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Comparison Between Interval and Continuous Method of Amateur Women's Futsal Team Training

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Summary

Interval training consists of doing high intensity exercises over a period and between periods of exercise pausing during a percentage of the workout being active or not, since the continuous training is based on doing workout with moderate intensity and without pause keeping the rhythm training. In this sense, the objective of this research has a comparative effect between the two methods, in four topics: heart rate, Vo_2, we will measure the level of perception of effort of the athletes, body weight evaluation. The results of heart rate monitoring where it was assessed every month after a training session, in which continuous training had a better result, but without great differences between the two; VO_2 that the measurement was made after the test of the Mcardle bench in which the athletes who train in an intervalized way obtained better results and maintaining the average of each other. Regarding body weight, they did not have significant difference for any of the methodologies and all lost at least the minimum weight. The subjective perception and efforts the group that does continuous training pointed to lower PSE results, but also without large differences between groups, levels between the two groups ranged from 7 to 9. With these results it was concluded that both training methods produce positive results for female futsal athletes, with only a small advantage of continuous training.

Introduction

Interval training is a training method that consists of an interval between the periods of exercise and recovery, this interval can be active or passive depending on the intensity of the training that is intended to perform, since this form of training can optimize the capacity of different training systems. energy transfers [1].

It can be classified as intensive or extensive, with short, medium or long intervals,depending on the objective to be achieved, the extensive method is characterized by a high volume training and a relatively low intensity, prioritizing the aerobic system, the volume is relatively low, but the intensity is high above 90% of VO2 max, working the anaerobic system [2]. For Andrade [3] the futsal athlete participates in the match during periods / cycles, leaves and returns several times, this possibility he the dynamics and the physical requirement of the game, making it continuous and very intense. The athlete lives an unpredictable game where decision-making needs to be continuous and fast, in which the psychomotor initiative is fundamental to the game, and an athlete needs to have a quick act for the thought stimulus.

According to Fernandes Filho [4], futsal uses several physical capacities, including resistance, so the training needs to be based on continuous methodologies. The objective of this work is to analyze the physiological effects of training based on interval and continuous methodologies, based on literary and research reviews with a female amateur futsal team.

Methodology

During 4 months, we apply interval training to one group of athletes and for another group we will apply continuous training during this process, we will perform Vo_2 tests, monitor heart rate, measure athletes' level of perceived effort, body weight results for graphs and making the conclusion. VO_2 test will be Mcardle's bench, in which the athlete climbs and descends from the bench rhythmically by a metronome for 3 minutes, after exercise we will measure the heart rate. Heart rate monitoring will be done once a month, before and after a workout, in which it will be measured for 15 seconds and multiplied by 4.

The level of effort perception will be realized after a specific training session where each athlete will demonstrate at the level of 1 - 10, his fatigue and effort on that training. Each month, we will measure each athlete's body weight on a digital scale.

Literature

Review

In the study by Santos, et al. [5] the interval training caused the increase of the VO_2 max of the people who participated in the training program and decreased the percentage of fat, linking this to the improvement of the cardiovascular system. According to Arins [6] after 10 sessions of applied training sessions based on high intensity interval training, the heart rate did not have major changes, also in the research can identify that there were no great differences of subjective perception of effort, however the research indicates that in the trainings of simulated games, the athletes in surveys gradually decreased the time they stand still and walking in the game, consequently they began to participate more effectively.

For Santos, et al. [5] continuous training does not have very broad effects for the decrease of fat percentage, as much as in the anaerobic metabolic pathway, but is a resultant training to improve aerobic resistance. After a week of studies based on continuous training aimed at the anaerobic threshold, Junior, Pereira and Gonzaga [8] states that in the research time did not notice advances in the anaerobic threshold in the futsal team evaluated, but points out that the result may be another with a longer research time.

For Caputo, et al. [7] aerobic training brings improvements in oxygenation in exercises even though it is high intensity, but training optimizes the little fatigue in long- term sports, where the athlete will be able to make better decisions, because the body will be well conditioned, and supporting to a long time without generating wear.

Ferreira, et al. [8] in his research analyzing the anaerobic power, dividing the athletes and their results by position, obtained that the athletes surveyed did not have great differences among themselves, however the goalkeepers pointed out a great index of fatigue, because where the characteristics of the sport, aiming only at the specific position of the goalkeeper, thus causing the difference in fatigue index in response to anaerobic exercises.

Arins [6] did a study analyzing the caloric expenditure of futsal athletes in a futsal collective training, where the results were also divided into tactical positions of the game, the study indicates that goalkeepers are the least caloric expenditure in a futsal match, already the wings and the fixed ones have very similar spending being both positions that most spend calories.

A study conducted by Duarte [9] had 21 individuals performing interval training during 12 workouts and found that there was a significant difference in levels of fat mass, hip circumference, blood pressure and resting heart rate that decreased sharply and a considerable gain of VO_2. Santa Cruz, et al. [10] analyzed the subjective Perception of Effort (PSE) of 10 male futsal athletes in the U-17 category during 5 games, in the youth school games, in which the first PSE matches were 7.5 0 to 10) and in the second phase in which 3 surveys were carried out, the average was 8.5. Rodrigues, et al. [11] studied the anthropometric profile of athletes and not futsal athletes in the schools of rio grande do sul and paraná, with whom they performed the research with 100 adolescents between 13 and 15 years, obtaining the result that approximately 80% of the athletes are with weight considered "Normal" and approximately 5% are overweight, causing overweight and obesity, in which an analysis carried out for competitive sports may have a change in performance between the two groups.

Results

In the study conducted in September with the group that trained intervals, the heart rate ranged between 165 and 172 Bpm, and averaged 148 beats after intense training (Tables 1-7) (Figures 1-4).

Outcome of heart rate in interval training		
Evaluated	August	September
Evaluated 1	166 Bpm	164 Bpm
Evaluated 2	168 Bpm	164 Bpm
Evaluated 3	172 Bpm	168 Bpm
Evaluated 4	170 Bpm	167 Bpm
Evaluated 5	172 Bpm	171 Bpm
Evaluated 6	165 Bpm	165 Bpm

Table 1: Heart rate in interval training.

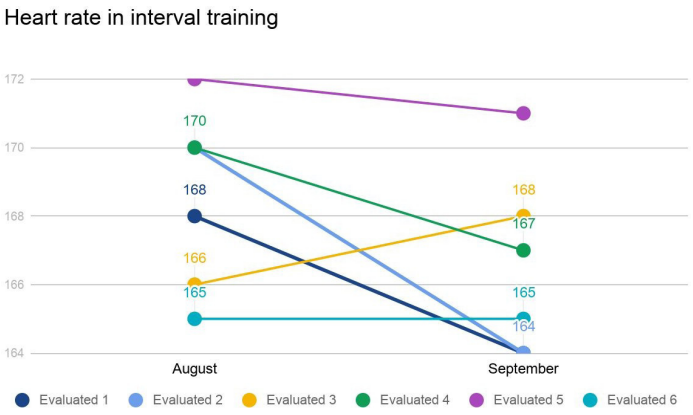

Figure 1: Heart rate in interval training.

The heart rate of those who did the continuous training varied between 155Bpm and 172Bpm, where the average was 165Bpm, after continuous training.

Cardiac output in continuous training		
Evaluated	August	September
Evaluated 1	172 Bpm	170 Bpm
Evaluated 2	168 Bpm	169 Bpm
Evaluated 3	156 Bpm	155 Bpm
Evaluated 4	162 Bpm	159 Bpm
Evaluated 5	156 Bpm	157 Bpm
Evaluated 6	164 Bpm	162 Bpm

Table 2: Cardiac output in continuous training.

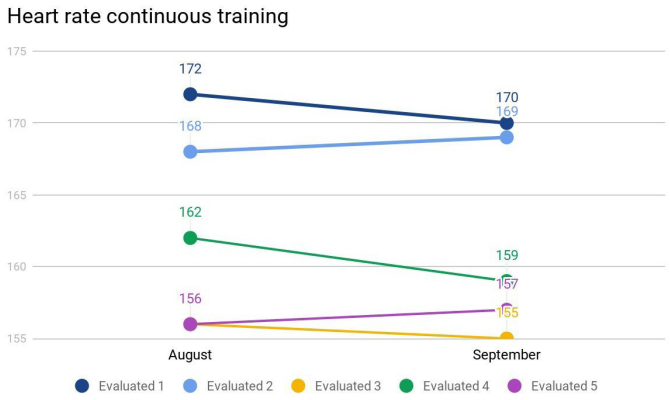

Figure 2: Heart rate in Continuous training.

In the interval training, the majority of athletes were in the 55 kg range, but the minimum weight reached 48.7 kg and the highest weight was 89.1 kg

- **Interval:**

Body weight in kilograms for the intarvalate training group		
Evaluated	August	September
Evaluated 1	60 Kg	59.8 Kg
Evaluated 2	59.9 Kg	59.9 Kg
Evaluated 3	58.6 Kg	58.2 Kg
Evaluated 4	49.2 Kg	48.7 Kg
Evaluated 5	64.3 Kg	64 Kg
Evaluated 6	89.1 Kg	88.7 Kg

Table 3: Body weight in kilograms for the intarvalate training group.

In continuous training the weight varied more, in which the lowest weight was 53.3 kg and the highest weight was 82 kg.

Continuous: In continuous training the weight varied more, in which the lowest weight was 53.3 kg and the highest weight was 82 kg.

Continuous:

Body weight in kilograms for the continuous training group		
Evaluated	August	September
Evaluated 1	62.0 Kg	61.9 Kg
Evaluated 2	59.5 Kg	59.5 Kg
Evaluated 3	72.3 Kg	72 Kg
Evaluated 4	53.5 Kg	53.3 Kg
Evaluated 5	82 Kg	81.8 Kg
Evaluated 6	56 Kg	56 Kg

Table 4: Body weight in kilograms for the continuous training group.

The VO_2 level after the bench test (Mcardle) hit the minimum amount of 34.0416 Mls / kg / min and the maximum quantity was 35.5192 mls / kg / min.

- **Interval:**

VO_2 obtained in the Mcardle bank test for the interval group		
Evaluated	August	September
Evaluated 1	35.1498 mls/kg/min	35.5192 mls/kg/min
Evaluated 2	34.7804 mls/kg/min	35.5192 mls/kg/min
Evaluated 3	34.0416mls/kg/min	34.7804 mls/kg/min
Evaluated 4	34.411mls/kg/min	36.258mls/kg/min
Evaluated 5	34.0416mls/kg/min	34.2263mls/kg/min
Evaluated 6	35.3345mls/kg/min	35.3345mls/kg/min

Table 5: VO_2 obtained in the Mcardle bank test for the interval group.

The athletes who participated in the continuous training, the minimum level was 34.0416 mls / kg / min and the maximum amount of VO_2 was 36.4427mls / kg / min.

- **Continuous:**

VO_2 obtained in the Mcardle bench test for continuous group		
Evaluated	August	September
Evaluated 1	35.1498 mls/kg/min	35.5192 mls/kg/min
Evaluated 2	34.7804 mls/kg/min	35.5192 mls/kg/min
Evaluated 3	34.0416mls/kg/min	34.7804 mls/kg/min
Evaluated 4	34.411mls/kg/min	36.4427mls/kg/min
Evaluated 5	34.0416mls/kg/min	36.8121mls/kg/min
Evaluated 6	35.3345mls/kg/min	35.8886mls/kg/min

Table 6: VO_2 obtained in the Mcardle bench test for continuous group.

- **Perception of Effort**

The level of effort perception after interval training maintained a certain balance, where all athletes indicated a level between 7 and 9.

- **Interval:**

Level of perception of interval training effort		
Evaluated	August	September
Evaluated 1	9	9
Evaluated 2	9	8
Evaluated 3	7	7
Evaluated 4	9	8

Evaluated 5	8	7
Evaluated 6	9	9

Table 7: Level of perception of interval training effort.

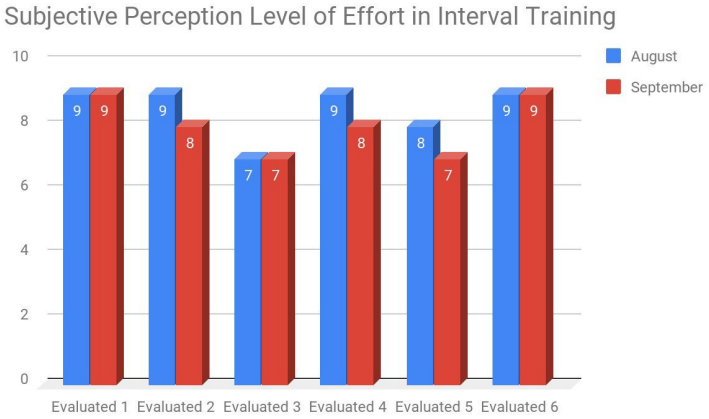

Figure 3: Perception level of Effort interval training.

The athletes who did continuous training even indicating also levels between 7 and 9, presented a level lower than 9 in comparison with the other group of athletes.

Continuous:

Level of perception of effort for continuous training		
Evaluated	August	September
Evaluated 1	8	8
Evaluated 2	8	7
Evaluated 3	7	7
Evaluated 4	9	8
Evaluated 5	7	7
Evaluated 6	9	8

Table 8: Level of perception of effort for continuous training.

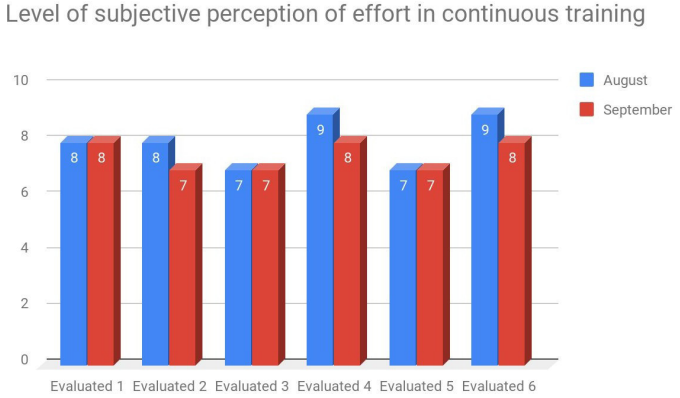

Figure 4: Level of subjective perception of effort for continuous training.

Discussion

The anthropometric values, mainly weight, are similar to those of other studies in the literary review, where the weight of the group of those who did interval training mainly to the study done by Rodrigues, et al. [11], which indicate a low level of athletes with unusual weight. Already the heart rate varied greatly in our measurements, where the lowest frequencies were 155 and the highest was 172 bpm, in the study performed by Duarte [9] the indices were similar to those performed in the present study.

The VO_2 Levels had evolutions, but not as significant, in Santos, et al. [5], also did not have significant effects for people who train in the methodology continues, already in the research of Caputo, et al. [7], the level of VO_2 for those who were higher for athletes who train at intervals. The level of perception of effort has approximated to 8, similar to the work done by Santa Cruz, et al. [10], in which athletes in general average also had level 8.

Conclusion

The values in kilograms of the futsal athletes varies a lot, since it is a sport where each position has a different characteristic, the athletes who normally play in the wing, are leaner and faster, since the fixed ones and pivots, generally have more muscular mass, causing the increase in weight and especially the average kilogram of the team. The heart rate of the athletes although they were in exercise, had little variation, however we saw in the study that was beginning to decrease the beat with each evaluation, would probably stabilize in a lower level than the presented one.

As with the above item, the VO_2 level also presented evolution, even if not significant, we believe that in the sequence of this work, the level of VO_2 increases significantly, causing a better performance for the athletes. The perception of effort remained within an average at work, but with the lowest heart rate and VO_2 growing every month, briefly the Subjective Effort Perception indication should drop because the body is making better gas exchange. With these results it was concluded that both training methods produce positive results for female futsal athletes, with only a small advantage of continuous training.

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