Analysis Of Dominant Physical Conditions To Increase Agility And Running Ability Of Aceh Sprinteratlets Ahead Of PON Aceh – Sumut

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Abstract This study aims to obtain a number of information, understanding in order to improve the agility and dominant physical condition of Acehnese sprinters, especially ahead of the grand opening of the sports field. This type of research is descriptive evaluative, namely: a study that tries to describe various phenomena, events and events and symptoms that exist in the present. The research method used is the experimental method by performing agility abilities and physical condition abilities of sprinter athletes. The population in this study were 15 special athletes built ahead of PON. The sample was taken using random sampling technique which amounted to 10 people. Data collection techniques are carried out using three test items, namely: agility, leg muscle explosive power, speed, and 100 meter running ability. The results obtained in this study are tests and analyzes the ability of 100 meter runners PON running athletes, with an average score of 96.7 in the high (good) category with the following details: (1) as many as 10 respondents were in the high category with a
percentage level of 90.12%, (2) as many as 6 respondents were in the medium category with a percentage level of 60.4%. Conclusion, thus the high ability to run the 100 meter distance of Aceh PON sprinters is at the level of agility and the dominant physical component of 100 meter runners, so overall it is in the very good category, with details: agility, leg muscle explosiveness of 100 meter runners of PON athletics is in the very good category, agility, speed of 100 meter runners, is in the very good category, the ability to run 100 meters of 100 meter runners can be said to be in the very good category and very ready to compete, especially at national scale events. So that it can be categorized as an agility category, the dominant physical condition of 100 meter runners PON athletics athletes is said to be in the very good category.

Keywords: agility, dominant physical condition, analysis and sprint running

INTRODUCTION

The world of national level sports events or better known as the National Sports Week (PON) will begin soon, as the host is Aceh Province and North Sumatra in 2024, with various sports will soon be competed (Comportamentos Táticos No Jogo de Futsal, n.d.). One of the physical condition factors is very decisive towards improving the quality of ability in a sport, because this factor is a factor that plays a very important role in supporting other factors (Ahcene et al., 2019).

Because having a good physical condition will make a big contribution to achieving maximum achievement (Ruiz-Pérez et al., n.d.). The elements of physical condition referred to as stated by Moeloek (2003: 2) are: (1) endurance, (2) speed, (3) strength, (4) agility, (5) flexibility, (6) accuracy, (7) balance, (8) macular power and (9) coordination (Tri Iswiyanti, 2009)

But keep in mind that the agility factor, strength is the basic capital that needs to be fostered and improved, so it needs to be prioritized first (Annisa, 2022). According to Nossek (Muhyiddin, 2020). "When the form of an exercise is given to athletes, especially those trained are novice athletes, the basic abilities of these athletes must be considered, especially their muscle strength". But keep in mind that, strength alone is not enough for athletes to improve their performance. However, other elements of physical condition should also not be ignored (Iqbal, Asmawi, & Tangkudung, 2019)

In athletics, especially in sprint running numbers, the elements of physical condition that are needed or dominant are leg muscle explosiveness and agility at the start (Iqbal, 2020a) These elements of physical condition must be trained and improved in every effort to obtain maximum running ability (Iqbal, 2020b) In addition, it must be believed that to achieve high performance is not as easy as imagined, but must be with training not only with the sport being pursued but must be specialized in other supporting fields (Iqbal, Asmawi, Tangkudung, et al., 2019)

All of the above factors are a unity that must be owned and improved in order to improve the ability to run the 100 meter sprint (Azita et al., 2019). This improvement can be
achieved only by doing regular and systematic exercises and still paying attention to the principles of an exercise. Talent also plays an important role in achieving maximum performance in short distance running numbers. On the other hand, differences in the arrangement of muscle fibers cause a person's ability to perform different sports activities, this is influenced by white and red muscle fibers, (Idris, 2016).

The elements of physical condition that are very dominant in short distance running are leg muscle explosiveness and speed. Physical condition plays a very important role in every sport, it can even be said to be fundamental to sports achievement, (Firdaus et al., 2020). Usually before being deployed to the race arena, an athlete must already be in a good physical condition or fitness level, so that he can deal with the intensity of work and all kinds of stress that he will face in a match or race. Without good physical condition preparation, athletes should not be deployed to participate in the race. In the preparation of training programs, physical condition must be well planned, systematic and aimed at improving the functional ability of the body system, thereby enabling athletes to achieve better performance. If an athlete has reached the optimal level of physical condition, then the athlete will easily improve his skill ability(Nuno et al., 2015)

Therefore, to become good and tenacious students in practicing, especially in the sport of sprint running, must be supported by various factors and need to have a prime level of physical condition, so that the efforts needed to be able to achieve maximum achievement can be obtained as well as possible.

Based on the results of observations so far in the field, a coach in analyzing the results of the race against the 100 meter run is only based on a classical method, some coaches cannot do a detailed analysis of the dominant physical analysis techniques especially for athletes. During training, the coach can only measure the total results of the athlete's 100 meter run, this results in difficulties for the coach in evaluating the results of training and matches, especially the 100 meter run how to set the right strategy especially when running to adjust the rhythm and tempo and duration of the athlete's run.

The results of a more in-depth analysis of the dominant physique will make it easier for the coach to find out the strengths and weaknesses of the student. In addition, the place of coaching also helps in supporting the student's career and achievements. As with schools improving agility and dominant physical condition of Acehnese sprinters where researchers see the lack of agility status and physical condition of students, especially in improving agility and dominant physical condition of Acehnese sprinters.

METHOD
1. Research Methods and Types

In accordance with the problems to be studied, this research includes descriptive evaluative research, namely: a study that tries to describe various phenomena, events and symptoms that exist in the present (Hassan et al., 2017) In this study only
measures the dominant physical analysis of leg muscle explosive power and speed to improve the ability to run 100 meters of PON Aceh athletics”.

2. Population and Research Sample

Population is the entire object of research (Razali & Iqbal, 2022), in this research study the researcher uses the object of research is athletics PON Aceh totaling 15. The sample is part or representative of the population studied (Yeemin et al., 2016) in this study is athletics PON Aceh totaling 10. (Fauzi & Armaidi, 2023) The samples will be taken from various components of agility activities and dominant physical conditions. Sampling using random sampling technique while the sample size is determined using the slovin formula, among others:

Table 3.1 List of Names and Number of Athletics Athletes PON Aceh

<table>
<thead>
<tr>
<th>No</th>
<th>Sampel</th>
<th>Jumlah Populasi</th>
<th>Sampel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jumlah atlet PON Aceh</td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

Jumlah 15 10

Data source: public relations KONI Aceh

3. Data Collection Techniques

1. Teknik tes

Measurement is a data collection process that is precise, objective, quantitative, and the results can be processed statistically. In this study, research data collection used leg muscle explosive power tests and speed tests.

a. Broadjamp standing test

<table>
<thead>
<tr>
<th>Rating</th>
<th>Males (cm)</th>
<th>Females (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excellent</td>
<td>&gt; 250</td>
<td>&gt; 200</td>
</tr>
<tr>
<td>Very Good</td>
<td>241 – 250</td>
<td>191 – 200</td>
</tr>
<tr>
<td>Above Average</td>
<td>231 – 240</td>
<td>181 – 190</td>
</tr>
<tr>
<td>Average</td>
<td>221 – 230</td>
<td>171 – 180</td>
</tr>
<tr>
<td>Below Average</td>
<td>211 – 220</td>
<td>161 – 170</td>
</tr>
<tr>
<td>Poor</td>
<td>191 – 210</td>
<td>141 – 160</td>
</tr>
<tr>
<td>Very Poor</td>
<td>&lt; 191</td>
<td>&lt; 141</td>
</tr>
</tbody>
</table>

b. Norms of the 20-meter run test

<table>
<thead>
<tr>
<th>Skor</th>
<th>Lari 20 meter Putra</th>
<th>Kriteria</th>
<th>Lari 20 meter putri</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>s.d - 2.7</td>
<td>Baik sekali</td>
<td>s.d – 3.7</td>
</tr>
</tbody>
</table>
RESULTS
1. Research Results

On the basis of the data from the research findings in the field and also accompanied by the suitability of the data with the research findings in the field, the research data obtained by filling out a questionnaire with a description of several indicators filled in by each respondent/research subject, (Fifit et al., 2016). So to facilitate data processing, then the data will be tabulated into a table, which will be described as follows:

The next step is to facilitate data processing, then the data is tabulated into a table, which will be described as follows:

Limb Muscle Explosiveness Test Results

The following will discuss the results of data findings which are the results of the agility test, leg muscle explosiveness, namely using the leg muscle explosiveness test obtained the following data:

Menghitung rata-rata skor:

\[ \bar{X} = \frac{\sum X_i}{n} \]

\[ = \frac{6137}{25} \]

\[ = 2.45 \]

Langkah Penyelesaian:
1. Rentang Maksimum = Skor tertinggi \times \text{jumlah item tes}
   = 4 \times 25
   = 100
2. Rentang Minimum = Skor terendah \times \text{jumlah item tes}
   = 1 \times 25
   = 17
3. Luas Jarak Sebaran = Rentang maksimum – rentang minimum
   = 676 – 25
   = 27,04
4. Satuan Deviasi (\( \sigma \)) = \frac{6137}{25}
   = 2,45
5. Mean Teoritis (\( \mu \)) = \frac{\text{skor maksimum + skor minimum}}{2}
   = \frac{676}{2} = 338,5

<table>
<thead>
<tr>
<th></th>
<th>2.8 - 3.6</th>
<th>Baik</th>
<th>3.8 – 4.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3.7 - 4.7</td>
<td>Cukup</td>
<td>4.8 – 5.9</td>
</tr>
<tr>
<td>2</td>
<td>4.8 -5.3</td>
<td>Kurang</td>
<td>6.0 – 7.9</td>
</tr>
<tr>
<td>1</td>
<td>5.4-dst</td>
<td>Kurang sekali</td>
<td>8.0 –dst</td>
</tr>
</tbody>
</table>

SPJ : SPORT PEDAGOGY JOURNAL, 12 (2), 2023 Page 29 of 36
Menggolongkan subjek atau jawaban kedalam 3 kategorisasi diagnosis tingkat kinerja, maka keenam satuan deviasi standar dibagi kedalam tiga tingkatan Analisis yaitu sebagai berikut:

\[
X < (\mu - 1,0 \sigma) = \text{Analisis Rendah}
\]

\[
(\mu - 1,0 \sigma) < X < (\mu - 1,0 \sigma) = \text{Analisis Sedang}
\]

\[
(\mu + 1,0 \sigma) < X = \text{Analisis Tinggi}
\]

Langkah selanjutnya, memasukkan nilai \( \mu \) dan \( \sigma \) kedalam kategorisasi tersebut diatas.

1. Untuk kategori Analisis rendah
\[
X < (\mu - 1,0 \sigma)
\]
\[
X < (42,5 - 1,0 \times 8,5)
\]
\[
X < (42,5 - 8,5)
\]
\[
X < 34 \text{ (Skor kurang dari 34 kategori tingkat analisis rendah)}
\]

2. Untuk kategori Analisis sedang
\[
(\mu - 1,0 \sigma) < X < (\mu - 1,0 \sigma)
\]
\[
(42,5 - 1,0 \times 8,5) < X < (42,5 - 1,0 \times 8,5)
\]
\[
(42,5 - 8,5) < X < (42,5 + 8,5)
\]
\[
34 < X < 51 \text{ (Skor 34 – 51 kategori tingkat analisis sedang)}
\]

3. Untuk kategori Analisis tinggi
\[
(\mu + 1,0 \sigma) < X
\]
\[
(42,5 + 1,0 \times 8,5) < X
\]
\[
(42,5 + 8,5) < X
\]
\[
51 < X \text{ (Skor 51 keatas tingkat analisis tinggi)}
\]

Based on the results of data analysis with the level categories above, the following table 4.7 can be seen the classification/category level of analysis of the ability to run 100 meters.

<table>
<thead>
<tr>
<th>No</th>
<th>Nama Sampel</th>
<th>Data</th>
<th>Kategori</th>
</tr>
</thead>
<tbody>
<tr>
<td>1)</td>
<td>Safrizal</td>
<td>54</td>
<td>Tinggi</td>
</tr>
<tr>
<td>2)</td>
<td>Arwin</td>
<td>60</td>
<td>Tinggi</td>
</tr>
<tr>
<td>3)</td>
<td>Richard</td>
<td>57</td>
<td>Tinggi</td>
</tr>
<tr>
<td>4)</td>
<td>Asril</td>
<td>55</td>
<td>Tinggi</td>
</tr>
<tr>
<td>5)</td>
<td>Burhan</td>
<td>47</td>
<td>Sedang</td>
</tr>
<tr>
<td>6)</td>
<td>Bukhari</td>
<td>54</td>
<td>Tinggi</td>
</tr>
</tbody>
</table>
2. Research Data Analysis

Calculating Average (Mean)

Based on the Analysis of Ability to Run 100 meters in table 4.3 above, the next step is to calculate the basic statistics, namely:

\[ \bar{x} = \frac{\sum X}{n} \]

\[ = \frac{1365}{25} \]

\[ = 54.6 \]

Based on the results of the above calculations, the average value of the Analysis of Ability to Run 100 meters of 54.6 is in the high category.

Calculating Percentage

The next step is to calculate the classification of the 100 meter Running Ability Analysis, using the following formula:

\[ P = \frac{F}{N} \times 100\% \]

Keterangan:

\( P \) = Persentase
\( F \) = Frekwensi
\( N \) = Sampel
100\% = Bilangan Tetap

Rendah \( P = \frac{0}{5} \times 100\% = 0\% \)

Sedang \( P = \frac{1}{5} \times 100\% = 20\% \)

Tinggi \( P = \frac{4}{5} \times 100\% = 80\% \)

From the above calculations, it can be taken to analyze the ability to run 100 meters, each person including: (1) A total of 4 respondents were in the high category with a percentage level of 80\%, (2) A total of 1 respondent was in the medium category with a percentage level of 20\%.
Table 4.2.4 Recapitulation of Percentage Calculation Results The dominant physical analysis of the 100-meter running ability of PON Aceh athletes

<table>
<thead>
<tr>
<th>Kategori</th>
<th>Frekwensi</th>
<th>Persenntase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rendah</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sedang</td>
<td>1</td>
<td>20</td>
</tr>
<tr>
<td>Tinggi</td>
<td>4</td>
<td>80</td>
</tr>
</tbody>
</table>

The recapitulation results in table 4.4 above, when made in the form of diagrams / formulas are the same as follows:

![Figure 4.1 Analysis Diagram of Ability to Run 100 meters](image)

**DISCUSSION**

Based on the results of data collection while in the research location, it is more demanded that a coach in analyzing the results of the race against the 100 meter run is only based on a classical method, some coaches do not conduct a detailed analysis of the dominant physical analysis techniques especially for students. During training, the coach can only measure the total results of the implementation of running as far as 100 meters from students, this results in difficulties for the coach in evaluating the results of training and competition, especially running 100 meters how to set strategies when running to adjust the rhythm and tempo of student running.
The results of a more detailed analysis of the dominant physique will make it easier for coaches to find out the strengths and weaknesses of students. In addition, the coaching place also helps in supporting the career and achievements of these students. Based on the results of research and processing of the Analysis of Running Ability 100 meters agility, the dominant physical condition of PON Aceh athletes, which was carried out by conducting tests by respondents, the results as seen in the test results were classified as good. And it also turns out that after the research proves the Analysis of Ability to Run 100 meters agility, the dominant physical condition of PON Aceh athletes, with an average score of 54.6 is in the high category (good) with the following details:

Translated with www.DeepL.com/Translator (free version)
1) There are 4 respondents in the high category with a percentage level of 80%,
2) A total of 1 respondent was in the medium category with a percentage level of 20%. Thus agility, the dominant physical condition of PON Aceh athletes, due to the ability of good players and the high training patterns undertaken.

Dwi Prastowo Darminto (2003: 34). Analysis is a process of organizing and combining data into patterns, themes, categories, while interpretation is giving meaning to the analysis, explaining patterns or categories, and looking for relationships between several concepts. According to Harsono (1988: 24) Power is the product of strength and speed. Power is the ability to direct maximum strength in a very short time. Meanwhile, according to Sukadiyanto (2005: 117) power is the product of strength and speed. This means that strength and speed training has been trained first, although in every strength and speed exercise there is already an element of power training.

Speed is a fundamental physical component, so speed is a determining factor in sports such as short-distance running numbers, swimming, martial arts and game sports. Speed is the ability to perform consecutive similar movements in the shortest possible time or the ability to cover the shortest possible distance (Mochamad Sajoto 1988: 21).

Short distance running (Sprint) is all types of running that cover distances of 400 m and below (Tamsir Riyadi, 1982: 21), other experts say that short distance running as a branch of competition covers all distances up to 400 m (Gerry A. Carr, 1997: 13). Aip Syaripuddin (1997: 86) explains that the definition of a 100 meter run is a run where the athlete covers a distance at maximum speed.

In training activities, there must be an assessment to determine the results of learning or practicing that has been taken and is also useful for distinguishing the level of ability in athletes. Assessment in the training process is very important because by knowing the level of ability of the trainee, the coach can determine the appropriate training material at the level of the trainee's ability. In accordance with the principle of gradual training and always improved from easy to more difficult stages.
Based on the results of the research, it can be concluded that: (1) It takes a dominant physical (leg muscle explosiveness and speed) that is developed in order to improve the ability to run 100 meters. (2) With the dominant physique developed, athletes who train are more effective and more efficient. (3) With the dominant physical exercise developed athletes are more motivated in the training atmosphere.

The following are details of the data obtained through the agility test results, the dominant physical condition of PON Aceh athletes, as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Aspek</th>
<th>Total</th>
<th>Rata-Rata</th>
<th>Ketuntasan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Explosive Power Test Results</td>
<td>62</td>
<td>2.45</td>
<td>Pass</td>
</tr>
<tr>
<td>2.</td>
<td>Speed Test Results</td>
<td>61</td>
<td>2.48</td>
<td>Pass</td>
</tr>
<tr>
<td>3.</td>
<td>Running Ability Test Results</td>
<td>87</td>
<td>35.08</td>
<td>Pass</td>
</tr>
<tr>
<td>4.</td>
<td>Dominant Physical Condition Test Result Data</td>
<td>67</td>
<td>27.04</td>
<td>Pass</td>
</tr>
</tbody>
</table>

So, with the results of the acquisition of these data, the ability of agility, the dominant physical condition of PON Aceh athletes, then declared good with the level of completeness / pass according to the criteria and variables that have been tested comprehensively.

CONCLUSION

Based on the results of research on agility, the dominant physical analysis to improve the 100-meter Running Ability of PON Aceh athletes, is as follows:

1. The explosive ability of the leg muscles of the samples is very good according to the data obtained, so if an athlete has good leg muscle explosiveness, the athlete will automatically be able to move easily and be able to run very fast and maximally. So the ability of leg muscle explosiveness is the dominant physical condition to improve 100 meter running performance.

2. Running speed is a factor supporting achievement in running 100 meters. This is in accordance with the results obtained from data processing, in this regard a 100 meter runner must have good running speed. Speed in running 100 meters is needed to support the movement of an athlete when running, speed is also needed when an athlete moves from the start to the finish line, in that position an athlete needs high concentration in order to change position in time as quickly and efficiently as possible. With the following details:

<table>
<thead>
<tr>
<th>No</th>
<th>Aspek</th>
<th>Total</th>
<th>Rata-Rata</th>
<th>Ketuntasan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Agility Test Results</td>
<td>62</td>
<td>2.45</td>
<td>Pass</td>
</tr>
<tr>
<td>2.</td>
<td>Speed Test Results</td>
<td>61</td>
<td>2.48</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>Running Ability Test Results</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------------------------</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>87</td>
<td>35.08</td>
<td>Pass</td>
</tr>
<tr>
<td>4.</td>
<td>Dominant Physical Condition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Test Result Data</td>
<td>67</td>
<td>27.04</td>
<td>Pass</td>
</tr>
</tbody>
</table>

So, with the results of the acquisition of these data, the ability of agility, the dominant physical condition of PON Aceh athletes, then declared good with the level of completeness / pass according to the criteria and variables that have been tested comprehensively.

REFERENCES


