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The Effect of Four Weeks Preparatory Period Trainings on Aerobic And Anaerobic Power Values of Wrestlers

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Abstract

The aim of this study is to examine the effects of 4-week preparation period training on aerobic, anaerobic power and body weight values of wrestling athletes. Seven male wrestlers with an average age of 24.14, who are competitors in national and international competitions, were included in the study voluntarily. Aerobic, anaerobic power and body weight measurements were measured twice, at the beginning and end of the first phase of the preparation period. In order to determine whether there is a significant difference between the pre-test and post-test averages of the athletes, the Wilcoxon signed-rank test was used to analyze the data that were not normally distributed. The significance level was taken as $p<0.05$. Wrestler's Body weights of A significant difference was found between the pretest and posttest mean scores in favor of the posttest ($Z=-2.207$; $p<0.05$). MaxVO2 and Anaerobic power average values were not significantly affected by the four-week training at the beginning of the season ($p>0.05$).

Keywords*:* Wrestling, MaxVO2, Anaerobic power

Introduction

Physical and physiological characteristics of athletes differ according to sports branches. Sports branches have different training types as well as some disciplines and rules (Yolcu, 2012).

Wrestling sport; is a close combat sport performed in the weight concept, where motoric features such as strength, endurance, speed, strength, technique, tactics, and mobility should be combined (Demirhan, 2020). Energy is defined as the ability to do work. In other words; energy production is related to both time and intensity (Bayrakdar & Zorba, 2020). Adequate anaerobic power in athletes is directly proportional to the excess ability to use ATP - CP energy source (Salt et al., 2021). Anaerobic power development will occur if the amount of ATP-CP in energy stores is increased during the training process and the speed of their use is improved. Whether the level of anaerobic power is sufficient with the training and matches of the athletes is one of the important factors that directly affect the products specific to the branch (İmamoğlu et al, 2004). It is supported by the literature that anaerobic power is also associated with age, body weight, and lean body mass (Young, 2020).

Better preparation of the training programs to increase the performance of the athlete depends on determining the athlete profile in advance or at any stage of the program in the best way and creating it based on a scientific method. Because evaluating individuals or groups within the parameters of physical fitness provides basic information about the group or person being examined (Carlson et al., 1994; Coleman and Hale, 1998; Davis and Kimmet, 1986; Fox et al., 1988). Although anaerobic performance is important for all kinds of sportive activities (Salt et al., 2020), its importance increases even more in sports branches where anaerobic performance is predominantly used. Wrestling matches are held in two three-minute halves according to United World Wrestling (UWW) rules, and a developed anaerobic power is one of the most important characteristics required for victory in wrestling athletes. In addition, it has been stated that there is a high correlation between aerobic capacity and success in wrestling (Ziyagil, 1991). Citing information from another source, Saygın et al. (2017) reported that the contribution of energy systems in wrestling: 30% alactic anaerobic, 30% lactic, anaerobic, and 40% aerobic (Bompa and Carrera, 2005 cited by Yamaner et al., 2010).Nikooie et al., 2015, Saygın et al. (2017).

In the light of this information, the study is to examine the effect of the four week preparation period training of wrestling athletes on aerobic power values.

Material and Method

The effect of 4-week training in the first phase of the preparation period on the aerobic and anaerobic power values of wrestling athletes was investigated. Seven male wrestlers with an average age were included in the study voluntarily.

Measurements were taken twice, at the beginning and end of the first phase of the preparation period. Body weights of the wrestlers were recorded on a precision scale up to 20 grams with bare feet and only shorts. Height tall Height measurements were made with a 1 mm precision Holtain brand height meter (Demirhan et al., 2018; Kilincarslan et al. 2022). Aerobic capacity (maximum oxygen consumption): Measured with the 20m shuttle run test. The test area was determined for a distance of 20 meters and a colored funnel in the gym. Subjects rushed to both the arrival and return lines with the signal from the tape. The pre-prepared level follow-up form marked the levels at which the subjects left the test and was estimated as Max.VO2 ml/kg/min according to the evaluation table (Demirhan, et al., 2019). Monark 894 branded Wingate Anaerobic Power Test (WAnT) was used to determine anaerobic performances. Participants were subjected to a 30-second test period by applying 75gr of external resistance per body weight (Aydın et al., 2021).

Statistical Method:

In order to determine whether there is a significant difference between the pre-test and post-test scores of the athletes, the Wilcoxon Signed Ranks test was applied to analyze the data that did not show normal distribution.

Findings

In order to determine whether there is a significant difference between the pre-test and post-test scores of the athletes, the Wilcoxon Signed Ranks test was used to analyze the data that did not show normal distribution, and the results are given below. The mean age of the subjects is 24.14 (years), the mean age of sports is 13.14 (years). Height averages were determined as 163.85 (cm).

Table 1. Analysis of the pre-test and post-test values of the athletes according to the body weight variable (kg)

Body Weight Pre-Post Test	n	Row Mean	Sum of Row	Z	p
Negative Ranks	0	0.00	0.00	-2.207	0.027
Positive Ranks	6	3.50	21 ,00		
Equal Rows	1				

A significant difference was found between the pre-test and post-test (after 4 weeks) mean values in the body weight measurements of the wrestlers, in favor of the post-test averages ($Z= -2.207$; $p<0.05$). According to these results, it can be said that the body weights of the wrestlers increased according to the training method.

Table 2. Analysis of the pre-test and post-test values of the athletes according to the MaxVO2 variable (ml/kg/min)

MaxVO2 Pre-Post Test	n	Row Mean	Sum of Row	Z	p
Negative Ranks	7	3.00	3.00	-1.859	0.063
Positive Ranks	1	4, 17	25.00		
Equal Rows	6				

In Table 1, no significant difference was found between the pre-test and post-test averages of the aerobic capacities of the wrestlers ($p>0.05$). According to these findings, it was seen that the duration and content of the training performed in the development of the MaxVO2 values of the wrestlers were not sufficient.

Table 3. Analysis of the pre-test and post-test values of the athletes according to the Leg Peak Power variable (W)

Leg Peak Power Pre-Post Test	n	Row Mean	Sum of Row	Z	p
Negative Ranks	1	3.00	0.00	-1.859	0.063
Positive Ranks	6	4, 17	25.00		

Equal Ranks	0				

No significant difference was found between the pre-test and post-test scores of the subjects (p>0.05). According to these results, it has been seen that the Leg Peak Power values are at a level that will not be effective in the duration and content of the trainings.

Table 4. Analysis of the pre-test and post-test values of the athletes according to the Leg Minimum Power variable (W)

Leg Min.Power Pre-Post Test	n	Row Mean	Sum of Row	Z	p
Negative Ranks	2	2.50	5.00	-1.521	0.128
Positive Ranks	5	4 ,60	23,00		
Equal Ranks	0				

As seen in Table 4, no significant difference was found between the pre-test and post-test scores of the wrestlers (p>0.05). Accordingly, it has been observed that the effect of training duration and content is not sufficient according to Leg Minimum Powers.

Table 5. Pre-test and post-test values of the athletes according to the Leg Avarage Power variable analysis (W)

Leg Avarage Power Pre-Post Test	n	Row Mean	Sum of Row	Z	p
Negative Ranks	2	2.50	5.00	-1.521	0.128
Positive Ranks	5	3.60	23.00		
Equal Ranks	0				

No significant difference was found between the pre-test and post-test scores of the wrestlers (p>0.05). It was seen that the effect of training time and content was not sufficient according to the average values of the Leg Avarage Power of the wrestlers.

Discussion and Conclusion

In the study, the changes in body weight, aerobic capacity and anaerobic power of 7 wrestlers, who have international competition experience and continue active wrestling life, with an average age of 24,14 (years), were determined at the beginning and end of the 4-week training sessions at the beginning of the season.

According to the body weight values obtained in the study, a significant difference was found between the pre-test and post-test (after 4 weeks) measured body weight averages of the wrestlers in favor of the post-test scores ($Z= -2.207$; $p<0.05$). This difference was thought to be due to the effect of the applied training. In many studies examined, it has been seen that there are results that support our findings. It has been stated that there is an improvement in muscle fibers according to the working feature as a result of sports exercises (Akgün, 1989). In addition to these, studies that concluded that body weight increases following muscle development in wrestlers as a result of regular training are in line with our findings (Kürkçü, 2009; Cicioğlu, 2007). Especially fighting like wrestling Considering the assumption that exercises performed at the beginning of the season in athletes are generally aimed at maximal strength development. The increase in body weight averages detected in our study was evaluated as the enlargement of a muscle's diameter by giving high-tension stimuli (Demir & Filiz, 2004). Aydın et al., (2021), in their study, show that lower extremity muscle circumference measurements, leg mass and volume are effective on many factors in converting skill into scores (Aydın et al., 2021).

There was no significant difference between the pre-test and post-test (after 4 weeks) measured averages of MaxVO2 and Anaerobic power values of wrestlers' aerobic capacity ($p>0.05$). It is thought that these results may be due to the fact that the applied training program is at the beginning of the season and the loadings that can provide sufficient development have not been made yet. It is thought that a longer training period is required for the development of aerobic capacity and anaerobic power. Cicioglu et al. (2007) reported that anaerobic power did not increase statistically at the end of twelve weeks in his study. In another study, it was concluded that the anaerobic capacity of wrestlers did not change during the six-month preparation period (Sever et al. 2017). However, in a different study, it was found that training methods applied for nine months improved anaerobic power adequately (Kurt & Eroğlu, 2019). In another study, it was stated that anaerobic power increased as a result of a 12-week training program (Kürkçü et al. 2009). In a different study examining the anaerobic capacity of wrestlers, Song and Cipriano (1984) stated that the anaerobic capacity of elite American wrestlers aged 18-24, measured before and after the competition season, increased significantly at the end of the season compared to the pre-season. In another study, Ziyagil et al. (1996) stated that the anaerobic power of star wrestlers increased significantly at the end of the season compared to the pre-season. Our research findings are inconsistent with the researchers' results. It was thought that the most important reason for this was that the

measurements we made took place during the 4-week adaptation training period at the beginning of the season and that there was not enough time and training content for the development of anaerobic capacity.

As a result: According to the findings obtained from the research findings, it was seen that the training program applied for four weeks at the beginning of the season caused an increase in body weight values, but it was not sufficient for the development of aerobic capacity and anaerobic power values. It has been concluded that the reason for this is that the first trainings at the beginning of the season are generally aimed at adaptation, and the actual development and changes can be gained after this period. It is recommended to follow the trainings throughout the season and make measurements at periodic intervals, and studies in which the changes and developments of the parameters that will affect the performance can be followed closely.

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