

Tes Kecepatan dan Performa dalam Bola Tangan Unimed

Speed Test Performance In Unimed Handball

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Abstract

This study aims to analyze and compare the speed performance of handball athletes and non-athletes at Universitas Negeri Medan (UNIMED). Speed is a fundamental component influencing both offensive and defensive performance in handball. This research used a quantitative comparative approach. The subjects consisted of 10 participants, including 6 athletes and 4 non-athletes from the UNIMED Handball Club. The instrument used was a 20-meter sprint test. Data were analyzed using descriptive statistics and an independent sample t-test ($\alpha = 0.05$). The results showed that the average sprint time was 3.31 seconds, with the fastest time of 2.98 seconds and the slowest time of 3.70 seconds. Athletes demonstrated a faster average time (3.09 seconds) compared to non-athletes (3.63 seconds). The t-test result showed a significant difference between groups, $t(8) = -6.12, p < 0.05$. It can be concluded that there is a statistically significant difference in speed between athletes and non-athletes, indicating the importance of structured training in improving overall athletic ability

Keywords: Speed, Handball, Sprint Test, Physical Condition, Athletes

1 Introduction

Handball is a sport that requires a combination of physical, technical, tactical, and mental abilities. In its implementation, players are required to demonstrate high movement speed, both in attacking and defensive situations (Cetin & Ozdol, 2012; Cezar et al., 2013). Speed is one of the most important physical components because it is directly related to sprinting ability, changes of direction, and reaction time in dynamic game situations (Hermassi et al., 2020).

Speed performance plays a crucial role in determining success in handball, especially during fast-break situations, defensive transitions, and offensive movements. Players with better speed ability can create more scoring opportunities and perform more effective defensive recovery. Therefore, speed is considered a key determinant of overall performance in handball.

Speed performance is influenced by several factors, including training intensity, neuromuscular coordination, muscle strength, and athlete experience. Athletes who undergo structured and

continuous training programs tend to demonstrate better physiological adaptations compared to untrained individuals. These adaptations include improved muscle fiber recruitment, enhanced anaerobic capacity, and more efficient movement patterns (Pereira et al., 2021).

Universitas Negeri Medan (UNIMED) actively supports sports development, including handball. However, evaluation of athletes' physical condition, particularly speed performance, is still necessary to improve training effectiveness. Objective measurement through sprint testing can provide valuable data for coaches in designing appropriate and effective training programs.

Although many studies have examined speed performance, most focus on elite or professional athletes. Research comparing athletes and non-athletes at the university level, especially in Indonesia, is still limited. This gap highlights the need for further investigation to better understand performance differences in developing athletes.

Therefore, this study aims to analyze and compare the speed performance between athletes and non-athletes in the UNIMED Handball Club. It is hypothesized that athletes have significantly better speed performance than non-athletes due to regular and structured training.

2 Method

This study used a quantitative comparative research design to examine differences in speed performance between athletes and non-athletes.

The participants consisted of 10 individuals aged between 18 and 23 years from the UNIMED Handball Club. The sample included 6 athletes and 4 non-athletes selected using purposive sampling. Athletes were defined as individuals who actively participated in structured and regular handball training programs, while non-athletes had no regular training experience.

Speed performance was measured using a 20-meter sprint test, which is widely used in sports performance assessment and is relevant to handball due to its similarity to fast-break situations. The test was conducted on a flat and non-slippery surface under controlled environmental conditions to ensure consistency.

Before testing, all participants performed a standardized 15-minute warm-up. Each participant completed three sprint trials with a rest interval of 2–3 minutes between trials to minimize fatigue effects. The best time from the three trials was recorded as the final score.

Data analysis was conducted using descriptive statistics, including mean, minimum, maximum, and standard deviation. Prior to hypothesis testing, prerequisite tests were performed. The normality test was conducted using the

Shapiro-Wilk test, and the homogeneity test was conducted using Levene's test.

The results of the normality and homogeneity tests showed significance values greater than 0.05 ($p > 0.05$), indicating that the data were normally distributed and homogeneous. Therefore, the assumptions for parametric testing were met, and the independent sample t-test was used to determine differences between the two groups with a significance level of 0.05.

3 Result

Participant Characteristics

The participants in this study consisted of 10 individuals aged between 18 and 23 years. The sample included 7 females and 3 males. Based on training status, 6 participants were classified as athletes and 4 as non-athletes. Athletes were individuals who actively participated in structured and regular handball training programs, while non-athletes did not engage in structured training. These characteristics indicate that the sample represents a comparison between trained and untrained individuals within the same institutional environment. The characteristics of participants are presented in Table 2.1

Tabel 2.1 Participant Characteristics

No	Name	Gender	Age	Status
1	Putri	Female	21	Athlete

2	Kenzi	Female	18	Non-athlete
3	Dianta	Female	21	Athlete
4	Rini	Female	21	Athlete
5	Marsel	Female	20	Athlete
6	Patra	Male	22	Athlete
7	Ivan	Male	21	Athlete
8	Ika	Female	23	Non-athlete
9	Rosima	Female	21	Non-athlete
10	Juan	Male	22	Non-athlete

Sprint Test Results

The results showed that the overall average sprint time was 3.31 seconds, with the fastest time of 2.98 seconds and the slowest time of 3.70 seconds. The standard deviation of 0.29 indicates relatively homogeneous data. When grouped, athletes had an average sprint time of 3.09 seconds, while non-athletes recorded 3.63 seconds. This indicates that athletes tend to have better speed performance. The sprint performance data of participants are presented in Table 2.2

Table 2.2 Sprint Performance Results of Participant

No	Name	Gender	Age	Status	Sprint
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					Time (s)
1	Putri	Female	21	Athlete	3.20
2	Kenzi	Female	18	Non-athlete	3.65
3	Dianta	Female	21	Athlete	3.15
4	Rini	Female	21	Athlete	3.18
5	Marsel	Female	20	Athlete	2.98
6	Patra	Male	22	Athlete	3.05
7	Ivan	Male	21	Athlete	3.00
8	Ika	Female	23	Non-athlete	3.70
9	Rosima	Female	21	Non-athlete	3.60
10	Juan	Male	22	Non-athlete	3.55

Descriptive Statistics

The descriptive statistics showed that the overall mean sprint time of the participants was 3.31 seconds. The fastest

recorded time was 2.98 seconds, while the slowest time was 3.70 seconds. The standard deviation of 0.29 indicates that the data variation among participants was relatively low.

The descriptive statistics based on group classification are presented in Table 2.3. The table shows that athletes have lower mean sprint time compared to non-athletes, indicating better speed performance.

Table 2.3 Descriptive Statistics by Group

Group	N	Mean (s)	Min (s)	Max (s)	Std. Deviation
Athletes	6	3.09	2.98	3.20	0.09
Non-athletes	4	3.63	3.55	3.70	0.06

Normality Test

The results of the Shapiro-Wilk normality test showed that the significance value for the athlete group was 0.296 and for the non-athlete group was 0.972. Both values were greater than the significance level of 0.05 ($p > 0.05$), indicating that the data in both groups were normally distributed. Therefore, the assumption of normality for parametric testing was satisfied. The

results of the normality test are presented in Table 2.4.

Table 2.4 Normality Test (Shapiro-Wilk)

Group	N	Sig. Value	Significance Level	Interpretation
Athletes	6	0.296	0.05	Normally Distributed
Non-athletes	4	0.972	0.05	Normally Distributed

Homogeneity Test

The results of Levene's test showed a significance value of 0.105, which is greater than 0.05 ($p > 0.05$). This indicates that the variance between the athlete and non-athlete groups is homogeneous. Therefore, the assumption of homogeneity of variance was met, allowing further analysis using the independent sample t-test. The homogeneity test results are presented in Table 2.5.

Table 5. Homogeneity Test (Levene's Test)

Variable	Levene Statistic	df1	df2	Sig. Value	Interpretation
Sprint Time	3.351	1	8	0.105	Homogeneous Variance

Sprint Time	3.351	1	8	0.105	Homogeneous Variance
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Statistical Analysis

The results of the independent sample t-test showed a t-value of -6.12 with a significance value of 0.000 ($p < 0.05$). This indicates that there is a statistically significant difference in sprint performance between athletes and non-athletes.

Variable	t-value	df	Sig. (2-tailed)	Interpretation
Sprint Time	-6.12	8	0.000	Significant Difference ($p < 0.05$)

In outlining the result, one should only describe research results of data acquired in the research or field observation and data analysis interpretation. This section is outlined without providing discussion and should be written in logical sentences. The result is applicable in the form of a table, text, or figure.

4 Discussion

The results of this study indicate a significant difference in speed performance between athletes and non-athletes. Athletes demonstrated faster

sprint times compared to non-athletes, indicating superior speed ability.

This difference can be explained by physiological adaptations resulting from regular and structured training. Athletes tend to develop better neuromuscular coordination, increased fast-twitch muscle fiber activation, and improved anaerobic energy systems. These adaptations contribute to enhanced sprint performance and overall physical capacity.

In addition, the difference in sprint performance can also be associated with neuromuscular efficiency. Athletes who undergo regular training tend to have better motor unit recruitment and faster muscle contraction, which directly contribute to sprint ability. These factors allow athletes to generate greater force in a shorter time, resulting in improved acceleration and sprint performance.

Speed is a fundamental component in handball, particularly in fast-break situations where players must transition quickly from defense to offense. Athletes with better speed ability are more effective in creating scoring opportunities and performing defensive recovery. Therefore, speed development is an essential aspect of training in handball.

In the context of handball performance, sprint speed is particularly important during short-distance acceleration, especially in fast-break situations and defensive transitions. This makes speed not only a physical component but also a tactical advantage in the game, as players

who are faster can respond more effectively to dynamic game situations.

The findings of this study are consistent with previous research, which indicates that trained athletes generally demonstrate superior physical performance compared to untrained individuals (Hermassi et al., 2020; Pereira et al., 2021). Regular training improves both physiological and biomechanical aspects, leading to better sprint performance.

Furthermore, structured training programs allow athletes to develop more efficient movement patterns and running mechanics. This results in improved performance efficiency and reduced sprint time. In addition, training specificity plays an important role, where exercises designed to mimic game situations can enhance the transfer of training effects into actual performance.

From a practical perspective, these findings suggest that coaches should pay more attention to speed training programs. Training methods such as sprint drills, plyometric exercises, and neuromuscular training can be implemented to improve speed performance in handball athletes. These training approaches are effective in increasing explosive power and acceleration ability.

However, this study has several limitations. The sample size was relatively small, which may limit the generalizability of the findings. Additionally, this study only focused on speed performance without considering

other physical components such as strength, agility, and endurance.

Therefore, future research is recommended to involve larger sample sizes and include additional variables to obtain a more comprehensive understanding of physical performance in handball athletes. Further studies may also explore the relationship between speed and other performance components in handball to provide deeper insights into athlete development.

5 Conclusion

This study concludes that there is a significant difference in speed performance between athletes and non-athletes in the UNIMED Handball Club. Athletes demonstrated better sprint performance compared to non-athletes.

These findings highlight the importance of structured and continuous training programs in improving athletic performance. The results can be used as a reference for coaches in designing effective training programs, particularly in developing speed ability.

Future studies are recommended to involve larger samples and additional physical performance variables to strengthen the findings.

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