

The Relationship Between Visual Concentration Level and Handgrip Strength on Overhand Throw Accuracy

Hanif Irsyada^a, Siti Baitul Mukarromah^b, Said Junaidi^c
^{abc}Pendidikan Olahraga, Universitas Negeri Semarang, Indonesia

Correspondence: hanirsyada@gmail.com

Received: 26 June 2025 Accepted: 26 October 2025 Published: 31 October 2025



Abstract

Softball is a sport that requires good basic throwing techniques. Players have a primary focus on catching the ball that is hit to their area and killing baserunners. In baseball and softball, hand strength and coordination are main factors in finding out the quality of a throw. The purpose of this study was to analyze the relationship between concentration level and grip strength on overhand throw accuracy. This research approach uses a quantitative method with a descriptive correlational approach. The sampling technique in this research used total sampling, which used all samples on the field. The sample used was female softball athletes from Semarang City with a total of 18 female athletes. The technique of data analysis in this study was regression correlation, data normality test, linearity test, homogeneity test and hypothesis test using SPSS software version 25. Research conclusion: 1) There is no relationship between visual concentration and overhand throw accuracy. 2) There is a relationship between hand grip strength and overhand throw accuracy. 3) There is no relationship between visual concentration and hand grip strength to overhand throw accuracy.

Keywords: accuracy; concentration; grip power; overhand throw; softball

1. Introduction

The game of softball is one that involves many motor skill movements. Softball is a sport that requires players to possess good physical condition as well as sound fundamental techniques, such as batting, throwing, fielding, and base running (Hariyanti et al., 2020). This sport requires players to master the basic throwing technique (Marom & Soegiyanto, 2015). The goal is to enable the defensive team to win the game. As explained by Rahmat et al. (2023), a softball game is played by nine players divided into infield and outfield positions over seven innings, meaning each team alternates between defense and offense seven times. The switch occurs when the defensive team successfully puts out three offensive players (Setiyono & Rahayu, 2015).

Softball requires good hand-eye coordination, upper body strength, handgrip power, and coordinated movements of the hips, shoulders, arms, and wrists (Aswathy, 2018). Defensive players are divided into infielders and outfielders. The infielders consist of the first baseman, second baseman, shortstop, and third baseman (Putri et al., 2013). These techniques aim to secure victory by scoring as many points as possible when the offensive team successfully has a runner complete all the bases (Syaranamual et al., 2020). The outfielders include the left fielder, center fielder, and right fielder, who are responsible for catching balls hit deep into their area and preventing baserunners from advancing (Anwar et al., 2019). Good articulation and range of motion, speed, and long-throwing ability are crucial skills for outfielders. A defensive team capable

of throwing accurately will make it easier for teammates to perform catching and blocking actions to get runners out (Irsyada, 2019).

The ability to throw the ball accurately and with power is a fundamental aspect of the game, whether catching, throwing, or attempting long-distance throws (Irsyada et al., 2018). The overhand throw is one of the most important throwing techniques in softball. It is a complex, full-body motor skill essential in many sports and physical activities (Kurniawan et al., 2017). The basic throwing and catching techniques in overhand throwing involve finger strength and wrist snap to generate throwing speed, allowing players to release the ball accurately toward their target or teammate (Fufu et al., 2021).

Overhand throwing involves several key components, one of which is the level of visual concentration. Concentration can be defined as one of the essential cognitive functions for athletes in all sports disciplines, each with distinct characteristics (Nuryadi et al., 2018), both in contact and non-contact sports, which can be seen from aspects such as physical interaction, rules, player behavior, and psychological demands (Tache et al., 2017). Concentration is essential in mastering techniques, including the overhand throw in softball. It is a crucial psychological aspect every athlete must possess during training and competition. Therefore, coaches and sports practitioners should pay more attention to developing athletes' mental focus (Fatahilah & Firlando, 2020). Concentration plays a vital role since disruptions in focus can lead to performance issues and suboptimal outcomes (Taufik, 2019).

Studies have shown that motor performance in throwing techniques can be improved by directing attention externally toward the movement's effect on the environment rather than internally toward the movement itself (van der Graaff et al., 2018). The overhand throwing technique has an advantage in that the arm's motion moves from top to bottom, minimizing throwing errors as balls thrown downward can still be intercepted by the body (Reysta et al., 2021).

Concentration is a key factor influencing accuracy, speed, and efficiency of throwing movements (Eler & Eler, 2017). Mental visualization and concentration are internal factors that influence skill mastery; when either accuracy or concentration is lacking, the precision of the throw will decrease (Sandy et al., 2023). Accuracy in softball should receive more attention from all involved in the sport (Hadi et al., 2020). High concentration also helps players control breathing and muscle tension. During a throw, maintaining steady breathing and optimal muscle tension is essential (Hatzimanouil, 2019). Adequate concentration enables players to stay calm and focused, preventing failures in managing respiration and muscle tension that can disrupt movement performance (Yachsie et al., 2021).

In every sport worldwide, good concentration is vital for optimal performance, as it enables players to focus their attention during competition and achieve better results (Riyadi et al., 2019). The overhand throw is a fundamental technique in many sports, including baseball, softball, tennis, and javelin. Success in executing an overhand throw depends not only on physical strength but also on the player's concentration level (Alimuddin & Dahlan, 2020). Concentration, as a mental aspect of sports, plays a crucial role; when it is disturbed, various performance problems and suboptimal outcomes may occur (Taufik, 2019).

Handgrip strength is another essential attribute and standard parameter related to the functional integrity of the hand (Tajika et al., 2015). Estimating handgrip strength is vital in sports such as basketball, volleyball, baseball, and softball, where sufficient grip strength is required for success (Koley & Kumar, 2011).

2. Method

This research is a quantitative study with a descriptive correlational approach. The purpose of this study is to determine the relationship between concentration level, handgrip strength, and overhand throw accuracy in the sport of softball. The sampling technique used in this study was total sampling, meaning that all available subjects in the field were included. The sample consisted of 18 female softball athletes from the city of Semarang.

The instruments used in this study included several tests: (1) Concentration level was measured using the Grid Concentration Test (Sigit, 2014); (2) Handgrip strength was measured using a Handgrip Dynamometer (Sukania et al., 2022); (3) Throwing accuracy was measured using a modified version of the Shick Target Test (1970) (Miller, 2020). The data analysis method employed in this research was correlational statistical analysis using IBM SPSS Statistics version 25.

3. Result and Discussion

1. Hypothesis Test of the Relationship Between Visual Concentration and Overhand Throw Accuracy, and the Relationship Between Handgrip Strength and Overhand Throw Accuracy

Table 1. Correlations

		Concentration	Grip strength (x2)	Accuracy (y1)
Concentration (x1)	Pearson Correlation	1	.117	-.086
	Sig. (2-tailed)		.645	.735
	N	18	18	18
Grip strength (x2)	Pearson Correlation	.117	1	.547*
	Sig. (2-tailed)	.645		.019
	N	18	18	18
Accuracy (y1)	Pearson Correlation	-.086	.547*	1
	Sig. (2-tailed)	.735	.019	
	N	18	18	18

*. Correlation is significant at the 0.05 level (2-tailed).

Based on the data analysis in Table 1, the significance value of 0.735 is greater than 0.05. Therefore, it can be stated that there is no significant relationship between visual concentration and overhand throw accuracy. Meanwhile, based on the correlation data analysis in Table 1, the significance value for the handgrip strength variable is 0.019, which is smaller than 0.05. Thus, it can be concluded that there is a significant relationship between handgrip strength and overhand throw accuracy.

2. Hypothesis Test of the Relationship Between Visual Concentration and Handgrip Strength on Overhand Throw Accuracy

Table 2. Anova

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.933	2	20.966	3.551	.055 ^b
	Residual	88.567	15	5.904		
	Total	130.500	17			.055 ^b

a. Dependent Variable: Accuracy (y1)

b. Predictors: (Constant), Grip Strength (x2), Concentration (x1)

Based on the correlation data analysis in Table 2, the significance value is 0.055, which is greater than 0.05. Therefore, it can be stated that there is no significant relationship between visual concentration and handgrip strength on overhand throw accuracy.

4. Conclusion and Recommendation

Based on the results of the research and discussion on the hypothesis testing of the relationship between visual concentration and handgrip strength on the accuracy of the overhand throw, it can be concluded as follows: (1) There is no relationship between visual concentration and the accuracy of the overhand throw; (2) There is a relationship between handgrip strength and the accuracy of the overhand throw; (3) There is no relationship between visual concentration and handgrip strength on the accuracy of the overhand throw. Based on the conclusions above, several suggestions from the researcher can be presented as follows: (1) For athletes, proper throwing mechanics are very important. Athletes should grip the ball firmly, ensuring that the fingers—not the palm—control it. During the throw, the arm should form an “L” shape with a follow-through that directs energy toward the target. Aligning the body with the target, especially by stepping forward with the non-throwing foot, provides balance and power; (2) For coaches, mental focus and visualization techniques can improve accuracy. Athletes should clearly visualize their target, control their breathing, and trust their training. Feedback from coaches or self-recorded videos can highlight areas that need improvement, fostering better habits over time; (3) Regular practice can help improve the quality of the overhand throw.

References

- Alimuddin, & Dahlan, F. (2020). The development of Soft Ball sport through Toss Ball training in the athlete Softball. *Journal of Physical Education, Sport, Health and Recreation*, 9(1).
- Anwar, M. C., Budiono, I., & Pamot, H. (2019). Traditional Softball Games Effective Modified for Improving Nutritional Status and Physical Fitness in Elementary School Children. *Jurnal Kesehatan Masyarakat*, 15(2). <https://doi.org/10.15294/kemas.v15i2.21524>
- Aswathy, V. (2018). The Relation between Hand Grip Strength with Hand-Anthropometric Variable in Inter-University Level Softball, Cricket and Hockey Players. *International Journal of Recent Scientific Research*, 9(4(H)).
- Eler, N., & Eler, S. (2017). The effect of different training programs on throwing accuracy of elite female handball players. *Journal of Human Sciences*, 14(4). <https://doi.org/10.14687/jhs.v14i4.4445>

- Fatahilah, A., & Firlando, R. (2020). Tingkat Konsentrasi Atlet Kota Lubuklinggau. *Riyadhoh : Jurnal Pendidikan Olahraga*, 3(1), 38. <https://doi.org/10.31602/rjpo.v3i1.3096>
- Fufu, R. D. A., Hariyanto, A., Wismanadi, H., & Tajuddin, A. I. (2021). The Effect of Throw and Catch Exercise and the Accuracy and Speed of Throw to Target in Sport Softball. *JPEHSS (Journal of Physical Education Health And Sport Sciences)*. <https://doi.org/https://doi.org/10.35508/jpehss.v1i2>
- Hadi, S., Soegiyanto, & Sugiarto. (2020). Sumbangan Power Otot Lengan, Kekuatan Otot Tangan, Otot Perut Terhadap Akurasi Lemparan. *Journal of Sport Sciences and Fitness*, 2(1), 56–61.
- Hariyanti, M. A., Rahayu, N. I., & Pitriani, P. (2020). Hubungan Kadar Hemoglobin dan Vo2Max Pada Atlet Softball Putra. *Jurnal Terapan Ilmu Keolahragaan*, 5(1). <https://doi.org/10.17509/jtikor.v5i1.24191>
- Hatzimanouil, D. (2019). Throwing Effectiveness per Throwing Area and Playing Position among High Level Handball Players. *JOURNAL OF PHYSICAL EDUCATION AND SPORTS MANAGEMENT*, 6(1). <https://doi.org/10.15640/jpesm.v6n1a2>
- Irsyada, R. (2019). Development of Media Strike Zone for Pitching Learning Process on Softball. *Journal of Physical Education Health and Sport*, 6(1). <https://doi.org/10.15294/jpehs.v6i1.20108>
- Irsyada, R., Hartiwan, U., Pendidikan Jasmani, J., dan Rekreasi Fakultas Ilmu Keolahragaan, K., & Negeri Semarang, U. (2018). Modification of Hitball Games in Physical Education, Sports, and Health Learning in School How to Cite. *Journal of Physical Education Journal of Physical Education, Sport, Health and Recreation Roas Irsyada&Uen Hartiwan Journal of Physical Education, Sport, Health and Recreation*, 7(711).
- Koley, S., & Kumaar, S. (2011). Correlations of handgrip strength with selected hand-anthropometric variables in university softball players. *Biomedical Human Kinetics*, 3(2011). <https://doi.org/10.2478/v10101-011-0020-7>
- Kurniawan, I. W. Y., Prof. Dr. I Nyoman Kanca, M., & Dr. Ni Putu Dewi Sri Wahyuni, S. K. (2017). Pengaruh Pelatihan Medicine Ball Sit-up Throw terhadap Kekuatan Otot Lengan dan Kekuatan Otot Punggung. *Jurnal Ilmu Keolahragaan Undiksha*, 5(1). <https://doi.org/10.23887/jiku.v5i1.8027>
- Marom, A., & Soegiyanto. (2015). Pengaruh umpan pitched ball dan soft toss ball terhadap hasil latihan pukulan fly ball dan ground ball pada tim baseball Unnes 2015. *Journal of Sport Science and Fitness*, 4(3).
- Nuryadi, N., Negara, J. D. K., Juliantine, T., Slamet, S., & Gumilar, A. (2018). Hubungan Kebugaran Jasmani dengan Kemampuan Konsentrasi dan Respon Kortisol. *JURNAL PENDIDIKAN JASMANI DAN OLAHRAGA*, 3(2). <https://doi.org/10.17509/jpjo.v3i2.12578>
- Putri, N. S., Hanani, E. S., & Annas, M. (2013). Pengembangan Permainan Olahraga Softball Melalui Modifikasi Swingkasball Siswa SMA N Limbangan. *Jurnal PJKR*, 2(2).
- Rahmat, A. A., Listyasari, E., & Rohyana, A. (2023). Dampak Alat Bantu Latihan Reaksi yang Menggunakan Sinyal Lampu Terhadap Kecepatan dalam Lemparan Atas pada Cabang Olahraga Softball. *Jurnal SEGAR*, Volume 11. <https://doi.org/10.21009/segar/1102.04>
- Reysta, ferra A., Dinata, M., & Suranto. (2021). Hubungan Kekuatan Otot Lengan dan Koordinasi Mata Tangan Dengan Ketepatan Lemparan atas Permainan Softball Putri di Universitas Lampung Tahun 2016. *Angewandte Chemie International Edition*, 6(11), 951–952., 1.
- Riyadi, D., Sartono, H., & Komarudin, K. (2019). Pengaruh Metode Latihan Imagery terhadap Kosentrasi dan Keterampilan Bermain Sepakbola. *Jurnal Keipelatihan Olahraga*, 11(1). <https://doi.org/10.17509/jko-upi.v11i1.16825>

- Sandy, J. B., Atradinal, A., Ihsan, N., & Amra, F. (2023). Hubungan Konsentrasi terhadap Hasil Shooting Atlet Petanque Universitas Negeri Padang. *Jurnal JPDO*, 6(2).
- Setiyono, R., & Rahayu, T. (2015). Permainan Tibol Sebagai Media Pengenalan Permainan Softball pada Siswa Ekstrakurikuler di Sekolah Dasar. *JPES*, 4(2).
- Syaranamual, J., Tahapary, J. M., & Lolangluan, W. A. (2020). Pengaruh Latihan Koordinasi Mata Tangan Terhadap Keterampilan Lempar Tangkap Dalam Permainan Softball Pada Mahasiswa Penjaskesrek 2014. *Biofaal Journal ISSN : 2723-4959 (Online)*, Vol 1, No.
- Tache, N., Lubis, L., & Saputra, L. (2017). Concentration Level Differences between Athletes of Body Contact and Non-Body Contact Sports. *Althea Medical Journal*, 4(3).
- Tajika, T., Kobayashi, T., Yamamoto, A., Shitara, H., Ichinose, T., Shimoyama, D., Okura, C., Kanazawa, S., Nagai, A., & Takagishi, K. (2015). Relationship between grip, pinch strengths and anthropometric variables, types of pitch throwing among japanese high school baseball pitchers. *Asian Journal of Sports Medicine*, 6(1). <https://doi.org/10.5812/asjms.25330>
- Taufik, M. S. (2019). Hubungan Tingkat Konsentrasi Dengan Keterampilan Bermain Futsal Unit Kegiatan Mahasiswa Futsal Universitas Suryakencana. *Gladi : Jurnal Ilmu Keolahragaan*, 10(02). <https://doi.org/10.21009/gjik.102.01>
- van der Graaff, E., Hoozemans, M., Pasteuning, M., Veeger, D., & Beek, P. J. (2018). Focus of attention instructions during baseball pitching training. *International Journal of Sports Science and Coaching*, 13(3). <https://doi.org/10.1177/1747954117711095>
- Yachsie, B. T. P. W. B., Suhasto, S., Arianto, A. C., & Kurniawan, I. L. A. (2021). Keterkaitan konsentrasi dengan akurasi panahan. *Multilateral : Jurnal Pendidikan Jasmani Dan Olahraga*, 20(2). <https://doi.org/10.20527/multilateral.v20i2.10556>