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Implementing the Hollow Sprint Training Method to Increase 100 Meter Running Speed

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Abstract. This research method uses a quantitative approach with a quasi-experimental design in the form of a one-group pretest and posttest design. The sample used was 40 students of the Faculty of Sport and Health Sciences (FIKK) of Makassar State University (UNM) who participated in this study. The research procedure began with the implementation of a pretest, namely measuring the 100-meter running speed of each participant using a stopwatch as the main measurement instrument. The pretest aims to determine the initial running speed ability before being given the Hollow Sprint training treatment. After that, all participants participated in the Hollow Sprint training program carried out for a certain period, for example 12 meetings or according to the research needs. Based on the results of the paired sample t-test on the data on the 100-meter running speed ability of students of the PJKR FIKK UNM Study Program, it was obtained that the average value (mean) of the pre-test result was 15.42 seconds, while the average post-test result was 13.47 seconds. There was an average difference (mean difference) of 1.96 seconds, which indicates an increase in running speed ability after students participated in the training program or treatment given. Based on the data analysis, it can be concluded that there was a significant increase in the 100-meter sprint speed of students at the Physical Education and Sports Faculty (FIKK) of Universitas Negeri Makassar (UNM) after being given the Hollow Sprint training program.

Keywords: Method, Training, Hollow Sprint, 100-meter Run

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1 Introduction

The background of this research is based on the importance of developing sprint speed abilities in athletes, particularly in the 100-meter sprint, one of the most popular and frequently contested sprint events. Running speed is a vital aspect that significantly determines athlete performance in this event, particularly at the student level at the Faculty of Sport and Health Sciences (FIKK) at Makassar State University (UNM). According to Bompa, T.O. & Buzzichielli, (2019), speed is a key biomotor component that determines sprint performance. Increasing speed requires a combination of technique, strength, and high-intensity interval training.

The Hollow Sprint training method is a sprint training method with intervals designed to effectively increase leg muscle speed and endurance. According to Setiawan & Nurhayati (2020), interval sprint training can significantly improve leg muscle speed and efficiency compared to conventional, monotonous sprint training. This training combines alternating high-intensity sprints with specific rest periods, thus maximizing 100-meter sprint performance (Ferrerra et al., 2018). High-intensity sprint training, such as Hollow Sprints, can increase anaerobic capacity and muscle mechanical efficiency, contributing to increased explosive power and maximum speed in the 100-meter sprint (Harsono, 2015). This training combines alternating high-intensity sprints with specific rest periods, thus maximizing 100-meter sprint performance. High-intensity sprint training, such as Hollow Sprints, can increase anaerobic capacity and muscle mechanical efficiency, contributing to increased explosive power and maximum speed in the 100-meter sprint. This is especially important for university students, as young athletes are still developing their performance.

The implementation of the Hollow Sprint method among FIKK UNM students is highly relevant because this training can be performed with relatively limited facilities and time, yet still provides optimal effects on improving sprint performance. According to Syaifullah (2021), variations in interval training methods can significantly increase athletes' motivation and physiological adaptation. Furthermore, this training approach adapts the principles of interval training to suit the intensity and volume requirements of sprint runners (Sugiyanto, 2015). Furthermore, this training approach adapts the principles of interval training to suit the intensity and volume requirements of sprint runners.

A common problem in sprint training is the lack of method variation that maintains motivation and efficiently develops speed abilities. Therefore, this study seeks to demonstrate the effectiveness of the Hollow Sprint training method, which has not been widely applied specifically to FIKK UNM students.

The Hollow Sprint method also places significant emphasis on recovery between training sessions, thus minimizing the risk of injury, unlike sprint repetition training, which tends to be monotonous and carries a high risk if performed excessively without adequate rest. This research is crucial for contributing to the body of knowledge about effective athletic training methods, particularly for physical education and athletics professionals in higher education, so that it can serve as a reference in 100-meter sprint speed training programs. In addition to the speed aspect, Hollow Sprint training has the potential to improve other supporting physical

characteristics such as muscle endurance, motor coordination, and agility which are also very much needed in sprint sports and other physical activities in students (Sukadiyanto, & Muluk, 2011).

In addition to speed, Hollow Sprint training has the potential to improve other supporting physical characteristics such as muscle endurance, motor coordination, and agility, which are also essential for sprinting and other physical activities in university students. This research is also expected to provide practical recommendations to sports instructors and coaches at the Faculty of Sport and Community Service (FIKK) at UNM regarding the implementation of the Hollow Sprint training method as part of the training curriculum, which can improve students' sprint performance.

Overall, the implementation of the Hollow Sprint training method has a strong theoretical basis and empirical evidence for improving 100-meter sprint speed in student athletics, making this research highly relevant and strategic for the development of physical education at UNM.

2 Method

This research method employed a quantitative approach with a quasi-experimental design consisting of a one-group pretest and posttest. The sample size was 40 students from the Faculty of Sport and Health Sciences (FIKK) at Makassar State University (UNM). The research procedure began with a pretest, measuring each participant's 100-meter running speed using a stopwatch as the primary measurement instrument. The pretest aimed to determine their initial running speed before receiving the Hollow Sprint training. According to Sugiyono (2019), quantitative research is used to test hypotheses and analyze causal relationships between variables through numerical data processed using statistical methods. All participants then participated in the Hollow Sprint training program for a specified period, for example, 12 sessions, or as needed.

Following the training period, a posttest was conducted, re-measuring their 100-meter running speed using the same method as the pretest. Pretest and posttest running speed data were then analyzed using a paired sample t-test to determine whether there was a significant increase in students' running speed after participating in the Hollow Sprint training. The tools used in this study included a stopwatch, a marked 100-meter running track, and supporting facilities for Hollow Sprint training. All training sessions were conducted at predetermined locations and times to maintain consistent training conditions.

Data analysis was performed using the latest version of SPSS statistical software, comparing pretest and posttest running speed values to determine the effects of Hollow Sprint training. The results of this study are expected to provide empirical evidence regarding the effectiveness of the Hollow Sprint training method in improving 100-meter running speed in FIKK UNM students.

This one-group pretest-posttest design was chosen because it involved only one sample group, making it more practical to implement. It also allowed the study to focus on the effect of the training method on running speed without a control group. This method allows the study to describe changes in running speed directly resulting from Hollow Sprint training, making it

highly suitable for testing hypotheses about the training's effects on a sample of UNM athletic students. This one-group pretest-posttest design was deemed appropriate because it focused on performance changes resulting from a specific treatment without the intervention of external factors. According to Bompa & Buzzichielli (2019), pre- and post-training measurements are crucial for evaluating adaptation. physiological and performance progress of athletes in relation to the training program implemented.

3 Result

The results of this study consist of descriptive tests, normality tests, and hypothesis tests. The results are as follows:

Table 1. Descriptive Test Results

Data	PRE-TEST	POST-TEST
Mean	15.4200	13.4575
Median	15.4000	13.4000
Std. Deviation	.45373	.42616
Minimum	14.60	12.80
Maximum	16.20	14.20

Based on the results of a descriptive test of the 100-meter sprint speed of students in the Physical Education and Sports Sciences (PJKR) program at the Faculty of Public Health, Universitas Negeri Malang (FIKK), the average pre-test score was 15.4200 seconds, while the post-test score decreased to 13.4575 seconds. This decrease in the average score indicates an increase in sprint speed after the treatment or training program. Furthermore, the median score in the pre-test was 15.4000 seconds, which decreased to 13.4000 seconds in the post-test, indicating that most students experienced a relatively uniform increase in performance after the intervention.

In terms of standard deviation, the pre-test score was 0.45373 and the post-test score was 0.42616, indicating relatively little variation in ability between students both before and after training. However, the slight decrease in the standard deviation in the post-test indicates that the results after training have become more homogeneous, or in other words, that students' ability to achieve optimal speed has become more consistent.

The minimum and maximum values also support these findings, with the fastest time in the pre-test being 14.60 seconds and increasing to 12.80 seconds in the post-test, while the slowest time decreased from 16.20 seconds to 14.20 seconds. This indicates that not only did the average ability improve, but the overall running time range also improved. Therefore, descriptively, it can be concluded that there was a significant increase in students' 100-meter running speed after participating in the training program, as indicated by a decrease in the average and median times, as well as a narrowing of the range and variation of results.

Tabel 2. Hasil Uji Normalitas

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Data	Statistic	df	Sig.	Statistic	df	Sig.
PRE-TEST	.124	40	.124	.957	40	.137
POST-TEST	.099	40	.200*	.948	40	.067

Based on the results of normality tests using the Kolmogorov-Smirnov and Shapiro-Wilk methods on the 100-meter sprint speed data of students in the Physical Education and Training Program at the Faculty of Public Health, Universitas Muhammadiyah Malang (FIKK), the significance value (Sig.) for the pre-test data was 0.124 for the Kolmogorov-Smirnov test and 0.137 for the Shapiro-Wilk test. Meanwhile, the significance value for the post-test data was 0.200 for the Kolmogorov-Smirnov test and 0.067 for the Shapiro-Wilk test. Since all significance values were greater than the $\alpha = 0.05$ threshold, it can be concluded that both the pre-test and post-test data were normally distributed.

Thus, the results of the normality test indicate that the 100-meter sprint speed data before and after treatment met the assumption of a normal distribution. This indicates that the data are relatively evenly distributed and there are no significant deviations from the normal distribution. Therefore, the data are suitable for further analysis using parametric statistical tests, such as the paired sample t-test. In general, these results also show that student performance both before and after the intervention was in a reasonable and consistent distribution pattern between individuals.

Tabel 3. Hypothesis Test Results

Data	N	Mean	Selisih Mean	Sig.
Pre Test	40	15,42	1,96	0,000
Post Test		13,47		

Based on the results of a paired sample t-test on the 100-meter sprint speed data of students in the Physical Education and Sports Sciences (PJKR) program at the Faculty of Public Health, Universitas Negeri Malang (FIKK), the average pre-test score was 15.42 seconds, while the average post-test score was 13.47 seconds. There was a mean difference of 1.96 seconds, indicating an increase in sprint speed after the students participated in the training program or treatment. A significance value (Sig.) of 0.000, which is less than the α limit of 0.05, indicates that the difference between the pre-test and post-test results is statistically significant.

In other words, there was a significant effect of the training program or intervention on improving the students' sprint speed. These results indicate that the training significantly reduced the 100-meter sprint time, resulting in measurable improvements in the students' physical performance. Overall, it can be concluded that the training activities were effective in improving the 100-meter sprint speed of students in the Physical Education and Sports Sciences (PJKR) program at the Faculty of Public Health, Universitas Negeri Malang (FIKK).

4 Discussion

The Hollow Sprint training method has been proven to significantly improve the 100-meter sprint performance of students in the Physical Education, Health, and Recreation (PJKR) Study Program at the Faculty of Health and Recreation (FIKK) at Universitas Negeri Malang (UNM). This training focuses on a high-intensity sprint pattern separated by active rest periods such as jogging or walking, thereby simultaneously training endurance and speed. This is crucial for sprinters who require maximum bursts of speed in a short period of time.

The results showed an average increase in running speed of up to 1.95 seconds after implementing the Hollow Sprint method. This time difference indicates that the training is effective in improving student performance, which can be explained by the increased ability of leg muscles to generate the maximum explosive power required in the 100-meter dash.

Physiologically, the Hollow Sprint method increases anaerobic energy capacity and neuromuscular system efficiency. This means the muscles and nervous system work more efficiently in producing explosive power with sufficient recovery during training intervals, allowing for maximum running speed when sprinting again. Structured training using the Hollow Sprint method also helps improve students' running technique. By practicing sprints with an empty phase of jogging or walking, students can effectively control their speed technique without excessive fatigue, thus minimizing the risk of injury.

This study aligns with other research showing that interval sprint training, such as Hollow Sprints, is more effective in developing speed and muscular endurance than traditional repetitive sprint training methods. The uniqueness of Hollow Sprints lies in the active recovery phase, which maintains optimal athlete performance throughout the training session. In addition to quantitative speed improvements, this training method also contributes to fostering motivation and training consistency in students. Due to the varied and intense training structure, participants tend to be more challenged and motivated, unlike monotonous sprint training, which often leads to boredom.

This performance improvement is highly relevant for FIKK UNM students who are academically and practically studying sports. They gain not only theory but also hands-on experience through Hollow Sprint training, which can be applied to athletic learning and development activities on campus. Hollow Sprint training also aligns with modern training principles that emphasize variation, controlled intensity, and active recovery, resulting in optimal results without excessive physical stress. This makes it an appropriate method for students who must manage their time between lectures and training.

Overall, the Hollow Sprint training method significantly improved the 100-meter sprint speed of students at the Physical Education and Training Faculty of the University of Muhammadiyah Malang (FIKK) in the Physical, Technical, and Psychological Sciences (PJKR) Study Program, making it a suitable training method for sprint athlete development programs at this university.

5 Conclusion

Based on the results of the data analysis that has been carried out, it can be concluded that there was a significant increase in the 100-meter running speed ability of students of the

PJKR Study Program, FIKK UNM after being given the Hollow Sprint method training program.

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