The Relationship between Eye-Hand Coordination and Basketball Players' Shooting Results: A Meta-Analysis Study

Review Article

Okky Putra Alwi Pratama* Semarang State University, INDONESIA
Muhammad Budi Wijaya Semarang State University, INDONESIA
Dian Saputri Semarang State University, INDONESIA
Arif Rahman Semarang State University, INDONESIA
Gunarso Bagus Wicaksono Semarang State University, INDONESIA
Aljawahir Agus Kristiono Semarang State University, INDONESIA
Ines Hayuning Tiyas Semarang State University, INDONESIA
Indah Sari Dewi Semarang State University, INDONESIA

Abstract. (The word length is not more than 250 words) English Language

Background Eye-hand coordination has an important role in shooting ability in basketball players. This study aims to analyze the relationship between eye-hand coordination and basketball players' shots through a meta-analysis approach.

Objectives Therefore, this study aims to analyze how much hand-eye coordination influences shooting results through a meta-analysis approach.

Methods This study uses a meta-analysis method, a statistical analysis technique that combines the results of various similar studies to obtain a more comprehensive picture of quantitative data. The data analyzed were obtained from scientific articles published on Google Scholar. The keywords used in the search include "basketball," "eye-hand coordination," and "shooting results." The population in this study consisted of 521 articles published between 2018 and 2025. The sampling technique used was purposive random sampling, by setting specific inclusion and exclusion criteria, namely: (1) discussing the relationship between eye-hand coordination and shooting results, (2) publishing in the 2018-2025 time period, (3) using a quantitative research design with a correlational approach (cross-sectional), and (4) not limited by the author's institution of origin. From the selection process, 21 articles met the requirements for further analysis

Results Data were analyzed using an effect size test with the help of JASP software. The Random Effects model analysis showed a significant positive relationship between eye-hand coordination and basketball players' shooting results ($z = 8.199$; $p < 0.001$; 95% CI: 0.632–1.029). The Egger test results produced a p-value of 0.989, indicating no publication bias. Forest plot analysis showed that the combined effect size was in a strong category, with a value of 0.83 (-0.11 to 2.06).

Conclusion Hand-eye coordination significantly contributes to a basketball player's shooting results.

Keywords: Eye hand coordination ; Shooting ; Basket ball

Received: January 29, 2025. Accepted: March 28, 2025
*Correspondence: okkypratama1718@students.unnesoac.id
Okky Putra Alwi Pratama
Semarang State University, Indonesia

INTRODUCTION

Basketball is a court-based team sport characterized by various specific movements such as repeated sprints, typical changes of direction in the game, acceleration, jumps, and complex technical and tactical scenarios [1], [2]. o achieve peak performance in high-intensity, repetitive actions during a basketball game, a combination of aerobic and anaerobic energy metabolism, as well as optimal muscle and neuromuscular power capabilities, is required [3],

[4]. Meanwhile, aerobic energy metabolism is more dominant in low-intensity activities such as jogging, walking, and standing [5].

In basketball, several basic techniques are important to master, including shooting, dribbling, defending, pivoting, and other techniques [6], [7]. Of the four techniques explained previously, the shooting technique is essential to master well (Soemardiawan & Yundarwati, 2022). Shooting skills are basic basketball playing techniques that must be mastered by all players well. The types of shooting in basketball that players need to master so that the opportunity to score is greater include jump shots, hook shots, free throws, three-point shots, bank shots, and slam dunks [8].

Shooting is the most important element in scoring a win. This does not mean that other basic basketball techniques can be abandoned; to become a qualified player, the player must still master all basic basketball techniques [9], [10]. Football players must have good and correct shooting techniques to achieve high achievements. Shooting techniques in basketball are considered a determining factor in achieving victory for a team or club, both at the amateur and professional levels [11], [12]. Several studies have shown that points obtained through shooting range from 20% to 25% of the total match score [13], [14]. This percentage increases in the final moments of the game, and in close games, it can reach up to 69% of the points scored during these moments [15], [16].

The success of shooting in the game is greatly influenced by various physical and coordinative factors, including eye-hand coordination [17], [18]. Eye-hand coordination refers to an individual's ability to integrate vision (visual) with hand movements precisely and quickly in response to a stimulus. In basketball, this coordination plays an important role in directing the ball accurately toward the ring, especially when the player is under game pressure [19].

Several previous studies have shown a significant relationship between hand-eye coordination and shooting performance in basketball. Players with better coordination tend to have higher shooting accuracy than players with low coordination. However, the findings in various studies still show variation and inconsistency in terms of the strength of the relationship and the measurement method. This raises questions about how strong the relationship between hand-eye coordination and overall shooting results is and whether the findings can be generalized across different populations and research designs.

Therefore, a meta-analysis study is needed to collect, assess, and synthesize findings from various relevant studies to obtain a more comprehensive and objective picture of the extent of the relationship and effect size between hand-eye coordination and shooting results in basketball players.

METHOD

The method used in this study is meta-analysis. Meta-analysis is a statistical analysis technique used to summarize the results of various studies, resulting in findings that attempt to integrate recent findings. Meta-analysis has an important role in research as an evaluation method for various previous studies that discuss similar themes but with a level of data validity that has not been fully verified [20].

In this analysis, the effect size value is used as a parameter to determine the significance of the research results [21]. *Effect size can be expressed in raw form or standard r-value, which represents the correlation and average difference between the two variables analyzed* [22].

Procedure

The implementation of meta-analysis research includes several stages, namely: (1) selecting and reviewing the research topics to be used, (2) collecting research results with titles relevant to the topic, and (3) calculating the effect size of the selected research results [22]. (4) analyzing heterogeneity in effect size, (5) interpreting research results and drawing conclusions [23].

The data in this research analysis were obtained from published scientific articles. The data was collected online through the Google Scholar search engine by accessing articles directly from the respective publisher sites. The keywords used in the search include "Hand-eye coordination" and "Shooting results," they range in article publication years between 2018 and 2025. From the search results, 521 articles were obtained, but only 21 articles met the inclusion criteria and were used in further analysis.

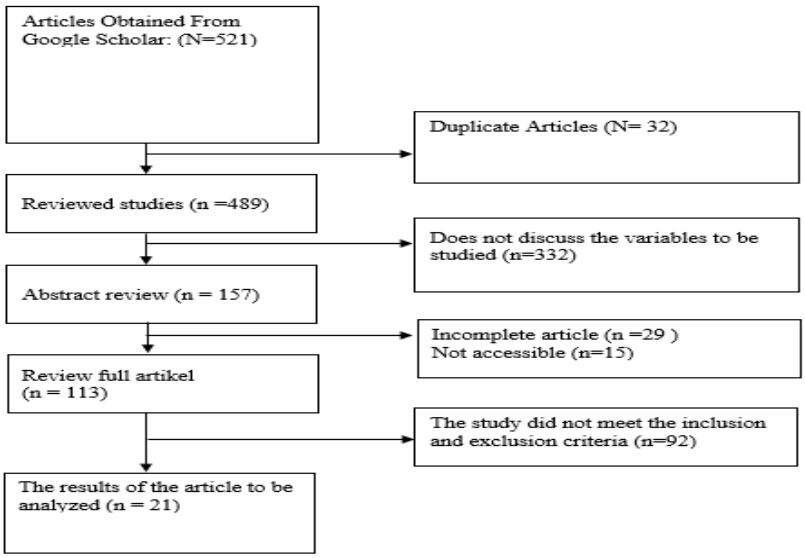

Figure 1. A flowchart is used to identify study data that is eligible for meta-analysis.

Statistical analysis

The data obtained will go through a series of systematic analysis stages: (1) Identifying research variables by entering the obtained variables into the appropriate columns. (2) Identifying the values in each article to be analyzed. If a research article only presents specific values, then these values must be converted using the following predetermined formula:

$F = t^2$

$t = \sqrt{F}$

$r = t / \sqrt{(t^2 + df)}$

(3) Converting the result values into a z distribution, which is used to measure the effect size of each study. (4) Calculating the variance values obtained. (5) The standard error values of all studies' z values and summary effects are also calculated. This summary effect calculation is done using the meta-analysis method of Jeffreys' Amazing Statistics Program software [24].

RESULTS AND DISCUSSION

Results

Through a keyword search on Google Scholar, 521 articles were obtained that discussed eye-hand coordination and shooting results in basketball games. Furthermore, a screening process was carried out based on inclusion and exclusion criteria, as shown in Figure 1. As a result, 21 articles met the requirements for further analysis. Details of the studies analyzed are presented in Table 1 below.

Table 1. Effect Size (Z) and Standard Error (SE) Value Conversion Results

No.	Author	N	R	SE	ES
1	[25]	28	0,873	1,346	0,200
2	[26]	24	0,508	0,560	0,218
3	[27]	20	0,643	0,763	0,243
4	[28]	30	0,689	0,846	0,192
5	[29]	25	0,570	0,648	0,213
6	[30]	15	0,883	1,389	0,289
7	[31]	10	0,845	1,238	0,378
8	[32]	29	0,693	0,854	0,196
9	[33]	30	0,968	2,060	0,192
10	[34]	30	0,537	0,600	0,192
11	[35]	25	9,533	0,594	0,213
12	[36]	30	0,537	0,600	0,192
13	[37]	10	0,716	0,899	0,378
14	[38]	28	0,875	1,354	0,200
15	[39]	33	0,460	0,497	0,183
16	[40]	25	0,587	0,673	0,213
17	[41]	15	-0,112	-0,112	0,289
18	[42]	34	0,491	0,537	0,180
19	[43]	27	0,512	0,565	0,204
20	[44]	52	0,830	1,188	0,143

21	[45]	30	0,362	0,379	0,192

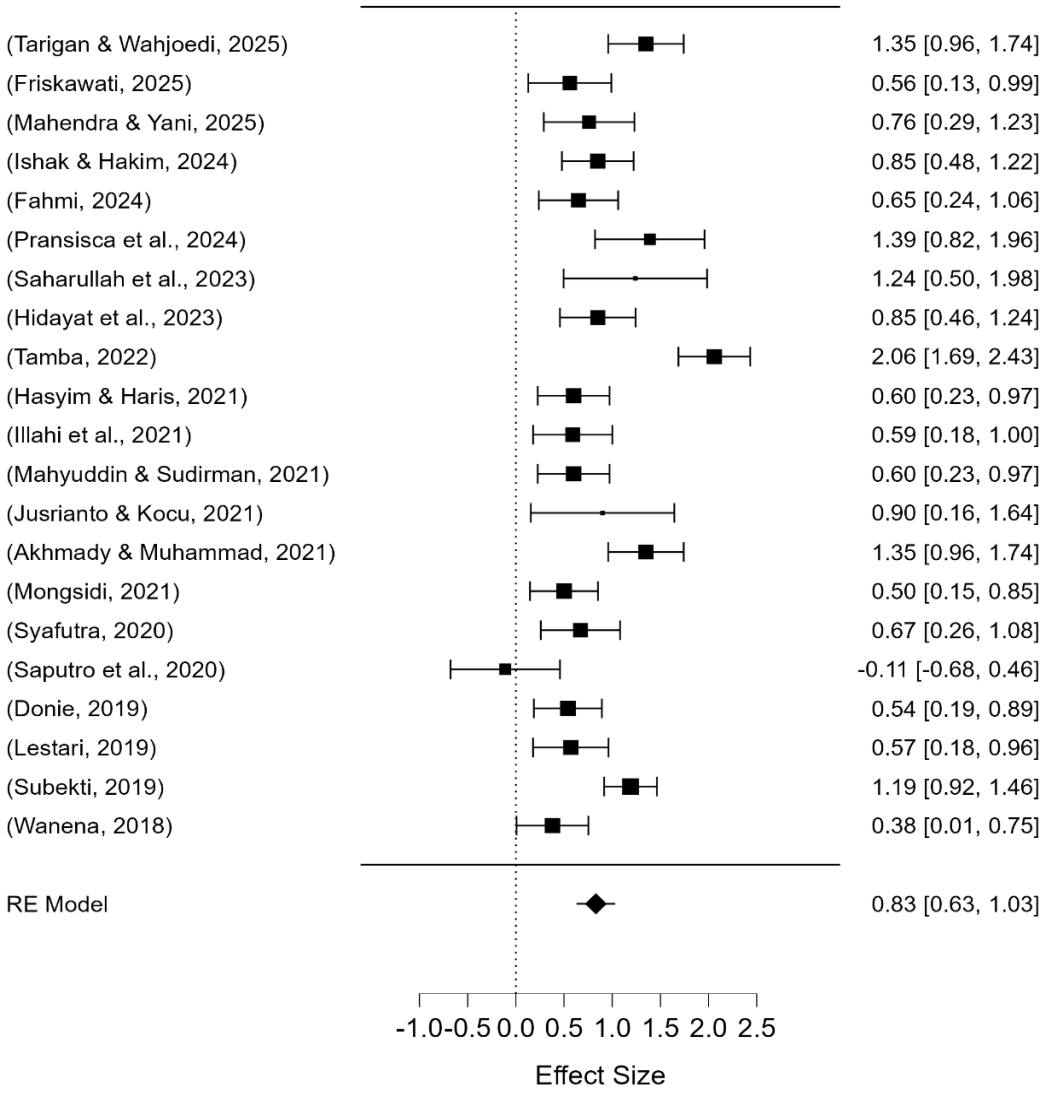

Figure 2. Forest Plot

Based on the results of the forest plot, it can be observed that the studies analyzed showed variations in influence values ranging from -0.11 to 2.06. In addition, an average influence value (summary effect) of 0.83 was obtained. This value explains that the average influence of hand-eye coordination on basketball players' shooting results is 83%, which is included in the high category. Based on the classification of effect sizes, namely r = 0.1 (low), r = 0.3 (moderate), and r = 0.5 (high) [46]. Meanwhile, 17% is influenced by other factors outside of hand-eye coordination.

Next, hypothesis testing and identification of potential publication bias were conducted on the collected data. Concluding meta-analysis using JASP software is based on the interpretation of z-values and p-values listed in the Coefficients table. To evaluate whether

physical components have a relationship with performance in petanque, hypothesis testing was conducted on the following basis:

H_0: *True effect size* = 0 → hand-eye coordination has no relationship with shooting results/ sample data shows indications of publication bias.

H_1: *True effect size* ≠ 0 → hand-eye coordination has a relationship with shooting results/ sample data does not show indications of publication bias.

The existence of publication bias is evaluated through the following decision-making formula:

H_0: *True effect size* = 0

H_1: *True effect size* ≠ 0

Hypothesis Testing

H_0: Sample data is indicated to contain publication bias

H_1: Sample data is not indicated to contain publication bias

The results of hypothesis testing obtained through JASP, especially in the Coefficients section, are shown in Table 4.

Table 2. Fixed and Random Effects

	Q_e	Df	P
Omnibus test of Model Coefficients	67.225	1	< .001
Test of Residual Heterogeneity	97.781	20	< .001

Note. *p* -values are approximate.

Note. The model was estimated using

Restricted ML method.

The analysis of the fixed and random effects table shows that the results of the 33 effect sizes of the studies analyzed are heterogeneous (Q = 97.781; 0.01 <0.05). Thus, the random effect model is more suitable for estimating the average effect size of the 21 studies to be analyzed.

Table 3. Residual Heterogeneity Estimates

		95% Confidence Interval	
	Estimate	Lower	Upper
τ^2	0.166	0.077	0.398
T	0.408	0.278	0.631
I^2 (%)	79.532	64.324	90.289
H^2	4.886	2.803	10.297

The analysis results of the Residual Heterogeneity Estimates table show a statistical relationship between hand-eye coordination and basketball players' shooting results, with a contribution of 21.5% and a relatively high level of study heterogeneity (I^2 = 79.5%). This

finding indicates that although hand-eye coordination is important in supporting shooting results, other factors also affect basketball players' shooting results.

Table 4. Coefficients Interval

		95% Confidence Interval				
	Estimate	Standard Eror	Z	P	Lower	Upper
Intercept	0.831	0.101	8.199	< .001	0.632	1.029

The results of the coefficients interval table with the random effect model show that there is a significant positive correlation between hand-eye coordination and shooting results with a z value = 8.199; p < 0.001, 95%CI (0.632; 1.029).

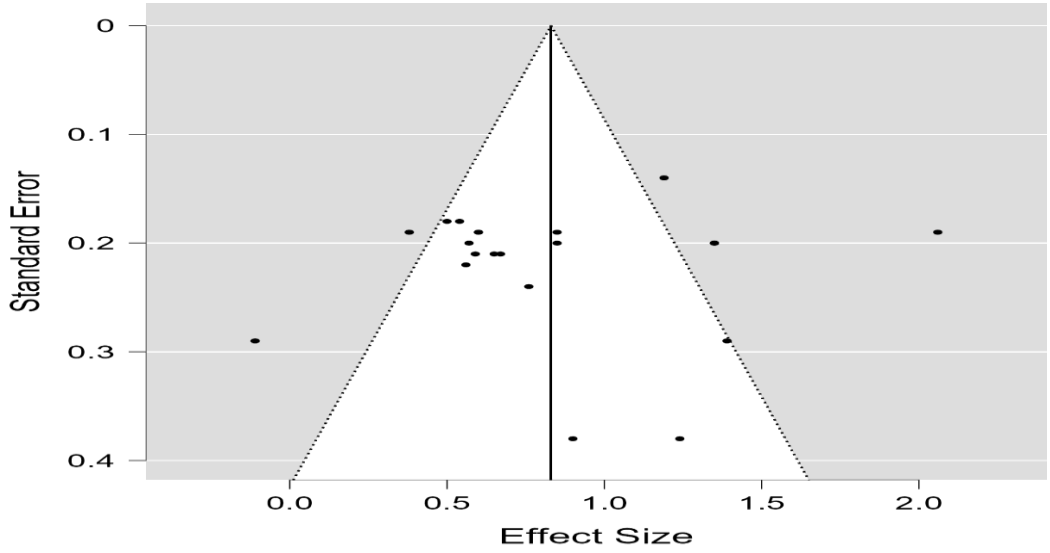

Figure 2. Regression Test for Funnel Plot

Figure 2 presents the regression test for the funnel plot, which shows an imbalance in the data distribution, thus not providing strong evidence of symmetry in the results. This result requires further analysis using Egger's test to evaluate the degree of symmetry and ensure the validity of the findings related to potential publication bias. The results of Egger's test analysis, which provide a more in-depth picture of this possible bias, are presented in Table 5 below.

Tabel 5. Regression Test for Funnel Plot Asymmetry ("Egger's test")

	Z	P
Sei	0.014	0.989

The results in Table 5 show that the Egger test results show a p-value of 0.989, which is far above the threshold of 0.05. This indicates that the meta-analysis conducted is free from publication bias. To improve the accuracy and validity of the results, the tendency of data distribution is further analyzed using the Drawer Record Test analysis, better known as Fail-safe N, as shown in Table 6 below.

Tabel 6. Record Drawer Test

	Fail-safe N	Target Sigificane	Observed Significane
Rosenthal	2548.000	0.050	< .001

Record drawer test analysis was used to estimate the number of articles with insignificant results that have not been published [47]. The results in the table show a fail-safe value of 2548,000. The analysis formula used is 5k + 10, where the k value represents the amount of data analyzed. K = 21, so 5k + 10 = 5 (21) + 10 = 115. There is no publication bias in meta-analysis research if the record drawer test value is greater [48]. Thus, it can be concluded that the fail-safe N value of 2548,000> 115 indicates no publication bias in this study.

Discussion

Eye-hand coordination is one of the fundamental elements in motor skills that play a vital role in various sports techniques, especially basketball. This coordination involves the ability of the sensorimotor system to integrate visual information and motor movements precisely, allowing individuals to respond to stimuli quickly and accurately. In basketball, eye-hand coordination is one of the main determinants of success in shooting, both in static conditions, such as free throws, and in dynamic conditions, such as jump shots or lay-ups [25], [33], [42], [49].

The results of a meta-analysis of several studies examining the relationship between eye-hand coordination and shooting results show a consistent pattern, namely a positive relationship between the two variables. This finding is in line with motor control theory and previous studies that emphasize that shooting success in basketball is greatly influenced by the player's ability to visually perceive the basket target and direct hand movements accurately in a minimal time. Players with good eye-hand coordination tend to have more stable movement control, faster motor decision-making, and higher shooting accuracy [26], [35].

In addition, eye-hand coordination plays a role in the mechanical aspects of shooting and quick decision-making during the game (Mahendra & Yani, 2025; Mahyuddin & Sudirman, 2021). In dynamic match situations, players must be able to visually recognize shooting opportunities while adjusting body movements quickly [28], [40]. Effective shooting results do not only depend on muscle strength or technique alone but also on the ability of the nervous system to coordinate perception and action efficiently [33], [34].

However, not all studies show consistent results. Several studies report a weak or negative relationship between eye-hand coordination and shooting results. This inconsistency can be caused by various factors, such as differences in coordination measurement methods (e.g., using manual vs. digital test equipment), variations in the type of shooting observed, data collection conditions (practice vs. match), and subject characteristics such as experience level, age, or training background. In addition, small sample sizes and uncontrolled confounding

variables such as fatigue, competition anxiety, or visual quality can affect the validity of the study results [30], [41].

Studies with many participants generally provide more precise effect estimates with low standard errors, indicating that the results are more generalizable [44]. In contrast, studies with few participants have limitations in the stability of relationship estimates, so the interpretation of findings from these studies should be done cautiously [31], [37].

The findings support the hypothesis that eye-hand coordination correlates significantly with basketball players' shooting results. This has important practical implications in the context of athlete training, especially in professional athletes' early childhood development phase. Exercises designed to improve eye-hand coordination, such as catching exercises with quick reactions, bouncing exercises with random directions, or using visual simulations in shooting, can be effective strategies to improve shooting accuracy and consistency.

CONCLUSION

It can be concluded that the relationship between physical fitness and student learning outcomes is included in the strong category, with a random effect correlation value of (r_re) = 0.525. In conclusion, testing can be carried out for further research on the influence of other variables that also affect student learning outcomes. The limitations of this study are that it only analyzes physical components; it is hoped that there will be studies that also analyze non-physical aspects. The database used is only from Google Scholar, and the research was conducted in Indonesia. By adding other databases and expanding the scope of the research location, it is hoped that there will be new findings.

ACKNOWLEDGMENT

Thank you to the team who helped in completing this research

AUTHOR CONTRIBUTION STATEMENT

OPAW, MBD and DS is responsible for conceptualizing and designing studies, AR, GBW, AAK and IHT collects data, and drafts the manuscript. ISW contributes to the analysis, interpretation of results, and critical revision of manuscripts. OPAP also acts as a correspondence writer, handling all correspondence and revisions related to publications.

CONFLICT OF INTEREST AND FUNDING

There is no conflict of interest

REFERENCES

[1] A. A. Kristiono, O. P. A. Pratama, S. Islam, A. K. Abadi, and M. B. Wijaya, “Effect of Small Side Games 3x3 on Oxygen Saturation (SpO2) in Extra-Curricular Participants Basketball SMK 1 Semarang,” in *Proceedings of International Conference on Physical Education, Health, and Sports*, 2024, pp. 109–116.

[2] I. Bouteraa, Y. Negra, R. J. Shephard, and M. S. Chelly, “Effects of Combined Balance and Plyometric Training on Athletic Performance in Female Basketball Players,” *J. Strength Cond. Res.*, vol. 34, no. 7, pp. 1967–1973, Jul. 2020, doi: 10.1519/JSC.0000000000002546.

[3] C. D. Gómez-Carmona, D. Mancha-Triguero, J. Pino-Ortega, and S. J. Ibáñez, "Exploring Physical Fitness Profile of Male and Female Semiprofessional Basketball Players through Principal Component Analysis—A Case Study," *J. Funct. Morphol. Kinesiol.*, vol. 6, no. 3, p. 67, Aug. 2021, doi: 10.3390/jfmk6030067.

[4] M. Mihajlovic, D. Cabarkapa, D. Cabarkapa, N. Philipp, and A. Fry, "Recovery Methods in Basketball: A Systematic Review," *Sports*, vol. 11, no. 11, p. 230, Nov. 2023, doi: 10.3390/sports11110230.

[5] B. Figueira *et al.*, "Repeated Sprint Ability in Elite Basketball Players: The Effects of 10 × 30 m Vs. 20 × 15 m Exercise Protocols on Physiological Variables and Sprint Performance," *J. Hum. Kinet.*, vol. 77, pp. 181–189, Jan. 2021, doi: 10.2478/hukin-2020-0048.

[6] A. A. Malik and I. Rubiana, "KEMAMPUAN TEKNIK DASAR BOLA BASKET: STUDI DESKRIPTIF PADA MAHASISWA," *J. Sport (Sport, Phys. Educ. Organ. Recreat. Training)*, vol. 3, no. 2, pp. 79–84, Dec. 2019, doi: 10.37058/sport.v3i2.1238.

[7] A. K. Abadi, I. S. Dewi, S. Islam, O. P. A. Pratama, A. A. Kristiono, and M. B. Wijaya, "Interactive learning media development in Purwokerto city: cognitive aspects of school basketball," *Retos*, vol. 58, pp. 891–902, 2024.

[8] A. L. Gaol, A. R. Dewi, N. Hamidah, and R. K. RVJ, "Analisis Kondisi Fisik Atlet serta Keterampilan Teknik Dasar Bola Basket," *Pubmedia J. Pendidik. Olahraga*, vol. 1, no. 2, p. 8, Jan. 2024, doi: 10.47134/jpo.v1i2.279.

[9] A. S. Dewi and A. Mulyono, "Pengaruh Latihan Jarak Bertahap dan Tetap terhadap Free throw Pemain Bolabasket Putri SMP Negeri 1 Ambarawa," *Indones. J. Phys. Educ. Sport*, vol. 4, no. 1, pp. 318–326, Jul. 2023, doi: 10.15294/inapes.v4i1.49801.

[10] W.-Y. Huang, C.-E. Wu, and H. Huang, "The Effects of Plyometric Training on the Performance of Three Types of Jumps and Jump Shots in College-Level Male Basketball Athletes," *Appl. Sci.*, vol. 14, no. 24, p. 12015, Dec. 2024, doi: 10.3390/app142412015.

[11] C. Wells and J. Liu, "Drills for Improving Shooting Accuracy in Middle School Basketball Players," *Strategies*, vol. 37, no. 2, pp. 25–28, Mar. 2024, doi: 10.1080/08924562.2024.2302776.

[12] D. El Shinta and H. Purnama Pribadi, "Pengaruh Kombinasi Latihan Burpee-Shooting Terhadap Hasil Tembakan Free Throw pada Peserta Putra Ekstrakurikuler Basket di SMP Negeri 7 Kota Malang," vol. 1, no. 4, pp. 122–132, 2023, doi: 10.59024/atmosfer.v1i4.350.

[13] N. Robin, L. Toussaint, C. Charles-Charlery, and G. R. Coudevylle, "Free throw performance in non-expert basketball players: The effect of dynamic motor imagery combined with action observation," *Learn. Motiv.*, vol. 68, p. 101595, Nov. 2019, doi: 10.1016/j.lmot.2019.101595.

[14] J. Sampaio and M. Janeira, "Statistical analyses of basketball team performance: understanding teams' wins and losses according to a different index of ball possessions," *Int. J. Perform. Anal. Sport*, vol. 3, no. 1, pp. 40–49, Apr. 2003, doi: 10.1080/24748668.2003.11868273.

[15] A. Coves, C. Caballero, and F. J. Moreno, "Relationship between kinematic variability and performance in basketball free-throw," *Int. J. Perform. Anal. Sport*, vol. 20, no. 6, pp. 931–941, Nov. 2020, doi: 10.1080/24748668.2020.1820172.

[16] S. J. Ibáñez, J. A. Santos, and J. García, "Multifactorial analysis of free throw shooting in eliminatory basketball games," *Int. J. Perform. Anal. Sport*, vol. 15, no. 3, pp. 897–912, Dec. 2015, doi: 10.1080/24748668.2015.11868839.

[17] N. Steff, D. Badau, and A. Badau, "Study on the Impact of Implementing an Exercise Program Using Fitlight Technology for the Development of Upper Limb Coordinative Abilities in Basketball Players," *Sensors*, vol. 24, no. 11, p. 3482, May 2024, doi: 10.3390/s24113482.

[18] E. Saputra *et al.*, "Eye-hand coordination with basketball dribbling skills: Does it have a relationship?," *Phys. Cult. Recreat. Rehabil.*, vol. 2, no. 1, pp. 10–17, Jun. 2023, doi: 10.15561/physcult.2023.0102.

[19] S. S. M. Fong *et al.*, "Wrist Flexibility, Upper Limb Proprioception And Eye-hand Coordination Of Amateur Basketball Players," *Med. Sci. Sport. Exerc.*, vol. 55, no. 9S, pp. 1027–1027, Sep. 2023, doi: 10.1249/01.mss.0000989384.56564.f2.

[20] G. Reinebo, S. Alfonsson, M. Jansson-Fröjmark, A. Rozental, and T. Lundgren, "Effects of Psychological Interventions to Enhance Athletic Performance: A Systematic Review and Meta-Analysis," *Sport. Med.*, vol. 54, no. 2, pp. 347–373, Feb. 2024, doi: 10.1007/s40279-023-01931-z.

[21] I. Maulana, S. Nugroho, and A. Nasrulloh, "Can traditional games improve gross motor performance of elementary school students ? Meta-analysis study Анотація Аннотация Motor development can be defined as a process of growth and development in conducting," no. 1, 2025.

[22] J. Cohen, *Statistical power analysis for the behavioral sciences*. routledge, 2013.

[23] N. J. Shipley and C. J. van Riper, "Pride and guilt predict pro-environmental behavior: A meta-analysis of correlational and experimental evidence," *J. Environ. Psychol.*, vol. 79, p. 101753, 2022.

[24] A. M. N. Pasaribu, J. Candra, R. Kamsurya, Zainur, Nurkadri, and A. A. N. P. Laksana, "The relationship of motor skills with performance: Meta-analysis study," *J. Sport Area*, vol. 6, no. 3, pp. 315–324, 2021, doi: 10.25299/sportarea.2021.vol6(3).6647.

[25] S. T. A. Tarigan and W. Wahjoedi, "Hubungan Koordinasi Mata dan Tangan dengan Kemampuan Dribbling dan Shooting pada Peserta Ekstrakulikuler Bola Basket di SMP Negeri 2 Singaraja," *Ranah Res. J. Multidiscip. Res. Dev.*, vol. 7, no. 3,

pp. 1550–1558, 2025.

[26] D. Friskawati, "HUBUNGAN KEKUATAN LENGAN, KESEIMBANGAN, DAN KOORDINASI MATA TANGAN DENGAN AKURASI THREE POINTS SHOOT BOLA BASKET," *Mandalika J. Ilmu Pendidik. dan Bhs.*, vol. 3, no. 1, pp. 40–48, 2025.

[27] M. Y. Mahendra and A. Yani, "Kontribusi Power Otot Lengan Dan Koordinasi Mata-Tangan Terhadap Hasil Throw In Pada SSB Tarai U 13-14," *Innov. J. Soc. Sci. Res.*, vol. 5, no. 2, pp. 852–864, 2025.

[28] M. Ishak and H. Hakim, "Shooting Techniques in Basketball Games (Correlation Study on Physical Condition Components)," *Cakra J. Sport. Heal.*, vol. 1, no. 1, pp. 1–18, 2024.

[29] F. Fahmi, "Hubungan Koordinasi Mata-Tangan, dan Kekuatan Otot Lengan dengan Kemampuan Tembakan 3pts Bola Basket," *J. Limit Multidisiplin*, vol. 1, no. 2, pp. 44–54, 2024.

[30] S. Pransisca, H. Neldi, A. Atradinal, and I. A. Marta, "Hubungan Daya Ledak Otot Lengan Dan Koordinasi Mata-Tangan Terhadap Kemampuan Medium Shoot Atlet Bolabasket Venom Lengayang Kabupaten Pesisir Selatan," *J. JPDO*, vol. 7, no. 1, pp. 184–190, 2024.

[31] S. Saharullah, A. Rahman, and J. Duapadang, "KONTRIBUSI KEKUATAN OTOT LENGAN DAN KOORDINASI MATA TANGAN TERHADAP KEMAMPUAN SHOOTING PEMAIN BOLA BASKET," *Joker (Jurnal Ilmu Keolahragaan)*, vol. 4, no. 3, pp. 311–324, 2023.

[32] R. Hidayat, S. Nur, and M. I. Hasanuddin, "Affecting Factors of Shooting Ability In Basketball Games: Coordination And Concentration," *JUARA J. Olahraga*, vol. 8, no. 1, pp. 10–17, 2023.

[33] T. W. A. Tamba, "PENGARUH DAYA LEDAK OTOT TUNGKAI, KOORDINASI MATA TANGAN DAN PERCAYA DIRI TERHADAP KETRAMPILAN LAY UP SHOOT PADA ATLET DUST BASKETBALL PULOMAS JAKARTA TIMUR," *J. Pendidik. Simalem*, vol. 1, no. 2, pp. 39–45, 2022.

[34] A. H. Hasyim and I. N. Haris, "Hubungan koordinasi mata tangan dan kekuatan otot lengan terhadap kemampuan shooting dalam permainan bola basket pada siswa sma kartika xx-i makassar," *J. Ilm. STOK Bina Guna Medan*, vol. 9, no. 2, pp. 65–71, 2021.

[35] A. Illahi, A. Alexon, and A. Sutisyana, "Kontribusi Daya Ledak Otot Tungkai dan Koordinasi Mata Tangan Terhadap Kemampuan Jump Shoot Bola Basket Pada Club 'Sangpati' Di Kabupaten Mukomuko," *Sport Gymnast. J. Ilm. Pendidik. Jasm.*, vol. 2, no. 1, pp. 1–13, 2021.

[36] R. Mahyuddin and A. Sudirman, "KORELASI KOORDINASI MATA TANGAN DAN KEKUATAN OTOT LENGAN DENGAN SHOOTING BOLA BASKET," *J. Olahraga dan Kesehat. Indones.*, vol. 1, no. 2, pp. 96–101, Jun. 2021, doi: 10.55081/joki.v1i2.305.

[37] A. S. Jusrianto and S. Kocu, "Kontribusi Koordinasi Mata Tangan, Daya Ledak Otot Lengan Dan Daya Ledak Otot Tungkai Terhadap Kemampuan Shooting Bola Basket Siswa Kelas XI SMA Negeri I AIFAT Kabupaten Maybrat," *Unimuda Sport J. J. Pendidik. Jasm.*, vol. 2, no. 1, pp. 15–20, 2021.

[38] A. L. Akhmady and S. Muhammad, "Kontribusi fleksibilitas pergelangan tangan, koordinasi mata-tangan dengan kemampuan shooting bolabasket," *J. pendas (Pendidikan Sekol. Dasar)*, vol. 3, no. 1, pp. 11–15, 2021.

[39] W. Mongsidi, "HUBUNGAN KOORDINASI MATA TANGAN DENGAN KEMAMPUAN SHOOTING BOLA BASKET PADA SISWA SMA NEGERI 2 RAHA," *J. Olympic (Physical Educ. Heal. Sport.*, vol. 1, no. 2, pp. 124–133, 2021.

[40] W. Syafutra, "Hubungan Koordinasi Mata Tangan dengan Hasil Shooting Atlit UKM Bola Basket STKIP PGRI LUBUKLINGGAU," *Edumaspul J. Pendidik.*, vol. 4, no. 1, pp. 202–207, Feb. 2020, doi: 10.33487/edumaspul.v4i1.342.

[41] A. Saputro, L. Manurizal, and R. Sinurat, "Hubungan Kekuatan Otot Lengan dan Koordinasi Mata-Tangan dengan Kemampuan Shooting Permainan Bola Basket pada Siswa Ekstrakurikuler Sma Negeri 1 Ujung Batu," *J. Sport Educ. Train.*, vol. 1, no. 1, pp. 20–28, 2020.

[42] D. Donie, "Kontribusi Daya Ledak Otot Tungkai dan Koordinasi Mata Tangan terhadap Kemampuan Jump Shoot Atlet Bola Basket," *J. Patriot*, vol. 1, no. 2, pp. 786–798, 2019.

[43] H. Lestari, "Hubungan Power Otot Tungkai dan Koordinasi Mata-Tangan dengan Hasil Shooting pada Cabang Olahraga Bola Basket pada Siswa Kelas X SMA Negeri 19 Palembang," *J. Olahraga*, vol. 5, no. 2, pp. 111–118, 2019.

[44] M. R. Subekti, "Hubungan Antara Daya Ledak Otot Lengan Dan Koordinasi Mata-Tangan Dengan Kemampuan Shooting Bola Basket Pada Siswa Sekolah Menengah Atas," *J. Pendidik. DASAR PERKHASA J. Penelit. Pendidik. Dasar*, vol. 5, no. 1, pp. 73–86, 2019, doi: 10.31932/jpdp.v5i1.382.

[45] T. Wanena, "Kontribusi power otot tungkai, kekuatan otot lengan, dan koordinasi mata tangan dengan kemampuan jump shot bolabasket pada mahasiswa FIK Uncen tahun 2017," *J. Power Sport.*, vol. 1, no. 2, p. 8, 2018.

[46] S. Baron-Cohen, A. M. Leslie, and U. Frith, "Mechanical, behavioural and Intentional understanding of picture stories in autistic children," *Br. J. Dev. Psychol.*, vol. 4, no. 2, pp. 113–125, Jun. 1986, doi: 10.1111/j.2044-835X.1986.tb01003.x.

[47] A. Marks-Anglin and Y. Chen, "A historical review of publication bias," *Res. Synth. Methods*, vol. 11, no. 6, pp. 725–742, 2020.

[48] N. Azzahrah, M. G. Ali, N. Hikmah, and S. Syaharuddin, "Advanced Analysis of Quality of Picture and Picture Learning

Model Reviewed from Moderator Variables Using JASP Software," *Justek J. Sains dan Teknol.*, vol. 4, no. 1, pp. 20–29, 2021.

[49] V. S. Sistiasih, N. K. Ramadhan, and S. S. Rumpoko, "HUBUNGAN KELENTUKAN PERGELANGAN TANGAN DAN KOORDINASI MATA TANGAN TERHADAP KEMAMPUAN FREE THROW BOLA BASKET PADA EKSTRAKURIKULER BASKET SMA AL-ISLAM 1 SURAKARTA," *J. Ilm. PENJAS (Penelitian, Pendidik. dan Pengajaran)*, vol. 10, no. 1, pp. 12–23, 2024.