

Zig-Zag Run Training : The Secret To Improving Students' Agility And Ball-Dribbling Control

Dwiky Putra Hanu Wijaya^{1*}, Maretno², Ihsan Hasani³
^{1,2,3}Sport Education Study Program, STKIP Kusuma Negara, Jakarta, Indonesia
*dwikyputrahanuwijaya@gmail.com

Abstract

This study aims to determine the effect of zig-zag run training on improving students' agility in ball dribbling. Agility is one of the essential components of physical fitness that supports both fundamental motor skills and athletic performance. This research employed an experimental method using a *one-group pretest-posttest design*. The subjects consisted of 15 futsal extracurricular students from Sukamaju 2 Public Elementary School, Depok City, selected through purposive sampling techniques. The instrument used was a 4x10 meter shuttle run test. The results showed an improvement in the average test score from 28.2 seconds in the pretest to 26.1 seconds in the posttest, with an average difference of 2.1 seconds faster. The *paired sample t-test* result indicated a significance value of $0.000 < 0.05$, suggesting that zig-zag run training had a significant effect on improving students' agility in ball dribbling.

Keywords: agility, ball dribbling, zig-zag run.

1 INTRODUCTION

Agility is one of the essential components of physical fitness that plays a crucial role in supporting movement skills in both sports and games. According to Harsono (2001), agility is the ability of an individual to change the direction and position of the body quickly and accurately without losing balance. Similarly, Bompá (2015) defines agility as the ability to move rapidly while maintaining balance, strength, speed, and body control.

In physical education practice, many students still demonstrate low levels of agility. This is evident from their slow responses to directional changes, unstable balance, and limited body coordination. Such deficiencies can hinder students' performance in physical education activities that require rapid movements, particularly in ball-handling sports. Therefore, developing agility through structured training is essential for improving motor skills and sports performance.

One effective training method for improving agility is the zig-zag run. This exercise involves rapid directional changes performed along a zig-zag course. It develops the coordination between limbs, strengthens the lower body, and enhances balance and reaction speed. Previous studies (Prasetyo, 2019; Rahman, 2021) have demonstrated that zig-zag run training effectively improves agility and movement control in both futsal and soccer players.

Based on these findings, the current study aims to analyze the effect of zig-zag run training on students' dribbling agility. The exercise was implemented systematically as part of the physical education learning process to evaluate its effectiveness in enhancing agility performance among elementary students.

2 RESEARCH METHODS

This study employed an experimental method using a one-group pretest-posttest design. The research participants were 15 students from the futsal extracurricular program at SDN Sukamaju 2, Depok City, selected through purposive sampling based on health condition, participation, and commitment.

The instrument used was the 4x10 meter shuttle run (get ball) test, which measures speed, coordination, and agility. The treatment consisted of zig-zag run training conducted for four weeks, with three sessions per week, each lasting 45 minutes.

The data analysis techniques included:

- Normality test: Shapiro-Wilk
- Homogeneity test: Levene's test
- Hypothesis test: Paired sample t-test at a significance level of 5% ($\alpha = 0.05$).

The research design can be summarized as follows:

Pretest → Treatment (Zig-Zag Run Training) → Posttest

3 RESULT AND DISCUSSION

The average pretest score was 28.2 seconds, while the average posttest score was 26.1 seconds, resulting in an average improvement of 2.1 seconds faster after the training intervention.

The Shapiro-Wilk test showed that the data were normally distributed (Sig. pretest = 0.200; posttest = 0.168 > 0.05), and the Levene's test confirmed that the data were homogeneous (Sig. = 0.412 > 0.05).

The paired sample t-test revealed a t-value of 14.58 with a significance level of 0.000 (< 0.05), indicating a significant difference between pretest and posttest results. This demonstrates that zig-zag run training significantly improves agility performance in dribbling tasks.

The findings of this study confirm that zig-zag run training is effective in improving students' dribbling agility. The exercise trains quick and repetitive directional changes that enhance coordination, balance, and reaction speed. This supports Bompa's (2015) theory that agility can be developed through exercises emphasizing rapid directional changes and controlled body movement.

The results are also consistent with studies by Prasetyo (2019), who reported improvements in agility among futsal players, and Rahman (2021), who found similar effects in soccer players. These consistent outcomes suggest that zig-zag run training is universally effective across different age groups and physical activity contexts. Furthermore, the exercise helps develop neuromuscular coordination by improving the communication between the nervous system and muscles, enabling students to move more efficiently. It also enhances reaction speed, allowing faster adaptation to dynamic situations, such as changing directions during dribbling or evading opponents in games. Thus, incorporating zig-zag run training into physical education programs is recommended as it supports both skill development and physical fitness. The exercise is simple, cost-effective, and suitable for school environments.

Table 1. Training Program Design

Week	Training Objectives	Training Activities	Frequency	Duration
1	Introduction to Zig-zag movement patterns and	- Light jogging + dynamic stretching	3 times/week	± 45 minutes

	basic coordination	- Zig-zag cone drill (5 m), 3 sets - Zig-zag walk-run combination - Directional reaction drills - Cool-down and reflection			
2	Developing agility and directional control	- Jogging + jump rope exercise - Zig-zag cone drill (7 m), 2 sets - Zig-zag sprint (10 m), 2 sets - Zig-zag run while dribbling a ball - Cool-down	3 times/week	± 45 minutes	
3	Dribbling simulation and quick reaction training	- Partner warm-up - Zig-zag dribbling avoiding defenders - Zig-zag dribbling with quick stops - Reaction cue training - Cool-down	3 times/week	± 45 minutes	
4	Trial and evaluation phase	- Jogging & stretching - Dribbling simulation - Evaluation of zig-zag run effectiveness - Coordination and reaction assessment - Cool-down	3 times/week	± 45 minutes	

Table 2. Agility Test Instrument Shuttle Run 4 x 10 m Get Ball (seconds)
Kriteria 5

Boys	Girls	Score	Category
≥ 23.18	≥ 24.58	5	Baik Sekali
23.19 – 27.19	24.59 – 28.29	4	Baik
27.20 – 30.18	28.30 – 31.02	3	Sedang
30.19 – 34.20	31.03 – 35.74	2	Kurang
≤ 34.21	≤ 35.76	1	Kurang Sekali

Table 3. Initial and Final Agility Test Data Shuttle Run 4 x 10 m Get Ball (seconds)

No	Name	Pre-Test Result	Post-Test Result
1	DG	28 S	26 S
2	AZ	29 S	27 S
3	EL	27 S	25 S
4	EF	30 S	27 S
5	BS	28 S	26 S
6	GA	29 S	27 S
7	MR	27 S	25 S
8	MA	28 S	26 S
9	MI	28 S	26 S
10	AS	29 S	27 S
11	DH	30 S	27 S
12	AF	27 S	25 S
13	AM	28 S	26 S
14	EB	29 S	27 S
15	FR	28 S	26 S
Average		28,2	26,1

Table 4. Normality Test : Shapiro-Wilk

Data	Shapiro-Wilk Statistic	Df	Sig.
Pretest	0,963	15	0,200
Posttest	0,955	15	0,168

Table 5. Homogeny Test : Levene's Test

F	Df1	Df2	Sig.
0,70	1	28	0,412

Table 6. Hypothesis test : Paired T-Test

	Mean Difference	Std Deviation	Std. Error Mean	T	df	Sig.
Pretest-Posttest t	2,10	0,56	0,14	14,58	14	0,000



Figure 1. Example illustration of zig-zag run training

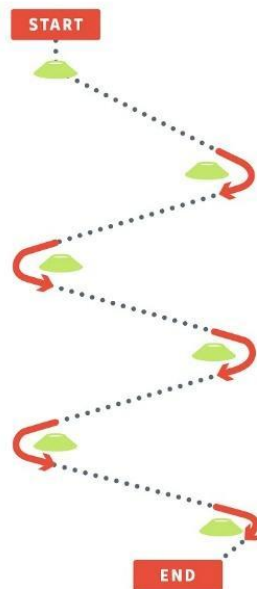


Figure 2. Example illustration of Zig-zag run

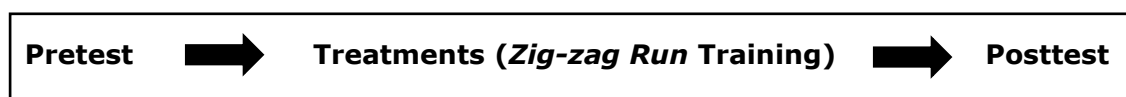


Figure 4. Research Scheme of One-Group Pretest-Posttest Design

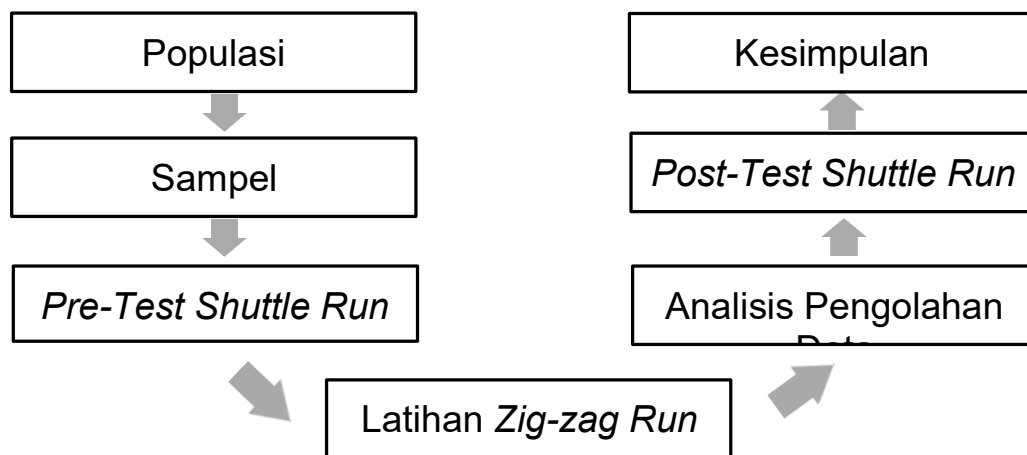


Figure 3. Research Procedures

3 CONCLUSION

Based on the results and statistical analysis, zig-zag run training has a significant and positive impact on improving students' agility in ball dribbling activities. The improvement is empirically supported by data showing a consistent reduction in average completion time between pretest and posttest results. Statistical tests confirmed that the data were

normally distributed and homogeneous, while the paired sample t-test produced a significance value of 0.000 (< 0.05), indicating a substantial difference between the two test results. These findings provide strong evidence that systematic and repetitive directional-change exercises can effectively enhance agility-related performance.

Furthermore, the zig-zag run training proved to be beneficial in developing multiple aspects of physical fitness, including coordination, balance, and reaction speed. Through the repetitive nature of the zig-zag pattern, students learn to control their body movements efficiently while maintaining stability and speed. This improvement not only contributes to better dribbling performance but also strengthens the students' overall motor abilities, which are essential in various physical education and sports contexts.

In light of these results, teachers and coaches are encouraged to incorporate zig-zag run exercises into physical education curricula and extracurricular sports programs. The training is simple to organize, requires minimal equipment, and can be easily adapted for different age groups and skill levels. Its implementation will not only enhance students' physical abilities but also promote discipline, teamwork, and confidence, contributing to the holistic development of young learners in school environments.

4 ACKNOWLEDGEMENT

The author would like to express sincere gratitude to all those who contributed to the completion of this research. Special appreciation is extended to the principal, teachers, and students of SD Negeri Sukamaju 2, Depok, for their participation, cooperation, and enthusiasm throughout the training and data collection process. The author also wishes to thank academic advisors and colleagues for their valuable guidance, constructive feedback, and continuous encouragement during the development of this study. Finally, heartfelt thanks are given to the author's family for their unwavering support and understanding, which made this research possible.

5 REFERENCES

- Arikunto, S. (2019). *Prosedur penelitian: Suatu pendekatan praktik*. Jakarta: Rineka Cipta.
- Bompa, T. (1999). *Theory and methodology of training: The key to athletic performance*. Champaign, IL: Human Kinetics.
- Bompa, T. (2015). *Theory and methodology of training*. Champaign, IL: Human Kinetics.
- Firmansyah, R. (2021). Pengaruh latihan lari zig-zag terhadap kelincahan pemain futsal. *Jurnal Pendidikan Olahraga*.
- Harsono. (2001). *Latihan fisik dalam olahraga*. Jakarta: PT Pustaka.
- Harsono. (2001). *Prinsip-prinsip latihan fisik*. Bandung: FPOK IKIP.
- Harsono. (2018). *Coaching dan aspek-aspek psikologis dalam coaching*. Bandung: PT Remaja Rosdakarya.
- Hidayat, M. (2018). *Pendidikan jasmani dalam konteks budaya Indonesia*. Jakarta: Rajawali Press.
- Hidayat, R. (2018). Permainan tradisional sebagai sarana pembelajaran PJOK. *Jurnal Pendidikan Jasmani*, 6(2).
- Mylsidayu, A. (2017). *Ilmu kepelatihan olahraga*. Jakarta: PT Raja Grafindo Persada.
- Nurhasan, B. (2015). *Model pembelajaran permainan tradisional dalam pendidikan jasmani*. Yogyakarta: UNY Press.
- Nurhasan. (2019). *Tes dan pengukuran dalam pendidikan jasmani*. Bandung: FPOK UPI.
- Prasetyo, A. (2019). Pengaruh latihan lari zig-zag terhadap kelincahan dalam permainan futsal. *Jurnal Olahraga*, 5(1).

- Rahman, F. (2021). Pengaruh latihan zig-zag run terhadap daya tahan dan kecepatan sepak bola. *Jurnal Ilmu Keolahragaan*, 9(2).
- Santoso, A. (2020). Pengaruh latihan perubahan arah terhadap peningkatan kelincahan siswa. *Jurnal Ilmu Keolahragaan*, 9(2), 112–120.
- Sari, D. (2020). Efektivitas latihan agility ladder terhadap kemampuan bermain hadang. *Jurnal Pendidikan Olahraga*, 8(1).
- Singer, R. (2001). *Motor learning and human performance: An application to physical education and sports*. New York: Macmillan.
- Sugiyanto. (2013). *Teori latihan*. Jakarta: Depdiknas.
- Sugiyono. (2018). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Bandung: Alfabeta.
- Suhardi, dkk. (2021). *Pedoman tes kebugaran siswa Indonesia (TKSI) fase C*. Jakarta: PPPPTK Penjas & BK.
- Suharno. (2010). *Permainan tradisional dalam pendidikan jasmani*. Jakarta: Rajawali Press.
- Suharno. (2010). *Permainan dan olahraga tradisional*. Yogyakarta: UNY Press.
- Suharsimi, A. (2017). *Dasar-dasar evaluasi pendidikan*. Jakarta: Bumi Aksara.
- Suherman, A. (2016). *Permainan tradisional dan pendidikan jasmani di sekolah dasar*. Bandung: PT Remaja Rosdakarya.
- Suherman, A. (2017). *Teori dan praktik permainan dalam pendidikan jasmani*. Bandung: CV Bintang Warliarta.
- Suherman. (2016). *Permainan tradisional hadang*. Bandung: Alfabeta.
- Undang-Undang Republik Indonesia Nomor 3 Tahun 2005 tentang Sistem Keolahragaan Nasional.