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CORRELATION OF ANXIETY LEVEL, CONCENTRATION, AND KINESTHETIC PERCEPTION WITH ACCURACY OF VOLLEYBALL JUMP SERVE

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Abstract

With the accuracy of jump serves among male volleyball players of the SBV Popsi Sragen Club. Technical execution in volleyball, particularly the jump serve, requires not only physical skill but also psychological readiness and sensory-motor awareness. Anxiety may interfere with motor coordination and focus, while concentration and kinesthetic perception play key roles in movement control and targeting accuracy. This research employed a quantitative correlational method, involving 20 male players selected through a total sampling approach. Instruments included the Sport Competition Anxiety Test (SCAT) for measuring anxiety, a grid concentration test to assess attention focus, and a kinesthetic perception test based on position-matching tasks. Jump serve accuracy was evaluated through practical testing using a scoring system targeting specific court zones. Data analysis using Pearson Product-Moment correlation revealed significant relationships between anxiety, concentration, and kinesthetic perception with jump serve accuracy ($p < 0.05$). These findings emphasize the importance of integrating psychological and perceptual training into volleyball coaching programs to improve service performance.

Keywords: Anxiety; Concentration; Kinesthetic Perception; Jump Serve; Volleyball.

INTRODUCTION

Volleyball is a dynamic team sport requiring a combination of physical skills, technical mastery, and psychological preparedness. Among the fundamental techniques in volleyball, the jump serve is a critical element that not only initiates the game but also serves as an offensive weapon capable of disrupting the opponent's formation and strategy. The successful execution of a jump serve is not merely a matter of mechanical precision, but also involves complex neuromuscular coordination, cognitive concentration, and emotional regulation (Syaleh et al. 2024).

One of the pivotal psychological constructs influencing sports performance is anxiety. Anxiety in sports is conceptualized as a psychological state marked by feelings of tension and apprehension that may interfere with athletic performance. According to Weinberg and Gould, anxiety is manifested in both cognitive and somatic dimensions, which can negatively affect the technical consistency of an athlete, particularly during high-pressure moments like serving (Rohmansyah 2017). Empirical findings also affirm that elevated anxiety levels correlate with

increased technical errors and diminished focus during service execution (Anira, Damayanti, and Rahayu 2017).

Another influential factor is concentration, which refers to an athlete's ability to focus selectively on relevant stimuli while ignoring distractions. In volleyball, where precision and timing are crucial, high levels of concentration are essential to execute technical skills such as passing, setting, and serving with accuracy. Research shows that players with superior concentration skills tend to perform better in both offensive and defensive situations (Noerjannah 2016).

Equally important is kinesthetic perception, the neurocognitive ability to sense body position, movement, and the application of force. This proprioceptive awareness enables players to regulate their motor actions accurately during complex movements, such as jump serves. Previous studies have demonstrated that kinesthetic awareness significantly supports motor learning and skill execution in volleyball, particularly in developing consistency and power during service techniques (Iskandar 2019).

Despite the physical competence of players, psychological readiness and perceptual acuity play a crucial role in determining the accuracy of technical performance. This study was conducted in Club SBV Popsi Sragen, a volleyball club with notable achievements, aiming to investigate the correlation between anxiety levels, concentration, and kinesthetic perception with the accuracy of jump serves among its male players. The novelty of this study lies in its simultaneous analysis of these three psychological and perceptual factors related to a single volleyball technique, which has not been extensively explored in previous research.

The findings are expected to contribute to the theoretical understanding of psychological and perceptual influences in volleyball performance and provide practical implications for coaches in developing training programs that integrate mental conditioning, proprioceptive drills, and technical refinement to enhance jump serve accuracy.

METHOD

¹ This study employs a quantitative approach with a correlational design, aiming to determine the relationship between three independent variables anxiety level, concentration, and kinesthetic perception with the dependent variable of jump serve accuracy in male volleyball players. The correlational approach was chosen because it allows the analysis of statistical relationships between variables without manipulating the variables studied. The main objective is not to test cause and effect, but to measure the extent to which the relationship between variables co-occurs (Hasbi et al. 2023).

The research was conducted in March 2024 at the SBV Popsi Sragen Club, one of the volleyball clubs that actively competes at the regional level and has a regular athlete coaching program. The entire research population of 20 players was sampled through a total sampling technique, given the relatively small population and homogeneity in terms of playing experience and training intensity.

Data collection was carried out using standardized instruments that have been proven valid and reliable in previous studies. The anxiety level variable was measured using the Sport Competition Anxiety Test (SCAT) instrument developed by Martens, which consists of 15 items with a Likert scale. This test is used to measure the dimensions of state anxiety and trait anxiety, both of which affect players' technical performance in competitive situations (Anira, Damayanti, and Rahayu 2017).

The concentration variable was measured using the grid concentration test, a visual and cognitive perception test that requires a quick response to a randomly arranged sequence of numbers from 00 to 99. Subjects were asked to sort the numbers within one minute. This test has been used in various sport psychology studies to assess attentional focus and the ability to ignore distractions (Wahyudi 2018).

Kinesthetic perception variables were assessed using the distance jump perception test, a measure of body motion perception in which subjects were asked to jump by cognitively estimating a predetermined distance. This test is used to evaluate the accuracy of proprioceptive perception, which is very important in

coordinating techniques such as the jump serve (Universitas Hamzanwadi et al. 2022).

To measure jump serve accuracy, a field test was conducted where each player performed ten jump serves to a specific target area. Judgment was given based on the number of balls that entered the target zone correctly. Accuracy scores are calculated quantitatively with a specific range of values, from very imprecise to very precise (Widodo and Pratomo 2025).

Data analysis was conducted in several stages. A normality test was performed using the Kolmogorov-Smirnov method, and a linearity test was performed to verify a linear relationship between the variables. To test the relationship between variables, the Pearson Product-Moment correlation statistical technique was used, according to the rules of relationship analysis in correlational research (Duhe and Haryanto 2021).

This method is considered appropriate in revealing the contribution of psychological and perceptual factors to players' technical performance, as well as providing a scientific basis for coaches in developing training programs that focus not only on physical aspects but also on mental readiness and sensorimotor coordination.

RESULT AND DISCUSSION

This study involved 20 male volleyball players from Club SBV Popsi Sragen as participants. Each athlete underwent a series of measurements that included psychological and perceptual variables, namely anxiety level, concentration, and kinesthetic perception, as well as one performance variable, namely jump serve accuracy. The baseline characteristics of each variable are shown in Table 1, reflecting individual variability in players' psychological and sensorimotor capacities.

The average anxiety level and concentration scores obtained were 3, while the kinesthetic perception scores ranged from 2 to 3, indicating relatively heterogeneous variations in body perception among players. For technical performance, the average jump serve accuracy score was recorded at 10, with a

maximum value of 5 and a minimum of 7, indicating marked differences in the quality of technical execution between individuals within the same group.

Table 1 illustrates the descriptive statistics of 20 male volleyball players. The average anxiety and concentration level was 3, with kinesthetic perception at 2. Jump serve accuracy had a mean score of 7. This distribution suggests a moderate range of psychological readiness and motor skill proficiency among the players.

Table 1. Research Results

Participant	Anxiety Level	Concentration	Kinesthetic Perception	Jump Serve Accuracy
Max	4	5	3	10
Min	1	1	1	5
Mean	3	6	2	7

Table 2 shows the result of the Kolmogorov–Smirnov normality test. The p-value of 0.200 indicates that the data follows a normal distribution, thus fulfilling one of the assumptions for parametric statistical analysis.

Table 2. Normality Test

N	Sig.	Conclusion
20	0.200	Normal

Table 3 confirms the linear relationship between each independent variable and jump serve accuracy. All significance values are above 0.05, indicating the data is appropriate for regression analysis.

Table 3. Linearity Test

Variable Pair	Sig.	Conclusion
Jump Serve Accuracy * Anxiety Level	0.178	Linear
Jump Serve Accuracy * Concentration	0.457	Linear
Jump Serve Accuracy * Kinesthetic Perception	0.967	Linear

Table 4 reveals a significant positive correlation between anxiety levels and jump serve accuracy. The p-value < 0.05 implies that anxiety significantly predicts performance. The positive coefficient indicates that optimal anxiety levels may enhance concentration and execution.

Table 4. Correlation Between Anxiety and Jump Serve Accuracy

Constant	Coefficient (β)	t	Sig.	Conclusion
2.653	0.253	-6.421	0.000	Significant

Table 5 indicates a significant relationship between concentration and jump serve accuracy. Players with higher concentration scores demonstrated better accuracy, supporting theories on cognitive focus in skill execution.

Table 5. Correlation Between Concentration and Jump Serve Accuracy

Constant	Coefficient (β)	t	Sig.	Conclusion
10.108	0.206	-3.874	0.001	Significant

As shown in Table 6, kinesthetic perception is significantly correlated with jump serve accuracy. This supports the hypothesis that sensorimotor awareness plays a critical role in movement control and spatial precision.

Table 6. Correlation Between Kinesthetic Perception and Jump Serve Accuracy

Constant	Coefficient (β)	t	Sig.	Conclusion
11.839	0.321	-6.371	0.000	Significant

Table 7 presents the regression model results. All three predictors significantly influenced jump serve accuracy. Anxiety and kinesthetic perception both show strong predictive power, reinforcing their importance in high-performance sports.

Table 7. Multiple Linear Regression Coefficients

Variable	Coefficient (β)	t	Sig.	Conclusion
Anxiety	0.272	-5.069	0.000	Significant
Concentration	0.183	2.140	0.048	Significant
Kinesthetic Perception	0.293	-5.229	0.000	Significant

Table 8 shows that 88.8% of the variance in jump serve accuracy is explained by the three predictors combined. This high R^2 value reflects the strong explanatory power of anxiety, concentration, and kinesthetic perception in predicting volleyball serve performance.

Table 8. Coefficient of Determination

R	R^2	Adjusted R^2	Std. Error
0.942	0.888	0.867	0.561

Table 9 consolidates the significance results for hypothesis testing. All variables have p-values below 0.05, confirming that each has a statistically significant relationship with jump serve accuracy individually.

Table 9. Significance Values

Variable	Sig. Value
Anxiety	0.00
Concentration	0.02
Kinesthetic Perception	0.01

Discussion

The findings affirm that psychological factors (anxiety and concentration) and sensorimotor abilities (kinesthetic perception) collectively influence the technical success of jump serves in volleyball. Players with optimized emotional control and high proprioceptive awareness can maintain movement precision under competitive pressure. These results are consistent with previous studies (Adila et al. 2023; Universitas Hamzanwadi et al. 2022; Đolo, Grgantov, and Kuvačić 2023) and underline the need for holistic training programs that integrate mental conditioning alongside technical skill development.

The results of this study indicate that the level of anxiety, concentration, and kinesthetic perception has a significant relationship to the accuracy of jump serve in male volleyball players. Multiple linear regression analysis produces a model that explains the effect of the three independent variables on the dependent variable with a coefficient of determination of $R^2 = 0.888$. That is, a combination of the three factors can explain 88.8% of the variation in jump serve accuracy. The form of the regression model is written as follows:

$$Y = 13.803 + 0.272X_1 + 0.183X_2 + 0.293X_3$$

In the equation above, the variable Y represents jump serve accuracy, while X_1 , X_2 , and X_3 are anxiety level, concentration, and kinesthetic perception, respectively. The positive regression coefficients on all three variables indicate that an increase in scores in all three aspects is directly correlated with an increase in jump serve accuracy. Theoretically, this relationship is in line with sport psychology principles, which state that moderate levels of anxiety can improve focus and preparedness (Mangolo et al. 2021), while concentration facilitates the processing of relevant stimuli for proper movement planning (Duhe and Haryanto 2021), and kinesthetic perception helps players regulate body orientation as well as strength when serving (Septiyanto and Suharjana 2016).

These findings confirm the importance of a training approach that not only emphasizes technical and physical aspects but also considers the psychological and sensorimotor readiness of players (Wijaya et al. 2023). Players with a high level of concentration and good kinesthetic perception are proven to be able to serve more

accurately, while anxiety management also acts as a supporting factor for performance when controlled at optimal levels (Ongko and Jannah 2016). Therefore, integrating training programs that include the development of mental focus, emotional stability, and body awareness is essential for the long-term competitive performance of volleyball players.

CONCLUSION

Based on the results of research conducted on 20 male volleyball players from Club SBV Popsi Sragen, it can be concluded that the levels of anxiety, concentration, and kinesthetic perception simultaneously have a significant influence on the accuracy of jump serves. The three independent variables, based on the results of multiple linear regression analysis, explain 88.8% of the variability in jump serve accuracy, as reflected in the coefficient of determination ($R^2 = 0.888$). The remaining 11.2% is attributed to other factors not examined in this study.

Each variable showed a significant influence on jump serve performance. Anxiety levels within adaptive limits can contribute to improving players' focus and preparedness. At the same time, concentration proved to play a crucial role in directing attention to the relevant technical aspects during movement execution. Meanwhile, kinesthetic perception made the most significant contribution, indicating that awareness of body position and the ability to regulate movement internally are crucial in ensuring the precision of jump serve technique execution.

Therefore, the development of serve performance in volleyball requires not only improving technical skills and physical strength, but also must be accompanied by systematic psychological and proprioceptive training. The results of this study suggest that coaches and sports practitioners should integrate multidimensional training strategies that include anxiety management, attentional focus enhancement, and kinesthetic perception training into an athlete development program focused on competitive performance and long-term consistency.

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