Kinestetik : Jurnal Ilmiah Pendidikan Jasmani 9 (1) (2025)
Kinestetik : Jurnal Ilmiah Pendidikan Jasmani
https://ejournal.unib.ac.id/index.php/kinestetik/index
DOI : 10.33369/jk.v9i1.40889

Comparison Of Boomerang Run And Hexagon Drill Training On Badminton Athletes' Footwork

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Info Artikel

Article History :

Received : March 2025

Revised : March 2025

Accepted : March 2025

Kata Kunci:

boomerang run,
footwork,
hexagon drill,

Abstrak

This study uses a quantitative approach with an experimental design to analyze the effect of Boomerang Run and Hexagon Drill training on badminton athletes' footwork. The research sample consisted of 30 athletes of the UPI Sumedang Campus Badminton UKM who were selected by purposive sampling based on certain criteria. The instrument used was a footwork skill test that had a validity of 0.865 and a reliability of 0.758. Data were analyzed using a normality test (Shapiro-Wilk), a homogeneity test (Levene's Test), a hypothesis test (Independent Samples T-Test), and a correlation test (r test) with the SPSS 26.0 program. The results showed that the Sig. (2-tailed) value was 0.000 <0.05, so it can be concluded that Boomerang Run and Hexagon Drill training had a significant effect on improving badminton athletes' footwork. In addition, the R-Square test results showed that Boomerang Run training had an effect of 68.2% on improving footwork, while Hexagon Drill had an effect of 48.2%. Thus, this study confirms that both training methods are effective in improving badminton athletes' footwork, with Boomerang Run having a greater impact.

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ISSN 2685-6514 (Online)
ISSN 2477-331X (Print)

INTRODUCTION

Badminton is a type of game that requires good speed and agility to hit the shuttlecock, where the correct footwork and stroke techniques will produce a perfect hit. (Hamid & Aminuddin, 2019). Badminton players must master good and quality basic techniques, which require fast, strong and efficient footwork so that the shuttlecock strokes are varied and effective(Febby Ardhia et al., 2022). Menurut (Gunawan et al., 2023) Badminton players must be able to control the playing field and are required to be able to move quickly and precisely in various directions. There are six basic areas of footwork in badminton, namely (1) movement to the left of the face, (2) movement to the right side of the face, (3) movement to the left, (4) movement to the left, (5) movement to the right back, and (6) movement to the left back.(Chiu et al., 2020). The basic principle of footwork in this sport is to keep the position of the feet in line with the hand holding the racket, so that the movement and strokes can go hand in hand (Kurniawan et al., 2024). Therefore, badminton athletes are required to have good and efficient footwork. (Ma et al., 2024).

One of the important components in the progress and results of badminton athletes is effective footwork, which allows athletes to move quickly and efficiently, adjust the right body position, and minimize the time to move between areas of the court (KAMISOPA, 2017). With trained footwork, an athlete can easily dealing with the fast and changing movement of the shuttlecock, both when attacking and defending (Luo et al., 2022). Badminton athletes strive to achieve the highest level of skill through structured, intensive and systematic training. Menurut (Sari Helen Purnama, 2017) An athlete needs coaching from an experienced coach and a well-designed training program. Therefore, an athlete needs coaching from an experienced coach and a well-designed training program. As mentioned in the journal (Aprilia et al., 2020) "Well-planned training allows an athlete to develop specific skills that support performance on the field, such as agility, speed and footwork.

However, in reality, my observations at the 2025 UPI Sumedang Open Championship still show that many athletes have difficulty moving quickly and efficiently to reach the shuttlecock in various areas of the field. Some of the problems identified include poor movement coordination, slow reactions to changes in the direction of the shuttlecock, and less than ideal body positions when having to move forward, sideways, or backward. Suboptimal footwork causes limited mobility, making it difficult for athletes to reach the shuttlecock quickly and efficiently.(Sari Helen Purnama, 2017) . In addition, according to (Gandala Putra et al., 2023) Poor footwork technique can result in postural imbalance, which has the potential to increase the risk of errors in hitting and reduce the effectiveness of game strategies. Therefore, proper training is needed to overcome this problem, in this study, boomerang run and hexagon drill exercises are the solution to overcome footwork problems in badminton athletes.

Boomerang Run training is a very effective method for improving the footwork agility of badminton athletes, because it is specifically designed to train speed and responsiveness in dealing with fast and dynamic game situations (Hulfian, 2020). This drill involves a series of forward and backward running movements with sharp changes in direction, forming a boomerang-like pattern, where the athlete runs from the starting point to the target and back again. (Nugraha & Syafi'i, 2022). This process not only trains speed, but also improves coordination and leg muscle strength, which is important for moving

quickly and agilely on the badminton court. (Wildan Ramadhani, 2023). During training, athletes are accustomed to optimizing their steps and body position, so they can quickly respond to the movement of the shuttlecock and the position of the opponent.

Hexagon Drill is a training method designed to improve the agility of badminton athletes, with a focus on lateral, diagonal movements and quick changes of direction. (Qasim Saeed Almousawi, 2016). In this drill, athletes move around a hexagonal pattern consisting of six dots, requiring them to move from one dot to another quickly and efficiently. (Pratama et al., 2024). This exercise aims to improve reaction speed, coordination and balance when moving, which is very much needed in badminton games which often require sudden movements and sharp changes in direction.(Permadi & Lubis, 2017)

Research from (Rizky et al., 2022) shows that increasing agility in PB. Berkat Abadi Banjar badminton players through ladder drill training has greater significance compared to increasing agility through hexagon drill training (footwork) in the sandpit. Research from (Permadi & Lubis, 2017) shows that there is a significant influence of Hexagon drill with barriers training with training intervals of 1:3 and 1:5 on leg muscle power and agility in PB Garuda badminton athletes. Research from (Achmad Rifai et al., 2020) shows the influence of footwork and shadow training on the agility of PB Setia Putra badminton team athletes.

The update of this study is that no one has studied the urgency of boomerang run and hexagon drill training on badminton athletes' footwork. In this study, researchers tried to prove the boomerang run and hexagon drill training methods and compare which training is most effective in improving footwork.

This study aims to provide new insights that are useful for coaches and athletes in choosing the most effective training methods, as well as providing a stronger scientific basis for designing training programs that are more focused, efficient, and suited to the specific needs of badminton athletes.

METHODS

This study uses a quantitative approach with an experimental design. Quantitative research is a research methodology that uses scientific techniques to collect numerical data, perform statistical analysis, and draw conclusions based on the findings. Experimental research is a special type of research used to determine what variables are and how they relate to each other. (Suharsimi, 2010). Experimental research is used to determine cause and effect by applying one or more treatment conditions to one or more experimental groups and comparing the results of one group with another group. (Candra Susanto et al., 2024). It is hoped that with this method researchers can compare the effects of boomerang run and hexagon drill training on the footwork of badminton athletes.

Participants

The research participants used in this study were badminton athletes at the UPI Sumedang Campus Badminton UKM who had been selected through specified criteria such as having participated in badminton championships, having good basic technical skills, and actively practicing professionally at a badminton club.

Sampling Procedures

The population that will be used as a sample in this study are badminton athletes at the UPI Badminton UKM Sumedang Campus, with a total population of 50 people. The sampling technique used by the researcher is Purposive Sampling. Which means that sampling is done intentionally according to predetermined criteria. Therefore, the sample that will be used in this study is

badminton athletes at the UPI Badminton UKM Sumedang Campus, totaling 30 athletes consisting of 20 men and 10 women.

Materials and Apparatus

This research instrument will use a footwork skill test. This test measures a person's footwork when playing badminton, namely right-left forward steps, right-left sideways, and right-left backwards Tohar (Mujami', 2010). With a validity level of this instrument of 0.865 and a reliability level of 0.758, it is a consideration for researchers when using it. This instrument is also widely used and effective for athletes and students, because it is easy to use and successful. The instrument used comes from Tohar in (Mujami', 2010). The aim is to measure the movement of the feet to 6 points in the game of badminton. Assessment of Foot Movement Test (Tohar, in (Mujami', 2010) Tools and Equipment: (1) Stopwatch and whistle, (2) Chalk or plaster, and (3) Test form and writing tools. In the footwork test, players step to 6 points, namely forward right-left, sideways right-left, and backward right-left for 30 seconds.

Procedures

This study began with the selection of athlete samples according to the criteria, followed by a briefing session covering the objectives, procedures, benefits, and rules of the study. Participants were then randomly divided into two groups: Group A underwent Boomerang Run training, while Group B did Hexagon Drill. The researcher provided an explanation of the training method, the duration of each session, and the measuring instruments used. Before the training began, a pretest was conducted using the Footwork Test to measure the initial agility of the athletes, ensuring that the testing area was up to standard and all measurements were carried out consistently.

In the treatment phase, Group A underwent Boomerang Run training, which involved sprinting to one point and then returning to the starting point with variations in distance and speed, aiming to improve acceleration and the ability to change direction. Meanwhile, Group B did Hexagon Drill, which is jumping in and out on each side of a hexagon formed by cones, to improve coordination, agility, and balance.

After the training period lasted for 4–6 weeks, a posttest was conducted using the same procedure as in the pretest to measure changes in athlete agility. The results of the travel time in the posttest were compared with the pretest to evaluate the effect of Boomerang Run and Hexagon Drill training on badminton athlete agility.

Design or Data Analysis

Data analysis in this study includes normality test, homogeneity test, hypothesis test, and correlation test (r test), which were conducted using SPSS 26.0 for Windows. The normality test used Shapiro-Wilk because the number of samples was less than 50, with a significance criterion of $\alpha = 0.05$. If the data is normally distributed (P-value $\geq$ 0.05), then it is continued with a homogeneity test to determine the similarity of variance between the experimental and control groups. If the data is proven to be homogeneous (P-value ≥ 0.05), then the analysis is continued with a t-test (Independent Samples T-Test), while if it is not homogeneous, a t-test' is used. Hypothesis testing was conducted to compare the effectiveness of boomerang run and hexagon drill exercises on the agility of badminton athletes by comparing t count and t table at a significance level of $\alpha = 0.05$. In addition, this study also used a correlation test (r test) to determine the relationship between training methods and increased agility.

The value of r count is compared with r table based on degrees of freedom

(df = n - 2) at a certain level of significance. If r count > r table, then there is a significant relationship between the variables, while if r count ≤ r table, then there is no significant relationship.

RESULT

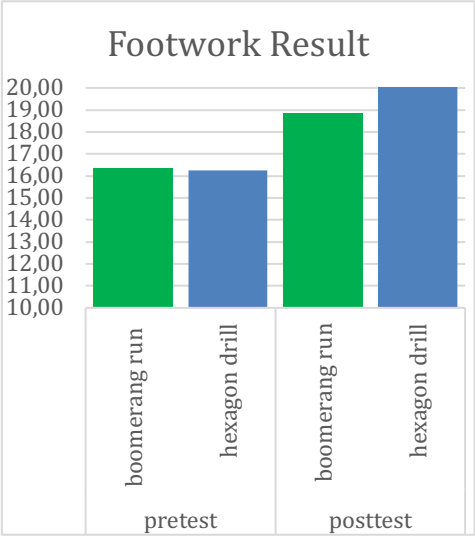

Figure 1. Footwork Grapic Result

Based on the analysis of the table above, the results of footwork performance in badminton games indicate a range of scores, with the lowest recorded score being 13 and the highest reaching 23. Specifically, the average results obtained by the boomerang run training group during the pretest phase were recorded at 15.9, while an improvement was observed in the posttest phase, where the average score increased to 18.8. Similarly, the hexagon drill training group demonstrated an average pretest score of 16.2, which showed further enhancement during the posttest phase, reaching an average score of 20. These findings suggest that both training methods contributed to improvements in footwork performance, with notable progress observed in both groups after the intervention.

Tabel 1. Tes Uji Normalitas

Result	Sig	Shapirio Wilk
Pretest Group A	.280	Normal
Posttest Group A	.406	Normal
Pretest Group B	.511	Normal
Posttest Group B	.180	Normal

The normality test shown in the posttest data was obtained after the treatment was carried out and calculated using the Shapiro Wilk formula with the IBM SPSS 20 program. Data can be normally distributed if the significant value obtained is greater than Sig. > 0.05, then Ho is accepted.

Tabel 2.
Homogeneity test result

Lavene Statistic	df1	df2	Sig	Information
.141	1	28	.710	Homogen

Homogeneity Based on the table above, it shows that the significant value of homogeneity is 0.710 > 0.05. With these results, it can be said that the pretest and posttest data are homogeneous.

Tabel 3.
Hipotesis test result

		t	df	Sig (2-tailed
Pair 1	Pretest-Postest (A)	-7.643	14	.000
Pair 2	Pretest-Posttest (B)	-7.466	14	.000

Based on table 4.5, it can be seen that the Sig. (2-tailed) value shows a result of 0.000 <0.05, which means that H_1 is accepted and H_0 is rejected. In this case, it can be concluded that there is "an influence of boomerang run and hexagon

drill training on badminton athlete footwork" accepted. Furthermore, to find out how big the influence of the implementation of boomerang run training is and hexagon drill In improving footwork in athletes at the UPI Sumedang Campus Badminton UKM, the R-Square test was then carried out.

Tabel 4.
R-Square test Result

Model	R	R	Adjusted R Square	Std. Error of the Estimate
Group A	.826a	.682	.657	1.372
Group B	.694[a]	.482	.442	1.903

The results in table 4.6 show that the R Square value is 0.682 in the boomerang run group and 0.482 in the Hexagon drill group. With these results, it can be concluded that there is an effect of implementing boomerang run training of 68.2% and an effect of implementing hexagon drill training of 48.2% on improving athlete footwork in the UPI Sumedang Campus Badminton UKM.

DISCUSSION

Boomerang run drills involve quick movement patterns and sharp changes of direction that mimic real-world situations in a badminton game. (Achmad Rifai et al., 2020), where athletes are required to react quickly and move dynamically in various directions. The characteristics of this exercise are in accordance with the needs of footwork in badminton, which emphasizes agility and the ability to change direction quickly. (Valldecabres et al., 2020). Research shows that training that mimics competition conditions can improve training effectiveness and athlete performance.

Meanwhile, Hexagon drill helps improve foot coordination as well as agility and stability, which are very important for badminton athletes in optimizing their footwork. With this drill, athletes can move faster, control changes of direction more efficiently, and maintain balance when performing sudden maneuvers, such as attacking with a smash or defending from an opponent's shot(Miranda et al., 2016). This allows them to remain stable and responsive on the pitch, thus improving their overall performance in the game. but at a lower percentage.

Based on the results of data processing that has been done, it shows that there is an effect of boomerang run and hexagon drill training on badminton athlete footwork. This is shown by the results of the normality test using the Shapiro-Wilk method on the posttest data, a significance value of more than 0.05 was obtained, so it can be concluded that the data is normally distributed. In addition, the results of the homogeneity test show a significance value of 0.710 (> 0.05), which means that the pretest and posttest data are homogeneous. With the fulfillment of the assumptions of normality and homogeneity, further analysis can be carried out to see the effect of training on badminton athlete footwork.

The results of the hypothesis test show that the Sig. (2-tailed) value is 0.000 (<0.05), which indicates that H_0 is rejected and H_1 is accepted. This proves that there is a significant effect of boomerang run and hexagon drill training on improving badminton athletes' footwork. Furthermore, to determine the magnitude of the effect of each training method, an R-Square analysis was carried out.

Based on the results of the R-Square analysis, boomerang run training has a contribution of 68.2% to the improvement of footwork, while hexagon drill training contributes 48.2%. This difference shows that boomerang run

training is more effective than hexagon drill in improving the footwork of badminton athletes in the UPI Sumedang Campus Badminton UKM.

In addition, the results of this study indicate that the effectiveness of training is greatly influenced by careful planning and structured implementation under the guidance and supervision of the coach (Ilahi et al., 2020). With good supervision, athletes can develop their skills optimally and achieve their best performance. (Prestasi et al., 2021). In addition, coaching that is carried out systematically and continuously is an important factor in improving overall sports performance. (Nirendan & Murugavel, 2019)

The results of this study are in line with previous studies showing that training that emphasizes rapid changes in direction and dynamic reactions can improve the agility and speed of movement of athletes in sports that require high mobility. Research by (Hidayat, 2015) shows that hexagon drill and boomerang run training with the intensive interval method have a significant effect on the agility of soccer players, with hexagon drill training showing a greater effect than boomerang run.

In addition, research by (Kardani & Rustiawan, 2020) showed that shadow training is more effective than shuttle run in improving footwork agility in badminton players. This finding supports the results of this study, where more specific training and imitating real game conditions showed higher effectiveness in improving badminton athletes' footwork.

CONCLUSION

Based on the discussion of the research data results, it can be concluded that boomerang run and hexagon drill exercises are effective in badminton footwork. In increasing the effectiveness of each group, the results of boomerang run exercises are superior to hexagon drill exercises. The results of this study are expected to provide benefits in the development of training methods that support athletes in improving their achievement. The findings in this study can be applied to various categories of players, from beginners to high-achieving athletes.

ACKNOWLEDGEMENT

I would like to thank the UPI Physical Education PGSD Study Program, the supervisor and all the lecturers, fellow UPI Physical Education PGSD students of the 2021 batch, the UPI Sumedang Campus Badminton UKM and especially my family and parents, for their support so that this article can be completed.

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