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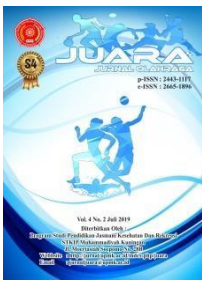

BODY COMPOSITION ON FINSWIMMING ATHLETES: CORRELATION ANALYSIS

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Abstract

This study aims to analyze the body composition of athletes from the West Java finswimming team and to explore the correlations between various body composition metrics. The sample comprises 8 athletes whose body composition was assessed using Tanita Body Composition DC-360S. Key metrics evaluated include weight, fat mass (FATMASS), fat-free mass (FFM), muscle mass (MUSCLEMASS), total body water (TBW), and bone mass (BONEMASS).

Correlation analysis demonstrates significant positive relationships between weight and other body composition metrics, particularly fat-free mass (Pearson correlation = 0.966, $p < 0.001$), muscle mass (Pearson correlation = 0.964, $p < 0.001$), total body water (Pearson correlation = 0.973, $p < 0.001$), and bone mass (Pearson correlation = 0.994, $p < 0.001$). These findings underscore the interconnected nature of body composition variables and their potential impact on athletic performance.

The study provides valuable insights into the body composition profiles of finswimmers, which can inform tailored training and nutritional strategies to enhance athletic performance. Future research should focus on longitudinal studies to assess the effects of specific interventions on these metrics over time.

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INTRODUCTION

The study of body composition is crucial in the field of sports science as it provides essential insights into the physical characteristics that influence athletic performance. Body composition refers to the proportion of fat mass, muscle mass, bone mass, and total body water within an individual's body (Sudari et al., 2023). Accurate assessment and analysis of these components are fundamental for developing effective training and nutritional strategies tailored to the needs of athletes (Castillo et al., 2022).

Finswimming is a sport that combines speed and agility with the use of fins, requires athletes to have an optimal body composition to maximize their performance (Sellés-Pérez et al., 2023). Previous research has demonstrated that specific body composition profiles are associated with enhanced performance in various sports, including swimming (Marion et al., 2010). For finswimmers, maintaining a lower fat mass and higher muscle mass is particularly beneficial as it contributes to better buoyancy and propulsion in the water (Gautier et al., 2004).

The current study focuses on the West Java finswimming team, which represents a significant group of competitive athletes in Indonesia.

Despite the growing popularity of finswimming, there is a lack of comprehensive data on the body composition profiles of these athletes (Fernando et al., 2019). Body composition is one of the dominant factors for the emergence of critical illness is the lack of exercise and physical activity (Ita et al., 2022). Coaches need this data so that the training program is right on target for their athletes (Haryanto et al., 2021). This study aims to fill this gap by providing detailed descriptive statistics of key body composition metrics, including weight, fat mass, fat-free mass, muscle mass, total body water, and bone mass.

Additionally, the study explores the correlations between these metrics to understand their interrelationships and potential implications for training and performance (Menargues-Ramírez et al., 2022). By identifying these correlations, coaches and sports scientists can better tailor their training programs to enhance specific aspects of body composition that are most beneficial for finswimming performance (Oshita et al., 2013).

Finswimming is a unique aquatic sport that requires a combination of strength, endurance, and flexibility (Asrianti et al., 2023). Understanding the relationship between body composition and finswimming performance can provide valuable insights for athletes and coaches (Rizkia et al., 2021). This study aims to investigate the correlation between body composition and finswimming

performance in elite finswimming athletes.

METHOD

To understand the body composition of athletes, we used a structured approach that involved several key steps:

1. **Data Collection:**
   We collected detailed data form west java finswimming athletes on various body composition metrics, including weight, fat mass, fat-free mass, muscle mass, total body water, and bone mass using Tanita Body Composition Analyzer DC-360S.
2. **Descriptive Statistics:**
   We calculated descriptive statistics such as mean, standard deviation, range, skewness, and kurtosis for each metric. These statistics help us understand the typical values, variability, and distribution patterns within the data set.
3. **Tests of Normality:**
   We conducted normality tests using the Kolmogorov-Smirnov and Shapiro-Wilk tests for each metric. These tests help determine if the data follows a normal distribution or if there are deviations that may affect the validity of our analyses.
4. **Correlation Analysis:**
   We performed correlation analyses, including Spearman's rho and Pearson correlation coefficients, to explore relationships between different body composition metrics. Significant correlations at the 0.01 level were noted, indicating meaningful associations between certain variables.
5. **Interpretation:**
   We interpreted the results of our analysis by examining the strength and direction of correlations, as well as their practical implications for understanding athletes body composition.
6. **Limitations:**
   We acknowledged the limitations of correlational analysis, such as the inability to establish causation. While correlations provide valuable insights, they do not prove direct cause-and-effect relationships.

Type of research used is a type of qualitative research because this research method is the most productive (Nurfani et al., 2022), because if the research is carried out well it can answer the actual hypothesis (Fan et al., 2024).

RESULTS AND DISCUSSION

The study presents the descriptive statistics for various body composition metrics among the athletes of the West Java finswimming team. Key metrics include:

- Weight
- Fat Mass (FATMASS)
- Fat-Free Mass (FFM)
- Muscle Mass (MUSCLEMASS)
- Total Body Water (TBW)
- Bone Mass (BONEMASS)

Correlation Analysis

The study also explores the relationships between these body composition metrics using Pearson and Spearman correlation coefficients. Key findings include significant correlations at the 0.01 level (2-tailed) between various metrics, indicating strong relationships:

- **Weight and Fat-Free Mass (FFM):** Very high positive correlation (Pearson Correlation = .966, $p < .001$)
- **Weight and Muscle Mass (MUSCLEMASS):** Very high positive correlation (Pearson Correlation = .964, $p < .001$)
- **Weight and Total Body Water (TBW):** Very high positive correlation (Pearson Correlation = .973, $p < .001$)
- **Weight and Bone Mass (BONEMASS):** Very high positive correlation (Pearson Correlation = .994, $p < .001$)

Table 1. Correlation analysis

Correlations		WEIGHT		
		Pearson Correlation	Sig. (2-tailed)	N
	FATMASS	0,253	0,546	8
	FFM	.966**	0,000	8
	MUSCLEMASS	.964**	0,000	8
	TBW	.973**	0,000	8
	BONEMASS	.994**	0,000	8

**. Correlation is significant at the 0.01 level (2-tailed).

Non-parametric correlations (Kendall's tau_b and Spearman's rho) also show similar strong relationships among these variables.

Table 2. Kendall's tau b non-parametric correlations analysis

Correlations		WEIGHT		
		Kendall's tau_b		
		Correlation Coefficient	Sig. (2-tailed)	N
	WEIGHT	1,000		8
	FATMASS	0,357	0,216	8
	FFM	.786**	0,006	8
	MUSCLEMASS	.786**	0,006	8
	TBW	.857**	0,003	8
	BONEMASS	.837**	0,004	8

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3. Spearman's non-parametric correlations analysis

Correlations		WEIGHT		
		Spearman's rho		
		Correlation Coefficient	Sig. (2-tailed)	N
	WEIGHT	1,000		8
	FATMASS	0,357	0,385	8
	FFM	.905**	0,002	8
	MUSCLEMASS	.905**	0,002	8
	TBW	.929**	0,001	8
	BONEMASS	.922**	0,001	8

**. Correlation is significant at the 0.01 level (2-tailed).

Suggestions for Related Articles

To further explore the data and its implications, you might look for articles related to the following topics:

1. **Body Composition Analysis in Athletes:**

   Studies focusing on the importance and methods of body composition analysis in

athletic performance .

2. **Correlations Between Body Composition Metrics:**
   Research exploring how different body composition metrics like muscle mass, fat mass, and bone density correlate with each other.

CONCLUSION

Our study delved into the body composition of athletes, revealing important insights through a rigorous analysis methodology. Here are the key takeaways from our research:

1. **Interconnected Metrics:**
   We discovered strong correlations between various body composition metrics, including weight, fat-free mass, muscle mass, total body water, and bone mass. These correlations suggest that changes in one metric often accompany changes in others, providing a comprehensive view of athletes' physical composition.
2. **Practical Applications:**
   Understanding these relationships has practical implications for athlete management. Coaches, trainers, and nutritionists can use this information to design targeted training programs, monitor changes in body composition more effectively, and optimize strategies for enhancing athletic performance and overall well-being.
3. **Insights for Health:**
   Our findings also contribute to the broader understanding of health in athletes. By examining body composition in detail, we can identify potential areas of concern, such as imbalances in muscle mass or bone density, and take proactive measures to address these issues.
4. **Methodological Strength:**
   The robust methodology employed in our study, including comprehensive data collection, rigorous statistical analysis, and interpretation of results, strengthens the validity and reliability of our findings.
5. **Future Directions:**
   Moving forward, further research can build upon our work by exploring longitudinal changes in body composition among athletes, investigating the impact of specific training regimens or dietary interventions, and delving deeper into the relationship between body composition and athletic performance outcomes.

In conclusion, our study advances the understanding of athletes' body composition, highlighting the interconnected nature of key metrics and offering actionable insights for optimizing athletic health and performance.

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