



# Integration of circuit training towards improving shooting ability in athletes of basketball

Adi Rahadian<sup>1ABCDE\*</sup>, Muhammad Arifin<sup>1BCDE</sup>

<sup>1</sup> Universitas Suryakencana, Indonesia,

\*Author's correspondent: Adi Rahadian<sup>1\*</sup>, Universitas Suryakencana, Indonesia, email: [adira@unsur.ac.id](mailto:adira@unsur.ac.id)

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Info article	Abstract
<p><b>Filed in:</b> 2024-10-05 <b>Accepted:</b> 2024-11-29 <b>Published:</b> 2024-11-30</p> <p><b>Keyword:</b> Circuit, Shooting, Basketball</p>	<p><i>A study was conducted to examine the impact of circuit training on basketball shooting skills among the athletes of Suryakencana University basketball club. The research utilized an experimental design, allowing for a close resemblance to a real experiment. The objective was to test the effect of the independent variable (circuit training) on the dependent variables (shooting skills) and establish a cause-and-effect relationship. The experimental group received the circuit training treatment, while the control group did not. The study involved a population of Suryakencana University basketball club athletes, with a sample size of 20 out of 40 individuals. Results of the research revealed that the 14-week circuit training program had a significant impact on improving shooting skills, as indicated by the N-Gain Score of 0.89, which exceeded the threshold of 0.7. Particularly, the training enhanced arm strength and leg muscle strength among the athletes.</i></p>

## 1. INTRODUCTION

A series of movement activities are ways to improve and maintain human health to stay good and maintain immunity. Sport is also a collection of physical activities that provide great benefits to the quality of life (Rahadian et al., 2021) of a nation that is commonly practiced by every individual, both men and women,

ranging from children, adolescents to adults both indoors and outdoors with the aim that physical and mental health and freshness are maintained at their prime.

On the other hand, specifically, sports plays a role in realizing success in achieving sports achievements (Rahadian, 2022). Meanwhile, in general, sport is a physical activity that involves a series of human body movements that are carried out repeatedly, systematically, and structured to improve physical fitness. Thus in this context, the physical condition of each individual is determined by their movement and performance.

Physical condition components, including speed, agility, strength, endurance muscle power, coordination, and balance (Harsono, 2018) are important physical elements in basketball games. Basketball games are intermittent team sports with various physical requirements, ranging from the intensity of running, putting the ball into the ring, changing direction and running speed, and jumping height (Aoki et al., 2017). Furthermore, Garcia-Gil et al. (2018) explained that performance in playing basketball is not only limited to technical, tactical, and psychological skills, but also depends on physical fitness (such as jumping strength, agility with and without the ball, and speed of movement).

The optimal basketball athlete in a match, namely by scoring as many points as possible for the team. If you can master shooting skills properly and correctly, it can provide an opportunity to win in the match ". On the other hand, repetition of shooting practice is one of the assets for basketball athletes. This is a continuous effort made by athletes, either by using one or two hands accompanied by a jump in follow-through shooting. Thus, in the process, it can use various combinations of point/post-shooting training patterns arranged based on the scheme and training program.

Furthermore, researchers are trying to unravel the problems regarding the less-than-optimal shooting skills in basketball games. Based on data and facts in the field, basketball shooting speed has an average of  $1.94 \pm 0.56$  m / s and an

average time of  $1.30 \pm 0.18$  seconds (Yunus, 2023), free throw shot accuracy is 51.2%, while undering shot accuracy is 47.22% (Siregar, 2023). Furthermore, the results of the survey (Anonymous, 2017) show that the factors that affect the performance of basketball players are leg power 16.89%, reaction speed 16.67%, and leg muscle strength 15.75%. These results show that leg muscle power is very important for a basketball player.

To reflect on the data from the various sources above, researchers are guided by training methods that involve the repetition of exercises. Athletes strive to train for the development and improvement of their performance abilities through a systematic, planned, and continuous training process. The process of activities is carried out repeatedly, namely to improve the main physical condition in the process of achieving optimal performance in a competition in each match (Tangkudung and Puspitorini, 2021). Thus, for athletes with high-performance goals to achieve high performance, this is an absolute requirement to master all components of the physical condition which is the starting point for optimizing achievement.

## **2. METHOD**

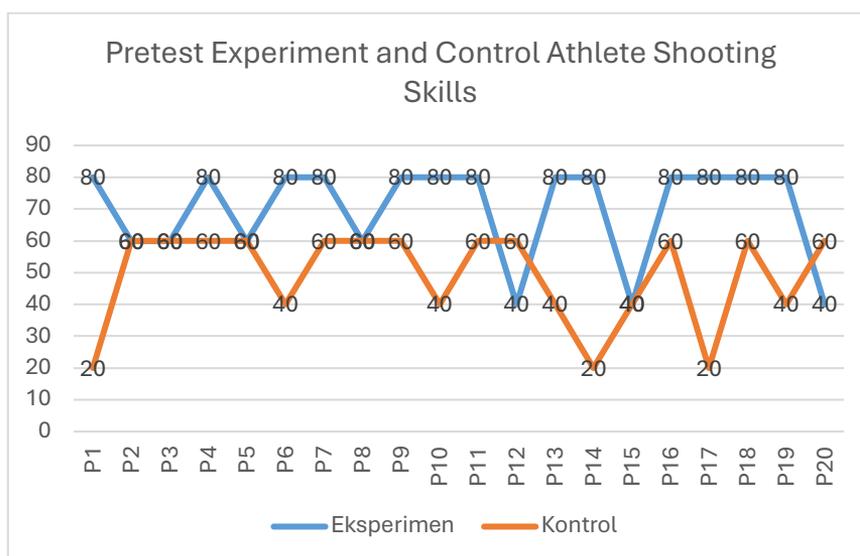
This research uses a quantitative approach with an experimental method that seeks to find the treatment of the influence of certain variables (independent variables) on other variables (dependent variables) in strictly controlled conditions and is carried out directly and continuously. By using the experimental method, researchers can find out how the influence of the independent variable on the dependent variable is carried out in practice directly by the researcher at the place designated as the object of research.

Research design with a periodic research plan that aims to provide clear and structured guidance to researchers in conducting their research, starting from data collection, and analysis, until the required hypothesis is fulfilled. The

problem in this study is to find out how circuit training exercises can affect the improvement of athletes' ability to shoot skills of basketball athletes. The research design used is in the form of a Pretest - pretest-posttest control Group Design with one type of treatment (Sugiyono, 2019, p.112). Participants in this study, namely Suryakencana University basketball ukm male athletes with a total of 20 people.

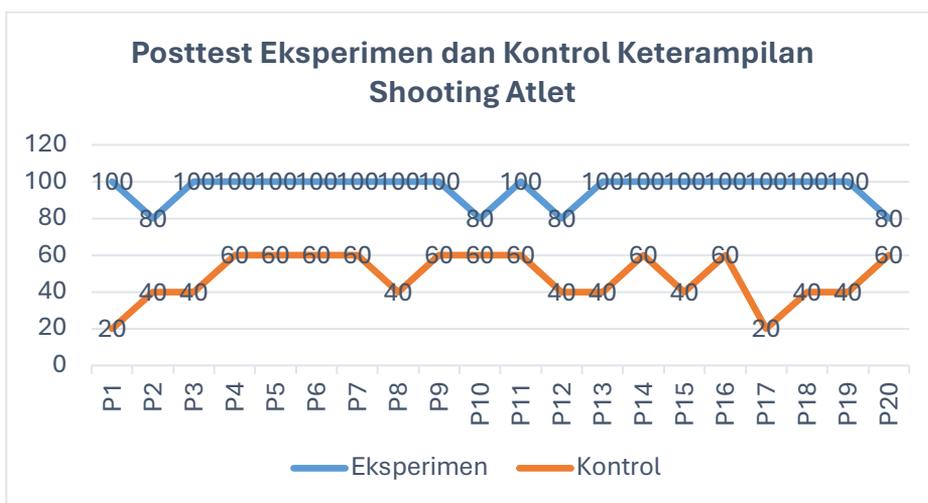
### **3. RESULTS AND DISCUSSION**

This research seeks to get an analytical picture to fulfill the research feasibility requirements, with details of 1 pretest, 14 treatment meetings, and 1 posttest. Testing efforts are carried out periodically to see the development of athletes against the treatment applied during the training dose. Furthermore, basic assumption testing plays an important role for researchers to ensure that the data generated is by predetermined criteria (Fraenkel, Wallen, and Hyun, 2019) and then relevant statistical data processing analysis techniques are carried out using application tools (Ms. Excel and SPSS).



**Figure 1.** Statistical Graph of Pretest Shooting Skills of Experimental and Control Groups

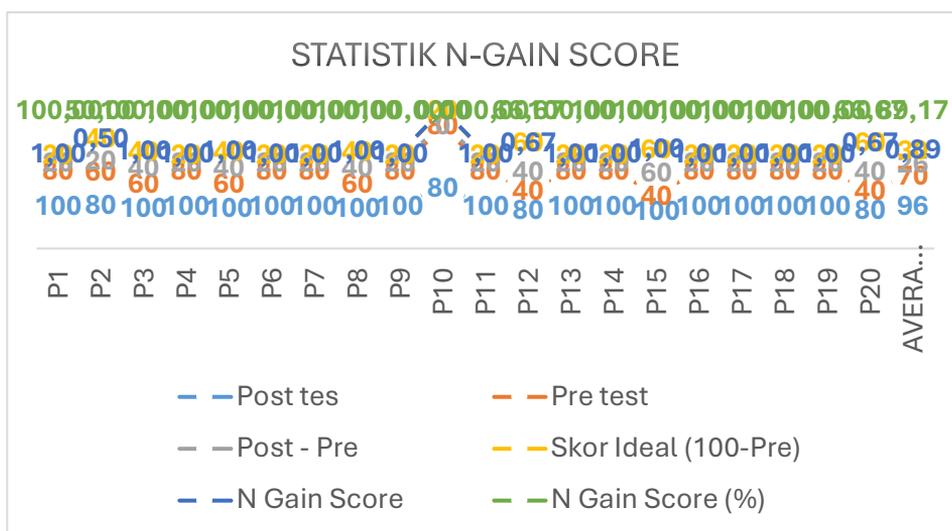
Based on the data presentation in Figure 1 which is displayed in the form of a pretest statistical graph from the experimental group, there are 13 athletes' shooting skills in the "GOOD" category, 4 athletes with "MEDIUM", and 3 athletes with "LESS" with an average field goals (FG) of 70%. For the control group, 12 athletes in the "MEDIUM" category and 8 athletes in "LESS" with an average field goal (FG) of 49%. In his findings, for the control group, none were categorized as "GOOD".



**Figure 2.** Statistical Graph of Posttest Shooting Skills of Experimental and Control Groups

Based on the data presentation in Figure 2 which is displayed in the form of a posttest statistical graph from the experimental group, there are 20 athletes' shooting skills in the "GOOD" category with an average field goal (FG) of 96%. For the control group, 10 athletes are in the "MEDIUM" category and 10 athletes are "LESS" with an average field goal (FG) of 48%. In his findings, for the experimental group, none were categorized as "MEDIUM" and "LESS" and there was also a significant increase in field goals (FG) of 26%. This means that the interpretation of the significance of the success of the circuit training program (with the main

segmentation of leg muscle power and arm muscle power) for 14 weeks is effective and efficient ( $g > 0.7$ ) for the progress of shooting skills and athlete achievement. While in the control group, none were categorized as "GOOD" and there was also a decrease in field goals (FG) of 1%.



**Figure 3.** N-Gain Score Statistical Graph of Basketball Athletes' Shooting Skill Improvement

Based on the presentation of the results of the N-Gain Score test data analysis in Figure 1.3, the average N-Gain Score value is 0.89, namely ( $g > 0.7$ ). So it can be concluded that the results of the analysis of the N-Gain Score interpretation value are included in the high category, which means that its effectiveness is high. Thus, circuit training on the shooting skills of Suryakencana University Basketball UKM athletes has a significant effect.

#### 4. CONCLUSION

Based on the results of the research and reference data analysis that has been carried out, the following conclusions are obtained: 1) The circuit training

model significantly increases the strength of leg muscles and arm muscles, especially during the 14 weeks of treatment carried out the development of shooting movement skills with the results of an increase in efforts to enter the ball in the basket or field goal (FG) by 26% (0.89 > 0.7) and 2) The specification of training programs in a systematic, programmed, and sustainable manner produces training doses that are appropriate for sports, especially basketball.

## **ACKNOWLEDGMENTS**

I would like to thank FKIP and UKM Basketball University of Suryakencana

## **5. REFERENCES**

- Aoki, M. S., Ronda, L. T., Marcelino, P. R., Drago, G., Carling, C., Bradley, P. S., & Moreira, A. (2017). Monitoring training loads in professional basketball players engaged in a periodized training program. *The Journal of Strength & Conditioning Research*, 31(2), 348–358.
- Bompa, T. O., & Haff, G. (2019). *Periodization: Theory and methodology of training*. United States: Human Kinetics
- Festiawan, R., Hooi, L. B., Pramadhan, K., Ali, M., & Nuryadin, A. (2021). Improvement physical fitness level on mountain climbing athletes: high-intensity interval training and oregon circuit training effect. *Jurnal SPORTIF: Jurnal Penelitian Pembelajaran*, 7(1), 19–36.
- Fraenkel, Jack R, Wallen, Norman E, Hyun, Helen H. (2019). *How to Design and Evaluate Research in Education 10th Edition*. Boston: McGraw-Hill Higher Education.
- Garcia-Gil, M., Torres-Unda, J., Esain, I., Duñabeitia, I., Gil, S. M., Gil, J., & Irazusta, J. (2018). Anthropometric parameters, age, and agility as performance predictors in elite female basketball players. *The Journal of Strength & Conditioning Research*, 32(6), 1723–1730.
- Harsono. (2018). *Latihan kondisi fisik untuk atlet sehat aktif*. PT Remaja Rosdakarya.
- Hermassi, S., Laudner, K., & Schwesig, R. (2020). The effects of circuit strength training on the development of physical fitness and performance-related variables in handball players. *Journal of Human Kinetics*, 71(1), 191–203.
- Irianto, D. P. (2018). *Dasar-dasar latihan olahraga untuk menjadi atlet juara*. Bantul: Pohon Cahaya.
- Krause, J. V., & Nelson, C. (2019). *Basketball skills & drills*. Human Kinetics.
- Kusuma, D. W. C. W (2019) *Strategi Yang Efektif Membelajarkan Teknik Shooting dalam Permainan Bola Basket*.
- Mohanta, N., Kalra, S., & Pawaria, S. (2019). A comparative study of circuit training and plyometric training on strength, speed, and agility in State Level Lawn Tennis Players. *Journal of Clinical & Diagnostic Research*, 13(12).

- Nofrizal, D. (2017). Perbedaan pengaruh metode latihan sirkuit dan metode latihan senam kebugaran jasmani (SKJ 2012) terhadap peningkatan kebugaran jasmani. *Curricula: Journal of Teaching and Learning*, 1(3).
- Putri, A. E., Donie, D., Fardi, A., & Yenes, R. (2020). Metode Circuit training dalam peningkatan daya ledak otot tungkai dan daya ledak otot lengan bagi atlet bolabasket. *Jurnal Patriot*, 2(3), 680-691.
- Rahadian, A., Ma'mun, A., Berliana, B., Nuryadi, N., Mutohir, T. C., & Irianto, D. P. (2021). Gerakan sport for all kunci keberhasilan olahraga Indonesia. *Jurnal Olahraga Pendidikan Indonesia (Jopi)*, 1(1), 78-95.
- Rahadian, A. (2022). *PEMBINAAN DAN PENGEMBANGAN ATLET ELITE DALAM PENCAPAIAN PRESTASI: STUDI KASUS PELATNAS PBSI* (Doctoral dissertation, Universitas Pendidikan Indonesia).
- Ridwan, Puja Pratama (2022). Menilik Performa “Chef” Curry, Sang Raja 3 Points NBA [Online Tersedia]: <https://goodstats.id/article/menilik-performa-chef-curry-sang-raja-3-points-nba-QRRZF> di akses pada tanggal 19 Januari 2024 pukul 10.00 wib.
- Setiawan, E., Patah, I. A., & Jumareng, H. Budiarto., Kastrena, E.(2022). Tes, Evaluasi dan Pengukuran Dalam pendidikan Jasmani dan Olahraga.
- Siregar, Ghatfan Adly. (2023). Shooter Terbaik yang Mecetak Rekor Terbaik Sepanjang Masa. [Online tersedia]: <https://www.kompasiana.com/ghatfan/653be346edff76035c4e1ff2/stephen-curry-shooter-terbaik-yang-mecetak-rekor-terbaik-sepanjang-masa> di akses pada tanggal 19 Januari 2024 pukul 10.00 wib.
- Sugiyono (2019). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R&D)*. Bandung: Alfabeta
- Tangkudung, James dan Puspitorini, W. (2021). *Kepelatihan Olahraga “Pembinaan Prestasi Olahraga”*. Jakarta. Cerdas Jaya.
- Wilke, J., Kaiser, S., Niederer, D., Kalo, K., Engeroff, T., Morath, C., Vogt, L., & Banzer, W. (2019). Effects of high-intensity functional circuit training on motor function and sport motivation in healthy, inactive adults. *Scandinavian Journal of Medicine & Science in Sports*, 29(1), 144–153.
- Yunus, Sapto. (2023). Daftar Pencetak Poin Terbanyak NBA Sepanjang Masa. [Online tersedia]: <https://sport.tempo.co/read/1689273/lebron-james-membuat-sejarah-ini-daftar-pencetak-poin-terbanyak-nba-sepanjang-masa> di akses pada tanggal 19 Januari 2024 pukul 10.00 wib.