INTRODUCTION

Endurance is one of the ten biomotor components of humans. According to Syafruddin (2013) endurance is one of the most important elements of physical condition because it is the foundation or basis for the development of other elements of physical condition. In soccer, which has a playing time span of up to 90 minutes and with high intensity, every player is required to have good endurance, one of which is aerobic endurance. This concurs with Haris's (2018) statement which states that the physical conditions that football players need to have include aerobic endurance / Vo2Max (aerobic endurance). If players have good aerobic endurance then they can easily carry out the techniques and tactics instructed by the coach.

According to Emral (2013) that aerobic endurance is a person's ability to cope with training loads for a period of more than 3 minutes continuously. Furthermore, according to Bafirman (2013) states that aerobic endurance is a system for mobilizing energy using

FARTLEK EXERCISES ON AEROBIC RESISTANCE

M. Haris Satria
Sports Education, Faculty of Teacher Training, Education and Language, Universitas Bina Darmap, Palembang, Indonesia

Abstract

The problem in this research is the level of aerobic endurance of football players at Bina Darmap University which is not good. The study was conducted to determine whether fartlek training can increase the aerobic endurance of Bina Darmap University football players. This research is an experimental research. The instrument used was the blepp test. The data analysis used SPSS statistics 23. The result of $t_\text{(count)} = 11.115 > t_\text{(table)} = 1.740$ so that it states that fartlek training can increase the aerobic endurance of Bina Darmap University football players.

Keywords:
Fartlek, aerobic endurance, football
oxygen, the activity of exerting energy can be in the form of inhaling and expelling air, muscle contraction, etc. From this opinion it can be concluded that aerobic endurance is the ability a person performs physical activity without experiencing fatigue for a long time through aerobic breathing and because it is supported by good organ systems (heart, lungs, blood circulation, etc.). This means that each individual has the ability to endure that is different from one another.

Having a good aerobic endurance ability is not obtained instantly, there is a process that must be done and undertaken, namely through training. An exercise in order to get maximum results must follow the principles of a practice. These training principles include: (1) actively participating in training, (2) overall development, (3) specialization, (4) individually, (5) variety, (6) models / forms during the training process, (7) an increase in load / overload (Bompa, 1994). The improvement / progress of an exercise can be seen after undergoing 6-8 weeks of training. This is reinforced by the opinion of Muhajir (2004) who argues that an athlete who follows an intensive physical condition training program for 6-8 weeks before the competition season, will have strength.

Departing from existing theories and problems in the field, the researcher will conduct a study with the title "Fartlek Exercise Against Aerobic Endurance.

METHODS

This type of research is a type of experimental research. The research design used was one group pretest posttest design, which means that there is no comparison group, only one group will be given treatment. For details, it can be seen in the image below:

![Figure 1: Research Design](image)
The research was carried out at the Sriwijaya State Sports School Football Field, according to the training schedule on Monday, Wednesday and Friday. The sample of this research is the whole population (total sampling) of 17 soccer players at Bina Darma University. The instrument used to measure aerobic endurance is the bleep test. The hypothesis of this study is that there is an effect of fartlek training on the aerobic endurance of Bina Darma University soccer players. The data analysis technique used SPSS statistic 23.

RESULT

Description of Initial Test Result Data

The preliminary test results show that the lowest result is 37.1 while the highest result is 43.60. Complete details of the initial test results can be seen in table 1.

| Test Taker | Initial Test Results |
|------------|----------------------|
| S1         | 39.9                 |
| S2         | 40.8                 |
| S3         | 39.2                 |
| S4         | 38.5                 |
| S5         | 37.1                 |
| S6         | 39.9                 |
| S7         | 39.6                 |
| S8         | 42.0                 |
| S9         | 43.3                 |
| S10        | 40.2                 |
| S11        | 39.9                 |
| S12        | 44.2                 |
| S13        | 42.6                 |
| S14        | 43.60                |
| S15        | 41.5                 |
| S16        | 40.8                 |
| S17        | 39.2                 |

Final Test Result Data Description

The preliminary test results showed that the lowest result was 40.2 while the highest result was 47.10. Complete details of the final test results can be seen in table 2.

| Test Taker | Initial Test Results |
|------------|----------------------|
| S1         | 42.90                |
| S2         | 43.6                 |
| S3         | 40.2                 |
| S4         | 40.2                 |
| S5         | 41.1                 |
| S6         | 42.6                 |
| S7         | 43.3                 |
| S8         | 44.9                 |
| S9         | 47.1                 |
| S10        | 43.6                 |
| S11        | 43.3                 |
| S12        | 49.3                 |
| S13        | 43.3                 |
| S14        | 46.2                 |
| S15        | 44.6                 |
| S16        | 44.6                 |
| S17        | 43.6                 |

Hypothesis testing

| Test Taker | Initial Test Results |
|------------|----------------------|
| S1         | 42.90                |
| S2         | 43.6                 |
| S3         | 40.2                 |
| S4         | 40.2                 |
| S5         | 41.1                 |
| S6         | 42.6                 |
| S7         | 43.3                 |
| S8         | 44.9                 |
| S9         | 47.1                 |
| S10        | 43.6                 |
| S11        | 43.3                 |
| S12        | 49.3                 |
| S13        | 43.3                 |
| S14        | 46.2                 |
| S15        | 44.6                 |
| S16        | 44.6                 |
| S17        | 43.6                 |

Seen from table 3, where the average value of aerobic endurance which was previously 40.7235 becomes 43.7882. this indicates an increase in aerobic endurance.
Table 4. Paired Samples Correlations

|           | Correlation | Sig.       |
|-----------|-------------|------------|
| Pai first | 17          | .872       |
| Pai last  | .000        |            |

The p-value α (0.05)> (0.00) above indicates that there is a significant relationship between aerobic endurance before and after treatment.

Table 5. Paired Samples Test

| Paired Differences | M via erratio o | Low | Upp | d tail |
|--------------------|-----------------|-----|-----|-------|
| S                  | 95%             |     |     |       |
| td                  |                  |     |     |       |
| Confidenc e         |                 |     |     |       |
| e Interval          |                 |     |     |       |
| M of the            |                 |     |     |       |
| e Difference        |                 |     |     |       |
| St a                |                 |     |     |       |
| d. n                |                 |     |     |       |
| De E                |                 |     |     |       |
|                  |                 |     |     |       |
| Tes                  |                 |     |     |       |
| ai aw                |                 |     |     |       |
| r al                 |                 |     |     |       |
| l                    |                 |     |     |       |
| -                   |                 |     |     |       |
| -                   |                 |     |     |       |
| -                   |                 |     |     |       |
| -                   |                 |     |     |       |
| 06                  |                 |     |     |       |
| 13                  |                 |     |     |       |
| 7                   |                 |     |     |       |
| 3.64                |                 |     |     |       |
| 2.48                |                 |     |     |       |
| 1                   |                 |     |     |       |
| 60                  |                 |     |     |       |
| tes                  |                 |     |     |       |
| 47                  |                 |     |     |       |
| 68                  |                 |     |     |       |
| 5                   |                 |     |     |       |
| 922                 |                 |     |     |       |
| 019                 |                 |     |     |       |
| 15                  |                 |     |     |       |
| kas                  |                 |     |     |       |
| 1                   |                 |     |     |       |
| 5                   |                 |     |     |       |
| 3                   |                 |     |     |       |
| t                    |                 |     |     |       |

Based on the table above, fartlek training can affect and increase a person's aerobic endurance, in this case the soccer player at Bina Darma University. The results of statistical calculations show that where \( t = -11.115 > t \text{table} = 1.740 \) and at the same time answering the research hypothesis.

The characteristics of fartlek training that play the speed where the activities are running, walking, jogging and carried out with a long time and distance are very in accordance with the characteristics of the game of football. Where we know that playing football is when players have to run fast, run moderately, run slowly, walk and for a long duration. Furthermore, the characteristics of fartlek training can also be adapted to the atmosphere in a soccer match.

Fartlek training is one of the aerobic endurance exercises because it is relatively long in practice so it requires a lot of oxygen intake. This is in line with Atradinal's (2018) statement that fartlek is a method of aerobic endurance training because it is a form of endurance training with a long duration. In connection with the sport of football, endurance is very important for soccer players to have because if they do not have a good level of aerobic endurance it will affect the quality and techniques that are owned and the tactics of a coach.

Increasing one's endurance is obtained through exercise. The exercises that are carried out must be based on the level of one's seriousness by referring to
the principles of practice. Without the seriousness of an exercise you will not get maximum results. Of course, the results of an exercise are also determined by supporting factors such as gender, age, genetics to a person's lifestyle. This agrees with the opinion of the World Helath Organization (2010) which states that a person's endurance is influenced by several factors, namely physical activism in sports, one's nutritional intake, one's nutritional status, gender and age.

That way, a person's ability in this case aerobic endurance can be increased through a well-programmed exercise, a high level of seriousness and willingness and both internal and external supporting factors.

CONCLUSION

Departing from the results of research that has been carried out and studies on research discussion that fartlek training can increase aerobic endurance in this case, namely the aerobic endurance of football players at BIna Darma University. The increase can be shown through statistical calculations where tcount = -11.115> ttable = 1.740.

REFERENCES

Arisman, A. (2019). Pengaruh Latihan Square terhadap Daya Tahan Aerobic Atlet Sriwijaya Archery Club. Gelanggang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga, 2(2), 45-53.

Atradinal . Pengaruh Model Latihan Fartlek Terhadap daya Tahan Aerobik Atlet Sekolah Sepak Bola PSTS Tabing. Jurnal Sport Saintika, 3(1), 432-441.

Bafirman. (2013). Fisiologi Olahraga. Malang : Wineka Media

Budiman, I. (2010). Perbandingan pengaruh latihan daya tahan aerobik dengan parameter laktat dan denyut nadi. Jurnal Kedokteran Maranatha, 6(1), pp-13.

Bompa Tudor. (1994). Theory And Methodology Of Training (Terjemahan). Bandung: UNPAD.

Depdiknas.(2000).Pedoman dan Modul Pelatihan Kesehatan Olahraga Bagi Pelatih Olahragawan Pelajar. Jakarta: Pusat Pengembangan Kualitas Jasmani.

Emral. (2013). Metodologi Latihan Fisik.Padang : Sukabina Press.

Haris, M Satria. (2018). Pengaruh Latihan Circuit Training Terhadap Peningkatan Daya Tahan Aerobik Pemain Sepak Bola Universitas Bina Darma, Jurnal Bina Edukasi, 11(1), 34-43.

Harsono. (2016). Latihan Kondisi Fisik. Bandung: Rosdakarya.

Kharisma, Y., & Mubarok, M. Z. (2020). Analisis Tingkat Daya Tahan Aerobik Pada Atlet Futsal Putri AFKAB Indramayu. Physical Activity Journal, 1(2), 125-132.

Maksum, Ali. (2012). Metode Penelitian Dalam Olahraga. Surabaya: Unesa University Press-2012.

Muhajir. (2004). Pendidikan Jasmani Teori dan praktik SMA Kelas X. Jakarta : Erlangga.

Nugroho, S. (2007). Pengaruh Latihan Sirkuit (Circuit Training) Terhadap Daya Tahan Aerobik (Vo2 Max) Mahasiswa Pko Fakultas Ilmu
Keolahragan Universitas Negeri Yogyakarta. Yogyakarta: Universitas Negeri Yogyakarta.
Syafruddin. (2013). *Ilmu Kepelatihan Olahraga*. Padang: UNP.
WHO. 2010. *Global Recommendations on Physical Activity for Health*. Switzerland: WHO.