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Analysis of Volleyball Players' Physical Condition and Basic Technical Skills at Smandel Padang Club

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Abstrac: This study aimed to determine the physical condition and basic technical skills of players from the Smandel Padang Volleyball Club. This research employed a quantitative descriptive design. The population consisted of 16 active volleyball players from the Smandel Padang Volleyball Club, and all participants were selected using the total sampling technique. Physical condition was assessed using the bleep test for endurance, the two-hand medicine ball put test for upper-body explosive power, the vertical jump test for lower-body explosive power, and the T-test agility for agility. Basic technical skills were evaluated through serve, Brumbach Forearm Pass Wall-Volley, AAHPER Face Pass Wall-Volley, and smash tests. The results revealed that the players' overall physical condition was classified as fair, while their overall basic technical skills were also classified as fair. These findings indicate the need for structured and continuous training programs, particularly to improve endurance, agility, and attacking skills.

Keyword: Basic Technical Skills, Physical Condition, Quantitative Descriptive, Volleyball

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INTRODUCTION

Sports are a part of daily life that play a vital role in maintaining physical and mental health and contribute to improving public health (Masrun, 2016). In sports, whether for beginners or professional athletes, the primary goal is to achieve excellence. Therefore, the development of competitive sports must be carried out in a planned, tiered, and sustainable manner to produce athletes capable of excelling at the regional, national, and international levels (Purnomo et al., 2020; Nasution et al., 2023). This is in line with Law of the Republic of Indonesia No. 11 of 2022 on the National Sports System, Article 28, paragraphs (1) and (5), which stipulate that the nurturing and development of competitive sports are directed toward achieving excellence through the empowerment of sports associations, the development of training centers, and the organization of competitions in a tiered and sustainable manner (Kusumah & Siregar, 2022). One sport that requires continuous development is volleyball, which enjoys high popularity in Indonesia, as evidenced by the large number of both official and unofficial competitions held (Husaeni & Hasmarita, 2021). These various competitions serve as a means for athletes to improve their skills, develop their potential, and prepare themselves to achieve their best results so they can bring honor to their regions and the nation at both the national and international levels (Donie et al., 2023).

Volleyball is a ball sport played by two teams, each consisting of six players, with the objective of sending the ball over the net into the opponent's court to score points (Irwandi & Iskandar, 2025). Performance in volleyball is influenced by various factors, both internal and external. Internal factors include physical, technical, tactical, and psychological aspects, while external factors include coaches, facilities and equipment, family support, nutrition, and other supporting factors (Mokodensho et al., 2024). Psychological factors, such as motivation and self-confidence, are also important determinants of athletes' performance (Masrun et al., 2022).

Physical condition is a key factor determining an athlete's success in achieving performance goals, as it supports mastery of technique, tactics, and mental readiness (Setiawan et al., 2021). In volleyball, every player is required to be in good physical condition to be able to apply basic techniques optimally during both practice and matches (Oliveira et al., 2025). In addition to improving technical and tactical quality, excellent physical condition also plays a role in enhancing performance and reducing the risk of injury (Masrun et al., 2023). Furthermore, proper technique must be executed in accordance with the rules of the game and mastered through consistent practice so that basic technical skills such as the serve, underhand pass, overhand pass, and spike can develop effectively (Rudyanto & Khairoh, 2025). High motivation also encourages athletes to actively participate in the training process, improves discipline, and accelerates the mastery of the motor skills required in sports (Alkassasbeh & Akroush, 2025). Therefore, volleyball players need to be in top physical condition, have a good command of basic techniques, and possess high motivation to train so that they can perform at their best and achieve optimal results.

In addition, the development of physical condition should be supported by the implementation of appropriate training methods to ensure that training objectives are achieved optimally. Putra et al. (2023) reported that the application of appropriate training methods had a positive effect on improving movement ability. These findings indicate that well-planned and systematic training programs are important factors in supporting the development of athletes' physical condition as well as the mastery of basic technical skills. Furthermore, successful volleyball performance requires not only good physical fitness and technical proficiency but also effective perceptual and tactical decision-making during play, enabling athletes to respond appropriately to dynamic game situations (Rudyanto, Arifan, et al., 2025). Endurance is necessary so that players can compete for long periods without becoming overly fatigued; explosive strength in the arms and legs supports effective smashes, while agility is needed to pass the ball and receive serves and smashes from opponents (Putra et al., 2025; Tanyeri & Oncen, 2020). Therefore, periodic assessments of athletes' physical condition and basic technical skills are essential to identify their strengths and weaknesses and to provide objective information for designing more effective training programs. Such evaluations also enable coaches to monitor

athletes' readiness and determine appropriate training priorities to improve overall volleyball performance (Putra et al., 2026).

In the city of Padang, there are several clubs that regularly conduct volleyball training; one of them is the Smandel Padang Volleyball Club, led by Mr. Hasmal. This club has good potential for growth because it is supported by adequate facilities and equipment, such as a court, balls, a net, physical training equipment, and certified coaches. However, the club's achievements have not yet yielded optimal results, despite the regular training sessions. In recent years, the Smandel Padang Club has only managed to reach the quarterfinals of the 2019 Avatar Bunguih Open Tournament, the round of 16 in the 2022 Palapa Tournament, and was eliminated in the preliminary rounds of the 2023 Petak Padang Pariaman Tournament, the 2023 Surgana Cup Siteba Tournament, and the 2026 Avatar Bunguih Tournament.

Based on field observations and interviews with the coach of the Smandel Padang Volleyball Club, Mr. Hasmal, it was found that there are still various obstacles hindering the athletes' performance, particularly in terms of physical condition, mastery of basic techniques, and the application of training methods that are not yet optimal. Observations conducted on Thursday, April 17, 2026, showed that some athletes tire quickly, have inconsistent endurance, and lack maximum explosive power in their arms and legs which affects the quality of their serves, smashes, and jumps as well as low agility, causing them to be too slow to chase the ball or execute blocks. In addition, many basic technical errors were still observed, such as serves that frequently went out of bounds or got caught in the net, poorly directed overhead and underhand passes, and ineffective smashes that were easily anticipated by opponents.

The interview results also showed that the coach had never systematically conducted physical fitness tests or basic technical skill tests, either during training sessions or before matches, so the athletes' condition could not be objectively assessed. In fact, conducting these tests is essential as a basis for developing a training program that is more targeted, measurable, and tailored to the athletes' needs in order to improve the performance of the Smandel Padang Club. Although previous studies have described the physical condition or technical abilities of volleyball players (Setiawan et al., 2021; Masrun et al., 2023; Oliveira et al., 2025), limited research has comprehensively examined both physical condition components and basic technical skills within the same athlete population at the club level, particularly in developing volleyball clubs in Indonesia.

This study addresses that gap by providing an integrated assessment of endurance, arm explosive power, leg explosive power, agility, and fundamental volleyball techniques among players of the Smandel Padang Volleyball Club. Unlike previous descriptive studies that generally focused on only one aspect of performance, this research combines physical and technical performance profiles to identify specific strengths and weaknesses that can be used as evidence for designing more targeted training programs. Therefore, the scientific contribution of this study lies in providing a comprehensive baseline profile of athletes' physical and technical performance, which may serve as an empirical reference for coaches, sports practitioners, and future researchers in evaluating player readiness and developing evidence-based training strategies. Based on these considerations, the researcher conducted a study entitled "Analysis of the Physical Condition and Basic Technical Skills of Volleyball Players at the Smandel Padang Club."

METHOD

Research Design

This study employed a descriptive research design using a quantitative approach to determine the physical condition and basic technical skills of players from the Smandel Padang Volleyball Club. A descriptive quantitative design is appropriate for systematically describing the characteristics and performance profile of a specific population based on objective measurements (Thomas & Zubkov, 2023). The study was conducted at the Smandel Padang Volleyball Club, Padang, Indonesia, in July 2026. Prior to data collection, all participants were informed about the objectives, procedures, potential benefits, and risks of the study, and written informed consent was obtained from all participants. Participation was voluntary, and the

confidentiality of participants' personal information was maintained throughout the study in accordance with ethical principles for human research.

Participants

The population consisted of all 16 players who were actively participating in training at the Smandel Padang Volleyball Club. Because the population comprised fewer than 100 individuals, total sampling was employed, meaning that all members of the population were included as research participants. This technique was selected to ensure that the data represented the entire population and to eliminate sampling bias in describing the players' physical condition and technical skills.

Instrument

Data were collected using standardized and widely accepted field tests that have demonstrated validity and reliability in evaluating volleyball players' physical fitness and technical performance (Grbić et al., 2026). Physical condition was assessed using:

- (a) Bleep Test to measure aerobic endurance.
- (b) Two-Hand Medicine Ball Put Test to assess upper-body explosive power.
- (c) Vertical Jump Test to measure lower-body explosive power.
- (d) T-Test Agility Test to evaluate agility.

Basic technical skills were assessed using:

- (a) Serve Test for serving accuracy.
- (b) Brumbach Forearm Pass Wall Volley Test for underhand passing ability.
- (c) AAHPER Face Pass Wall Volley Test for overhand passing ability.
- (d) Smash Test for smash performance.

These instruments were selected because they are practical, sport-specific, easy to administer in field settings, and have been extensively used to evaluate volleyball athletes, enabling objective assessment of both physical and technical performance (Grbić et al., 2026). The interpretation of each test result was based on the assessment norms provided in the respective testing manuals and previous studies that established normative classifications for each instrument.

Data Collection

Data collection was carried out during scheduled training sessions at the Smandel Padang Volleyball Club. Before testing, all participants performed a standardized warm-up to minimize injury risk and ensure optimal performance. Physical condition tests were administered first, followed by the volleyball basic technical skill tests. Each participant completed all tests according to standardized procedures under the supervision of the researcher and the club coach to ensure consistency and accuracy in data collection.

Data Analysis

The data were analyzed using descriptive statistics, including the calculation of the mean, standard deviation, frequency, and percentage. The results of each test were then classified according to the assessment norms of the respective instruments to determine the players' performance categories. To obtain an overall profile of players' physical condition and basic technical skills, the raw scores from each test were converted into standardized T-scores using the following formula (1):

$$T = 50 + 10 \frac{(x - \bar{x})}{SD} \quad (1)$$

Where X represents the individual score, $\bar{x}$ is the group mean, and SD is the standard deviation. The standardized T-scores from all test components were then combined to produce an overall performance score, allowing comparison across variables measured on different scales. The final T-score classifications were subsequently interpreted using standardized performance categories to provide a comprehensive profile of the physical condition and basic technical skills of the Smandel Padang Volleyball Club players.

RESULT

Descriptive Data Analysis

Table 1. Data Distribution on the Physical Condition and Basic Technical Skills of Volleyball Players at the Smandel Padang Club

No	Physical Condition and Basic Technical Skills of the Volleyball Players at the Smandel Padang Club	Sampel (n)	Average Score	Category
Physical Condition				
1	Aerobic Endurance	16	36,34 ml Kg bb/ menit	Poor
2	Arm Muscle Power		4,82 Meter	Fair
3	Leg Muscle Power		102,22 Kg.m/sec	Very Good
4	Agility		13,55 Detik	Poor
Basic Techniques				
1	Servis	16	8,31 Poin	Enough
2	Underhand Pass		48,50 Poin	Enough
3	Overhead Pass		54,38 Poin	Enough
4	Smash		8,44 Poin	Not Enough at All

Based on Table 1, the physical condition profile of the Smandel Padang Volleyball Club players varied across the measured components. Aerobic endurance was classified as poor, indicating that many players may experience fatigue more quickly during prolonged rallies and extended matches, potentially reducing the consistency of their performance. Agility was also categorized as poor, suggesting limitations in rapid changes of direction, defensive movements, and court coverage, which are essential during offensive and defensive transitions.

In contrast, arm muscle power was categorized as fair, indicating that although players possess an adequate level of upper-body explosive strength, further improvement is needed to optimize the effectiveness of serves and spikes. Leg muscle power achieved a very good classification, demonstrating that the players have strong lower-limb explosive ability, which provides an advantage for jumping actions such as blocking and spiking. The evaluation of basic technical skills also revealed differences among skill components. Serve, underhand pass, and overhead pass were all classified as fair, indicating that the players have mastered the fundamental techniques but still demonstrate inconsistencies in execution accuracy and control. These results suggest that technical refinement remains necessary to improve performance under competitive conditions. The weakest component was the smash, which was categorized as very poor. This finding indicates that most players have not yet developed optimal attacking performance, particularly in producing powerful and accurate spikes. Considering that the smash is one of the primary offensive skills in volleyball, this weakness may substantially reduce the team's ability to score points during competition.

Overall, these findings demonstrate that although the players possess excellent leg muscle power, deficiencies in aerobic endurance, agility, and several technical skills particularly the smash remain evident. The results indicate that future training programs should prioritize improving aerobic endurance, agility, and attacking techniques while maintaining the players' existing lower-body explosive power. Such a balanced training approach is expected to enhance overall performance and competitiveness.

Physical Condition

The results of the physical fitness assessments of 16 volleyball players from the Smandel Padang Club covered four components: endurance, upper-body explosive strength, lower-body explosive strength, and agility. Endurance measurements using the bleep test showed an average VO_2 max value of 36.34 ml/kg body weight/minute, which falls into the "poor" category, with the majority of players (56.25%) falling into the "very poor" category. Measurements of upper-body explosive strength using the Two-Hand Medicine Ball Put Test yielded an average value of 4.82 meters, which falls into the "fair" category, with the majority of players (56.25%) in the same

category. Meanwhile, lower-body muscle power, measured using the vertical jump test, yielded an average value of 102.22 kg·m/sec, which falls into the “very good” category, with 87.5% of the players in that category. In contrast to the previous component, the agility measurement using the T-Test Agility showed an average score of 13.55 seconds, which falls into the “poor” category, and all players (100%) were in that category.

To determine the overall level of physical fitness, the results from these four components were first converted into T-scores so that they would have the same units and could be combined. The analysis results showed that the players’ physical fitness scores averaged 50, which falls into the “adequate” category, with the highest score being 58.89 (“very good”) and the lowest being 37.03 (“very poor”). The frequency distribution shows that 8 players (50%) fall into the “fair” category, 4 players (25%) into the “poor” category, 2 players (12.5%) into the “good” category, and 1 player each (6.25%) into the “very good” and “very poor” categories. Thus, it can be concluded that, in general, the physical condition of the Smandel Padang Volleyball Club players falls into the “fair” category, although there are still weaknesses in the endurance and agility components that need to be addressed when designing training programs.

Basic Technical Skills

The results of the basic technical skills assessment of 16 volleyball players from the Smandel Padang Club included serving, underhand passing, overhand passing, and spiking. The serving test results showed an average score of 8.31 points, which falls into the “fair” category, with the largest proportion of players falling into the “fair” and “poor” categories at 31.25% each. Underhand passing ability, measured using the Brumbach Forearm Pass Wall-Volley Test, yielded an average score of 48.50 points, which also fell into the “adequate” category, with the majority of players (37.5%) falling into the “adequate” and “below adequate” categories. Furthermore, the overhand passing ability, measured using the AAHPER Face Pass Wall-Volley Test, showed an average score of 54.38 points, which falls into the “fair” category, although the majority of players (37.5%) were in the “good” category. In contrast to these three components, the smash ability had an average score of 8.44 points, which fell into the “very poor” category, with the majority of players (81.25%) falling into the “very poor” category.

To determine the overall level of basic technical ability, the results from these four components were converted into T-scores so that they would have the same unit of measurement and could be combined. The analysis results showed that the players’ average basic technical ability was 50, which falls into the “fair” category, with the highest score of 57.42 (the “good” category) and the lowest score of 41.89 (the “very poor” category). The frequency distribution shows that 6 players (37.5%) fall into the “good” category, 5 players (31.25%) into the “fair” category, 4 players (25%) into the “poor” category, and 1 player (6.25%) into the “very poor” category; no players fall into the “excellent” category. Thus, it can be concluded that, in general, the basic technical skills of the Smandel Padang Volleyball Club players fall into the “fair” category; however, their smashing ability remains the weakest component and therefore requires special attention in the training program to improve overall game performance.

DISCUSSION

The findings of this study indicate that although the overall basic technical skills of the Smandel Padang Volleyball Club players were classified as **fair**, this level of performance may not yet be sufficient to meet the demands of competitive volleyball. Mastery of fundamental techniques is not solely determined by technical practice but is also influenced by the players’ physical condition, which enables technical movements to be performed efficiently and consistently throughout a match. Therefore, technical proficiency and physical fitness should be viewed as complementary components that jointly determine volleyball performance.

Among the technical components evaluated, smash performance emerged as the weakest aspect. This finding suggests that effective attacking performance depends not only on mastering the movement pattern but also on the integration of several physical abilities, including explosive leg power, upper-body explosive power, agility, and aerobic endurance. Although the players demonstrated very good leg muscle power, their poor aerobic endurance, poor agility, and only

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fair arm muscle power may have limited the effective execution of smash techniques, particularly during prolonged or high-intensity play. Fatigue resulting from insufficient endurance may reduce movement quality and decision-making, while inadequate agility can delay positioning before take-off. Likewise, limited upper-body explosive power may reduce ball velocity during attacking actions. These findings emphasize that technical performance in volleyball is the result of the interaction between physical fitness and motor skill execution rather than either component alone.

The present findings are consistent with Weldon et al. (2021), who stated that the fundamental techniques of volleyball including the serve, underhand pass, overhead pass, and smash are essential skills that every player must master to ensure effective and efficient game performance. Adequate technical mastery enables players to maintain ball control, develop offensive strategies, and maximize scoring opportunities through effective teamwork. Similarly, Hamdani et al. (2024) reported that volleyball athletes generally demonstrate only sufficient technical ability and therefore require continuous technical training to improve playing performance. Furthermore, Kaya & Paçacı (2024) emphasized that attack effectiveness, particularly successful smash execution with minimal technical errors, is one of the most important determinants of success in volleyball competition. Conversely, frequent technical errors during attacking actions substantially reduce a team's opportunity to score points and win matches.

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From a practical perspective, these findings suggest that coaches should adopt an integrated training approach rather than emphasizing technical repetition alone. Training programs should combine technical drills with the systematic development of aerobic endurance, agility, coordination, balance, and upper-body explosive power to improve the execution of volleyball-specific skills under match conditions. Regular physical fitness and technical skill assessments should also be incorporated into the training cycle to objectively monitor athletes' progress and to provide evidence for adjusting training loads according to individual needs. In addition, coaches should pay attention to athletes' psychological readiness and overall well-being because these factors influence training consistency, rehabilitation adherence, and the ability to regain optimal performance following physical demands or sports-related injuries (Rudyanto, Lesmana, et al., 2025). Such a comprehensive approach is expected to improve both individual player performance and overall team competitiveness.

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This study has several limitations that should be acknowledged. First, the study involved only 16 athletes from a single volleyball club, limiting the generalizability of the findings to other clubs or competitive levels. Second, the descriptive research design was intended to provide a performance profile and therefore did not examine causal relationships between physical condition and technical skills. Third, several factors that may influence volleyball performance, such as playing position, training experience, training frequency, and psychological characteristics, were not included in the analysis. Future studies are therefore recommended to involve larger and more diverse samples and to employ correlational or experimental research designs to further investigate the relationships between physical fitness, technical performance, and other factors influencing volleyball achievement.

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CONCLUSION

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Based on the findings of this study, it can be concluded that the physical condition and basic technical skills of the Smandel Padang Volleyball Club players are generally at a fair level. Among the physical condition components, lower-body explosive power was classified as very good, while upper-body explosive power was fair. However, aerobic endurance and agility remained poor, indicating that these components require greater attention in future training programs. Regarding basic technical skills, the players demonstrated fair performance in serving, underhand passing, and overhead passing, whereas smash performance was classified as very poor, making it the primary technical weakness that should be prioritized for improvement. These findings indicate that although the players possess adequate physical and technical abilities to support performance, several key components still require systematic improvement to optimize individual and team performance.

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The scientific contribution of this study lies in providing a comprehensive profile of the physical condition and basic technical skills of volleyball players within the same athlete population, thereby offering baseline evidence for evidence-based training program development at the club level. Practically, the findings suggest that coaches should integrate physical conditioning with technical skill training, with particular emphasis on improving aerobic endurance, agility, upper-body explosive power, and smash technique while maintaining lower-body explosive power. Regular evaluations using standardized physical and technical tests are also recommended to monitor athletes' progress objectively. Since this study was limited to a descriptive analysis involving athletes from a single volleyball club, future research is recommended to include larger and more diverse samples and employ correlational or experimental research designs to examine the relationships between physical condition, technical skills, and volleyball performance more comprehensively.

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