

The Effect of Circuit Training on Futsal Teams' Cardiovascular Support

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ABSTRACT

Due to its ability to maintain and enhance health, futsal is one of the more and more popular sports that people like. Given the area of use and comparatively short duration, football players must be in good physical condition because movement is determined by physical condition. The purpose of the study is to determine how cardiovascular resistance is impacted by circuit training. Thirty sons of futsal players are the focus of this study. This study uses a prescript-posttest control design group. Quantitative research methodologies are used in this kind of study. The multistage test tool (bleep test) obtained by conducting a circuit training exercise on an experiment group and for control groups without an exercise circuit training is used in data gathering methods. The test size sample t test is the data analysis method used to test hypotheses. Since the experimental group's sig value (2-tailed) was $0.004 < 0.05$, the results are known to be inconclusive; yet, circuit training may enhance fighter support.

Keywords: Circuit Training, Cardiovascular Resistance

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INTRODUCTION

In the prominent sport of futsal, Indonesia is ranked 42nd in the world and 7th in Asia, with third place in ASEAN. It has drawn the public, particularly young futsal enthusiasts, based on the graduation of the Indonesian Futsal Federation and the numerous accomplishments of the national futsal team. The game of futsal moves quickly and dynamically. Futsal players must learn the fundamentals of the game in order to play brilliantly, control attacks in accordance with strategy, and remain composed when opponents attack (Dandi & Nurhidayat, 2022). The fundamental skills of futsal include dribbling, kicking, blocking the ball, and passing. Passing, blocking the ball, kicking, and dribbling are all fundamental futsal skills that players need to learn. Futsal players need to be in good physical shape because their movement is affected by their physical condition, which is necessary given the length of the field and the relatively quick time (Aljabar & Purnomo, 2023)

Agility, flexibility, coordination, explosive power, muscle endurance, bounce, flexibility, and relaxation are some of the traits of physical condition (Fellani, 2018). Because futsal games require a high level of intelligence, futsal players who possess culkulp, or good cardiovascular endurance, will not become fatigued; conversely, those who lack cardiovascular endurance will become fatigued, and when fatigued,

they will be unable to execute basic techniques correctly (Hartanto & Hariyoko, 2022).

Sports success is not attained by quick fixes, but rather by perseverance and consistent practice (Hullfian et al., 2018). The primary objective is to improve physical condition, thus the choice of training methods must be thoughtful and targeted toward this end. One training technique that consistently improves endurance is circulation, which includes power, endurance, flexibility, agility, speed, and other physical attributes. In 2023, Xotelrik et al. Circuit training, according to Elfelndi (2016), is a training approach that consists of multiple posts, with different workloads being completed sequentially at each post, interspersed with rest periods when posts are switched.

According to the research's observations, players can move and rotate during practice to find a spot to bounce, pass vertically or horizontally, or cross with the ball before moving again. The ball can also bounce rapidly while being played. On the other hand, due to the high level of match intelligence, these motions are not visible during the match. In a high-intensity match, players are unable to pass, their movements become passive, they do not rotate, they repeat, and they lose focus. This indicates that the players' endurance is declining, making it difficult for the game to resume when they are hit by a counterattack, which allows the opponent to score a goal. It also affects the match's tactics, which become chaotic and do not follow the original plan.

Endurance Performance Improvement Program Through Zone 4 Intensity Training for Basketball Athletes is the title of a study (Wahyono et al., 2023). One of the attempts to get success is physical fitness. Strength, endurance, speed, coordination, and flexibility are just a few of the numerous elements that make up physical condition, which is dependent on movement needs. According to the findings of the researcher's initial observations at the training center (TC), the athletes' physical state was still deemed insufficient for them to compete with competitors from other regions, particularly with regard to endurance. Nearly every athlete appeared exhausted during the third and fourth halves of the sparring, which was evident. The goal of this study was to help male basketball players in Kediri City increase their anaerobic endurance through zone 4 intensity training. This study employed the Pre-Experimental The One Group Pretest-Post-test Design as its quantitative research methodology. 0.034, or Sig. <0.05, was the significance data from the analysis results derived by the variables investigated, specifically biomotor endurance ability. Therefore, it can be said that zone 4 intensity exercise has a major impact on building endurance capacity.

METHOD

Since the results were transformed into statistically analyzed numbers, the study took precedence over quantitative research. This study is an experiment of sorts. Temposive sampling is the method employed. Unpredictable sampling strategies define samples based on predetermined criteria (Sugiyono, 2014). The sample employed in this study consisted of thirty football players from Pgri University in Buana Surabaya who met certain requirements, such as being men and actively practicing the game.

Pretest-posttest design group design. Dwitana (2018) states that the study split the samples into two groups. There are two groups in the study: the control group and the experimental group. The goal of the control group is to serve as a referral. A pretest would be required before the first group was divided, and the Bleep test, a fitness test, would be the best method to determine how durable the tests were. After that, the distribution of the groups would be planned, with the experiment groups receiving treatment and the control groups receiving no treatment.

Prior to starting the circuit training program, the experimental group receives vocational training. The experimental group also receives physiological treatment. Because football players have varying mileage, physiological adaptation seeks to wear a three-post circuit training and calculate time dosages in a series of circuit workouts. The training program circuit for this study uses the 1:1 interval paradigm to flood the four intelligence zones.

Table 1. Exercise Program

Hari		Jenis latihan	set	Rep	rest	Ket
Minggu 1	Rabu	<i>Circuit Training</i>	-	-	-	Adaptasi fisiologi
	Sabtu		-	-	-	<i>Pretest</i>
Minggu 2	Rabu	<i>Circuit Training</i>	4	1:1	1:1	
	Sabtu		4	1:1	1:1	
Minggu 3	Rabu	<i>Circuit Training</i>	4	1:1	1:1	
	Sabtu		4	1:1	1:1	
Minggu 4	Rabu	<i>Circuit Training</i>	6	1:1	1:1	<i>Treatment</i>
	Sabtu		6	1:1	1:1	
Minggu 5	Rabu	<i>Circuit Training</i>	6	1:1	1:1	
	Sabtu		6	1:1	1:1	
Minggu 6	Rabu	<i>Circuit Training</i>	8	1:1	1:1	
	Sabtu		8	1:1	1:1	
Minggu 7	Rabu	<i>Circuit Training</i>	8	1:1	1:1	
	Sabtu		8	1:1	1:1	
Minggu 8	Rabu	<i>Circuit Training</i>	-	-	-	<i>Posttest</i>

RESULT AND DISCUSSION

Pretests and posttests administered using the Bleep test provided the data for this investigation. The experiment group's and the control group's data are shown here.

Table 2. Pretest and group posttest results

No	Nama	Exsperimen Group	
		<i>Pretest</i>	<i>Posttest</i>
1	Surya	39.6	42.6
2	Alam	38.9	41.8
3	Redondo	38.5	40.5
4	Alan	37.8	35.4
5	Faizi	37.5	36
6	Bayu	35.7	37.5
7	Arif	35.7	35
8	Dimas	35	36.8
9	Fafan	33.9	35
10	Oji	32.6	34.7
11	Indra S.	31.4	33.6
12	Rama	32.4	36.4
13	Yosep	28.7	31.4
14	Nauval	28	32.9
15	Fatir	27.2	33.2

Table 3. A descriptive analysis of the group experiment

Descriptive Statistics				
	PreTes Eksperimen		PostTes Eksperimen	
N	15		15	
Mean	34.193		36.187	
Minimum	27.2		31.4	
Maximum	39.6		42.6	

The espelmen group of 15 futsal players is shown in the chart above. described as being met at a minimum value of 27.2, a maximum value of 39.6, and an average of 34,193 for the experimental group's pretest. The post-test group experiment must have an average of 36.187, a minimum of 31.4, and a maximum of 42.6.

Table 4. Pretest and control group posttest results

No	Nama	Kelompok Kontrol	
		<i>Pretest</i>	<i>Posttest</i>
1	Fahruq	39.2	39.9
2	Rian	39.2	40.2
3	Aan	38.2	38.9
4	Abdila	37.8	36.8
5	Danda	36.8	36.4
6	Felbrian	36	36
7	Alvin	35	33.6
8	Velmas	35	32.9
9	Mashulr	33.2	34.3
10	Elko	32.9	33.2

11	Iqbal	31.8	29.5
12	Dhani	30.6	32.6
13	Tama	28.3	31.4
14	David	28.3	28.7
15	Didin	27.2	26.4

Table 5 . A descriptive analysis of the control group

Descriptive Statistics			
	Pretes Kontrol		Posttest Kontrol
N	15		15
Mean	33.967		34.053
Minimum	27.2		26.4
Maximum	39.2		40.2

The control group's value was defined as follows based on the results of the chart above: control minimized = 27.2; maximum value: 39.2; average = 33,967. The posttest group value control average is 34.052, with a minimum of 26.4 and a maximum of 40.2.

Priorities to confirm normality and then homogeneity first supported the data analysis employed in the study. With the requirement that data from a normal distribution meet $\text{sig} > 0.05$, the normal test analysis determines whether the data utilized in the study is normal. Whether the difference between the experimental and control groups, on which the ataul is based, is greater than 0.05 is determined by its homogeneity test.

Table 6. Normality test results

<i>Kolmogorov-Smirnov</i>			
Kelompok	Sig.	Berdistribusi	
<i>Pretest Eksperimen</i>	.200*	Normal	
<i>Posttest Eksperimen</i>	.200*	Normal	
<i>Pretest Kontrol</i>	.200*	Normal	
<i>Posttest Kontrol</i>	.200*	Normal	

The following table concludes that the data is normally distributed based on the above chart, which also shows that the value of $\text{sig.} > 0.05$ for the total data of the expo and control groups.

Table 7. shows the homogeneity test findings.

<i>Test of Homogeneity of Variance</i>					
	<i>Levene Statistic</i>	df1	df2	Sig.	
Hasil	<i>Based on Mean</i>	.889	1	28	.354
	<i>Based on Median</i>	.869	1	28	.359
	<i>Based on Median and with adjusted df</i>	.869	1	27.877	.359
	<i>Based on trimmed mean</i>	.939	1	28	.341

The aforementioned figure indicates that the data is homogeneous since the mean of the data is $0.354 > 0.05$. The above table's normal distribution data and homogenous data are known to be caused by sig. > 0.05 , according to the findings of the normal and ulji homogeneity tests. A hypothetical test covers the data if it is normal. For a hypothetical test, researchers utilize t test samples. To determine whether there was an influence between the experiment groups and the control groups at a level of 0.05, tests offered t-test samples. If the sig value (2-tailed) is greater than 0.05, then vocational training has no effect on cardiovascular support; if it is declined, then h_0 is received. If the two-tailed sig value is less than 0.05, then either h_0 is rejected or h_a is received, indicating that cardiovascular resistance is influenced by training.

Table 8. Paired T test

Paired Samples Test	
	Sig. (2-tailed)
Pretes Eksperimen - Posttes Eksperimen	.004
<u>Pretes Kontrol - Posttest Kontrol</u>	<u>.823</u>

Two conclusions can be drawn from a hypothetical test using a sample t test: an expert training program on cardiovascular resistance is necessary because the experiment had a sig. (2 tailed) of .004.05. The sig value (2 tailed) for the control groups is $0.823 > 0.05$, indicating vocational training has no effect on cardiovascular resistance. Cardiovascular training programs that use intelligence 4 zones have been used to determine the effect of circuit training on cardiovascular support. (Bompa, O., Tudor & Bulzzichelli, 2015) Intelligence Zone 4 USES a 1-6 minute intensity with interval 1:1 models and heat rate 85% to 90% of MHR. A high-intensity circuit training workout is conducted using the four intelligence zones.

Some researchers have conducted studies on the effects of guided circuit training on cardiovascular players. The paper for "circuit training exercises" training on the cardiovascular endurance team at PGRI University Semarang study was researched (Ashfahani, 2020). is referred to be the cardiovascular endurance level based on the Upgris football team's vo2max as determined by MFT (0,000) $> (0.05)$ research, which implies that the cardiovascular training exercise system is now influenced.

Anaerobics and aerobics are the two categories into which football durability is divided. Anaerobics are short-duration, high-intensity physical activities that don't require oxygen support, whereas aerobics are low-intensity, prolonged oxygen-dependent physical activities. Widyah Kusnanik and Muchlis Jubairi, 2020. The main sport that uses anaerobic energy systems supported by aerobic energy systems is fastball football, which is dynamic and high-intensity. A study (Wahyono et al., 2023) that used a bolabasket zone 4 intensity workout to improve endurance performance also energized this 4 intelligence zone exercise program. The biomotor durability test variable yielded an analysis of 0.034, or sig. < 0.05 . < 0.05 . It was

possible to draw the conclusion that zone 4 intelligence training significantly contributed to improved durability.

REFERENCES

- Aljabar, G. A., & Purnomo, M. (2023). Profil Kondisi Fisik Atlet Futsal Profesional Tim Bintang Timur Surabaya. *PO : Jurnal Prestasi Olahraga*, 6(1), 1–7. <https://ejournal.unesa.ac.id/index.php/jurnal-prestasi-olahraga/article/view/50181>
- Ashfahani, Z. (2020). Pengaruh Latihan Circuit Training Terhadap Daya Tahan Kardiovaskuler Pada Tim Futsal Universitas PGRI Semarang. *Journal of Sport Coaching and Physical Education*, 5(2), 63–67. <https://doi.org/10.15294/jscpe.v5i2.36823>
- Bompa, O, Tudor & Buzzichelli, C. (2015). *Periodization Training for Sports Third Edition*. Dandi, M., & Nurhidayat. (2022). Analisis Tingkat Kedisiplinan Siswa dalam Mengikuti Kegiatan Ekstrakurikuler. *Jurnal Porkes*, 5(1), 272–282. <https://doi.org/10.29408/porkes.v5i1.5739>
- Dwitana, A. (2018). Pengaruh Metode Praktek Terhadap Lay Up Shoot Dalam Pembelajaran Bola Basket (Peserta ekstrakurikuler siswa SMK Pasundan Subang). *Jurnal Ilmiah FKIP Universitas Subang ISSN (p) 2461-3961 (e) 2580-6335* PENGARUH, 4(01). <https://ejournal.unsub.ac.id/index.php/FKIP/article/view/208>
- Efendi, A. Y. (2016). Perbedaan Pengaruh Latihan Metode Bermain dan Sirkuit Terhadap Peningkatan Kebugaran Jasmani (Studi Eksperimen Pada Siswa SMP Negeri 9 Padang). *Menara Ilmu*, X(73). <http://jurnal.umsb.ac.id/index.php/menarailmu/article/view/95>
- Felani, M. F. (2018). Analisis Tingkat Kondisi Fisik Pemain Futsal Rejeki Sport Centre (RSC) Duduksampeyan Gresik U -20. *Jurnal Prestasi Olahraga*, 2(2), 1–6. <https://ejournal.unesa.ac.id/index.php/jurnal-prestasi-olahraga/article/view/29479>
- Hartanto, S., & Hariyoko, H. (2022). Kontribusi Indeks Massa Tubuh dan Daya Tahan Kardiovaskular dengan Keterampilan Dasar Futsal Sekolah Menengah Atas. *Sport Science and Health*, 2(5), 279–284. <https://doi.org/10.17977/um062v2i52020p279-284>
- Heriyanto, L. (2016). Untuk Meningkatkan Ketepatan Shooting Menggunakan Punggung Kaki Siswa Yang Mengikuti Ekstrakurikuler Di Smp N the Effects of Kicking Variation Practice To Various Targets in Order To Increase. *Journal Student UNY*, 1–10.
- Hulfian, L., Sapta, L., Kusuma, W., Mawardi, L., Sutandra, A., Training, A. A., Sirkuit, L., & Dasar, K. B. (2018). Aplikasi Air Alert Training Untuk Komponen Biomotorik Dasar Pemain Sepak Bola Ekstrakurikuler SMAN 1 Volume 5 Nomor 2 , September 2018 ISSN : 2355-4355. *PLoS ONE*, 5(September), 66–70.
- Muchlis Jubairi, S., & Widyah Kusnanik, N. (2020). Analisis Kemampuan Aerobik Dan Anaerobik Tim Futsal Jomblo Fc Ponorogo. *Jurnal Prestasi Olahraga*, 3(1), 1–6.

- Oktavianus, I., Bahtiar, S., & Bafirman. (2018). Bentuk Latihan Pliometrik, Latihan Beban Konvensional Memberikan Pengaruh Terhadap Kemampuan Three Point Shoot Bolabasket. *Jurnal Performa Olahraga*, 3(01), 21–29.
- Wahyono, M., Pelamonia, S. P., & Putra, I. B. (2023). *SPRINTER : Jurnal Ilmu Olahraga Program Peningkatan Performa Endurance Latihan Intensitas Zona 4 Atlet Bolabasket Melalui*. 4(3), 440–445.
- Xoterik, Syafrial, & Restu Ilahi, B. (2023). Pengaruh latihan circuit training daya tahan untuk meningkatkan kesegaran jasmani pemain sepakbola u-12 SSB abhiseva Bengkulu tengah. *SPORT GYMNASTICS : Jurnal Ilmiah Pendidikan Jasmani*, 4(1), 50–59.
<https://doi.org/10.33369/gymnastics.v4i1.24629>