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The Effect of Plyometric Training on Crescent Kick Speed Among Members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City, Indonesia

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Abstract: Penelitian ini bertujuan untuk membahas bagaimana pengaruh latihan Plyometrics terhadap tendangan sabit pada anggota pencak silat Api Sakti Kecamatan Oba Utara. Penelitian ini menggunakan metode eksperimen dengan desain penelitian *One Group Pretest- Posttest Design*. Sampel penelitian berjumlah 10 orang anggota laki-laki Api Sakti Kecamatan Oba Utara dari populasi yang yang berjumlah 38 orang. Teknik pengambilan sampel dilakukan secara *Non Probability Sampling*. Data penelitian diperoleh dengan melakukan tes pengukuran kecepatan tendangan sabit yang dianalisis secara kuantitatif. Dari hasil penelitian pada anggota pencak silat Api Sakti Kecamatan Oba Utara dengan metode latihan *plyometrics* selama 16 kali pertemuan, nilai output statistik yang didaptkan, yaitu Asymp. Sig (2-tailed) bernilai 0,020 < 0,05 dan T hitung (2,815) > T tabel (1,833). Hal tersebut menunjukkan adanya perbedaan nilai *pre-test* dan *post-test*. Dengan demikian hasil penelitian ini menunjukkan adanya sedikit pengaruh kecepatan tendangan sabit yang dilihat dari hasil perbandingan *pre-test* dan *post-test*. Hal ini disebabkan pemberian metode latihan *plyometrics* (*double leg speed hop* dan *single leg hurdle hop*) terhadap kecepatan tendangan sabit anggota pencak silat Api Sakti Kecamatan Oba Utara Kota Tidore Kepulauan.

Kata Kunci : *latihan plyometrics, kecepatan kendangan sabit, pencak silat*

Abstrak: This study aims to examine the effect of plyometric training on the speed of the crescent kick (crescent kick) among members of the Api Sakti Indonesian Martial Art club in North Oba District. An experimental method utilizing a One-Group Pretest-Posttest design was employed. The sample consisted of 10 male members of the Api Sakti club in North Oba District, selected from a total population of 38 using a non-probability sampling technique. Data were obtained through speed measurement tests of the crescent kick and analyzed quantitatively. The results, based on 16 sessions of plyometric training, yielded a statistical output of Asymp. Sig. (2-tailed) = 0.020 (< 0.05) and a calculated t-value (2.815) greater than the t-table value (1.833). These figures indicate a significant difference between the pre-test and post-test scores. Thus, the study demonstrates an effect on crescent kick speed, as evidenced by the comparison of pre-test and post-test results. This outcome is attributed to the implementation of plyometric training methods—specifically double-leg speed hops and single-leg hurdle hops—aimed at improving the crescent kick speed of Api Sakti Indonesian Martial Art members in North Oba District, Tidore Islands City.

Keywords: plyometric training, crescent kick speed, Indonesian Martial Art

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Introduction

Pencak silat is a traditional martial art and one of Indonesia's ancestral cultural heritages. It has long been recognized as a form of self-defense. In ancient times, humans needed self-defense skills to survive in harsh environments and protect themselves against wild animals. Consequently, humans gradually developed various martial arts movements. These movements generally include kicks, punches, blocks, evasive techniques, and takedowns, each serving a specific function.

Today, pencak silat has developed rapidly, as evidenced by the increasing number of pencak silat schools and clubs across various regions of Indonesia. One of these is Api Sakti, a local pencak silat club located in North Maluku Province, particularly in North Oba District, Tidore Islands City.

Based on observations conducted by the researchers among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City, it was found that several athletes had participated in pencak silat championships at local, regional, and national levels. However, some athletes were unsuccessful in the selection process due to weaknesses in executing attacks using the crescent kick. Although their kicking techniques were technically almost perfect, their kicking speed remained inadequate. During selection competitions, Api Sakti athletes frequently failed because their crescent kicks were easily anticipated by opponents, allowing them to catch the kicks and launch counterattacks. In comparison with other kicking techniques, the crescent kick has several advantages, including its speed, practicality, and effectiveness in delivering a powerful impact upon contact with the target.

In this context, speed and accuracy in executing the crescent kick are crucial aspects of pencak silat competitions. The crescent kick is an essential technique because it not only demonstrates technical proficiency but also serves as an effective strategy for achieving victory. When the crescent kick is performed too slowly, the consequences can be serious, as opponents have opportunities to anticipate the movement and execute counterattacks, such as catching the kicking leg followed by throws, low sweeps, or scissor takedowns. Therefore, improving crescent kick speed has become a primary focus in efforts to enhance the competitive performance of Api Sakti pencak silat athletes in North Oba District.

Improving crescent kick speed requires appropriate and systematic training. Training is a structured process involving the gradual and progressive increase of physical workloads to improve athletic skills and physical fitness. Various training methods can be applied to enhance crescent kick speed, one of which is plyometric training.

Plyometric training is a physical training method that utilizes muscular strength and speed to develop explosive power. This training approach offers considerable potential for improving athletes' ability to execute crescent kicks effectively. Plyometric exercises are designed to enhance movement speed and muscular explosive power through specific exercises, including double-leg speed hops and single-leg hurdle hops. According to Chu and Myer (2013), plyometric training is one of the training methods that can contribute to the development of muscular strength and speed.

Plyometric training, commonly associated with jumping exercises, has become an important component of athletic training programs across various sports disciplines. However, its application in pencak silat, particularly in improving crescent kick speed, requires further investigation. Therefore, this study seeks to address this research gap by examining the extent to which plyometric training influences crescent kick speed among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City.

Based on the background described above, the researchers conducted a study entitled "The Effect of Plyometric Training on Crescent Kick Speed Among Members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City, Indonesia." This study focuses on examining the effects of plyometric training, particularly double-leg speed hops and single-leg hurdle hops, on the crescent kick speed of pencak silat athletes.

Research Problem

Based on the research background and the problems identified above, the research question is formulated as follows:

Does plyometric training have a significant effect on crescent kick speed among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City?

Research Objective

The objective of this study is to investigate the effect of plyometric training on crescent kick speed among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City. Specifically, the study aims to determine whether the implementation of plyometric exercises, including double-leg speed hops and single-leg hurdle hops, contributes to improvements in athletes' crescent kick speed.

Significance of the Study

The findings of this study are expected to provide both theoretical and practical benefits for various stakeholders, including coaches, athletes, researchers, and readers.

1. For Coaches

The findings of this study can serve as a reference and consideration for coaches in designing and implementing effective training programs to prepare pencak silat athletes for competitions. In particular, the results may provide useful insights into the application of plyometric training to improve crescent kick speed.

2. For Pencak Silat Athletes

This study is expected to provide athletes with valuable knowledge and practical guidance regarding appropriate training methods to maximize their technical skills and physical performance in pencak silat, particularly in executing faster and more effective crescent kicks.

3. For Researchers

This study is expected to enhance researchers' understanding of plyometric training methods and their potential benefits for improving athletic performance. Furthermore, it may contribute to the development of knowledge regarding the relationship between plyometric exercises and kicking speed in martial arts.

4. For Readers and Future Researchers

The findings of this study may serve as a reference for readers and future researchers interested in investigating plyometric training and crescent kick performance. Additionally, the study may provide a foundation for further research on training methods, physical conditioning, and performance enhancement in pencak silat.

Note: This English version has been refined into a formal academic writing style suitable for a scientific journal article while maintaining the original meaning, research context, and main arguments.

METHOD

A. Research Method and Design

Research Design

This study employed an experimental research method in which a specific treatment was administered to the research participants. The study adopted a one-group pretest–posttest design, in which participants underwent an initial assessment (pretest) before receiving the treatment, followed by a final assessment (posttest) after completing the intervention.

The treatment consisted of modified pencak silat crescent kick training through plyometric exercises, particularly double-leg speed hops and single-leg hurdle hops. The purpose of this design was to examine changes in participants' crescent kick speed before and after the training intervention.

The research design is illustrated as follows:

Figure 1. One-Group Pretest–Posttest Research Design

Where:

- T1: Pretest (initial assessment)
- X: Treatment (plyometric training intervention)
- T2: Posttest (final assessment)

B. Population and Sample

Population

According to Sugiyono (2018), a population refers to a generalization area consisting of objects or subjects with specific qualities and characteristics determined by researchers for investigation and subsequent conclusion drawing.

The population of this study consisted of 58 members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City, Indonesia.

Sample

Sugiyono (2018) defines a sample as a subset of a population that represents its characteristics.

The sampling technique employed in this study was non-probability sampling, specifically purposive sampling. This technique involves selecting participants based on predetermined criteria or specific considerations relevant to the research objectives (Sugiyono, 2018).

The research sample consisted of 10 male members of the Api Sakti Pencak Silat Club in North Oba District who met the selection criteria established for this study.

C. Research Variables

According to Sugiyono (2018), a research variable is an attribute, characteristic, or value associated with individuals, objects, or activities that exhibits variation and is determined by researchers for investigation and conclusion drawing.

This study involved two main variables:

Independent Variable (X): Plyometric training, consisting of two exercise variations: double-leg speed hops and single-leg hurdle hops.

Dependent Variable (Y): Crescent kick speed among members of the Api Sakti Pencak Silat Club in North Oba District.

The independent variable represented the training intervention, while the dependent variable represented the performance outcome measured before and after the intervention.

D. Research Instrument

Research instruments are measurement tools used to collect the data required to address research objectives. The quality and appropriateness of research instruments play an important role in determining the accuracy and reliability of the data obtained.

The instrument used in this study was a crescent kick speed test designed to measure the number of kicks performed within a specified period.

Data Collection Procedures

Data were collected by administering a crescent kick speed test to the participants. The test was conducted according to the following procedures:

1. Each participant stood behind a punching bag or designated target, with one supporting foot positioned behind a line adjusted according to the participant's kicking distance.
2. At the command "Go," the participant performed a crescent kick using the right leg and returned to the starting position by placing the kicking foot on the floor behind the designated line. The participant then continued performing as many right-leg crescent kicks as possible within 10 seconds. The same procedure was repeated using the left leg.
3. Each participant was allowed three trials, and the highest number of kicks completed within 10 seconds was recorded as the test score. The target height was set at 75 cm for female athletes and 100 cm for male athletes.

Scoring Criteria

The participants' performance was assessed based on the maximum number of crescent kicks successfully executed within 10 seconds.

Table 1. Crescent Kick Speed Assessment Criteria

Category	Female Athletes	Male Athletes
Very Good	>24	>25
Good	19–23	20–24
Fair	16–18	17–19
Poor	13–15	15–16
Very Poor	<12	<14

Source: Lubis and Wardoyo (2016).

E. Data Analysis Techniques

The data obtained from the pretest and posttest were analyzed quantitatively to determine whether there was a statistically significant difference in crescent kick speed

following the plyometric training intervention.
The hypothesis was tested using a paired-samples t-test. Before conducting the hypothesis test, preliminary statistical analyses were performed to examine the normality and homogeneity of the data.
Normality Test
The normality test was conducted to determine whether the research data followed a normal distribution.
The study described the use of the Lilliefors normality test and the one-sample Kolmogorov–Smirnov test with the assistance of IBM SPSS Statistics 25 for Windows.
The normality test was interpreted using a significance level of 0.05.
Homogeneity Test
The homogeneity test was conducted to determine whether the pretest and posttest scores exhibited homogeneous variances.
This analysis was intended to examine the consistency of variance between the two sets of measurements.
Hypothesis Testing
Hypothesis testing was conducted using a paired-samples t-test to compare the mean crescent kick speed scores obtained before and after the plyometric training intervention.
The statistical significance level was established at $\alpha = 0.05$, corresponding to a 95% confidence level.
The hypotheses were formulated as follows:
H_0 (Null Hypothesis): There is no statistically significant difference in crescent kick speed between the pretest and posttest measurements among members of the Api Sakti Pencak Silat Club.
H_1 (Alternative Hypothesis): There is a statistically significant difference in crescent kick speed between the pretest and posttest measurements among members of the Api Sakti Pencak Silat Club.

RESULTS AND DISCUSSION

A. Results
Descriptive Statistical Analysis
This section presents the findings concerning changes in crescent kick speed following plyometric training among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City.
The research involved 10 male pencak silat athletes who participated in the pretest and posttest assessments. The analysis focused on comparing their crescent kick speed before and after the implementation of plyometric training.
1. Pretest Results
The pretest was conducted to assess the participants' initial crescent kick speed before receiving the plyometric training intervention.
The results indicated that the highest pretest score was 15 kicks, while the lowest score was 11 kicks. The mean score was 13.80, with a median of 14.00, a mode of 14, and a standard deviation of 1.229.
Table 2. Descriptive Statistics of Pretest Crescent Kick Speed

Statistical Measure	Pretest
Valid N	10
Missing	0
Mean	13.80
Median	14.00
Mode	14
Standard Deviation	1.229
Minimum	11
Maximum	15
Sum	138

The descriptive statistical results indicate that participants' initial crescent kick performance was relatively low. The mean score of 13.80 kicks suggests that, on average, participants completed approximately 14 crescent kicks within the 10-second testing period.
To provide a clearer understanding of participants' performance, the pretest results were classified according to the established crescent kick speed assessment criteria.
Table 3. Frequency Distribution of Pretest Crescent Kick Speed

Performance Category	Frequency	Percentage
Very Good	0	0%
Good	0	0%
Fair	0	0%
Poor	3	30%
Very Poor	7	70%
Total	10	100%

Pretest Performance Distribution
Percentage of athletes in each performance category



Figure 2. Frequency Distribution of Pretest Crescent Kick Speed
Based on Table 3 and Figure 2, three participants (30%) were classified in the poor category, while seven participants (70%) were classified in the very poor category.
These findings demonstrate that all participants were initially classified in the two lowest performance categories. This condition indicates the need for an appropriate training intervention to improve their crescent kick speed.
2. Posttest Results
The posttest was conducted after participants completed the plyometric training intervention to evaluate changes in crescent kick speed.
The results showed that the highest posttest score was 18 kicks, while the lowest score was 13 kicks. The mean score was 16.10, with a median of 15.50, a mode of 14, and a standard deviation of approximately 2.51.
Table 4. Descriptive Statistics of Posttest Crescent Kick Speed

Statistical Measure	Posttest
Valid N	10
Missing	0
Mean	16.10
Median	15.50
Mode	14
Standard Deviation	2.51
Minimum	13
Maximum	18
Sum	161

The posttest results indicate an improvement in participants' crescent kick speed compared with their initial performance. The mean score increased from 13.80 kicks in the pretest to 16.10 kicks in the posttest.
This improvement suggests that participants demonstrated better kicking performance after completing the plyometric training program.

The posttest scores were subsequently classified according to the established assessment criteria.

Table 5. Frequency Distribution of Posttest Crescent Kick Speed

Performance Category	Frequency	Percentage
Very Good	0	0%
Good	0	0%
Fair	3	30%
Poor	4	40%
Very Poor	3	30%
Total	10	100%

Posttest Performance Distribution
Percentage of athletes in each performance category

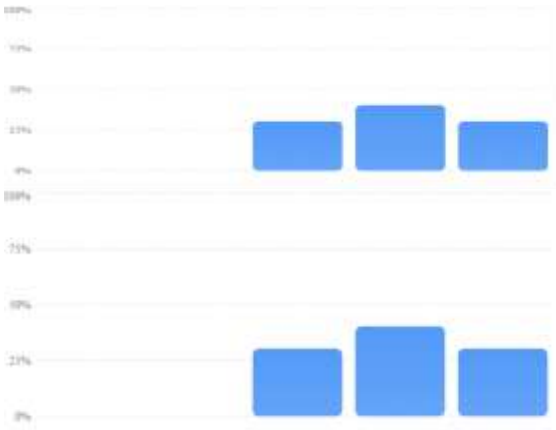


Figure 3. Frequency Distribution of Posttest Crescent Kick Speed

As presented in Table 5 and Figure 3, three participants (30%) were classified in the fair category, four participants (40%) were classified in the poor category, and three participants (30%) remained in the very poor category.

Compared with the pretest results, the proportion of participants in the very poor category decreased from 70% to 30%, while 30% of participants reached the fair category. These findings indicate an overall improvement in crescent kick performance following the implementation of plyometric training.

3. Comparison of Pretest and Posttest Results

A comparison of the pretest and posttest descriptive statistics was conducted to examine changes in crescent kick speed following the training intervention.

Table 6. Comparison of Pretest and Posttest Crescent Kick Speed

Statistical Measure	Pretest	Posttest
Number of Participants	10	10
Mean	13.80	16.10
Median	14.00	15.50
Minimum	11	13
Maximum	15	18
Standard Deviation	1.229	2.51

Mean Crescent Kick Speed Before and After Training
Number of kicks completed within 10 seconds

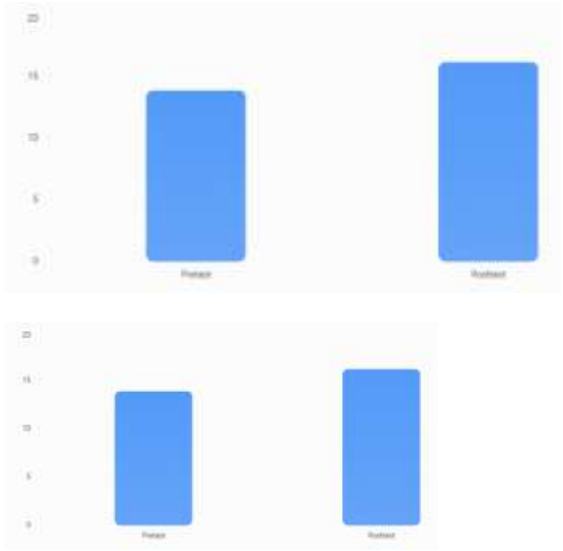


Figure 4. Comparison of Mean Pretest and Posttest Crescent Kick Speed

The comparison shows that the mean crescent kick speed increased by 2.30 kicks, representing an improvement of approximately 16.67% relative to the pretest mean.

This increase indicates a positive change in participants' crescent kick performance after the plyometric training intervention.

The increase in the mean score provides descriptive evidence of improved performance, although further inferential statistical analysis is required to determine whether the observed difference is statistically significant.

Important Notes for Manuscript Revision

Before submitting the article to an international journal, several details should be verified against the original research data:

1. Population discrepancy: The Methods section reports 58 club members, whereas the abstract in the uploaded manuscript reports 38. The correct population must be confirmed.
2. Assessment categories: The scoring ranges in Lubis and Wardoyo (2016), as reproduced in the manuscript, contain gaps at certain scores. The reported frequency classifications should be checked against the original scoring procedure.
3. Normality analysis: For a paired-samples t-test, the normality assumption concerns the distribution of paired differences, rather than requiring separate normality tests alone.
4. Homogeneity analysis: A homogeneity-of-variance test is generally not required for a paired-samples t-test because the measurements are obtained from the same participants.
5. Research design: Because the study did not include a control group, the findings can demonstrate changes associated with the training intervention but cannot conclusively establish that the intervention alone caused the improvement.

The remaining Results and Discussion sections can be developed using the original normality, homogeneity, and hypothesis-testing results, including the reported significance value of $p = 0.020$, followed by an interpretation of the findings and their implications for

pencak silat training.

4.1 Data Analysis Results

A. Normality Test Results

The normality test was conducted to determine whether the pretest and posttest data followed a normal distribution. In this study, the Kolmogorov–Smirnov normality test was employed to examine the distribution of crescent kick speed scores before and after the plyometric training intervention.

Table 7. Results of the Normality Test

Measurement	N	Significance Value	Significance Level	Interpretation
Pretest	10	0.127	0.05	Normal
Posttest	10	0.200	0.05	Normal

Based on the Kolmogorov–Smirnov normality test results presented in Table 7, the significance values for both the pretest and posttest were greater than 0.05. These findings indicate that neither distribution showed a statistically significant deviation from normality.

Therefore, the data were considered suitable for further parametric statistical analysis. Accordingly, a paired-samples t-test was selected to examine differences in crescent kick speed before and after the implementation of the plyometric training program.

B. Homogeneity Test Results

The homogeneity test was conducted to determine whether the pretest and posttest measurements exhibited homogeneous variances. The test was interpreted by comparing the calculated F-value (F-count) with the critical F-value (F-table).

According to the criteria applied in the original analysis, if the calculated F-value exceeded the critical F-value, the variances were considered heterogeneous. Conversely, if the calculated F-value was lower than the critical F-value, the variances were considered homogeneous.

Table 8. Results of the Homogeneity Test

Measurement	N	F-count	F-table	Interpretation
Pretest and Posttest	10	0.300	5.591	Homogeneous

The results presented in Table 8 indicate that the calculated F-value was 0.300, which was lower than the critical F-value of 5.591.

Based on the original testing criteria, the pretest and posttest data were therefore classified as having homogeneous variances.

C. Hypothesis Testing Results

Hypothesis testing was performed using a paired-samples t-test to determine whether there was a statistically significant difference between participants' crescent kick speed scores before and after the plyometric training intervention.

The analysis was conducted at a significance level of 0.05.

Table 9. Results of the Paired-Samples t-Test

Statistical Indicator	Result
Number of Participants	10
Pretest Mean	13.80
Posttest Mean	16.10
Mean Difference (Posttest − Pretest)	2.30
Calculated t-value	2.815
Reported Critical t-value	1.833
Significance (2-tailed)	0.020
Significance Level	0.05
Statistical Decision	Reject H_0

Based on the paired-samples t-test results, the significance value was 0.020, which was lower than the predetermined significance level of 0.05. This indicates a statistically significant difference between the pretest and posttest crescent kick speed scores.

Furthermore, the calculated t-value of 2.815 exceeded the reported critical t-value of 1.833, supporting the statistical decision to reject the null hypothesis.

The descriptive statistical results also demonstrated an increase in the mean crescent kick speed score from 13.80 in the pretest to 16.10 in the posttest, representing an improvement of 2.30 kicks or approximately 16.67%.

These findings suggest that participants demonstrated significantly improved crescent kick performance following the implementation of plyometric training.

Therefore, the results support the alternative hypothesis that crescent kick speed differed significantly between the pretest and posttest measurements among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City.

4.2 Discussion

Pencak silat is a traditional Indonesian martial art that incorporates various offensive and defensive techniques. One of the essential techniques that athletes must master is the crescent kick. This technique involves a curved kicking movement that follows a semicircular trajectory toward the opponent, typically making contact with the upper surface of the foot. The crescent kick is widely used in pencak silat competitions because of its effectiveness in delivering attacks and creating opportunities to score points.

The successful execution of a crescent kick depends on several physical and technical components, including muscular strength, explosive power, flexibility, coordination, accuracy, and movement speed. Among these components, kicking speed plays an important role because it determines how quickly an athlete can execute an attack before the opponent has sufficient time to anticipate or counter the movement.

Plyometric training is a physical conditioning method designed to enhance muscular explosive power through rapid muscle stretching and contraction. This training method emphasizes the development of strength and speed, particularly in the lower extremities, which are essential for performing powerful and rapid kicking movements.

In this study, the plyometric training intervention consisted of two exercise variations: double-leg speed hops and single-leg hurdle hops. Double-leg speed hops involve repeated explosive jumping movements using both legs, whereas single-leg hurdle hops involve jumping over obstacles using one leg. Both exercises are intended to develop lower-limb explosive power, neuromuscular coordination, and movement efficiency.

Theoretically, plyometric training can enhance the ability of the lower-limb muscles to generate force rapidly. This adaptation may contribute to improved kicking performance by allowing athletes to execute movements more quickly and efficiently. As explained by Chu and Myer (2013), plyometric exercises are designed to improve athletic performance by developing the interaction between muscular strength and speed.

The findings of the present study demonstrated a statistically significant improvement in crescent kick speed following the implementation of plyometric training among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City.

The statistical analysis revealed a reported two-tailed significance value of 0.020, which was lower than the significance threshold of 0.05. In addition, the calculated t-value of 2.815 was greater than the reported critical t-value of 1.833. These results indicate a statistically significant difference between participants' pretest and posttest performance.

The descriptive statistical analysis further supported these findings. Before the intervention, the participants achieved an average crescent kick speed score of 13.80 kicks within 10 seconds. Following the plyometric training intervention, the average score increased to 16.10 kicks within the same testing period.

This improvement of 2.30 kicks represents an increase of approximately 16.67% compared with the initial performance level. The results suggest that the training program was associated with positive changes in the participants' ability to execute crescent kicks rapidly.

Furthermore, the frequency distribution of performance categories demonstrated improvements following the training intervention. During the pretest, 70% of participants were classified in the very poor category, while the remaining 30% were classified in the poor category. Following the intervention, the proportion of participants in the very poor category decreased to 30%, while 40% were classified in the poor category and 30% achieved the fair category.

These changes indicate that several participants demonstrated improvements in their kicking performance classifications after completing the plyometric training program.

The findings are consistent with the theoretical principles of plyometric training, which emphasize the development of explosive muscular contractions and rapid movement execution. The exercises implemented in this study may have contributed to improvements in lower-limb power and neuromuscular coordination, thereby supporting faster crescent kick execution.

In practical terms, the findings suggest that plyometric exercises such as double-leg speed hops and single-leg hurdle hops may be incorporated into pencak silat training programs to support the development of kicking speed. Coaches may consider integrating these exercises into structured physical conditioning sessions alongside technical kicking practice.

However, the effectiveness of plyometric training may depend on several factors, including training intensity, frequency, duration, exercise progression, individual physical condition, and athletes' previous training experience. Therefore, training programs should be designed systematically and adjusted to athletes' physical capabilities and competitive requirements.

It is also important to acknowledge that this study employed a one-group pretest–posttest design involving only 10 male participants. Because no control group was included, the observed improvements cannot be attributed exclusively to the plyometric training intervention. Other factors, such as repeated testing, technical practice, and natural performance variation, may also have contributed to the changes.

Despite these limitations, the study provides preliminary empirical evidence that plyometric training is associated with improvements in crescent kick speed among pencak silat athletes.

Overall, the findings highlight the potential value of incorporating structured plyometric exercises into pencak silat conditioning programs. Regular, progressive, and appropriately supervised training may contribute to improved lower-limb explosive power and faster kicking movements, thereby supporting the development of athletes' technical and physical performance.

CONCLUSION

Based on the findings and discussion, this study concludes that crescent kick speed improved significantly following the implementation of plyometric training among members of the Api Sakti Pencak Silat Club in North Oba District, Tidore Islands City, Indonesia. The paired-samples t-test revealed a statistically significant difference between pretest and posttest scores, with a reported significance value of 0.020 ($p < 0.05$) and a calculated t-value of 2.815. These findings indicate that participants demonstrated measurable improvements in crescent kick performance after completing the training intervention.

The descriptive statistical results showed that the mean crescent kick speed increased from 13.80 kicks in the pretest to 16.10 kicks in the posttest, representing an average improvement of 2.30 kicks or approximately 16.67%. This improvement was observed following the implementation of plyometric exercises consisting of double-leg speed hops and single-leg hurdle hops. The findings suggest that these exercises may support the development of lower-limb explosive power, movement coordination, and kicking speed, which are essential components of effective pencak silat performance.

In conclusion, plyometric training can be considered a potentially beneficial component of physical conditioning programs for pencak silat athletes, particularly for improving crescent kick speed. Coaches are encouraged to implement structured, progressive, and regularly supervised training programs to optimize athletes' physical and technical development. Nevertheless, because this study involved a relatively small sample and employed a one-group pretest–posttest design without a control group, further research involving larger samples, control groups,

and longer intervention periods is recommended to establish stronger evidence regarding the effectiveness of plyometric training on crescent kick performance.

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Curriculum Vitae

Profil singkat berupa narasi data kelahiran; pendidikan dari jenjang sarjana sampai pendidikan terakhir yang berisi prodi, dan tahun kelulusan serta pekerjaan/aktivitas yang dilakukan sampai saat ini.