INSPIREE:
INDONESIAN SPORT INNOVATION REVIEW
ISSN 2746-6965 (Online), 2774-2520 (Print)
Journal Homepage: https://inspiree.review/index.php/inspiree

BASIC SCIENCES

OPEN ACCESS

The Connection Between Essential Running Techniques and Long Jump Performance Indicators in Elementary School Learners Aged 10-11 Years

https://doi.org/10.53905/inspiree.v5i03.135

*Lilis Lasma Suriani. S[1abcde]

[1]*Universitas Pahlawan Tuanku Tambusai, Indonesia.*

ABSTRACT

The purpose of the study. The primary objective of this research is to analyze the link between running technique proficiency and long jump performance in 10 to 11-year-old elementary students.

Materials and methods. A sample of 28 male students, aged 10 to 11 years, was selected for this study. A cross-sectional research design was utilized to investigate the relationship between basic running techniques and long jump performance in this demographic. Pearson correlation analysis was conducted to assess the association between running methodologies and long jump effectiveness. The results of this analysis determined the strength and direction of the relationship between the two variables.

Results. The analysis yielded a significant correlation coefficient of r= 0.917, with a p-value of 0.000<0.005, indicating a strong positive correlation. This finding suggests that students' skills in body alignment, arm swing, and leg coordination in running are closely related to their ability to generate the power, speed, and control necessary for superior long jump performance.

Conclusions. This study provides empirical support for the claim that proficiency in fundamental running techniques, including body alignment, arm swing, and leg coordination, correlates significantly with improved long jump performance in 10 to 11-year-old elementary school students.

Keywords: *Long Jump Performance Outcomes; Elementary School Students; Aged 10-11 Years; Fundamental Running Techniques.*

ARTICLE INFO

Article History:
Received: September 01,2024
Accepted: September 27,2023
Published: September 27,2024

INTRODUCTION

The cultivation of athletic competencies during early childhood is imperative for the promotion of comprehensive health and athletic efficacy among children. The attainment of essential movement capabilities, including running and jumping, establishes a foundation for the execution of more intricate physical endeavors, thereby significantly enhancing children's physical, cognitive, and social welfare (Kohl et al., 2013). Through the promotion of these vital competencies during early

*Corresponding Author: Lilis Lasma Suriani. S., e-mail: lilissuryani09k@gmail.com

abcdeAuthors'Contribution: a-Study design; b-Data collection; c-Statistical analysis; d-Manuscript preparation; e-Funds collection.

childhood, individuals are capable of establishing a robust groundwork that undergirds their sustained involvement and achievements in athletic pursuits and physical well-being (Bidzan-Bluma & Lipowska, 2018). This aspect holds significant relevance for elementary school pupils within the age range of 10 to 11 years, given that this developmental phase is critical in influencing their physical competencies and establishing the groundwork for enduring fitness and athletic endeavors (Lloyd et al., 2016)(Purcell, 2005). Throughout this pivotal developmental phase, children experience swift transformations in their physical, cognitive, and social domains, which exert substantial influence on their comprehensive development and prospective engagement in sports and physical activities (Long-Term Athletic Development, 2023)(Eisenmann et al., 2020). By promoting the development of essential motor competencies, including running and jumping, during this critical period, educators and coaches are positioned to assist children in establishing a robust foundation that will facilitate their sustained involvement and achievement in a diverse array of athletic pursuits.

The long jump constitutes a highly specialized athletic discipline necessitating a complex amalgamation of physical characteristics, encompassing strength, velocity, and coordination (Bompa & Carrera, 2015)(Koyama et al., 2007)(Jaitner et al., 2001). The acquisition of these fundamental movement skills is critical for achieving optimal performance in the long jump, as they establish the requisite groundwork for the intricate biomechanical actions and neuromuscular coordination necessary to perform a proficient jump (Hulteen et al., 2018). Achieving proficiency in the fundamental running techniques, including appropriate body alignment, arm movement, and leg coordination, is essential for cultivating the strength, agility, and bodily control necessary to produce maximum force output and attain optimal jump distance (Reiser et al., 2006). By concentrating on the progression and enhancement of these essential movement competencies, athletes are able to establish a robust foundation that underpins their overall long jump proficiency and amplifies their potential for achievement in this challenging athletic field. Comprehending the correlation between

these fundamental running methodologies and long jump performance is imperative for formulating effective training regimens and intervention frameworks that can optimize the athletic development of elementary school pupils.

Investigations have consistently illustrated the significance of foundational movement competencies, such as running mechanics, in shaping the physical fitness and athletic prowess of children (Nesbitt & Bullard, 2021). Specifically, empirical research has demonstrated that the proficiency in essential running techniques, including appropriate posture, stride length, and motor coordination, exhibits a positive correlation with enhanced long jump performance metrics among elementary school pupils (Battista et al., 2020)(Pardilla, 2021). This implies that the cultivation and enhancement of these essential competencies may exert a considerable influence on children's capacity to achieve excellence in long jump and various other athletic activities.

Numerous scholarly investigations have scrutinized the correlation between essential running methodologies and long jump efficacy among elementary school pupils. These investigations have uniformly demonstrated that children displaying superior proficiency in running techniques, including appropriate body posture, effective arm movement, and coordinated leg action, are inclined to attain greater long jump distances (Ardha et al., 2021)(Chen et al., 2010). This emphasizes the significance of concentrating on the cultivation of these essential competencies as a strategy for improving long jump proficiency within this demographic. Furthermore, scholarly investigations have elucidated numerous variables that may impact the relationship between foundational running methodologies and long jump efficacy among elementary school pupils (Audina et al., 2024)(Chen et al., 2010)(Glassow & Kruse, 1960). These factors encompass the comprehensive physical fitness levels of the students, their degree of engagement and familiarity with organized physical activities, as well as their developmental stage. By taking these variables into account, scholars and practitioners can attain a deeper comprehension of the intricate interplay between

running methodologies and long jump efficacy, thereby formulating more efficacious strategies to foster the advancement of these critical competencies.

The principal aim of this research endeavor is to examine the relationship between the proficiency in essential running techniques and the resultant performance metrics in long jump activities among elementary school pupils within the age bracket of 10 to 11 years.

MATERIALS AND METHODS

Study participants

A total of 28 male elementary school students, aged 10 to 11 years, were enlisted to partake in this investigation. The subjects were chosen from local educational institutions and possessed no previous exposure to structured long jump training.

Study Organization

This investigation employed a cross-sectional research methodology to explore the correlation between fundamental running techniques and long jump performance within a cohort of elementary school students aged 10 to 11 years. The subjects were initially evaluated on their proficiency in essential running techniques, encompassing aspects such as body alignment, arm swing, and leg coordination. This evaluation was carried out by seasoned coaches and professionals in physical education utilizing a standardized assessment rubric.

Statistical Analysis

In order to examine the association between essential running methodologies and long jump efficacy, the researchers executed a Pearson correlation analysis. The findings derived from this analysis were employed to ascertain the magnitude and orientation of the correlation between the two variables.

RESULTS

The findings derived from the Pearson correlation analysis indicated a robust, positive association between the participants' proficiency in fundamental running techniques and their performance metrics in long jump events. The outcomes of this investigation are presented in the subsequent table:

Descriptive Statistics

In order to examine the detailed representation of the statistical data, kindly refer to Table 1 presented below:

Table 1. description of the statistics

	N	Minimum	Maximum	Mean	Std. Deviation
fundamental running techniques	28	4.95	7.00	5.6824	.66776
long jump performance	28	2.47	3.75	3.0441	.40210
Valid N (listwise)	28				

Normality Assessment Outcomes

The assessment of normality is illustrated in Table 2 presented below:

Table 2. Normality Test Results

N		28	28
Normal Parameters[a,b]	Mean	5.6824	3.0441
	Std. Deviation	.66776	.40210
Most Extreme Differences	Absolute	.138	.121
	Positive	.138	.121
	Negative	-.136	-.107
Test Statistic		.138	.121
Asymp. Sig. (2-tailed)		.200[c,d]	.200[c,d]

Results of Correlation and Hypothesis Tests

In order to ascertain the degree of correlation between the variables, one can refer to the subsequent table:

Table 3. Correlation Between Variables

fundamental running techniques	Pearson Correlation	1	.917**
	Sig. (2-tailed)		.000
	N	28	28
long jump performance	Pearson Correlation	.917**	1
	Sig. (2-tailed)	.000	
	N	28	28

Table 4. Hypothesis Testing Results

	Paired Differences					T	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of theDifference				
				Lower	Upper			
Fundamental running techniques and Long jump performance	2.63824	.94719	.22973	2.15123	3.12524	11.484	26	.000

Specifically, the analysis revealed a statistically significant correlation coefficient of r= 0.917, with a (2-tailed) p-value of 0.000<0.005, signifying a robust and substantial positive association between the two variables. This outcome indicates that the participants' proficiency in executing appropriate body alignment, efficient arm swing, and coordinated leg movement during the running activity was intrinsically linked to their ability to produce the necessary power, speed, and body control required for attaining greater distances in long jump. The pronounced correlation emphasizes the pivotal role that the advancement and refinement of these fundamental running techniques play in facilitating and enhancing long jump performance among elementary school students aged 10-11 years.

This outcome implies that elementary school students who demonstrate superior execution of essential running techniques, including proper body alignment, arm swing, and leg coordination, are likely to achieve greater long jump distances. This strong positive correlation accentuates the significant role that the development and refinement of these fundamental running skills contribute to the enhancement of long jump performance within this demographic. The mastery of these foundational movement patterns appears to be intricately connected to an athlete's ability to generate the requisite power, speed, and body control essential for effective long jump execution. By prioritizing the systematic enhancement of running technique proficiency, physical education curricula and sports training programs can assist young athletes in establishing a solid foundation that empowers them to optimize their long jump capabilities and attain greater competitive success in this challenging athletic discipline

DISCUSSION

The results of the present investigation yield significant understanding regarding the association between basic running techniques and long jump proficiency among elementary school students. The pronounced positive correlation identified in this research underscores the necessity of prioritizing the cultivation and enhancement of these fundamental motor skills as a strategy for improving long jump performance

within this demographic (Thomas et al., 2020)(Román et al., 2017)(Kalaja et al., 2012)(Grainger et al., 2020).

Multiple factors may elucidate the identified correlation between running techniques and performance in the long jump. Primarily, the adeptness in fundamental running techniques, encompassing proper body alignment, efficient arm swing, and well-coordinated leg movement, can enhance overall running biomechanics and neuromuscular control. Such enhancements in running proficiency can subsequently result in augmented power generation, effective force application, and improved body control during the execution of the long jump, ultimately facilitating the athlete in achieving superior jump distances (Husnayadi, 2024)(Blazevich & Fletcher, 2022)(Makaruk et al., 2020).

Moreover, empirical investigations have demonstrated that the cultivation of essential running mechanics, including correct postural alignment, effective arm oscillation, and synchronized lower limb motion, is significantly associated with enhancements in additional critical physical fitness parameters that serve as pivotal factors influencing long jump efficacy (Panoutsakopoulos et al., 2022)(Loturco et al., 2023). For example, the acquisition of these essential running competencies may result in augmented running efficiency, superior biomechanical function, and enhanced neuromuscular regulation, which subsequently may correlate with elevated vertical jump performance and accelerated sprinting velocities (Thompson, 2017)(Schache et al., 2014)(Maćkała et al., 2015). The aforementioned physical characteristics are imperative for the production of the requisite power, the application of force, and the regulation of bodily control essential for the proficient execution of the long jump (Martinez, 2017). Through the concentrated emphasis on the methodical cultivation of these essential movement competencies, athletes are able to establish a resilient physical base that underpins their comprehensive athletic capabilities and improves their performance in the long jump (Koyama et al., 2007).

The findings derived from this investigation possess significant ramifications for physical education and athletic training curricula aimed at elementary school learners. By prioritizing the cultivation of essential running methodologies, educators and trainers can not only augment long jump efficacy but also promote the comprehensive physical maturation and fitness of this demographic.

CONCLUSION

This research presents empirical evidence indicating that proficiency in essential running techniques, encompassing body alignment, arm swing, and leg coordination, is significantly associated with enhanced long jump performance metrics in elementary school students within the age range of 10 to 11 years. These results underscore the necessity of integrating specific interventions aimed at the cultivation of these fundamental movement competencies into physical education curricula and athletic training programs tailored for this demographic.

ACKNOWLEDGMENT

The authors express their profound appreciation to all organizations and individuals that have contributed significantly to the research and development of this scholarly journal.

REFERENCES

Ardha, M A A., Yang, C B., Nurhasan, N., Kartiko, D C., Kuntjoro, B F T., Ristanto, K O., Wijaya, A., Adhe, K R., Putra, K P., Irawan, F A., Nevangga, R P., Sasmita, N S., & Rizki, A Z. (2021, January 1). Biomechanics Analysis of Elementary School Students' Fundamental Movement Skill (FMS). https://doi.org/10.2991/assehr.k.211223.082

Audina, A., Sary, D M., Purba, A., & Halawa, B P S. (2024, May 29). Long Jump Ability: Analyze of Leg Explosive Power and Running Speed for Junior High School Students. , 5(02), 47-53. https://doi.org/10.53905/inspiree.v5i02.129

Battista, R A., Bouldin, E D., Pfeiffer, K A., Pacewicz, C E., Siegel, S R., Martin, E., True, L., Branta, C F., Haubenstricker, J., & Seefeldt, V. (2020, December 28). Childhood

Physical Fitness and Performance as Predictors of High School Sport Participation. Taylor & Francis, 25(1), 43-52. https://doi.org/10.1080/1091367x.2020.1865964

Bidzan-Bluma, I., & Lipowska, M. (2018, April 19). Physical Activity and Cognitive Functioning of Children: A Systematic Review. Multidisciplinary Digital Publishing Institute, 15(4), 800-800. https://doi.org/10.3390/ijerph15040800

Blazevich, A J., & Fletcher, J R. (2022, January 1). More than energy cost: Multiple benefits of the long Achilles tendon in human walking and running. Cornell University. https://doi.org/10.48550/arxiv.2205.13298

Bompa, T., & Carrera, M. (2015, January 1). Conditioning Young Athletes. Human Kinetics

Chen, Z., Ishii, Y., Wang, Y., & Watanabe, K. (2010, January 1). Developmental Movement Of Standing Long Jump In Elementary School Children By Kinematics Analysis. Lippincott Williams & Wilkins, 24, 1-1. https://doi.org/10.1097/01.jsc.0000367255.46870.ff

Eisenmann, J C., Howard, R., & Moreno, T. (2020, September 1). Long-Term Athletic Development As A Framework To Influence Wellness During Childhood And Adolescence. Lippincott Williams & Wilkins, 24(5), 24-31. https://doi.org/10.1249/fit.0000000000000604

Glassow, R B., & Kruse, P. (1960, October 1). Motor Performance of Girls Age 6 to 14 Years. Taylor & Francis, 31(3), 426-433. https://doi.org/10.1080/10671188.1960.10762049

Grainger, F., Innerd, A., Graham, M., & Wright, M. (2020, October 3). Integrated Strength and Fundamental Movement Skill Training in Children: A Pilot Study. Multidisciplinary Digital Publishing Institute, 7(10), 161-161. https://doi.org/10.3390/children7100161

Hulteen, R M., Morgan, P J., Barnett, L M., Stodden, D F., & Lubans, D R. (2018, March 9). Development of Foundational Movement Skills: A Conceptual Model for Physical Activity Across the Lifespan. Springer Science+Business Media, 48(7), 1533-1540. https://doi.org/10.1007/s40279-018-0892-6

Husnayadi, I. (2024, January 27). The Impact of Problem Based Learning Methods on Long Jump Learning Outcomes for Primary School. , 5(01), 21-28. https://doi.org/10.53905/inspiree.v5i01.126

Jaitner, T., Mendoza, L E., & Schöllhorn, W I. (2001, December 1). Analysis of the long jump technique in the transition from approach to takeoff based on time-continuous kinematic data. Taylor & Francis, 1(5), 1-12. https://doi.org/10.1080/17461390100071506

Kalaja, S., Jaakkola, T., Liukkonen, J., & Digelidis, N. (2012, September 1). Development of junior high school students' fundamental movement skills and physical activity in a naturalistic physical education setting. Taylor & Francis, 17(4), 411-428. https://doi.org/10.1080/17408989.2011.603124

Kohl, H W., Cook, H., & Board, N. (2013, October 30). Physical Activity and Physical Education: Relationship to Growth, Development, and Health. https://www.ncbi.nlm.nih.gov/books/NBK201497/

Koyama, H., Muraki, Y., & Ae, M. (2007, July 20). Athletics. https://www.tandfonline.com/doi/abs/10.1080/14763140508522858

Lloyd, R S., Cronin, J., Faigenbaum, A D., Haff, G G., Howard, R., Kraemer, W J., Micheli, L J., Myer, G D., & Oliver, J L. (2016, June 1). National Strength and Conditioning Association Position Statement on Long-Term Athletic Development. Lippincott Williams & Wilkins, 30(6), 1491-1509. https://doi.org/10.1519/jsc.0000000000001387

Long-Term Athletic Development. (2023, January 1). https://www.nsca.com/about-us/position-statements/youth-training-and-long-term-athletic-development/long-term-athletic-development-position-statement

Loturco, I., Pereira, L A., Freitas, T T., Moura, T B M A., Mercer, V P., Fernandes, V., Moura, N., Moura, N A., Zając, A., & Bishop, C. (2023, July 31). Plyometric Training Practices of Brazilian Olympic Sprint and Jump Coaches: Toward a Deeper Understanding of Their Choices and Insights. De Gruyter Open, 88, 131-150. https://doi.org/10.5114/jhk/169167

Maćkała, K., Fostiak, M., & Kowalski, K. (2015, March 1). Selected Determinants of Acceleration in the 100m Sprint. De Gruyter Open, 45(1), 135-148. https://doi.org/10.1515/hukin-2015-0014

Makaruk, H., Starzak, M., & Porter, J M. (2020, October 31). Influence of Attentional Manipulation on Jumping Performance: A Systematic Review and Meta-Analysis. De Gruyter Open, 75(1), 65-75. https://doi.org/10.2478/hukin-2020-0037

Martinez, D B. (2017, August 1). Consideration for Power and Capacity in Volleyball Vertical Jump Performance. Lippincott Williams & Wilkins, 39(4), 36-48. https://doi.org/10.1519/ssc.0000000000000297

Nesbitt, D., & Bullard, D. (2021, May 3). Understanding Fundamental Movement Skills. Taylor & Francis, 34(3), 5-10. https://doi.org/10.1080/08924562.2021.1896909

Panoutsakopoulos, V., Kotzamanidou, M C., Giannakos, A., & Kollias, I. (2022, May 28). Relationship of Vertical Jump Performance and Ankle Joint Range of Motion: Effect of Knee Joint Angle and Handedness in Young Adult Handball Players. Multidisciplinary Digital Publishing Institute, 10(6), 86-86. https://doi.org/10.3390/sports10060086

Pardilla, H. (2021, May 27). Physical Fitness and Learning Achievement Academic in Children Aged 10-12 years. , 2(2). https://doi.org/10.53905/inspiree.v2i2.51

Purcell, L. (2005, July 2). Sport readiness in children and youth. Oxford University Press, 10(6), 343-344. https://doi.org/10.1093/pch/10.6.343

Reiser, R F., Rocheford, E C., & Armstrong, C J. (2006, August 1). Building a Better Understanding of Basic Mechanical Principles Through Analysis of the Vertical Jump. Lippincott Williams & Wilkins, 28(4), 70-80. https://doi.org/10.1519/00126548-200608000-00012

Román, P Á L., García-Pinillos, F., & Mora-López, D S D L. (2017, February 1). Reference Values of Standing Long Jump in Preschool Children: A Population-Based Study. Human Kinetics, 29(1), 116-120. https://doi.org/10.1123/pes.2016-0076

Schache, A G., Dorn, T W., Williams, G., Brown, N A T., & Pandy, M G. (2014, October 1). Lower-Limb Muscular Strategies for Increasing Running Speed. American Physical Therapy Association, 44(10), 813-824. https://doi.org/10.2519/jospt.2014.5433

Thomas, E., Petrigna, L., Tabacchi, G., Teixeira, E., Pajaujienė, S., Sturm, D J., Şahin, F N., López, M G., Paušić, J., Paoli, A., Alesi, M., & Bianco, A. (2020, June 17). Percentile values of the standing broad jump in children and adolescence aged 6-18 years old. PAGEPress (Italy), 30(2), 240-246. https://doi.org/10.4081/ejtm.2020.9050

Thompson, M. (2017, August 1). Physiological and Biomechanical Mechanisms of Distance Specific Human Running Performance. Oxford University Press, 57(2), 293-300. https://doi.org/10.1093/icb/icx069

APPENDIX

Information About The Authors:

Lilis Lasma Suriani. S.
Email: lilissuryani09k@gmail.com; Program Studi Pendidikan Jasmani Kesehatan Dan Rekreasi. Universitas Pahlawan Tuanku Tambusai, Jl. Tuanku Tambusai No. 23 Bangkinang Kota, Kab. Kampar, Provinsi Riau, Indonesia, 28412.