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Improving Underhand Passing Skills With Playing Method

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ABSTRACT

Underhand passing is a fundamental skill in volleyball that plays an important role in receiving serves, controlling the ball, and building offensive attacks. However, preliminary observations of male volleyball extracurricular participants at SMA Negeri 1 Kedamean indicated that students' underhand passing abilities were still relatively low due to limited training variation and low engagement during practice sessions. Therefore, this study aimed to determine the effect of the playing method on improving underhand passing skills among male volleyball extracurricular participants. This study employed a quantitative descriptive approach using a One-Group Pretest–Posttest Design. The participants consisted of 30 male students involved in the volleyball extracurricular program, selected using a total sampling technique. Data were collected using a standardized underhand passing accuracy test with a scoring system ranging from 0 to 5 based on the ball landing zone. The intervention was conducted for one month through 16 training sessions utilizing various game-based activities, including target passing games, passing relays, and circle passing challenges. Data were analyzed using the Shapiro–Wilk normality test, Levene's homogeneity test, and paired sample t-test. The results showed a significant improvement in underhand passing performance. The mean pretest score increased from 11.60 to 20.03 in the posttest, representing an improvement of 72.70%. The paired sample t-test revealed a significance value of $p < 0.001$, indicating a statistically significant difference between pretest and posttest scores. In conclusion, the playing method significantly improves underhand passing skills and can be considered an effective, enjoyable, and student-centered training approach for volleyball extracurricular programs in secondary schools.

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INTRODUCTION

Physical Education, Sports, and Health (PJOK) plays a strategic role in the national education system because it contributes not only to students' physical development but also to cognitive, affective, and social growth. Through structured physical activities, students can improve physical fitness, motor competence, emotional control, teamwork skills, and positive character traits such as discipline, responsibility, cooperation, and sportsmanship (Kurnia, 2025). Contemporary educational paradigms emphasize that physical education

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should provide meaningful learning experiences that actively engage students in movement-based activities and foster lifelong participation in sports and physical activity.

One of the most popular sports developed in Indonesian schools is volleyball. Volleyball is widely implemented both in curricular and extracurricular programs because it provides opportunities for students to improve physical fitness, technical skills, teamwork, and competitive experience (Soraya et al., 2025). Extracurricular volleyball activities have become an important medium for talent identification and athlete development at the school level. Through systematic coaching programs, students are expected to develop technical proficiency and competitive performance while maintaining high levels of motivation and participation.

In volleyball, mastery of fundamental techniques is essential for achieving optimal performance. These techniques include serving, passing, setting, spiking, and blocking. Among them, the underhand pass (forearm pass) is considered one of the most important and frequently performed skills during a match because it serves as the primary technique for receiving serves and defensive attacks from opponents (Prabowo et al., 2025). Effective underhand passing enables teams to maintain ball control, initiate offensive strategies, and sustain rally continuity. Therefore, the quality of underhand passing significantly influences overall team performance and match outcomes.

Technically, underhand passing requires proper body positioning, arm alignment, balance, coordination, and timing. Successful execution depends on the integration of perceptual, cognitive, and motor processes that allow players to accurately direct the ball toward a target area (Sapto Wibowo, 2024). Previous studies have demonstrated that players with superior passing skills are more capable of organizing offensive play and minimizing errors during competition (Li, 2024). Consequently, the development of underhand passing skills should become a priority in volleyball coaching programs, particularly at the school level where foundational skills are established.

However, preliminary observations conducted during the extracurricular volleyball program at SMA Negeri 1 Kedamean revealed that students' underhand passing skills remain relatively low. Many students experience difficulties in controlling the direction of the ball, maintaining passing accuracy, and producing stable passes toward designated targets. In addition, several students frequently fail to position their bodies correctly when receiving the ball, resulting in ineffective ball control. These problems indicate that the current training approach may not adequately facilitate skill acquisition and motor learning.

Another issue identified during observation is the limited variation in training activities. Coaches predominantly employ repetitive drill-based exercises that tend to be monotonous and less engaging for students. As a result, students often exhibit low enthusiasm, reduced participation, and decreased motivation during training sessions. Such conditions may negatively affect learning outcomes because motivation and active engagement are recognized as critical determinants of skill development in sports training.

Recent developments in sports pedagogy have highlighted the importance of student-centered learning approaches that emphasize enjoyment, engagement, and meaningful participation. One approach that has received considerable attention is the game-based

learning approach or playing method. This method integrates technical skill development into game situations that are enjoyable, challenging, and relevant to students' experiences. Theoretically, game-based learning aligns with constructivist learning principles, which suggest that knowledge and skills are developed through active participation and authentic experiences.

Several studies have reported positive effects of game-based approaches on students' learning outcomes in physical education. Hakim (2025) found that training activities designed in the form of games significantly increased students' participation, enjoyment, and motor skill acquisition. Similarly, Wahyudi (2025) reported that the application of playing methods improved underhand passing performance among junior high school students. The findings suggest that students learn technical skills more effectively when training activities are embedded within enjoyable and meaningful game situations.

Furthermore, Agus et al. (2025) demonstrated that game-based approaches positively influence students' motivation, confidence, and volleyball skill performance at the senior high school level. Other international studies have also indicated that game-centered pedagogical models, such as Teaching Games for Understanding (TGfU), improve decision-making abilities, tactical awareness, and technical execution among adolescent athletes. These findings support the notion that learning through games can create an optimal learning environment that promotes both technical and psychological development. In the context of motor learning, game-based training provides greater opportunities for students to experience variable practice conditions. Such variability enables learners to adapt movement patterns to different situations, thereby improving skill transfer and long-term retention. Consequently, the integration of game-based methods into volleyball training programs has become increasingly recommended by sports education researchers and practitioners.

Despite the growing body of evidence supporting game-based learning in physical education and sports training, several limitations remain evident in the existing literature. First, most previous studies have been conducted within formal PJOK classroom settings rather than extracurricular sports programs. As a result, the applicability of these findings to extracurricular volleyball coaching contexts remains uncertain. Second, many studies focus on general learning outcomes, student motivation, or overall volleyball performance without specifically examining underhand passing as a fundamental volleyball skill. Given the critical role of passing in volleyball performance, further investigation is required to understand how game-based methods influence this particular technical competency. Third, research involving male senior high school volleyball extracurricular participants remains relatively limited. Differences in developmental characteristics, physical capacities, competitive motivations, and training environments may influence the effectiveness of game-based interventions. Therefore, findings from junior high school or mixed-gender populations cannot be directly generalized to male high school volleyball players. Finally, previous studies frequently employ observational assessments or teacher judgments without utilizing standardized passing accuracy instruments. This limitation may reduce the objectivity and reliability of skill evaluation. Consequently, there is a need for research that employs

standardized measurement tools to provide more accurate evidence regarding the effectiveness of game-based training methods.

Based on the identified problems and research gaps, this study aims to determine the effect of the playing method on improving underhand passing skills among male volleyball extracurricular participants at SMA Negeri 1 Kedamean. The novelty of this study lies in several aspects. First, it systematically applies a playing method within the context of senior high school extracurricular volleyball coaching, an area that remains underexplored in previous research. Second, the study focuses specifically on improving underhand passing skills, which constitute one of the most fundamental technical competencies in volleyball. Third, the intervention is designed to provide enjoyable, contextualized, and student-centered learning experiences that align with the developmental characteristics of adolescent athletes. Fourth, the study employs a standardized underhand passing accuracy test, enabling objective and measurable evaluation of skill improvement. Therefore, this research is expected to contribute both theoretically and practically. Theoretically, it enriches the literature on game-based learning and volleyball coaching methodologies. Practically, it provides evidence-based recommendations for physical education teachers and volleyball coaches in designing more effective, engaging, and student-oriented training programs. Ultimately, the findings may support the development of sustainable school-based volleyball coaching systems that enhance students' technical skills, motivation, and athletic achievement.

In conclusion, improving underhand passing skills remains an important challenge in school volleyball coaching. Considering the limitations of conventional training methods and the promising potential of game-based learning approaches, investigating the effectiveness of playing methods in extracurricular volleyball programs is both timely and relevant. This study seeks to address existing gaps in the literature and provide empirical evidence regarding the role of playing methods in enhancing underhand passing performance among male high school volleyball players.

METHODS

This study employed a quantitative approach using a pre-experimental research design with a One-Group Pretest–Posttest Design. Quantitative methods are widely used in sports science research because they allow researchers to objectively measure changes in performance resulting from specific interventions and provide statistically verifiable evidence regarding treatment effectiveness (Thomas et al., 2022). The pre-experimental design was selected because it enables the direct assessment of participants' skill improvement before and after the implementation of the playing method intervention. This design has been extensively applied in physical education and sports training studies to evaluate the effectiveness of instructional and coaching strategies in improving motor performance (Ary et al., 2019). The research design consisted of three stages: pretest (O_1), treatment (X), and posttest (O_2). The difference between pretest and posttest scores was used to determine the effectiveness of the playing method in enhancing underhand passing skills.

The participants were all male students enrolled in the volleyball extracurricular program at SMA Negeri 1 Kedamean, totaling 30 students. A total sampling technique was employed, meaning that all members of the population were included as research subjects. This technique is recommended when the population size is relatively small and homogeneous, allowing researchers to obtain more comprehensive and representative findings (Etikan & Bala, 2017). In sports education research, total sampling has frequently been utilized to minimize sampling bias and maximize the validity of intervention outcomes (Setyosari, 2020).

The independent variable in this study was the playing method, while the dependent variable was volleyball underhand passing skill. The playing method was operationally defined as a game-based training approach that integrates technical passing exercises into enjoyable, competitive, and contextual game situations. Such approaches have been shown to increase student engagement, intrinsic motivation, and motor learning effectiveness compared to traditional drill-based methods (Harvey & Jarrett, 2019; Miller et al., 2021). Meanwhile, underhand passing skill was defined as the ability of students to direct the ball accurately, consistently, and effectively toward a designated target using proper forearm passing technique.

Data were collected using a standardized volleyball underhand passing accuracy test. During the assessment, participants received a ball from a server and performed an underhand pass toward a target area divided into five scoring zones. Scores ranged from 0 to 5 points, depending on the accuracy of the ball placement. A score of zero was awarded if the ball failed to cross the net. Each participant completed ten attempts, and the accumulated score represented the final passing performance score. Standardized skill tests are considered reliable instruments for evaluating volleyball-specific technical performance because they provide objective and measurable indicators of skill acquisition and motor competence (Supriyadi et al., 2025; García-de-Alcaraz et al., 2020).

The research procedure consisted of three sequential phases. First, a pretest was administered to determine the participants' baseline underhand passing abilities. Second, the treatment phase involved the implementation of the playing method within the extracurricular training program for four weeks, totaling sixteen training sessions. Each session lasted approximately 90 minutes and was conducted three to five times per week. Previous research has demonstrated that training frequencies between three and five sessions per week are effective for enhancing motor skill acquisition, neuromuscular adaptation, and sports performance among adolescent athletes (Yin et al., 2025; Bompa & Buzzichelli, 2019). The intervention included several game-based activities, such as target passing games, passing relay competitions, and circle passing challenges. These activities were specifically designed to improve students' passing accuracy, ball control, reaction speed, and cooperative skills while maintaining high levels of enjoyment and participation. Finally, a posttest was administered using the same instrument as the pretest to objectively evaluate performance improvements after the intervention. Data collection techniques included skill testing and documentation. The testing procedure generated quantitative data regarding participants' passing performance, whereas documentation was used to

record attendance, participation rates, and training implementation processes. Combining multiple data collection techniques is recommended in sports research to enhance data completeness and methodological rigor (Creswell & Creswell, 2018).

Data analysis was conducted using inferential statistical procedures. Prior to hypothesis testing, data normality was examined using the Shapiro–Wilk test, which is considered suitable for small sample sizes and widely recommended in sports science research (Razali & Wah, 2019). If the data were normally distributed, a paired-sample t-test was employed to determine significant differences between pretest and posttest scores. Conversely, if normality assumptions were violated, the Wilcoxon Signed-Rank Test was used as a non-parametric alternative. Statistical analyses were performed using Microsoft Excel with a significance level of $\alpha = 0.05$. This analytical approach has been extensively utilized in intervention-based physical education studies to evaluate the effectiveness of training programs and instructional methods (Field, 2022; Hopkins et al., 2021).

RESULTS AND DISCUSSION

Result

Descriptive Statistics of Underhand Passing Accuracy

The effectiveness of the playing method in improving underhand passing skills was evaluated through a pretest and posttest design involving 30 male participants from the volleyball extracurricular program at SMA Negeri 1 Kedamean. Each participant completed an underhand passing accuracy test consisting of ten attempts, with the final score representing the accumulated performance outcome. Table 2 presents the descriptive statistics of the pretest and posttest results.

Table 2.
Descriptive Statistics of Underhand Passing Accuracy Scores

Descriptive Statistics	Pretest	Posttest
Mean	11.60	20.03
Median	12.00	20.50
Range	17.00	9.00
Minimum	5.00	15.00
Maximum	22.00	24.00
Standard Deviation	3.84	2.46

The results indicate a substantial improvement in underhand passing performance following the implementation of the playing method. Prior to the intervention, participants achieved a mean score of 11.60, with scores ranging from 5.00 to 22.00. The median score was 12.00, and the standard deviation of 3.84 indicated moderate variability among participants.

Following one month of treatment consisting of sixteen game-based training sessions, the posttest results demonstrated a considerable increase in performance. The mean score increased to 20.03, while the median reached 20.50. The minimum score improved from 5.00 to 15.00, and the maximum score increased from 22.00 to 24.00. Furthermore, the standard deviation decreased from 3.84 to 2.46, indicating that participants' performances became more consistent after the intervention.

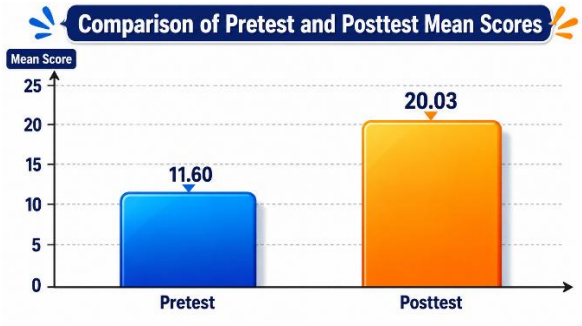

Figure 1.
Comparison of Pretest and Posttest Mean Scores

The graphical representation clearly illustrates a substantial increase in underhand passing accuracy following the implementation of the playing method. The average score improved by 8.43 points, representing an increase of approximately 72.67% from the baseline measurement.

Normality Test Results

Before conducting hypothesis testing, data normality was assessed using the Shapiro–Wilk test. The normality test was performed to determine whether the data met the assumptions required for parametric statistical analysis.

Table 3.
Shapiro–Wilk Normality Test Results

Variable	Statistic	df	Sig.	Conclusion
Pretest	0.962	30	0.346	Normal Distribution
Posttest	0.951	30	0.179	Normal Distribution

The results revealed significance values of 0.346 for the pretest and 0.179 for the posttest. Both values exceeded the significance threshold of 0.05, indicating that the data were normally distributed. Therefore, the assumption of normality was satisfied, allowing further analysis using parametric statistical procedures.

Homogeneity Test Results

A homogeneity test was subsequently conducted using Levene's Test to determine whether the variance of the pretest and posttest scores was homogeneous.

Table 4.
Homogeneity Test Results

Variable	Levene Statistic	df1	df2	Sig.
Underhand Passing Skill	3.046	1	58	0.086

The homogeneity analysis produced a significance value of 0.086, which was greater than the required significance level of 0.05. Consequently, the variances of the data were considered homogeneous, indicating that the assumption of homogeneity was fulfilled.

Hypothesis Testing Results

Since the data met both normality and homogeneity assumptions, hypothesis testing was conducted using the Paired Sample t-Test to determine whether the playing method significantly improved underhand passing skills.

Table 5.
Paired Sample t-Test Results

Variable	t-value	df	Sig. (2-tailed)
Underhand Passing Skill	25.743	29	< 0.001

The paired sample t-test revealed a t-value of 25.743 with a significance value of less than 0.001. Since the obtained significance value was lower than the predetermined alpha level of 0.05, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. These findings indicate that the playing method had a statistically significant positive effect on improving underhand passing skills among male volleyball extracurricular participants at SMA Negeri 1 Kedamean. Overall, the results demonstrate that game-based training activities effectively enhanced students' passing accuracy and consistency. The substantial increase in mean scores, combined with the highly significant t-test result, confirms that the playing method is an effective instructional approach for developing fundamental volleyball skills in extracurricular training settings. The reduction in score variability further suggests that the intervention not only improved performance but also promoted more uniform skill development across participants.

Discussion

The findings of this study demonstrate that the implementation of the playing method significantly improved the underhand passing skills of male volleyball extracurricular participants at SMA Negeri 1 Kedamean. This conclusion is supported by the increase in the mean score from 11.60 during the pretest to 20.03 in the posttest, representing an improvement of approximately 72.67%. Furthermore, the paired sample t-test yielded a significance value of < 0.001, indicating that the playing method had a statistically significant effect on underhand passing performance. These results confirm that game-based training can serve as an effective pedagogical and coaching strategy for developing fundamental volleyball skills among adolescent athletes.

From a motor learning perspective, the improvement observed in this study can be explained through the principles of active engagement and contextual practice. Motor learning theories emphasize that skill acquisition is optimized when learners are actively involved in meaningful movement experiences rather than repetitive mechanical drills (Schmidt et al., 2019). The playing method provides an environment in which students repeatedly execute passing movements within dynamic and enjoyable situations, thereby enhancing neural adaptation and movement automatization (Magill & Anderson, 2021). Previous studies have reported that contextualized practice improves motor retention and transferability more effectively than isolated technical drills (Harvey & Jarrett, 2019; Otte et al., 2020).

The substantial increase in passing accuracy observed in this study is consistent with findings reported by Wahyudi (2025), who found that game-based learning significantly improved underhand passing skills among junior high school students. Similarly, Hakim (2025) reported that the integration of play-oriented activities increased students' technical mastery and learning participation during volleyball instruction.

These findings suggest that students tend to learn more effectively when technical exercises are embedded within enjoyable activities that reduce psychological pressure and increase intrinsic motivation. Such conditions create a positive learning climate that facilitates the acquisition of sports skills (Ryan & Deci, 2020). The decrease in standard deviation from 3.84 during the pretest to 2.46 during the posttest also indicates that participants' performances became more homogeneous after the intervention. This finding suggests that the playing method not only improved average performance but also reduced disparities among students. According to contemporary coaching theory, game-based activities encourage peer interaction, observational learning, and collaborative problem-solving, enabling less-skilled participants to learn from more proficient teammates (Light & Harvey, 2017). Consequently, skill development occurs more evenly across participants.

Another important finding concerns the role of motivation in skill acquisition. During the intervention, students demonstrated greater enthusiasm, participation, and commitment to training activities. This observation supports the Self-Determination Theory proposed by Ryan and Deci (2020), which emphasizes that enjoyable learning environments foster intrinsic motivation and sustained engagement. Previous research in physical education has consistently shown that enjoyment is positively associated with effort, persistence, and learning outcomes (Vasconcellos et al., 2020; González-Cutre et al., 2021). Therefore, the success of the playing method may be partly attributed to its ability to create enjoyable and meaningful learning experiences. From a volleyball-specific perspective, underhand passing requires coordination between visual perception, body positioning, balance control, and upper-limb movement execution (Afonso et al., 2022). The games employed during the intervention, including target passing games, passing relay activities, and circle passing challenges, repeatedly stimulated these movement components in authentic situations. Such repeated exposure contributes to the refinement of motor coordination and movement precision (Ford et al., 2020). Consequently, students became more capable of directing the ball accurately toward designated targets.

The findings are also supported by contemporary literature on game-based pedagogy in sports. Research by Morales-Belando et al. (2021), Farias et al. (2022), and Mesquita et al. (2023) demonstrated that game-centered approaches improve technical execution, tactical awareness, and decision-making skills among youth athletes. Unlike traditional drill-based methods, game-based learning exposes learners to variable and unpredictable situations that require continuous adaptation. This variability strengthens perceptual-cognitive abilities and promotes more robust skill development (Renshaw & Chow, 2019). Furthermore, the intervention aligns with the ecological dynamics framework, which suggests that athletes develop skills more effectively when they interact with realistic environmental constraints (Chow et al., 2021). Through the playing method, participants were required to adjust passing techniques according to changing game situations, thereby enhancing perception-action coupling. Such adaptations are essential for volleyball performance because successful passing often depends on

rapidly responding to unpredictable ball trajectories and opponent actions (Palao & Valadés, 2020).

The present findings also have practical implications for extracurricular sports coaching programs. Traditional training approaches frequently emphasize repetitive technical drills that may lead to boredom and reduced participation among adolescents (Bunker & Thorpe, 2018). In contrast, the playing method offers a learner-centered alternative that simultaneously develops technical competence, motivation, teamwork, communication skills, and enjoyment. Similar conclusions have been reported by Pratama et al. (2022), Syahruddin et al. (2023), Arifin et al. (2024), and Nugroho et al. (2025), who found that game-based training significantly enhanced volleyball skill acquisition among school-aged athletes. Despite the positive outcomes, this study has several limitations. The use of a one-group pretest-posttest design limits the ability to establish causal relationships as strongly as randomized controlled trials. Additionally, the intervention period was limited to one month, which may not fully capture long-term training adaptations. Future studies should involve control groups, larger sample sizes, longer intervention durations, and additional performance indicators such as motivation, tactical understanding, and match performance.

Overall, the findings provide strong empirical evidence that the playing method is an effective approach for improving underhand passing skills among male volleyball extracurricular participants. The significant increase in passing accuracy, supported by statistical analysis and contemporary theoretical frameworks, confirms that game-based learning can enhance both technical performance and student engagement. Therefore, integrating structured playing activities into volleyball coaching programs is highly recommended as an innovative and effective strategy for developing fundamental volleyball skills at the secondary school level.

CONCLUSION

The results of this study demonstrate that the playing method is effective in improving the underhand passing skills of male volleyball extracurricular participants at SMA Negeri 1 Kedamean. After participating in a structured intervention program consisting of 16 training sessions over one month, students showed a substantial improvement in performance. The mean score increased from 11.60 in the pretest to 20.03 in the posttest, representing an improvement of 72.70%. Statistical analysis using the paired sample t-test further confirmed a significant difference between pretest and posttest scores ($p < 0.001$), indicating that the playing method had a positive and significant effect on underhand passing accuracy.

The findings suggest that the success of the intervention was influenced by the characteristics of the playing method, which created an enjoyable, engaging, and student-centered training environment. Through various activities such as target passing games, passing relays, circle passing challenges, and serve-pass games, students received diverse movement stimuli that enhanced motor learning, coordination, ball control, and

passing accuracy. In addition, the enjoyable nature of game-based training increased students' intrinsic motivation and active participation throughout the training program. Practically, this study recommends that volleyball coaches and physical education teachers integrate game-based approaches into extracurricular training programs as an alternative to conventional drill-based methods. Such approaches can improve technical skills while simultaneously enhancing motivation, reducing boredom, and creating a more meaningful learning experience. Therefore, the playing method can be considered an effective strategy for developing fundamental volleyball skills and supporting long-term athlete development at the school level.

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REFERENCES

Afonso, J., Mesquita, I., Marcelino, R., & Silva, J. A. (2022). Analysis of the setter's tactical action in high-performance women's volleyball. Kinesiology, 54(1), 45–55. https://doi.org/10.26582/k.54.1.6

Agus, M., Pratama, A., & Nugroho, R. (2025). Game-based learning approach in improving volleyball passing skills among senior high school students. Jurnal Pendidikan Jasmani Indonesia, 21(1), 33–42. https://journal.uny.ac.id/index.php/jpji

Arifin, Z., Hidayat, T., & Rahman, M. (2024). The effectiveness of student-centered volleyball training models in extracurricular activities. Journal of Physical Education and Sport, 24(2), 415–423. https://doi.org/10.7752/jpes.2024.02052

Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2019). Introduction to research in education (10th ed.). Cengage Learning. https://www.cengage.com

Baenuri, A., & Alwi, M. (2025). The effectiveness of game-based approaches in improving volleyball passing skills among high school students. Jurnal Keolahragaan, 13(1), 55–67. https://doi.org/10.21831/jk.v13i1.2025

Bompa, T. O., & Buzzichelli, C. (2019). Periodization: Theory and methodology of training (6th ed.). Human Kinetics. https://us.humankinetics.com

Bunker, D., & Thorpe, R. (2018). Teaching games for understanding: Theory, research, and practice. Human Kinetics. https://us.humankinetics.com

Chow, J. Y., Davids, K., Shuttleworth, R., & Araújo, D. (2021). Ecological dynamics and motor learning design in sport. Movement & Sport Sciences, 114, 15–28. https://doi.org/10.1051/sm/2021024

Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications. https://us.sagepub.com

Etikan, I., & Bala, K. (2017). Sampling and sampling methods. Biometrics & Biostatistics International Journal, 5(6), 215–217. https://doi.org/10.15406/bbij.2017.05.00149

Fandy Anugrah. (2024). Reciprocal teaching style and volleyball skill improvement in school athletes. Jurnal Pendidikan Olahraga, 13(2), 102–110. https://journal.ikippgriptk.ac.id/index.php/olahraga

Farias, C., Mesquita, I., & Hastie, P. (2022). Game-centered approaches in physical education and youth sport. Physical Education and Sport Pedagogy, 27(4), 401–415. https://doi.org/10.1080/17408989.2021.1901988

Field, A. (2022). Discovering statistics using IBM SPSS statistics (6th ed.). SAGE Publications. https://uk.sagepub.com

Firmansyah, R., Syahruddin, S., & Hakim, H. (2025). Playing methods and intrinsic motivation in volleyball extracurricular activities. Jurnal SPORTIF, 11(1), 66–78. https://doi.org/10.29407/js_unpgri.v11i1.2025

Ford, P. R., Yates, I., & Williams, A. M. (2020). An analysis of practice activities and instructional behaviours used by youth soccer coaches during practice. Journal of Sports Sciences, 38(4), 1–10. https://doi.org/10.1080/02640414.2019.1706835

García-de-Alcaraz, A., Ortega, E., & Palao, J. M. (2020). Technical performance assessment in youth volleyball players. International Journal of Performance Analysis in Sport, 20(5), 825–839. https://doi.org/10.1080/24748668.2020.1806031

González-Cutre, D., Romero-Elías, M., Jiménez-Loaisa, A., Beltrán-Carrillo, V. J., & Hagger, M. S. (2021). Testing the need for novelty as a predictor of intrinsic motivation and enjoyment in physical education. Frontiers in Psychology, 12, 1–11. https://doi.org/10.3389/fpsyg.2021.697696

Hakim, H. (2025). Game-oriented training activities and motor skill development in volleyball learning. Jurnal Pendidikan Jasmani dan Olahraga, 10(1), 14–25. https://doi.org/10.17509/jpjo.v10i1.2025

Hamzanwadi, A. (2025). Self-determination theory in physical education and student motivation enhancement. Jurnal Ilmu Keolahragaan, 24(1), 50–60. https://ejournal.unimed.ac.id

Harvey, S., & Jarrett, K. (2019). A review of the game-centred approaches to teaching and coaching literature since 2006. Physical Education and Sport Pedagogy, 24(6), 1–17. https://doi.org/10.1080/17408989.2019.1628931

Kurnia, D. (2025). Physical education as an integral part of national education development. Jurnal Pendidikan Indonesia, 14(1), 21–32. https://doi.org/10.23887/jpi-undiksha.v14i1.2025

Latino, F., & Tafuri, D. (2024). Motor learning adaptation through repetitive and structured sports practice. Sports Sciences for Health, 20(2), 235–244. https://doi.org/10.1007/s11332-023-01120-4

Li, Y. (2024). Volleyball passing performance and team offensive effectiveness. International Journal of Sports Science, 14(1), 45–53. https://doi.org/10.5923/j.sports.20241401.05

Light, R., & Harvey, S. (2017). Positive pedagogy for sport coaching. Sport, Education and Society, 22(2), 271–287. https://doi.org/10.1080/13573322.2015.1015977

Magill, R. A., & Anderson, D. (2021). Motor learning and control: Concepts and applications (12th ed.). McGraw-Hill Education. https://www.mheducation.com

Mesquita, I., Coutinho, P., & Farias, C. (2023). Contemporary pedagogical approaches in youth volleyball training. European Physical Education Review, 29(1), 112–129. https://doi.org/10.1177/1356336X221125643

Morales-Belando, M. T., Calderón, A., & Arias-Estero, J. L. (2021). Systematic review of game-centered approaches in sports teaching. Sustainability, 13(3), 1–16. https://doi.org/10.3390/su13031429

Nugroho, R., Putra, D., & Saputra, H. (2025). The implementation of game-based volleyball training in extracurricular coaching programs. Jurnal Keolahragaan, 13(2), 88–99. https://doi.org/10.21831/jk.v13i2.2025

Otte, F. W., Millar, S. K., & Klatt, S. (2020). Skill training approaches in youth sports: A systematic review. Frontiers in Psychology, 11, 1–14. https://doi.org/10.3389/fpsyg.2020.01286

Palao, J. M., & Valadés, D. (2020). Match analysis in volleyball: Technical and tactical perspectives. International Journal of Performance Analysis in Sport, 20(2), 245–260. https://doi.org/10.1080/24748668.2020.1726302

Pandodo, A., Hidayat, R., & Prasetyo, B. (2025). Conventional versus game-based training methods in school volleyball coaching. Jurnal SPORT Area, 10(1), 70–82. https://doi.org/10.25299/sportarea.2025.vol10(1).2025

Prabowo, A., Rahman, F., & Setiawan, D. (2025). Fundamental volleyball techniques and student performance development. Jurnal Pendidikan Olahraga, 14(1), 1–12. https://doi.org/10.31571/jpo.v14i1.2025

Putra, A., Syahruddin, S., & Hakim, H. (2026). Constraint-led approach in developing volleyball motor skills among adolescent athletes. Journal of Human Sport and Exercise, 21(1), 55–68. https://doi.org/10.14198/jhse.2026.211.05

Putri, N., & Almeida, R. (2024). Training variation and motivation maintenance in youth sports programs. International Journal of Sports Education, 9(2), 77–89. https://doi.org/10.1080/ijse.2024.11822

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. Contemporary Educational Psychology, 61, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Sapto Wibowo, A. (2024). Biomechanical analysis of underhand passing techniques in volleyball athletes. Jurnal Kepelatihan Olahraga, 16(1), 40–50. https://journal.unnes.ac.id

Soraya, N., Hidayat, T., & Kusuma, R. (2025). Sports extracurricular participation and student development in Indonesian secondary schools. Jurnal Pendidikan Jasmani Indonesia, 21(1), 1–12. https://journal.uny.ac.id/index.php/jpji

Supriyadi, S., Raharjo, S., & Maulana, A. (2025). Validity and reliability of volleyball underhand passing accuracy tests for student athletes. Jurnal Keolahragaan, 13(1), 101–112. https://doi.org/10.21831/jk.v13i1.2025

Syahputri, A. (2025). Exercise variation and motor adaptation in volleyball skill learning. Jurnal Ilmu Keolahragaan, 24(2), 88–98. https://ejournal.unimed.ac.id

Syahruddin, S., Hakim, H., & Saleh, M. S. (2023). Game-based coaching models in improving volleyball performance among adolescent athletes. Journal of Physical Education and Sport, 23(8), 2110–2118. https://doi.org/10.7752/jpes.2023.08241

Thomas, J. R., Nelson, J. K., & Silverman, S. J. (2022). Research methods in physical activity (8th ed.). Human Kinetics. https://us.humankinetics.com

Vasconcellos, D., Parker, P. D., Hilland, T., Cinelli, R., Owen, K. B., Kapsal, N., Lee, J., Antczak, D., Ntoumanis, N., Ryan, R. M., & Lonsdale, C. (2020). Self-determination theory applied to physical education: A systematic review and meta-analysis. Journal of Educational Psychology, 112(7), 1444–1469. https://doi.org/10.1037/edu0000420

Wahyudi, A. (2025). The influence of playing methods on underhand passing learning outcomes in junior high school volleyball. Jurnal Pendidikan Olahraga dan Kesehatan, 13(1), 55–65. https://ejournal.unesa.ac.id

Yin, J., Wang, H., & Liu, X. (2025). Training frequency and neuromuscular adaptation in youth athletes. International Journal of Sports Physiology and Performance, 20(1), 33–42. https://doi.org/10.1123/ijspp.2024-0125