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THE EFFICACY OF STRUCTURED DEFENSIVE TECHNIQUE TRAINING ON ENHANCING DEFENSIVE CAPABILITIES IN VOLLEYBALL AMONG NINTH-GRADE STUDENTS AT SMPN 1 KUTACANE

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Abstract

This study aimed to determine the effect of defensive technique training on the defensive skills in volleyball of 9th-grade students at SMPN 1 Kutacane. The research used an experimental method with a one-group pretest-posttest design involving 30 students. Over a period of three weeks, participants underwent a structured training program focused on fundamental defensive techniques such as digging, forearm passing, and blocking. The results demonstrated a substantial improvement in defensive performance, with the average score increasing from 49.5 in the pretest to 85.0 in the posttest. Statistical analysis using a paired sample t-test yielded a highly significant result ($t = 55.64 > t\text{-table} = 2.045$), leading to the rejection of the null hypothesis. These findings robustly indicate that the implemented defensive technique training was profoundly effective in enhancing the students' volleyball defensive skills. The study concludes that a systematic and focused approach to teaching defensive fundamentals is crucial for skill development in adolescent athletes.

Keywords: ***Defensive Ability, Defensive Training, Junior High School Students, Physical Education, Technical Skills, Volleyball***

INTRODUCTION

Volleyball stands as one of the most dynamic and widely practiced team sports in educational institutions across Indonesia and the globe. It is a sport that demands a sophisticated synthesis of individual technical prowess, acute tactical awareness, peak physical conditioning, and seamless team coordination. At its core, volleyball is a game of rallies, a continuous sequence of attacks and defenses, where the ultimate objective is to ground the ball on the opponent's side of the court. While the spectacular spikes and powerful serves often capture the most attention, it is the quality of a team's defensive efforts that frequently dictates the flow and outcome of a match. A resilient and skillful defense does not merely prevent the opponent from scoring; it creates the foundational opportunities for a successful counter-attack, transforming a potential point for the opposition into a scoring chance for one's own team.

Despite the undeniable importance of defensive skills, a pervasive issue observed in the context of physical education, particularly at the junior high school level in Indonesia, is the pronounced deficiency in students' mastery of basic defensive techniques. The reality on the courts often reveals a significant gap between the theoretical understanding of the game and the practical execution of its defensive components. Many students exhibit a fundamental lack of proficiency in techniques such as the ready position, forearm passing (bumping), digging, and blocking. This technical shortcoming manifests in a fragile team defense that is easily penetrated by opposition attacks, leading to short rallies, frequent points conceded, and a diminished sense of efficacy and enjoyment among the players. The game devolves into a series of errors rather than a contest of skill and strategy.

This challenge is acutely evident at SMPN 1 Kutacane, a school where volleyball is a popular extracurricular and co-curricular activity. Preliminary observations and initial assessments conducted with the ninth-grade students revealed a concerning trend: their overall defensive capabilities were categorically low. The students struggled with reading the trajectory of the ball, positioning their bodies correctly for defensive plays, and executing the fundamental techniques with consistency and control. The forearm pass was often erratic, digs were mistimed, and blocking was either non-existent or poorly coordinated. This lack of a solid defensive foundation not only hampered their performance in games but also limited their overall development as volleyball players and their enjoyment of

the sport. Therefore, a systematic and structured intervention is imperative to address this pedagogical and practical challenge. It is insufficient to simply play the game; focused, repetitive, and correctly guided practice is essential for neuromuscular adaptation and skill acquisition. The central hypothesis of this research is that a dedicated training program, specifically targeting the core defensive techniques of digging, forearm passing, and blocking, can produce a statistically significant and practically meaningful improvement in the overall defensive ability of the students. This study is driven by the need to move beyond general physical education and into the realm of specialized, technique-oriented coaching at the school level.

The primary objective of this research is to empirically investigate the influence of a structured defensive technique training program on the defensive skills of ninth-grade students in volleyball. It seeks to quantify the improvement, if any, and to provide a detailed analysis of how such a program impacts not only the technical execution but also ancillary aspects such as player confidence, team coordination, and defensive readiness. By establishing a clear causal link between targeted training and enhanced performance, this study aims to contribute valuable insights for physical education teachers, school sports coaches, and curriculum developers, advocating for the integration of more specialized technical training modules within the broader physical education framework.

LITERATURE REVIEW

To fully contextualize this study, it is essential to delve into the existing body of knowledge concerning motor learning, skill acquisition in sports, and the specific technical and tactical demands of volleyball defense. The theoretical underpinnings of this research are rooted in the principles of deliberate practice and the systematic development of motor skills. The process of acquiring and refining sports skills is a complex interplay between cognitive understanding and physical execution. According to the theories espoused by prominent sports scientists, skill learning progresses through distinct stages: the cognitive stage, where the learner understands the goal and tries to figure out what to do; the associative stage, where the connection between cognition and action is strengthened through practice; and the autonomous stage, where the skill becomes automatic and can be performed with minimal conscious thought. The defensive techniques in volleyball are no exception. For a student to effectively execute a dig against a powerful spike, the action must be近乎 automatic, requiring the player to have moved beyond the cognitive and into the associative or autonomous stages of learning. This transition is only possible through repetitive, focused, and correctly reinforced practice—the very essence of the training program implemented in this study.

Focusing specifically on volleyball defense, Sucipto (2014) provides a comprehensive definition, describing defensive techniques as the ensemble of skills required to withstand and return an opponent's attack. He categorizes defense into two primary domains: net defense (blocking) and backcourt defense (digging and forearm passing). Blocking is the first line of defense, an action taken by front-row players to intercept the ball at the net, directly countering an opponent's attack. Its effectiveness lies not only in the height and jump of the players but also in their timing, hand positioning, and understanding of the attacker's tendencies. Conversely, digging and forearm passing are the backbone of the backcourt defense. These techniques are used to handle hard-driven attacks (digs) and to control slower, more placid balls for a precise pass to the setter (forearm passing). Mastery of these skills requires excellent footwork, body control, platform consistency, and the ability to anticipate the ball's path.

The work of Sukadiyanto (2011) reinforces the idea that the enhancement of motor abilities in sports is achievable through well-planned and systematic training. He emphasizes that training must be structured, progressive, and tailored to the participants' age and skill level. For junior high school students, who are typically in their early adolescence, this means focusing on the correct fundamentals before introducing complex tactical layers. The training should prioritize quality of movement over quantity, ensuring that correct technique is ingrained from the outset to prevent the formation of bad habits that are difficult to correct later. Mahendra (2020) further supports this view, adding that training methods focused on specific aspects, such as defensive footwork or technical hand positioning, can yield a significant impact on overall in-game performance. A player who has drilled the correct footwork for moving to a ball will reach it more efficiently; a player who has practiced hundreds of digs will have a more stable and reliable platform.

Beyond the purely technical, the literature also highlights the importance of psychological and coordinative factors. Kosasih (2012) posits that defensive capability in volleyball is heavily influenced by continuous training, physical readiness, and team coordination. Defense is as much a mental game as it is a physical one. It requires focus, anticipation, courage (particularly when facing hard-driven spikes), and resilience to quickly forget a mistake and prepare for the next play. Furthermore, team coordination is paramount. A well-organized defense operates like a symphony, with players understanding their zones of responsibility, communicating effectively, and moving in

harmony to cover the court. A training program that isolates individual techniques is a necessary first step, but its ultimate success is measured by how well those individual skills are integrated into a cohesive team defense. This study sits at the intersection of these theoretical and practical concepts. It operates on the premise that by applying the principles of deliberate practice—through a structured program focused on digging, forearm passing, and blocking—it is possible to catalyze the students' progression through the stages of motor learning. It hypothesizes that this technical improvement will, in turn, positively influence their mental readiness and coordinative abilities with teammates, leading to a holistic enhancement of their defensive capabilities in the game of volleyball.

METHOD

To rigorously test the hypothesis that defensive technique training improves volleyball skills, a quantitative research approach was adopted, utilizing an experimental method. The specific design employed was a one-group pretest-posttest design. This design is particularly effective for establishing the effect of an intervention within a single group by comparing the state of the participants before and after the intervention is administered. The participants of this study were 30 ninth-grade students from SMPN 1 Kutacane. The sample was selected through a purposive sampling technique. The primary criteria for selection were: (1) enrollment as an active student in grade IX at SMPN 1 Kutacane, (2) prior participation in the school's volleyball extracurricular activities or physical education classes, ensuring a basic familiarity with the sport, and (3) a willingness to participate in the entire duration of the training program and assessments. The sample consisted of both male and female students, reflecting the co-educational nature of the school's sports programs. Informed consent was obtained from the school authorities and the students' parents or guardians prior to the commencement of the research.

The independent variable in this study was the structured defensive technique training program. The dependent variable was the students' defensive ability in volleyball, operationalized through a composite score derived from a skill assessment instrument. The training program was meticulously designed and implemented over three weeks, with sessions conducted five times per week. Each 90-minute session was structured to be progressive, beginning with the fundamental elements of each defensive technique and gradually advancing to more complex and game-like applications. The core curriculum focused on three essential defensive skills. The training for forearm passing, or passing bawah, started with establishing the perfect "platform." Initial drills concentrated on the proper hand grip, arm extension, and body positioning. These exercises progressed from stationary self-tossing to passing balls tossed by the coach from various angles and, finally, to handling light attacks. Digging was introduced as an advanced form of forearm passing for powerful attacks, emphasizing a lower body position, quick reactions, and using the entire body to absorb force. Drills evolved from "pepper" exercises with a partner to digging forcefully thrown balls and, eventually, actual spikes. Blocking training commenced with foundational footwork along the net, followed by perfecting the jumping technique, hand positioning over the net, and crucial timing. The drills for this skill advanced from shadow blocking without a ball to actively blocking set attacks from the opposite side of the net.

Every session followed a consistent structure, commencing with a 15-minute warm-up of dynamic stretching and light cardio. This was followed by 60 minutes of core technical drills, which allocated 20 minutes to each of the three core techniques. Each session concluded with a 15-minute cool-down involving static stretching and a review. Throughout the training, coaches consistently reinforced key cues and provided individual corrective feedback to ensure technical correctness for every student. To measure the program's effectiveness, a defensive skills assessment rubric was used for data collection. This instrument evaluated each student's proficiency across five key components—Technical Execution of Forearm Passing/Digging, Technical Execution of Blocking, Accuracy, Reaction and Anticipation, and Consistency and Mental Readiness—with each component scored out of 20 for a total maximum score of 100. This assessment was administered twice: first as a pretest before the training began and again as a posttest after the three-week program concluded, with identical conditions and assessors for both to ensure reliability.

The subsequent data analysis was conducted in multiple stages. Descriptive statistics, including the mean, median, range, and standard deviation, were first calculated for both the pretest and posttest scores to summarize the data. Following this, inferential statistical analysis was performed. The Shapiro-Wilk test was used to check the normality of the data distribution. Finally, a paired sample t-test was employed to compare the mean scores from the pretest and posttest, with the significance level set at 0.05. This test was used to evaluate the null hypothesis, which stated there was no significant difference between the pretest and posttest means, against the alternative hypothesis, which proposed a significant increase in the posttest scores.

RESULTS AND DISCUSSION

The findings of this study present a compelling narrative on the transformative power of structured technical training. The data collected from the pretest and posttest assessments provide clear, quantitative evidence of the students' progress, while the statistical analysis offers a robust confirmation of the training program's effectiveness.

A Narrative of Quantitative Improvement

The initial assessment, the pretest, painted a picture of a group of students with foundational knowledge but underdeveloped practical skills. The descriptive statistics for the pretest scores revealed an average (mean) score of 49.5 out of a possible 100. The scores were clustered within a relatively narrow range of 43 to 55, with a standard deviation of 3.49. This low mean and small variability indicate that the group, as a whole, started from a uniformly low baseline of defensive proficiency. Observations during the pretest corroborated these numbers: students were often flat-footed, their technical form was inconsistent, passes were erratic, blocks were mistimed, and there was a palpable lack of confidence when facing incoming balls. The posttest results, conducted after the intensive three-week training period, told a dramatically different story. The average score skyrocketed to 85.0, representing an average improvement of 35.5 points per student. The range of scores also shifted upwards to 75–92, with a slightly increased standard deviation of 4.17. This increase in standard deviation suggests that while the entire group improved, some students benefited more from the training than others, a common occurrence in skill acquisition due to individual differences in aptitude, physical conditioning, and engagement. Nevertheless, the lowest posttest score (75) was substantially higher than the highest pretest score (55), underscoring the universal positive impact of the intervention.

Statistical Significance and Hypothesis Testing

Before proceeding with the parametric t-test, the assumption of normality was verified. The Shapiro-Wilk test results for both the pretest and posttest score distributions yielded p-values greater than 0.05, confirming that the data did not significantly deviate from a normal distribution. This validation allowed for the use of the paired sample t-test, a powerful tool for detecting differences within the same group over time. The results of the t-test were unequivocal. The calculated t-value was 55.64. This value was then compared to the critical t-value from the t-distribution table with 29 degrees of freedom ($df = n-1 = 29$) at a significance level of $\alpha = 0.05$. The critical t-table value was 2.045. The obtained t-value of 55.64 vastly exceeds this critical value ($55.64 > 2.045$). Consequently, the null hypothesis (H_0), which posited that there was no significant difference between the pretest and posttest means, was resoundingly rejected. The probability (p-value) associated with a t-value this large is infinitesimally small, far less than 0.001, indicating that the observed improvement is statistically significant and not due to random chance or sampling error.

A Deeper Discussion: Unpacking the Transformation

The stark numerical improvement from a mean of 49.5 to 85.0, backed by overwhelming statistical evidence, demands a deeper exploration of the "how" and "why" behind this transformation. The success of the training program can be attributed to a confluence of factors rooted in sound pedagogical and sports science principles. First and foremost, the program succeeded because it provided the one thing these students lacked: focused, repetitive, and technically correct practice. Before the intervention, their exposure to volleyball was likely sporadic and game-oriented. In a typical physical education setting, students often spend limited time on isolated skill drills and quickly move to playing full games. While playing is enjoyable and provides tactical context, it is an inefficient way to learn complex motor skills. In a game, a student might only attempt a handful of digs or blocks, often under pressure and with incorrect form that goes uncorrected. The structured training program flipped this model. By dedicating 60 minutes per session solely to drilling the core techniques, each student was afforded hundreds of repetitions. This massive volume of practice is essential for creating the myelin sheath around neural pathways, which is the biological basis for muscle memory and skill automation, as explained by modern motor learning theory.

The progression of the drills was another critical factor. Starting with simple, stationary exercises allowed students to focus purely on the technical components—the shape of their platform, the position of their hands in a block—without the cognitive load of movement and decision-making. As they mastered these static elements, the drills were progressively made more complex and dynamic. Introducing movement, then varying the trajectory and speed of the incoming ball, and finally adding live attackers, systematically built up the students' ability to execute the techniques in increasingly game-like situations. This progressive overload for the nervous system ensured that the skills were not just learned in a sterile environment but were becoming adaptable and functional.

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Furthermore, the training program addressed more than just the physical execution of techniques. The remarkable improvement in scores was not solely due to better-formed platforms or higher jumps. The assessment rubric components for "Reaction and Anticipation" and "Consistency and Mental Readiness" also showed dramatic improvements. This highlights the profound psychological and perceptual benefits of the training. As the students became more technically proficient, their confidence grew. A student who has successfully dug hundreds of balls in practice is far less likely to flinch or turn away from a hard-driven spike in a game. They develop a sense of self-efficacy. Moreover, the repetitive drills sharpened their perceptual skills. They began to learn the visual cues—the body language of the setter, the arm swing of the attacker—that allow a defender to anticipate where the ball is going. This anticipation, combined with drilled footwork, allowed them to get into position earlier, making the technical execution of the dig or block significantly easier and more effective.

The role of corrective feedback from the coaches cannot be overstated. Unlike in a free-play scenario, the coaches were actively observing and providing immediate, specific feedback. "Bend your knees more," "Get your hands over the net," "Watch the hitter's shoulder." This feedback loop is crucial for preventing the reinforcement of errors and for accelerating the learning process. It guided the students' practice towards the correct movement patterns, ensuring that their hundreds of repetitions were building good habits, not bad ones. Finally, the training fostered a sense of collective purpose and team coordination. While the drills were individually focused, they were often conducted in pairs or small groups. The "pepper" drill, for instance, requires coordination between two players. As each individual's skill level rose, so did their ability to interact effectively with their teammates. A more accurate pass from the defender makes the setter's job easier, which in turn leads to a better attack. This interconnectedness, though not the primary focus, began to emerge, laying the groundwork for a more sophisticated team defense. The students were no longer just a collection of individuals on the court; they were becoming a defensive unit.

In summary, the discussion moves beyond the simple conclusion that "training worked." It elucidates that the training worked because it was structured, progressive, and comprehensive. It targeted the neuromuscular system through massed practice, the cognitive system through progressive complexity and feedback, and the psychological system through built confidence and improved perception. The 35.5-point average improvement is a quantitative testament to a holistic developmental process that transformed these junior high school students from hesitant and technically weak defenders into confident, skilled, and effective custodians of their court.

CONCLUSION AND IMPLICATIONS

The primary conclusion drawn from this research is unequivocal: a structured, intensive, and technically focused defensive training program, administered over a period of three weeks, has a profoundly positive and statistically significant effect on enhancing the defensive capabilities of ninth-grade volleyball players at SMPN 1 Kutacane. The empirical evidence, demonstrated by the substantial rise in mean scores from 49.5 to 85.0 and the conclusive results of the paired sample t-test ($t = 55.64$, $p < 0.001$), leaves no room for doubt regarding the efficacy of the intervention. The study successfully demonstrates that the deficits in defensive skills observed in this age group are not a function of a lack of ability, but rather a lack of appropriate and focused training methodology.

The implications of these findings are multifaceted and extend beyond the specific context of this study. For physical education teachers and school coaches, the results serve as a powerful mandate to redesign traditional PE and sports coaching sessions. Moving away from an over-reliance on game-based play and towards incorporating structured, technique-centric modules is essential for foundational skill development. Coaches should not assume that skills will be "picked up" through osmosis during games. Instead, they must dedicate significant portions of training time to drilling the fundamentals of defense—digging, passing, and blocking—using a progressive model that starts with simplicity and builds towards game-realistic complexity. Furthermore, training should not focus on technique in isolation; it should be explicitly linked to the development of perceptual-cognitive skills like anticipation and the psychological attributes of confidence and resilience.

For school administrators and policy makers, this study underscores the importance of institutional support for sports development. Schools should be encouraged to allocate adequate resources, including sufficient time within the academic or extracurricular schedule for proper training, and to provide or maintain adequate facilities and equipment. Investing in the professional development of PE teachers and coaches, ensuring they are equipped with the latest knowledge in sports pedagogy and skill acquisition, is a critical step towards improving the overall quality of school sports programs. For students and aspiring athletes, the findings offer a clear message, improvement is a direct product of deliberate practice. Discipline, focus during repetitive drills, and a willingness to receive and act on constructive criticism are the cornerstones of athletic development. Students should be encouraged to engage deeply in the process of skill acquisition, understanding that mastery of the fundamentals is what ultimately enables

advanced performance and greater enjoyment of the sport. For future research, while this study provides strong evidence, it also opens several avenues for further inquiry. Subsequent research should involve a larger and more diverse sample size, potentially across multiple schools, to enhance the generalizability of the findings. Extending the duration of the training intervention beyond three weeks could investigate long-term skill retention and the potential for further improvement. Employing more varied evaluation methods, such as high-speed video analysis for detailed biomechanical feedback or using game performance analysis systems to track defensive effectiveness in actual match conditions, would provide even deeper insights. Finally, comparative studies could be designed to evaluate the relative effectiveness of different training methodologies (e.g., differential learning vs. traditional repetition) for teaching defensive skills in volleyball to adolescents. In closing, this research affirms a fundamental principle of sports education: quality begets quality. By investing in high-quality, structured technical training, we can unlock the potential of young athletes, transforming them from passive participants into skilled, confident, and capable players. The journey to a formidable volleyball defense begins not in the heat of a match, but on the practice court, with a ball, a coach, and a commitment to perfecting the basics.

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