Sig = 0.04 < α 0.05). It can be concluded that Ha is accepted and H_0 is rejected. This means that there is a post-test effect of chinning-up and push-up methods on shooting free throw result. For pre-test and post test chinning-up and push-up method of shooting free throw result, it appeared that the significance value is (Sig = 0.003 < α = 0.05). It can be concluded that H_a is accepted and H_0 is rejected. This means that there is an influence of pre-test and post test of chinning-up and push-up method to shooting free throw result.

The influence of post-test of chinning-up, post-test of push-up, post-test of shooting free throw and arm length at female basketball athletes at PGRI University of Palembang obtained by Between-Subjects Effects test showed that for arm, it is significance (Sig = 0.00 < α = 0.05). It can be concluded that H_a is accepted and H_0 is rejected. This means that there is an influence between the long arm and short arm. The chinning-up test showed the significance value is (Sig = 0.287 < α = 0.05). This means that ther is no effect of chinning-up test result with long arm category and chinning-up test result with short-arm category. The Between-Subjects Effects test result showed that for the arm, the significance value is (Sig = 0.00 < α = 0.05). This means that there is an influence between the long arm and short arm. The result of the push-up test of its significance value is (Sig = 0.725 < α = 0.05). This means that there is no effect of push-up test result with long arm categories and push-up test result with short-arm categories. The Between-Subjects Effects test result showed that for the arm, its significance value is (Sig = 0.00 < α = 0.05). This means that there is an influence between the long arm and short arm. Shooting free throw test result showed its significance value is (Sig = 0.919 < α = 0.05). This means that there is no effect of shooting free throw result test with long arm category and short arm category.

The influence of the interaction between chinning-up and arm-length training methods on shooting free throw result at female basketball athletes at Palembang PGRI University obtained by Between-Subjects Effects test showed that for the chinning-up method of shooting free throw result, the significance value is (Sig = 0.00 < α = 0.05). It can be concluded that Ha is accepted and Ho is rejected. It means that there is an influence of chinning-up training methods on shooting free throw result. While, the variable on the arm length to shooting free throw result appeared that the significance value is (Sig = 0.01 < α 0.05). It can be concluded that H_a is accepted and H_0 is rejected. This means that there is an influence of arm length to shooting free throw result. For chinning-up and arm length methods of shooting free throw result, it appeared that the significance value is (Sig = 0.000 < α = 0.05). It can be concluded that H_a is accepted and H_0 is rejected. This means that there is an influence of chinning-up and arm length methods on shooting free throw result.

CONCLUSION

Based on the hypothesis test conducted, it can be ontained three analysis: (1) There is a difference of influence of chinning-up and push-up training method to shooting free throw result. (2) There is no influence between the long arm category and the short arm category on female basketball athletes at PGRI University of Palembang. (3) There is an interaction effect between chinning-up training methods and arm length to shooting free throw result on female basketball athletes at PGRI University of Palembang.

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