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THE TRAINING PERFORMANCE OF SUB ELIT ADOLESCENT ARCHERY ATHLETES BEFORE AND DURING COVID-19 PANDEMIC

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Abstract. The purpose of this study was to know training performa sub elite adolescent archery athletes at the Center for Education and Training for Student Sports (PPLP) before and during covid-19 pandemic. The method used descriptive quantitative. The subject is six female and three male adolescent archery athletes with maximum age is 18 years old. The instrument used push-up test during one minutes to measure arm muscle endurance, a scoring test to measure target accuracy and measure athletes pulse one minutes to find out the ratio of pulse rate during training. Data analysis techniques used are the mean, standard deviation, percentage and normality test, and Paired Sample T Test. The conclusion from the results of this study is that there is no significant difference in the endurance of the athlete's arm muscles ($P > 0.05$), but there is significant differences in the results of target accuracy and athlete's pulse ($P < 0.05$) before and during the Covid-19 pandemic. The impact of this study is the decline in athlete's performance.

Keywords: Arm muscle endurance, target accuracy, pulse, athlete, archery.

1. INTRODUCTION

Various kinds of sports have made quite high achievements by winning big events in World. One of the sports is archery, which is a shooting skill with a bow and arrow. Meanwhile, archery is a skill or art by shooting arrows using a bow [1].

According to Munawar et al [2] Arm muscle endurance strength is one of the factors that influence archery sport achievement which is an important part of athlete's performance in a competition.

Archery can be interpreted as a sports activity of targeting accuracy because with the correct archery technique and the regularity of shooting arrows at the target as precisely as possible [3]. Archery is competed from the national to international level with various divisions are: *standard bow*, *recurve*, and *compound*. The distances contested are also different, standard bow division distance is 30-50 meters, recurve division is 60-90 meters, and compound division distance is 50 meters [4]. So that archery athletes to get good and consistent results they are need required physical condition and level of flexibility, coordination, balance and endurance [2].

At the time of lifting the bow, pulling the bowstring, aiming at the target and releasing the arrow, it really requires maximum arm muscle endurance so that the arrow focussed on the right target and gets high points [5].

By looking at this situation, there is the impact of Covid-19 which is very detrimental to all of us, even there are many athletes whose physical condition has decreased, one of which is an archery athlete who is not strong enough to pull the last encroachment and lose balance while aiming at the target so that they do not get results score maximum. In the archery sport, an athlete is required to get score a high by having good skills and techniques that will help in aiming at the [6].

According to Akbar et al [7]. The less of physical exercise and exercise will result in the influence of adrenergic hormones in the heart to be more dominant so that it can increase the pulse rate. Regular exercise will result in less adrenergic hormone activity while resting, which will lower the pulse rate in people who have regular exercise and physical exercise habits so that the heart becomes more effective in pumping blood throughout the body. The decline in sports activities during the

Covid-19 pandemic in sports students and an increase in sports activity patterns among non-sports students were the most prominent things. The purpose of this change was made by students to maintain immunity during the Covid-19 pandemic [8] .

The research states that tablets must always maintain immunity before, during and after exercise [9] . Bashri et al [10] in their research showed that educational media was very feasible based on the results of expert validation and user responses, especially the elderly. Prevention of covid-19 transmission and a healthy lifestyle for the elderly with herbal drinks developed through videos and e-flyers is one of the products of this educational media.

All people are encouraged to carry out regular physical activity during the Covid-19 outbreak as an effort to maintain immunity [11] . Similar research states that students have decreased physical activity during the Covid-19 pandemic. Therefore is highly recommended to do sports based on frequency, intensity, time, and type with a duration of 150 [12] .

Therefore, it is necessary to carry out this study to determine how much the ratio of muscle endurance, archery target accuracy and athlete's pulse training in the pre-Covid period with the current situation. So that athletes can improve their performance and coaches can understand and pay attention to the training in progress. For this reason, it is very important to carry out this research in order to obtain actual data.

2. METHOD

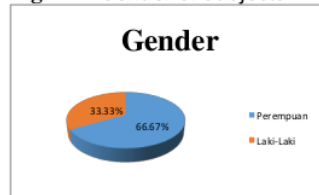
This research method is descriptive quantitative. This research design used a one-shoot study where the data collection only took place once a day. For data before pandemic is obtained by asked the coach for the best athlete performance data before the covid-19 pandemic. The target of this study used 9 athletes as the subject, with details of 6 female athletes and 3 male athletes from three divisions of *Standard Bow, Recurve and Compound* who are PPLP Panahn East Java athletes who live in Surabaya. In this study, researchers will do a push-up test to measure the endurance of the arm muscles, scoring to measure target accuracy and then a test to calculate the athlete's pulse to measure how much the pulse issued by PPLP Archery athletes of East Java. Data analysis techniques used mean, standard deviation, percentage, normality, and different tests using the Paired Sample T Test with the IBM SPSS version 24 and Microsoft Excel version 2010 analysis tools.

3. RESULTS

Based on the results of data analysis carried out using push-up tests, scoring tests and pulse counting tests for PPLP Archery athletes in East Java, the following profiles were obtained.

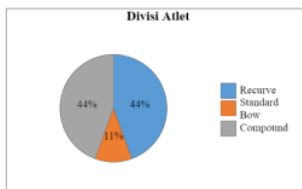
According to Diagram 1 in this study using 9 samples of East Java PPLP athletes consisting of 3 male athletes and 6 female athletes.

Diagram 1 Gender of Subjects Research



From diagram 1, it can be seen that the East Java PPLP Panahan athletes consisted of 33.33% male and 66.67% female athletes. Which means the number of athletes is 9 and consists of 3 male athletes and 6 female athletes.

Diagram 2 Division of Subject Athletes Research



From diagram 2 it can be seen that the PPLP Archery athletes of East Java, consist of 44.44% division *recurve*, 44.44% *compound* and 11.11% division *standard bow*. Which means the number of athletes is 9 and consists of 4 athletes *recurve*, 4 athletes *compound* and 1 athlete *standard bow*.

To find out the average value of arm muscle endurance, the accuracy of archery targets and the athlete's pulse in the period before Covid-19 and during the COVID-19 pandemic, athletes were tested with the Paired Sample T Test, which was obliged to perform a normality test first. Following are the results of data normality testing using Kolmogorov Smirnov and Shapiro Wilk which can be presented in table 1.

Table 1 Test Normality

	Kolmogorov-Smirnov ^a		Shapiro-Wilk	
	Sig.	Description	Sig.	Description
Normal_Otot	.200 [*]	Normal	.936	Normal
Normal_Accuracy	.200 [*]	Normal	.812	Normal
Normal_Deat	.200 [*]	Normal	.821	Normal

Based on table 1, it is known that the Kolmogorov-Smirnov significance value Sig. from arm muscle endurance (0.200), archery target accuracy (0.200) and the Covid-19 Pandemic pulse rate (0.200), each of which is > 0.05 , which means that the normality test uses the Kolmogorov Smirnov data normally distributed. In addition to testing for normality using Kolmogorov, Smirnov can also test with

Shapiro-Wilk with a Sig value. Arm muscle endurance (0.936), archery target accuracy (0.812) and the Covid-19 Pandemic pulse rate (0.821), each of which value is > 0.05 , it can be concluded that the data is normally distributed, which means that the normality requirements in the regression model are met. After the requirements are met, to calculate the average value of the comparative level of arm muscle endurance, the accuracy of archery targets and the pulse of the Covid-19 Pandemic athletes in the period before Covid-19 and during the Covid-19 pandemic, the difference can be calculated using the *Paired Sample T Test*. in Table 2.

Table 2 Muscle Descriptive Test

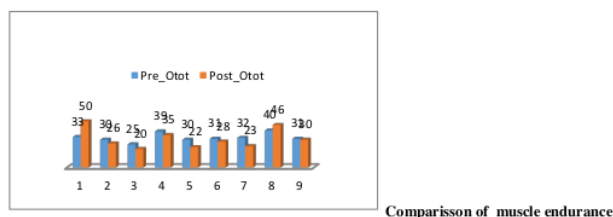
		Mean	Std. Deviation
Pair 1	Pre_Otot	32.3333	4.63681
	Post_Otot	31.1111	10.62361

In the results of Table 2, a summary of the descriptive results of the two data categories studied was obtained, namely the variables Before Covid-19 (Pre_Otot) and the Pandemic Situation (Post_Otot). For the Pre_Otot value, the mean Arm Muscle Endurance is 32.3333. As for the Post_Otot value, the mean value of Arm Muscle Endurance is obtained at 31.1111. The number of East Java Archery PPLP athletes used as respondents was 9 athletes.

Based on Diagram 3, it can be seen that the average ratio of values on muscle endurance was higher before the pandemic, this is because before the pandemic athletes received longer and more intensive training than during the pandemic. For more details, it can be seen in Figure 3 as follows.

Diagram 3 Diagram Difference Avg Arm Muscle Endurance Athletes Archery PPLP East Java In The Prior Covid-

19 With Pandemic Situations Covid-19



results mean arm muscle endurance in Before Pandemic 32.3333 < Masa pandemic 31.1111, concluded there

is a difference Mean Arm Muscle Endurance between Before and Moderate pandemic results. Then the t test difference test was carried out to analyze the significant differences between the two data which are found in Table 4 Paired Samples Test.

archery athletes is obtained, namely before the pandemic (pre-precision) and moderate pandemic (post accuracy). For the Pre accuracy value, the mean Target Accuracy is 302.3889. Meanwhile, for

the Post-precision value, a mean of 280.7222 was obtained. The number of East Java Archery PPLP athletes used as respondents was 9 athletes.

Table 5 Descriptive Test of Accuracy of

		Mean	Std. Deviation
Pair 1	Pre_Ceteness	302.3889	33.56130
	Post_Ketoritas	280.7222	44.08026

Based on Table 5, the results of the mean Target Accuracy at Pre_accuracy 302.3889 <Post_quality 280.7222 mean that there is a difference in mean Target Accuracy between Pre_accuracy and Post_accuracy results. Also obtained the results of the average difference value - 21.66667. Which of these results shows the difference between the average Pre_Correctness and the average Post Test Target Accuracy or $302.3889 - 280.7222 = 21.66667$ with the difference between 6.04430 to 37.28903. With the information t count has a positive value of 3.198, which means that the mean value of Pre_Ceteness> than the mean Post_Cetness.

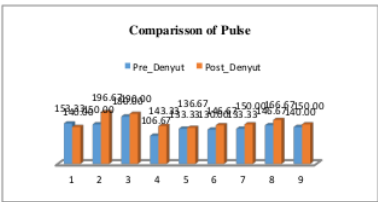
The results of table 7 show that there is a difference in the average difference in the target accuracy of PPLP Archery athletes in East Java before and during the Covid-19 Pandemic, the Sig value can be seen. amounted to $0.013 < 0.05$, which means that there is a significant difference in the accuracy of targeting for East Java PPLP Archery athletes before and during the Covid-19 Pandemic.

Table 7 DifferenceT TestTest Accuracy

		Sig. (2-tailed)	Description
Pair 1	Pre_Ketepatan -Post_Ketepatan	.013	Significant

Based average calculation on the result of calculation Arm Muscle Endurance before Pandemic Covid-19 showed 302.3889 which means that the average value of the athlete's Arm Muscle Endurance category before the Covid-19 Pandemic was in a lower category than when the Covid-19 Pandemic was 280.7222, which means the average value of the Arm Muscle Endurance category for athletes in the Covid-19 Pandemic situation in smaller category. And after using the Paired T Test, the results showed that there was a significant difference between the accuracy of archery before the Covid-19 Pandemic and during the pandemic.

Diagram 5 Diagram of Difference in Average Pulse Before and During the Covid-19 Pandemic



Results of mean Pulse Rate 141.4815 < Post_Deat 157.7778, which means that there is a difference in the

average pulse rate between Pre_Pulse and Post_Pulse results. Then performed a different test using the t test to analyze the significant differences in the two data which are found in table 10 Paired Samples Test.

In the results of table 8, a summary of the descriptive results of the two categories of data under study is obtained, namely the variables Before Covid-19 (Pre_Denyut) and the Pandemic Situation (Post_Denyut). For the Pre_Denyut value, an average of 141.4815 was obtained. Meanwhile, the Post_Denyut value obtained an average value of 157.7778. The number of PPLP Panahan athletes in East Java used as the research sample was 10 athletes.

Table 8 Descriptive Test Pulse

		Mean	Std. Deviation
Pair 1	Pre_Denyut	141.4815	20.00771
	Post_Denyut	157.7778	21.92158

In Table 8, it is also found that the value (*Mean Paired Differences*) is -16.29630 which shows the difference between the Pre_Pulse average and the Post-Pulse average, namely $141.4815 - 157.7778 = -16.29630$ and the difference between these differences.

Table 10 Differences T Test, Pulse Rate

		Sig. (2-tailed)	Information
Pair 1	Pre_Denyut - Post_Denyut	.024	Significant The

results of table 10 show that there is no mean difference in the accuracy of targeting athletes of PPLP Archery in East Java before and during the Covid-19 Pandemic, the Sig. is $0.024 < 0.05$, meaning that there is a significant difference in the Pulse of the East Java PPLP Archery athletes before and during the Covid-19 Pandemic.

Based on the calculation of the average data obtained the results of the Pulse calculation Before the Covid19 Pandemic, the results were 141.4815, which means that the average score for the Pulse Rate category of athletes before the Covid-19 Pandemic was in a lower category and when the Covid-19 Pandemic (the average (mean) was obtained, 157.7778 was obtained which means the average value of the Pulse Rate category The Covid-19 Pandemic situation athletes are in a larger category. And after using the *Paired T Test*, the results showed that there was a

significant difference between the pulse rate before the Covid-19 Pandemic and during the pandemic.

4. DISCUSSION

This chapter will explain the results of the research that the researchers obtained from the push-up test, the

scoring test and the athlete's pulse count test. The results of this research data were obtained from the research subjects of athletes PPLP Panahanin East Java.

From the data retrieval process that begins before data collection, the researcher makes a coordination or

agreement with the party to be studied so that data retrieval can run smoothly, this data collection is carried out when the athletes exercise together.

Muscle Endurance is a person's ability to use his muscle mass to contract sustainably with a long load [13]. Muscle endurance is needed to maintain activities that are dominant in muscles. As with other components, muscle endurance is only needed in muscle activity and will gradually decrease with age [14].

Harsono [15] explains: "Muscle endurance is the ability of muscles to contract consecutively for a long time". Harsono [15] states that: "Strength endurance is the ability of the body's organs to overcome fatigue during activities that require strength for a long time.

Achieving target accuracy in archery by doing systematic training, training using key words, practicing eye

control and training to focus attention or other methods that will be provided by the trainer [3].

According to Hausswirth [16] defines that the pulse is an indicator to measure the intensity of exercise

during physical activity. Recovery pulse rate is the number of pulse beats per minute measured after a 5 minute rest. This measurement is to measure how quickly a person's ability to recover after physical activity.

If an athlete has strong muscle power, accurate accuracy and a regular pulse, it will greatly affect his performance. Therefore an athlete must be able to maintain muscular endurance in the arms, archery accuracy and pulse both when training and competing with the right strategy. When an athlete is training they maintain the predominant activity of a group of muscles.

PPLP Archery athletes condition of muscle endurance, accuracy and regularity of the pulse is very influential because it is one of the components to improve performance. Athletes PPLP Archery have more intensive physical activity so the need for endurance training is needed. Requirements (Specific Endurance Specific Endurance) is endurance that works for a long, medium and short time that carries the characteristics of a sport [17].

The results of the analysis of the mean Arm Muscle Endurance Before Covid-19 (Pre_Test) for PPLP Archery East Java athletes are in a higher category, which means that the average value of the Arm Muscle Endurance category for athletes in the Covid-19 Pandemic (Post_Test) situation is in the category smaller. As for the results of the difference test that has been carried out on Arm Muscle Endurance Before Covid-19 (Pre_Test) and the Covid-19 Pandemic (Post_Test) situation, $p > 0.05$, which means that there is no significant difference in the endurance of the athlete's arm muscles.

Previous research found that Decline [18] there was a significant effect on bow training on the arm muscle

endurance of novice archery athletes. This research is also supported by [19] which states that athletes should pay more attention and increase the endurance of arm muscle strength and eye coordination in order to produce better performance. The most easy and inexpensive way to maintain muscle endurance is to continue to train, because continuing to train consistently greatly affects the increase in strength and endurance of the arm muscles [20] .

There are several ways to increase the strength and endurance of the athlete's arm muscles, one of which is

by using a dumbbell tool as described by [21] with the results of the analysis of the effect of dumbbell thera training to increase archery accuracy and arm muscle endurance in athletes. archery in Banyumas district.

It can be concluded that an athlete who cannot maintain his muscular endurance, then the athlete cannot give his best performance, and cannot achieve maximum performance results. So an athlete must maintain his body so that he always has good muscle endurance in the period before Covid-19 with the Covid-19 pandemic situation. As stated by Muslim [22] and Gunawan [23] there is a significant relationship between muscle endurance and accuracy of archery shots which is the opposite if an athlete has weak arm muscle endurance, it will reduce the level of target accuracy or accuracy of archery shots.

The results of the analysis of the difference between the average (mean) value of Target Accuracy before Covid-19 (Pre_Accuracy) and the Covid-19 (Post_Ketalore) situation in East Java Archery PPLP athletes The results obtained are smaller categories, which means the average value of the athlete's Arm Muscle Endurance category in the Covid-19 Pandemic situation. As for the results of the difference test that has been carried out on Target Accuracy before Covid-19 (Pre_Cetness) and the Covid-19 (Post_Ketoritas) situation in PPLP Archery athletes in East Java $p < 0.05$, which means that there is a significant difference in the accuracy of the athlete's archery target.

Accuracy in archery can be achieved through systematic exercises, exercises using key words, practicing

eye control and training to focus attention or other methods that will be given by the trainer [3] . Other research on the relationship between concentration levels and target accuracy has been conducted [24] . states that the duration of eye silence is much longer for accuracy than for inaccurate shots. The results suggest that the duration of focus decreases when the player is afraid, that focus reflects the efficiency of visual orientation. Therefore focused training is a useful intervention. Hardi & Nurama [3] and Mukhtar et al [25] also support the results of this study with the results that the higher the level of concentration and accuracy of archery will produce good shots.

The relationship between training that is consistent with target accuracy is not only influenced by the level

of focus or concentration of each athlete, but can also be influenced by psychology such as the athlete's panic level, self-confidence and also the intake of food and drink. This is supported by research [26] which states that the emergence of target panic or loss of control comes from themselves, which means that the athlete understands the panic of the target during competition or training in order to master emotions and better target accuracy. Another study conducted by [27] suggested the results of the analysis of the athlete's confidence level of 88.89%, which means that the greater the athlete's confidence will affect the accuracy of archery targets.

It can be concluded that an athlete who cannot maintain his shooting accuracy, then the athlete cannot give

his best performance, and cannot achieve maximum performance results. So an athlete must keep his body so that he always has good accuracy in the period before covid-19 with the covid-19 pandemic situation.

The results of the analysis of the difference between the value average of the pulse in the period before Covid19 (Pre-Pulse) and the Covid-19 pandemic situation (Post_Pulse) are in a larger category, which means the average value of the Pulse rate category. athletes The situation of the Covid-19 pandemic is smaller than before the Covid-19 pandemic. As for the results of the difference test that has been done, the results obtained are $p < 0.05$, which means that there is a significant difference in the archery pulse of athletes.

Previous research has found that [28] stated that *adrenergic hormone* is a factor in the lack of physical exercise which causes the heart to predominantly increase the pulse rate. There are several ways to recover after strenuous activity so that the athlete's pulse returns to normal, namely by buying watermelons which are supported by [29] which states that giving watermelons after carrying out activities greatly affects pulse recovery in postkibra students of SMA Negri 4 Medan. In another study [30] consuming green coconut water before physical activity can affect pulse recovery in athletic athletes.

It can be concluded that an athlete who cannot maintain the regularity of his pulse, the athlete cannot give his best performance, and cannot achieve maximum performance results. So an athlete must maintain his body with regular exercise so that he always has a good pulse regularity in the period before covid-19 with the covid-19 pandemic situation.

5. CONCLUSIONS AND RECOMMENDATIONS

Conclusion

. The conclusion from the results of this study is that there is no significant difference in the endurance of the athlete's arm muscles ($P > 0.05$), but there is significant differences in the results of target accuracy and athlete's pulse ($P < 0.05$) before and during the Covid-19 pandemic.

Suggestion

It is hoped that with the results like the above, the coaches pay more attention to the importance (always maintaining endurance of the arm muscles, accuracy of archery targets and regular pulse of the athletes) by regularly exercising and consuming good nutritious food in the pre-Covid-19 period with a pandemic situation. covid-19.

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