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Anthropometry and anaerobic exercise to aerobic athletes in weightlifting athletes

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Abstract

Anthropometric and aerobic exercise are important components in determining the success of weightlifters. This study aimed to determine anthropometry and anaerobic to aerobic exercise methods for weightlifters in Lampung Province. The sample included 20 athletes (14 male and 6 female). Body fat, 20 m sprint, vertical jump, standing broad jump and VO_2max tests were performed. The results showed that anthropometrically large athletes were male and relatively young, anthropometrically the mean (SD) height, weight, fat, and BMI of the two groups (male and female) showed significant differences. And there is a significant effect between anaerobic exercise on aerobic weightlifting athletes in Lampung Province to maximize the athlete's endurance and VO_2Max ability. For fat percentage, female athletes had a higher fat percentage than male athletes. Anaerobic capacity affects aerobic performance (VO_2max). This indicates that fast and vigorous exercise might result in an increased amount of ATP-PC. So, the ability of anaerobic capacity (sprint) affects aerobic capacity (VO_2Max) in weightlifters.

Keywords. Aerobics, anaerobic, anthropometry, weightlifting.

Introduction

Sport is an activity or activity that requires movement so that the body becomes healthy and fit. Sport is an activity carried out for physical refreshment (Wahyudi, 2018). Alit (2019) said that sport has the meaning of a form of physical activity contained in games, competitions, and intensive activities to obtain the relevance of victory and optimal achievement. Talking about sports, the scope of sports consists of educational sports, achievement sports, and recreational sports (Saputra & Hananingsih 2020). One of the achievement sports for each region or country has several superior sports. The leading sport in Lampung Province and has been worldwide been lifting iron.

Weightlifting is one part of weightlifting which is currently popular in the wider community because this sport can train the muscles of the body so that doing weightlifting exercises will reduce fat content and maintain or increase the composition of muscles and bones in the body (Sukahar & Prihatningtias, 2017). Rahmat (2017) explains that weightlifting is a sport that requires endurance and strength. He continued, that weightlifting is one of the most accomplished sports. Weightlifting is a sport that is competed for lifting heavy weights called barbells, which is done with a combination of strength, flexibility, concentration, ability, discipline (very important), athleticism, fitness, technique, and mental and physical strength (Rezky & Hermanzoni, 2019.)

Reaching the peak of the success of weightlifting athletes is influenced by several factors. In line with this statement, (Edwarsyah & Yulifri, 2018) the determinants of achievement in weightlifting include biological aspects consisting of 1) The potential or basic abilities of the body including strength, speed, muscle explosive power, and heart and lung work power, flexibility, coordination, and timing. 2) Functions of organs that include the work of the heart. 3. Body structure and posture which includes body shape. From the explanation above, it is stated that several important factors in success are influenced by the athlete's body structure or anthropometry. In line

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with this dependence, Iskandar et al. (2018) explained that the selection of talent for weightlifting athletes using a lifter is very good because it pays attention to the ideal age of children to start training, as well as the peak age. when the child is at its peak performance and how the child's body structure. Body composition is body composition described in two components, namely body fat and lean body mass, in male weightlifters who have a lower percentage of body fat mass and body fat weight but have lean body mass and bone. Fat, lower density. higher which correlates well with the achievements achieved (Ernalia et al., 2020).

In addition to posture and body structure which are important components in supporting the success of weightlifting athletes, one of the abilities that must be possessed is endurance. Endurance can be trained through athlete aerobics. In line with this opinion, Yan (2018) explains that the aerobic ability of weightlifters affects their appearance when competing. Exercise with an aerobic model can provide high effectiveness in the ability to lift weights athletes (Fu, 2019). Weightlifters are advised to use a load of at least 70% of one maximum repetition for optimal strength. One of the recommended exercises for maximizing strength abilities is the aerobic exercise method (Burke & Burke, 2017).

It is based on the explanation of anthropometry and endurance training through aerobic models in determining the achievement or success of weightlifting athletes. Researchers want to research anthropometry and anaerobic exercise in aerobic weightlifters. This research is integrated research because no research reveals the anthropometry of weightlifters in Lampung Province at Padepokan Gajah Lampung and there is no test on anaerobic exercise in aerobic exercise. The purpose of this study was to determine whether the anaerobic exercise model affected aerobic exercise performed by athletes, anaerobic athletes namely endurance in weightlifting athletes in Lampung Province. The results of this study are expected to be a reference for education and training managers and people involved in training camps at Padepokan Gajah Lampung so that their achievements and success can be maximized.

Methods

This research is descriptive and quantitative. This study aimed to describe anthropometry and determine how the effect of anaerobic exercise on the aerobic activity of athletes. The research population of all weightlifting athletes who were fostered at Padepokan Gajah Lampung was 32 people, but the sample that could be used in the study was 20 people because they did not live in a dormitory or Padepokan and were still in the Covid-19 pandemic.

Aerobic Capacity

Aerobic capacity was determined by using a Cooper test. The test includes completing a run-walk distance of 2.3 km.

Body Fat

To measure body fat using the RFM calculation method, you only need to measure your height and waist circumference, then calculate using the following formula: Male: 64 - (20 x height/waist circumference) = RFM (BF %) Female: 76 - (20 x height/waist circumference) = RFM (BF %).

20 Meter Sprint Test

The test is to run 20 m back and forth following a predetermined regular rhythm. If they hear 2 x blips, the participant is asked to leave.

Illinois Test

Participants should lie on their front (head to the start line) and hands by their shoulders. On the 'Go' command the stopwatch is started, and the athlete gets up as quickly as possible and runs forwards 10 m to run around a cone, then back 10 m, then runs up and back through a slalom course of four cones. Finally, the athlete runs another 10 m up and back past the finishing cone, at which the timing is stopped.

Vertical Jump Test

The vertical jump test is a test of lower body power. The test was first described nearly 100 years ago (Sargent, 1921). The procedure below describes the method used for directly measuring the vertical jump height jumped. There are other methods such as using

timing systems that measure the time of the jump and from that calculate the vertical jump height.

Standing Broad Jump

The test was conducted after a warm-up. Participants were asked to stand behind the starting line with both feet on the ground. Then, they jumped forward and as far as they could. The test was repeated 3 times and The longest distance they jumped forward was recorded as the standing long jump distance of the participants.

Statistical Analyses

The data was analyzed using SPSS version 23 (SPSS Inc., Chicago, IL, USA). Statistical significance level was set 0.05. The t-test was used to compare variables between gender.

Results

Based on the results of the analysis carried out, two research results will be described, namely anthropometry and anaerobic exercise. Before revealing the previous anthropometry, the results of the description of the data presented are as follows:

Data Description

Most of the weightlifters at Padepokan Gajah Lampung were 14 males (65%) and 6 females (35%). The ages of the athletes ranged from 14 - 32 years. There are 5 people under 15 years old (25%) and between 16-19 as many as 5 people (25%), the rest are aged 20 years to over 27 years. The most dominant body weight was 58-71 Kg as many as 8 people (40%), 44-57 kg and body weight between 72-112 kg, dominant height was 152-157 (35%), and 164-169 (30%).

Data Anthropometry

The results of the anthropometric analysis carried out showed the average age of the athletes was 22.1 ± 3.6 years; Height 167 ± 3.7 cm; Weight, 56.5 ± 4.9 kg; Fat, 13.1 ± 2.3%; and BMI, 19.7 ± 0.9. The mean (SD) of height, weight, fat, and BMI of the two groups showed a significant difference ($p < 0.05$). However, the BMI of all athletes is in the Ideal category. For the percentage of fat, female athletes have a higher fat percentage than male athletes with a value of 15% in women and 12% in men. Anthropometric data can be seen in Table 1.

Based on the analysis of the data obtained for the male sample, there were 14 people with an average age of 26 ± 3.4 years, then with an average height of 168.7 ± 2.4 cm, an average weight of 60.5 ± 3.3 kg the average body fat in the male sample in this study was 11.8 ± 2.2% so that the BMI of the male sample in this study was an average of 20.3 ± 0.8 kg/m^2 which was in the normal category. The female sample was 6 people with an average age of 21.1 ± 2.7 years with an average height of 163.9 ± 1.2 cm, for the female sample the average weight was 52.5 ± 2.3 kg, and body fat was 14.3 ± 1.7% so the BMI of the female sample in this study averaged 19.2 ± 0.7 kg/m^2 which was in the normal or ideal category.

Table 1
Demographic characteristics of the participants.

Anthropometry	Group	
	Male (n=14)	Female (n=6)
Age (years)	26 ± 3.4	21.1 ± 2.7
Height (cm)	168.7 ± 2.4	163.9 ± 1.2
Weight (kg)	60.5 ± 3.3	52.5 ± 2.3
FAT (%)	11.8 ± 2.2	14.3 ± 1.7
BMI (kg/m^2)	20.3 ± 0.8	19.1 ± 0.7

Test Result Data Description

After obtaining the anthropometric average for each sample, the researcher then carried out a physiological characteristic test where there were several test items carried out as shown in Table 2.

Table 2 presents the test results and comparisons of 20 m sprint, Illinois test, vertical jump, broad jump and VO_2max. The 20 m sprint performance was 3.3 ± 0.1 seconds in male and 3.7 ± 1.1 seconds in female. There was a significant difference between gender in 20 m sprint performances ($p = 0.001$). Male participants had 20 m sprint performance better than female. The mean Illinois test results were 16.8 ± 0.3 seconds for male and 18.4 ± 0.6 seconds for female. Illinois test showed that male participants had higher agility performance than female ($p = 0.001$).

Table 2

Test result data description.

Variables	Total Sampling	Group		*p*
		Male (n=14)	Female (n=6)	
Sprint 20 m (s)	3.5 ± 0.2	3.3 ± 0.1	3.7 ± 1.1	0.001*
Illinois Test (s)	17.6± 0.9	16.8 ± 0.3	18.4 ± 0.6	0.001*
Vertical Jump (cm)	54.2 ± 10.3	62.6 ± 7.4	45.8 ± 2.9	0.001*
Broad Jump (cm)	2.0 ± 0.2	2.2 ± 0.1	1.9 ± 0.1	0.001*
VO_2Max (ml/kg/min)	52.2 ± 3.5	54.7 ± 0.3	49.8 ± 3.3	0.008*

** p < 0.05*

Table 3

Calculated the data between anaerobic (sprint) and aerobic (endurance).

Sum of Squares	df	Mean Square	F	p
64.536	1	64.536	30.281	.000[b]

Table 4

Regression model.

Model	R	R Square	Adjusted R Square	Std. Error in the Estimate
1	.792[a]	.627	.606	1.45988

Vertical jump and broad jump test results for male on average 62.6 ± 7.4 cm, female 45.8 ± 2.9 cm with p = 0.001 based on data that male athletes were significant compared to female athletes, p = 0.001 for vertical jump tests. As for the board jump test, the average value was 2.2 ± 0.1 m for male and 1.9 ± 0.1 m for female with p = 0.001. The board jump test of male athletes was better than female athletes with p = 0.001. In addition, for the male VO_2Max results the average value is 54.7 ± 0.3 ml/kg/min. Meanwhile, female VO_2Max averaged 49.8 ± 3.3 ml/kg/min with p = 0.008.

The effect of anaerobic exercise on aerobic

In this study, the researchers calculated the data between anaerobic (sprint) and aerobic (endurance) exercise with the coefficient of determination test, the results of which can be seen in Table 3:

From the output data (Table 3), it was found a significant different (F value = 30.281; p = 0.000). So, the regression model can be used to predict the variable (X) to the variable (Y). Based on the Table 4, the R Square value is 0.627, which means that there is an influence between anaerobic exercise (sprints) on aerobics (endurance).

Discussion

Anthropometry

Based on the results of the research that has been done above, it shows that the respondents or samples who are athletes who are in the weightlifting and weightlifting training center at Pedepokan Gajah Lampung are 20 of the total 32 athletes. This is due to (1) the covid19 pandemic and (2) not living in a dormitory or Padepokan. The research results have similarities with previous research studies. The results of the study, (Almy & Sukadiyanto, 2014)) the factors that influence endurance are (1) intensity, (2) frequency, (3) exercise duration, (4) heredity, (5) age, and (6) gender Most of the male athletes are around 14 people (65%) and women are 6 people (35%). This means that weightlifting and weightlifting are more

suitable for boys than women because these sports tend to lift weights in the form of iron. This is in line with the opinion that gender and sports also affect the percentage of fat in athletes.

An athlete's excess body fat percentage will affect endurance, the cardiovascular system, a person's body composition, muscle endurance and flexibility, and performance (Amrinanto, 2016). This also agrees with (Edwarsyah, Hilmainur Syampurma & Yulifri, 2018) who states that weightlifting athletes must have good physical and mental conditions because weightlifting competitions require physical activity, strength, and muscle endurance to lift weights as heavy as possible so they must have a level of strength. maximum to achieve an optimal result.

This can be seen in table 1 regarding anthropometry, that their average age is 22.1 ± 3.6 years. According to (Dewi & Kuswary, 2013) aerobic endurance will decrease with age, but this decrease can decrease if done regularly from an early age. The body's resistance increases until it reaches the age of 25-30 years, then there will be a decrease in the functional capacity of the whole body by about 0.8-1% per year. Regular exercise can halve the decline; Height 167 ± 3.7 cm; Weight, 56.5 ± 4.9 kg; Fat, 13.1 ± 2.3%; and BMI, 19.7 ± 0.9. The mean (SD) of height, weight, fat, and BMI of the two groups showed a significant difference ($p < 0.05$).

However, the BMI of all athletes is in the Ideal category. For the percentage of fat, female athletes have a higher fat percentage than male athletes with a value of 14% in women and 11% in men. So it can be concluded that an anthropometry is a form of body size (Iskandar et al., 2018: 150). Anthropometric data can be seen in table 1. This follows the opinion of John Santrock (2007:159) reported in his dissertation that changes in body shape in infancy and early childhood increase in height (TBC). .) and body weight (BB) rapidly, then slowed down at the age of 6-11 years. Furthermore, Santrock, (2007:161-165) states that "the growth and development of elementary school-age children have increased in height (TB) an average of 5.08-7.62 cm in a year. Similarly, body weight (BB) is known to increase by about 2.50 - 4.50 kg in a year.

Strength sports are sports that prioritize muscle strength and last for a short time, such as judo, weightlifting, boxing, javelin throwing, discus throwing, shot put, and bodybuilding (Muth & Zive, 2019). Physical differences in weightlifting athletes are not a barrier to achievement because it is based on empirical facts that the success of weightlifters is not only caused by posture factors but is also influenced by many factors, including physiological changes. (Kurniantara et al., 2020) states that large muscle mass is the main capital for weightlifting athletes in competitions because the strength of muscle endurance is used to lift the heaviest loads, thus using fat as the main energy source, fat in the form of triglycerides. will be stored in limited quantities. in muscle tissue and will be stored in appreciable amounts in adipose tissue.

Anaerobic Exercise

Sukadiyanto (2011) said that anaerobic is an activity that does not require oxygen. Therefore, anaerobic endurance is not like aerobic endurance, which is the process of meeting energy needs that do not require the help of oxygen from outside the human body, while anaerobic ability itself can be interpreted as the maximum speed with work carried out using anaerobic energy sources. The ability of anaerobic capacity (sprint) affects aerobic capacity (VO_2Max) in Lampung weightlifters or speed training (sprint) (anaerobic) affects VO_2Max endurance (aerobic). This is in line with the opinion of (Debbian & Rismayanthi, 2016) who stated that VO2Max is an important element in the appearance of an athlete to improve physical work.

This means that speed training and strength and speed training (explosive power) including the speed of lifting barbells or weights repeatedly can improve aerobic ability. (Pelana et al., 2019) suggests that there are four divisions of the continuum energy zone, namely (1) under 30 seconds ATP+PC is used, (2) within 30 seconds to 1.5 minutes ATP +PC is used, and acid is used. lactate, (3) a time of 1.5 to 3 minutes energy used lactic acid + oxygen, and (4) over 3 minutes, energy used oxygen. Because weightlifting is carried out in under 30 seconds by lifting a barbell, the energy used is ATP + PC (the phosphagen system).

The activity of lifting weights is physiological, and tends to use strength and speed (power) The characteristics of Power training are: 1) against a relatively light load, the load itself, can also be added with a light external load, 2) relatively active, dynamic movement, and fast, 3) the movement is short, harmonious and complete, 4) the form of movement can be cyclic or acyclic, and 5) the intensity of work is submaximal or maximal (Kruk et al., 2018) Anaerobic excitatory threshold is a condition where aerobic

energy is no longer able to supply energy needs but is fulfilled anaerobically (Almy & Sukadiyanto, 2014).

Based on the analysis of the t-test, it shows that speed training (sprint) or anaerobic exercise affects endurance (VO^2Max) or aerobic exercise, where t count > t table. This means that the hypothesis is proven that anaerobic exercise (sprint training) affects aerobic exercise (endurance/Vo^2max). This indicates that fast and vigorous exercise will increase the number of ATP-PC. According to (Arifin, 2019) which states that the Sprint exercise will be able to have an impact on body endurance (VO_2Max) if it is done so that it can increase the maximum oxygen volume capacity for a person. The quality of cardiopulmonary endurance is expressed by the amount of VO_2Max in units of ml/kg/bb/minute (Goyena, 2019). The greater the muscle mass of an athlete, the greater the oxygen used in the process. Almy & Sukadiyanto (2014) states that each individual's heart-lung endurance optimally reduces the risk of getting tired quickly after doing a series of work activities. In the formation of ATP again if the supply of PC runs out, then the breakdown of glucose without oxygen is carried out or referred to as "Anaerobic Glycolysis". The ATP-PC system is useful for muscle contractions with a duration of between 3 to 8 seconds. When ATP breaks down into ADP (Adenosine diphosphate) and inorganic phosphate (Pi), energy production occurs which is used to contract skeletal muscles during exercise (Pelana et al., 2019) So, the energy used in weightlifting is ATP + PC or the phosphagen system.

Conclusion

Based on the results of the analysis of the data obtained, the conclusion is that most of the athletes are male and relatively young, anthropometrically, the average or mean (SD) height, weight, fat, and BMI of the two groups (male and female) shows differences meaning. However, the BMI of all athletes is in the Ideal category. For fat percentage, female athletes have a higher fat percentage than male athletes. Anaerobic exercise (sprint training) affects aerobic exercise (endurance/VO_2max). This indicates that fast and vigorous exercise will result in an increased amount of ATP-PC. So, the ability of anaerobic capacity (sprint) affects aerobic capacity (VO_2Max) in Lampung weightlifters.

References

Alit, I. G. A. N. (2019). Model Pembelajaran direct instruction dengan metode demonstrasi sebagai upaya untuk meningkatkan prestasi belajar pendidikan jasmani olahraga dan kesehatan siswa kelas iii semester i tahun pelajaran 2018/ 2019 SD Negeri 22 Dauh Puri. *Jurnal Pendidikan Dasar*, 4(1), 73-81.

Almy, M. A., & Sukadiyanto, S. (2014). Perbedaan pengaruh circuit training dan fartlek training terhadap peningkatan VO_2max dan indeks massa tubuh. *Jurnal Keolahragaan*, 2(1), 59–68.

Arifin, Z. (2019). Pengaruh latihan game dan sprint 50 meter terhadap peningkatan VO_2max atlet sepakbola SSB Kakimas Dampit Kabupaten Malang Kelompok umur 14-15. *Jurnal Pendidikan Jasmani Olahraga Dan Kesehatan*, 3(1), 103–114.

Burke, D. P., & Burke, D. T. (2017). Sports medicine and rehabilitation journal redefining the boundaries of weightlifting. *Sports Medicine and Rehabilitation Journal*, 2(2), 1020.

Debbian, A., & Rismayanthi, C. (2016). Profil tingkat volume oksigen maksimal (VO_2 Max) dankadar hemoglobin (Hb) pada atletyongmoodo akmil magelang. *Jurnal Olahraga Prestasi*, *12*(2), 115966.

Dewi, E. K., & Kuswary, M. (2013). hubungan asupan zat gizi makro dan status gizi terhadap kebugaran atlet bulutangkis jaya raya pada atlet laki-laki dan perempuan di asrama atlet ragunan tahun 2013. *Nutrire Diaita*, 5(2), 94-112.

Ernalia, Y., Azrin, M., & G, J. L. (2020). Differentiation of body fat composition measurement between skinfold caliper and bioelectrical impedance analysis methods among athletes. *Jurnal Kesehatan Komunitas*, 6(3), 267–271.

Fik-Unp, E., Syampurma, H., & Fik-Unp, Y. (2018). Kontribusi kekuatan otot lengan terhadap hasil teknik angkatan snatch atlet angkat besi di sasana hbt (himpunan bersatu teguh) Padang. *Jurnal MensSana*, *3*(2), 8-15.

Fu, Q. (2019). The therapeutic effect of rehabilitation mode of aerobic exercise on weightlifters after elbow fracture surgery. *Ekoloji*, *28*(108), 73–78.

Iskandar, D., Ramadan, G., & Indarto, P. (2018). Analisis kebutuhan pengembangan model latihan konsentrasi pada tembakan free throw pemain bola basket. *Prosiding Seminar Nasional Pendidika: Mengembangkan Potensi Pendidik Dalam Menghadapi Era Disrupsi*, 117–122.

Kurniantara, I., Antari, N., Winaya, I., & Adiputra, I. (2020). Penambahan core stability exercise pada thrower's ten exercisemeningkatkanjarak lemparan pemain outfielder's baseball di sman 8 denpasar. *Majalah Ilmiah Fisioterapi Indonesia*, 8(3), 63-69..

Pelana, R., Maulana, A., Winata, B., Widiastuti, W., Sukur, A., Kuswahyudi, K., Juriana, J., & Hermawan, R. (2019). Effect of contrast water therapy on blood lactate concentration after high-intensity interval training in elite futsal players. *Physiotherapy Quarterly*, *27*(3), 12–19.

Rahmat, Z. (2017). Analisis kebijakan koni aceh dalam penyelenggaraan training center (tc) atlet pon aceh tahun 2016. *Science of Surverying and Mapping*, *4*(2), 106–120.

Rezky, A., & Hermanzoni, H. (2019). *Latihan Beban dengan Sistem Set Berpengaruhterhadap Kemampuan Angkatan Snatch Angkat Besi. Jurnal Patriot,* 1(3), *866-875*.

Saputra, S. Y. & Hananingsih, W. (2020). Potensi alam dan kepariwisataan pulau bedil kabupaten sumbawa nusa tenggara barat sebagai medan pengembangan olahraga rekreasi. *Media Bina Ilmiah*. *14*(6), 2773-2780.

Sukahar, A. A., & Prihatningtias, R. (2017). Pengaruh olahraga angkat beban terhadap tekanan intraokuler. *Diponegoro Medical Journal (Jurnal Kedokteran Diponegoro)*, *6*(3), 1461–1466.

Wahyudi, N. A. (2018). Peran perkembangan industri olahraga dan rekreasi dalam menumbuhkan jiwa kewirausahaan bagi generasi muda. *Prosiding SNIKU (Seminar Nasional Ilmu Keolahragaan UNIPMA)*, *1*(1), 34–42.

Yan, G. (2018). Analysis and application of compound teaching theory of aerobics and weightlifting courses in the new era. *Advances in Social Science, Education and Humanities Research*, *194*(Etmhs), 110–113.

van der Kruk, E., van der Helm, F., Veeger, H., & Schwab, A. L. (2018). Power in sports: A literature review on the application, assumptions, and terminology of mechanical power in sport research. *Journal of Biomechanics*, 79, 1–14.

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