The Effect Of Ladder Drill Training On Agility

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Abstract: The purpose of this study was to obtain information about the effect of Ladder Drill Training on agility in PB athletes. Jaya Adinata Ciamis Regency. The research method used is the experimental method. The population in this study was the Badminton Association Jaya Adinata Ciamis Regency with a total of 20 people with the sampling used was purposive sampling technique, namely taking samples determined or needed by researchers (11-12 years old) Based on the results of data processing with statistical tests, it turns out that empirically the results of this study indicate that Ladder Drill Exercise has a significant effect on increasing agility in PB athletes. Jaya Adinata Ciamis Regency. Based on the results of this study, the authors suggest to various parties related to the field of sports, especially with badminton, that they should always try to improve agility, because agility is needed by badminton footwork, especially to master the field of their own area.

Keywords: Ladder Drill Exercise, Agility
INTRODUCTION

Sports have an important role in human life (Ahcene et al., 2019). Through sports, humans can be formed who are physically and mentally healthy and have a high personality, discipline, sportsmanship so that in the end a quality human being will be formed and can raise the dignity and honor of the nation (Iqbal, 2020). The role of sports in this case has a significant contribution to making humans healthy and fit, as reflected in the slogan mensana in corpore sano which means that in a healthy body there is a strong soul (Razali & Iqbal, 2022).

Explained in the Law of the Republic of Indonesia No. 3 Year 2005 Chapter 6 Article 17 there are 3 scopes of sports coaching and development including: “1) educational sports, 2) recreational sports, 3) achievement sports (Chandra et al., 2021).” Based on this explanation, that sports are not only educational and recreational but also aim to improve achievements to make Indonesia proud which are carried out individually and in groups, as explained in Law No. 3 of 2005 Chapter 2 Article 4 concerning the National Sports system which reads: “National Sports aims to maintain and improve health and fitness, achievement, human quality, instill moral values and noble character, sportsmanship, discipline, strengthen and foster national unity, strengthen national resilience, and improve the dignity and honor of the nation (Syamsulrizal & Iqbal, 2022).”

To achieve the perfection of these goals an athlete must process themselves in continuous training. In this process, high self-control is needed so that a sustainable training process is realized (Yeemin et al., 2016). The controlled training process is the path to achievement that will be achieved in other words, the good / bad achievement achieved depends on the training process (Avelar et al., 2008). This is reinforced in the National Sports Law No. 3 of 2005 Chapter I Article 1 paragraph 13 concerning the Scope of Sports which reads: “Achievement sport is a sport that fosters and develops sportsmen in a planned, tiered, and sustainable manner through competition to achieve achievements with the support of sports science and technology (Matzenbacher et al., 2016)”.

Sports achievement is a sport that is contested or competed on a regional, national and international scale. Sports achievements can also make the country proud in the international arena. This shows that sports coaching plays an important role in realizing the ideals of National development (Fauzi & Armaidi, 2023). In Indonesia, sports achievements are increasingly developing along with the desire of the Indonesian people to advance the field of sports, because with sports Indonesia can be recognized by other countries, as well as the sports industry (Academy, 2017).

Various sports are active in improving the achievements of their athletes, as well as the badminton sport. Badminton sports have been known for a long time, so this sport is one of the sports that is quite popular among the people of Indonesia. This badminton sport is a sport that contributes a lot of achievements and becomes one of the athletes ranked number one in the world both in the Men’s and Women’s Single class, as well as the Men’s and Mixed...
Doubles. Badminton sports are an increase in achievement that can arouse a sense of national pride. Badminton sports have a meaning not only for recreation, health, but more than that is also a means of education and even achievement (Aditia, 2021).

Badminton is an individual game and is played by one person against one person or two people against two people. This game uses a racket as a batting tool and shuttlecock as an object to hit, a rectangular playing field bounded by a net and has certain rules, to separate between one’s own playing area and the opponent's playing area (F, 2020). In badminton, players try to drop the shuttlecock in the opponent's playing area so that they cannot hit the shuttlecock or shuttlecock out of the field or so that it does not fall in their own area. There are several kinds of facilities and infrastructure that need to be needed in badminton games. What is needed in badminton games are: Badminton Game Field (net), shuttlecock, racket, badminton shoes, badminton shirt and pants (Pratomo & Iqbal, 2020).

In badminton games must always uphold portivity, cooperation, honesty, and other aspects so that the game can be a positive attitude among players, so in this case physical education is needed. Playing badminton for children if done properly and in accordance with certain criteria, there will be many benefits obtained, especially can affect the physical growth and psychological mental development of children. Badminton games prioritize physical activity, so as to stimulate faster physical growth and development. In addition, children will also have a better level of physical awareness (Andi Taufan Bayu, 2022).

Badminton has become a sport that is favored by Indonesians such as parents, teenagers, children in both male and female groups. And the development of badminton achievements in Indonesia is very rapid, many junior players to senior players who have given various world achievements, those who make many circles of Indonesian society interested in playing badminton (Case Study Research: Design and Methods - Robert K. Yin - Google Buku, n.d.).

To be able to play good badminton, especially to be able to achieve maximum performance, a player must master four aspects of the components in training, namely: technical, tactical, physical and mental aspects. Of these four aspects are the basics of a badminton athlete that must be mastered. In badminton basic techniques are skills that must be mastered to be able to play badminton. Basic badminton techniques consist of: Grip (grip), footwork (footwork), stroke (stroke). Every badminton player must master all forms of basic techniques to play badminton properly and correctly, especially those who have aspirations to become badminton athletes who excel to the international arena (Academy, 2017).

Apart from technique, physical condition also strongly supports the athlete's appearance on the field. By having a good physical condition, an athlete can display his technique well too. The components of physical condition support the achievement of a movement, especially in badminton games. The components of physical condition consist of stamina, muscular power, muscular endurance, speed, agility, strength, flexibility, balance, coordination (Ayarra et al., 2018).
While there are several components of physical condition that affect the quality of badminton games are agility, speed, flexibility, and balance, muscle explosiveness, endurance, strength. So if the quality of these physical condition components is good, it is certain that athletes will have the basics of playing good badminton as well (Sekulic et al., 2019).

According to Maliki, Hadi, & Royana, (2017) stated that:
That special physical condition is the physical condition of an athlete who has certain characteristics and in accordance with the needs of certain sports movements. This is because each sport has a unique movement pattern and is different from other sports so that an athlete must have a special physical condition, especially in badminton. (p. 2).

One of the physical conditions specific to badminton is agility. Without agility players will find it difficult to move, change direction, and avoid the opponent's feints. Agility is one of the physical conditions needed by badminton athletes, so in this study the authors will focus on the form of agility training.

Agility is someone who has the ability to change direction of motion quickly and precisely on purpose, without losing the balance of his body position. Agility can be continuous with speed, flexibility, and balance, if these components are well combined then agility will be achieved well. There are several forms of agility training that are often used in training, namely running back and forth (shuttle Run), zigzag running, boomerang run, dot drill, ladder drill, obstacle course, and others. Researchers will take one type of agility training, namely ladder drill (Nuno et al., 2015).

Ladder drill is a form of exercise using plastic and rope shaped like a ladder and placed on the floor. Athletes must be able to move through each rung quickly, precisely and not lose balance. Various forms of ladder drill training are often used by badminton athletes to improve speed and agility (Afrisetiawan, 2013).

The importance of developing badminton sports, starting from the formation of badminton sports club associations to organizing badminton matches themselves. Badminton sports are not only developing among the community but also developing among students to universities where the nursery process is tiered. Sports club is one of the most important coaching or organizational platforms to carry out the task of achievement coaching. The club is a place to gather athletes from beginner to professional level and from young to senior age. The club is a place of coaching, training and cadre. To achieve optimal performance, good training components and factors are needed (Sabdono et al., 2019).

Badminton sports clubs in Ciamis Regency, especially PB. Jaya Adinata, has a level of coaching badminton athletes from early childhood, children, beginners, adolescents, to
PB. Jaya Adinata was established in 2017, and was formalized or registered with PBSI Ciamis Regency in 2019. The establishment of the badminton club PB. Jaya Adinata is because it wants to advance badminton in the Ciamis Regency area so that there are several athletes who can excel at the National or International level.

PB. Jaya Adinata has 20 badminton athlete members, and of the 20 members there are boys and girls. The age of these athletes is pre-primary age, early age, children, beginners to adults. PB training. Jaya Adinata at Gor Sabi lulungan Sindangkasih, Pb Training Schedule. Jaya Adinata 1 week 4 times. The manager or chairman listed on PB. Jaya Adinata is Nandang Setianudin, and has 3 coaches, namely Wildan Ramdhani, Angga Wijaya, Iwan Setiawan. In the three coaches there is already one coach who has a BWF Level 1 License. Achievements that have been achieved by PB athletes. Jaya Adinata, namely 3rd place in the 2019 Men's Youth Age Kejurkab, 2nd place in the 2019 Men's Children's Age Kejurkab, 3rd place in the 2019 Imbanagara Cup Se-Priangan East Men's Youth Age, 1st place in O2SN Sindangkasih Elementary School District, 3rd place in O2SN Ciamis Regency 2019.

Based on the results of the evaluation by observing the match time or friendship PB. Jaya Adinata, athletes aged 11-12 years (Children's Age) are seen that the athlete's footwork or agility is still lacking and needs to be improved. This can be seen from the often late movement of taking the shuttlecock directed by the opponent, not quickly returning to the central position after hitting. This is one of the weak points of PB athletes. Jaya Adinata who must get attention in preparing future training programs.

Footwork techniques must be mastered well by every player so that they are not easily swayed by opponents. One of the basic keys to doing footwork training is doing agility physical condition training. The agility physical condition training model that will be used by researchers is ladder drill training. According to the researchers, this exercise has several advantages including: every movement made must be fast and precise so that it requires the body to move to change direction quickly, the relatively short distance makes athletes not feel significant fatigue, and has an attraction in doing so that it does not cause boredom when practicing.

Based on the above background, the researcher wants to conduct research related to the Effect of Ladder Drill Training on the Agility of PB Badminton Games. Jaya Adinata at the age of 11-12 years (Children's Age), and the research will be conducted in 1 week 4 times to reach 18 meetings.

**METHOD**

1. Research Methods and Types
To prove the hypothesis that the author put forward in this study, the authors conducted an experiment giving Ladder Drill Exercises to the agility of Badminton PB. Jaya Adinata Ciamis Regency. The results of the training experiment are expected to determine the position of the causal relationship between the independent variable and the dependent variable that the author examines.

Therefore, the character of the research that the author conducted is in accordance with Sugiono's opinion, (2017) argues "experimental research methods are research methods used to seek the effect of certain treatments." (p. 6). According to Arikunto, (2019) argues "A way to find a causal relationship (causal relationship) between two factors that are deliberately caused by researchers by eliminating or reducing or setting aside other factors that interfere, experiments are always carried out with the intention of seeing the effects of a treatment." (p. 9).

Based on the explanation above, it can be said that experimentation is a series of experimental activities aimed at examining the causal factors involved or used as research variables. Starting from the explanation above, the authors conducted experiments in this study aimed at seeing the effect of Ladder Drill Training on the agility of Badminton PB. Jaya Adinata Ciamis Regency.

According to Arikunto, (2019) says that "a variable is the object of research, or what is the point of attention of a study." (p. 161). According to Sugiono, (2017) independent variables are "variables that affect or cause changes or the emergence of dependent variables, while dependent variables are variables that are affected or that become the result, due to the existence of independent variables" (p. 39).

In this study the variables that have the object of research include
Independent variable (X): Ladder Drill Exercise
Dependent variable (Y): Agility


2. Population and Research Sample

Population is a group of subjects that will be used as research objects. According to Sugiono, (2018) suggests that "Population is a generalization area consisting of: Objects / Subjects that have certain qualities and characteristics that are applied by researchers to study and then draw conclusions." (p. 80). Thus the population in this study were PB athletes. Jaya Adinata Ciamis Regency which amounted to 20 people.

The sample is part of the total population to be studied. According to Sugiono, (2018) the sample is "part of the number and characteristics possessed by the population" (p. 81). The sample determination was carried out using purposive sampling technique. With a purposive sampling sample according to Sugiono, (2018) says that "purposive sampling is a data source sampling technique with certain considerations." (pp. 218-219). Based on the consideration or age criteria of PB. Jaya Adinata which will be studied is 11-12 years, therefore for determining the sample in this study using purposive sampling, the population that will be used as a sample is 8 people. Of the 8 people, 3 were female and 5 were male.
3. Data Collection Techniques

To obtain the data needed in this research, a research instrument is needed. According to Sugiono, (2017) a research instrument is "a tool used to measure observed natural and social phenomena" (p. 102).

A research instrument is a tool used to collect data or information that is useful for answering research problems. The research instrument that the author uses refers to the sports measurement and evaluation test book by (Abdul Narlan & Dicky Tri Juniar, 2020. p. 106).

1. The research instruments or tests used in this study are:
   a. To measure agility using the 20 yard shuttle Run test
   1) Purpose: measuring the agility component
   2) Equipment: stopwatch, whistle, 3 cones, meter, test form + pen, flat and non-slip area (minimum 10 m).
   3) Implementation: a. Make a parallel track (5 yards = 4.57 meters). Using 3 cones that have been set aside.
      b. Athletes stand at the center cone with their feet shoulder-width apart facing the cone.
      c. When the athlete is ready, according to the signal “Ready ... Go (while pointing left / right)” to start running.
      d. Athletes run to the first cone and touch the line, turn around and run through the center cone to the third cone and touch the line, then turn back to the center cone and end touching the center line.
      e. The official starts and stops the stopwatch when moving and stops at the center cone.
      f. Athletes are given the opportunity to do 2 repetitions, each repetition is given a 3-5 minute break.
   4) Score: the best time from two opportunities recorded to 0.01 seconds (1/100 second).

[Image: 20 Yard Shuttle Run Test]

20 Yard Shuttle Run Test
Source: https://aycfit.com/baseball-fitness-tests/
In accordance with the data processing procedures as disclosed in Chapter 3, the data were processed with statistical tests and the results are presented in this section.

1. The results of calculating the average score (mean), Standard deviation, and Variance of the initial and final tests can be seen in Table 4.1 below.

Table 4.1 Results of Calculating the Average Score (mean), Standard Deviation, and Variance of Each Test

<table>
<thead>
<tr>
<th>TES VARIABLE</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>VARIANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRE TEST</td>
<td>658</td>
<td>18</td>
<td>324</td>
</tr>
<tr>
<td>POST TEST</td>
<td>543</td>
<td>19</td>
<td>380</td>
</tr>
</tbody>
</table>

2. The results of testing the normality of the data using the data normality test formula through the test approach $\chi^2$ (Chi-squared) whose results can be seen in Table 4.2 below.

Table 4.2 Results of Data Normality Calculation of Each Test

<table>
<thead>
<tr>
<th>TEST VARIABLE</th>
<th>VALUE $\chi^2_{hitung}$</th>
<th>$\chi^2_{0.95(4-5)}$</th>
<th>CONCLUSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre Test</td>
<td>8.38</td>
<td>9.49</td>
<td>Normal</td>
</tr>
<tr>
<td>Post Test</td>
<td>3.67</td>
<td>9.49</td>
<td>Normal</td>
</tr>
</tbody>
</table>

The test criteria using the chi-squared distribution $\text{chi–kuadrat} (\chi^2)$ with the level $\alpha = 0.05$ and $dk = k – 1$. If then the data from each test is normally distributed can be accepted, for other $\chi^2$ prices are rejected. Based on the table above, $\chi^2_{hitung} < \chi^2_{table}$, namely 8.38 < 9.49. Thus both data are normally distributed.

3. Homogeneity Calculation Results

To find out the homogeneity of the sample data studied, the homogeneity of the research sample needs to be calculated first. Homogeneity testing is carried out using a test approach whose results can be seen in Table 4.3 below.

Table 4.3 Homogeneity Testing Results

<table>
<thead>
<tr>
<th>Test Variable</th>
<th>$F_{hitung}$</th>
<th>$F_{table}(\alpha = 0.05) dk(8;8)$</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tes Awal</td>
<td>1.17</td>
<td>3.79</td>
<td>Homogen</td>
</tr>
<tr>
<td>Tes Akhir</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The test criteria using the distribution $F$ with the real level $(\alpha) = 0.05$ and degrees of freedom $dk (8;8)$. If the number $F_{hitung}$ is smaller or equal to the $F$ distribution table.
\( F \leq \frac{1}{2} \alpha(v_1, v_2) \), then the data from the test group is homogeneous. \( F \leq \frac{1}{2} \alpha(v_1, v_2) \) obtained from the distribution \( F \) list with probability \( \frac{1}{2} \alpha \), while the degrees of freedom \( V_1 \) and \( V_2 \) each corresponds to \( d_k \) numerator and \( d_k \) denominator = \( n \). Based on the results of the calculation obtained \( F \) count 1.17 and \( F \) table 3.79 then the results of this conclusion are homogeneous.

4. Hypothesis Testing

To prove the truth of the hypothesis, the authors use a two-sided test equality test using the \( t \) test. It is necessary to formulate a null hypothesis (Ho) as follows, "Ladder Drill training significantly affects agility in badminton athletes PB. Jaya Adinata Kab. Ciamis". The results of these calculations can be seen in Table 4.5 below.

**Table 4.4 Hypothesis Testing Results**

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>( t ) hitung</th>
<th>( t ) tabel(( \alpha=0.05 ))</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tes Awal</td>
<td>12.4</td>
<td>2.36</td>
<td>Signifikan</td>
</tr>
<tr>
<td>Tes Akhir</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The test criterion is to accept the hypothesis (Ho) \( t < \frac{w_1 \bar{t}_1 + w_2 \bar{t}_2}{w_1 + w_2} \) where \( w_1 = \frac{S_1^2}{n_1}, t_1 = t(1-\alpha)(n_1-1) \) and \( w_2 = \frac{S_2^2}{n_2}, t_2 = t(1-\alpha)(n_2-1) \), \( t \) is obtained from the \( t \) distribution with degrees of freedom (dk) = \( n - 1 \) and real level \( \alpha = 0.05 \) or 95% confidence level, for other \( t \) prices the hypothesis is rejected. From the table above, it turns out that the calculated value of \( t > t_{table} (12.4 > 2.36 \) and is outside the hypothesis acceptance area. Thus the null hypothesis (Ho) is rejected at the real level \( \alpha = 0.05 \). This means that there is a significant effect or means ladder drill training on agility in badminton athletes PB. Jaya Adinata Kab. Ciamis.

In analyzing a data, first it is necessary to match the research hypothesis proposed as proposed in Chapter 2, which is as follows. "Ladder drill training significantly affects agility in badminton athletes PB. Jaya Adinata Kab. Ciamis". Through statistical hypothesis testing, the hypothesis is accepted which states that ladder drill training significantly affects agility in badminton athletes PB. Jaya Adinata Kab. Ciamis.

The truth of the hypothesis testing is supported by the research data using the \( t \) test, with the \( t \)-count of 12.4 being outside the hypothesis acceptance area (\( t \)-table of 2.36). From the above results, the hypothesis that the author proposes is that ladder drill training has a significant effect on agility in badminton athletes PB. Jaya Adinata Kab. Ciamis.
DISCUSSION

Based on the results of data processing and analysis as described above, it turns out that ladder drill training has a significant effect on agility in badminton athletes PB. Jaya Adinata Kab. Ciamis. Therefore, the authors discuss the results of the study as follows.

Exercise ladder drill performed by badminton athletes PB. Jaya Adinata Kab. Ciamis systematically and repeatedly and increasing the load is increasing day by day. In its implementation, the sample performed the ladder drill movement using 7 types of ladder drill movement variations, namely in out / jumping jack, icky shuffle, sideways, lateral in in out out, lateral jump lunge, double side jump, snake jump. Such movements if done systematically and repeatedly, by applying the principles of training.

CONCLUSION

Based on the results of data calculation and analysis as stated in CHAPTER 5, the authors conclude as follows. Empirically the results of this study indicate that "Ladder drill training has a significant effect on increasing agility in badminton athletes PB. Jaya Adinata Kab. Ciamis Age 11-12 years.".

SUGGESTION

Based on the above conclusions, the author proposes several suggestions to all parties related to this research:
1. Badminton coaches or clubs should always try to improve agility, because agility is very necessary for athletes in badminton, especially in badminton steps or footwork.
2. Badminton coaches should always try to apply the right training techniques and forms of exercise, according to the characteristics of athletes in an effort to improve the agility of their fostered athletes, so that effective forms of exercise and training techniques are found to improve agility.

REFERENCES


