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<https://ejournal.upi.edu/index.php/penjas/article/view/68822>DOI: <https://doi.org/10.17509/jpjo.v9i1.68822>**Analysis of the Technical Ability of the Indonesian Women's Volleyball Team
Sea Games 2023****Bujang*¹, Aridhotul Haqiyah¹, Mohamad Noor Mohamed²**¹Universitas Islam 45 Bekasi, Indonesia²Universiti Teknologi Mara, Malaysia**Article Info***Article History :**Received March 2024**Revised March 2024**Accepted March 2024**Available online April 2024**Keywords :**Attacking technique, Defensive technique,
Sea Games, Volleyball***Abstract**

Understanding the technical skills required for success in volleyball is critical as the game continues to evolve, with an emphasis on the speed and precision of attacks. The purpose of this study is to determine the level of technical ability of the Indonesian women's volleyball team Sea Games 2023. This is a descriptive qualitative study with a sample of 14 athletes and uses percentages to summarise and interpret the data. The techniques analysed are divided into two parts, which are attacking techniques consisting of serves, attacks, blocks and defensive techniques consisting of serve reception and defence. The results showed that the attacking techniques of the Indonesian women's volleyball team had good attacking abilities, but the ability to serve and block was extremely weak, many serves and blocks failed and resulted in points for the opponent. For defensive techniques, the Indonesian women's volleyball team has excellent service reception ability, most of the service receptions can produce attacks both attacks that produce points and limited attacks. However, the defensive ability was very poor, most of the defences failed and resulted in points for the opponent. Finally, this study concludes that the poor performance of the Indonesian women's volleyball team is related to very weak serving, blocking and defence. So, the Indonesian women's volleyball team has to improve on serving, blocking, and defence techniques.

INTRODUCTION

The volleyball game is one of the sports that is popular among people, both in Indonesia and in other countries around the world (Silva et al., 2016). The development of interesting innovations and the maturity of game techniques and tactics greatly enriches the connotation of volleyball and makes the volleyball game more interesting and full of vitality, inspiring enthusiasm of people for the volleyball game itself (Li, 2016).

Today, volleyball holds a prominent position among the top five international sports, and the international volleyball federation (Federation International Volley Ball / FIVB), with 220 affiliated National Federations, is one of the largest international sports federations in the world [FIVB, 2016]. Apart from that, this is demonstrated by the increasing number of championships in Indonesia, Southeast Asia, Asia and the world. For example, the Proliga championship in Indonesia continues to be held every year, the Southeast Asian Volleyball League (Sea V. League) and the Sea Games at the Southeast Asian level and the Asian volleyball league, and the ASEAN Games, at the Asian level, as well as the World Volleyball Championship held by the FIVB.

Discussing the analysis of the technical ability of Indonesian women's volleyball players is crucial for several reasons. Firstly, understanding the technical skills required for success in volleyball is essential as the game continues to evolve, with an emphasis on speed and precision in attacks (Li et al., 2022). Research has shown that physical fitness qualities are closely linked to the performance of sport-specific technical skills in female players (Farley et al., 2020). Moreover, differences in technical elements between men's and women's volleyball teams can impact match outcomes, highlighting the importance of focusing on specific technical skills that lead to victory (Patsiaouras & Gortsila, 2021).

Analysing the motion and performance of volleyball skills, such as the open spike, can lead to improvements in athletes' overall performance, including in Indonesian players (Irawan et al., 2023). Understanding the impact of recovery methods on volleyball smash performance can aid in adjusting strength training programs to enhance technical abilities (Abidin et al., 2021). Moreover, utilizing modern technology, such as computer analysis programs, can be instrumental in

evaluating and improving players' technical skills (Fadl, 2022). In conclusion, discussing the analysis of technical abilities in Indonesian women's volleyball is vital for enhancing player performance, optimizing training programs, and ultimately improving the competitiveness of Indonesian teams.

However, the popularity and development of volleyball in Indonesia are still not in line with the achievements of the Indonesian national volleyball team, especially the women's team. This is evidenced by the Indonesian National Women's Volleyball Team being ranked only 59th in the world with a score of 47.97 (FIVB, 2024) and ranked eighth in Asia. The following are the achievements of the Indonesian women's national volleyball team in several championships in Southeast Asia and Asia.

The Indonesian women's volleyball team has won only 1 gold medal, 7 silver medals, and 11 bronze medals from 23 Sea Games events. They received 1 bronze medal from 16 Asian Games, achieved in 1962. In the Southeast Asian Volleyball League (Sea V. League), Indonesia has not won any gold medals from five events, securing only 2 silver medals and 3 bronze medals. In the Asian women's volleyball league, which includes AVC members, Indonesia's highest achievement out of 20 events was a fifth-place finish in 1979. Looking at the team's performance in these championships, it is clear that their achievements are far from expectations and require in-depth evaluation.

The poor performance of the Indonesian women's volleyball team raises several questions: What has happened to the team? Is their technical mastery insufficient? Are they not keeping up with developments in volleyball technique? Are anthropometric factors less supportive, or are there other issues? Previous studies, such as the technical analysis of the 2013 Pro League women's volleyball games, revealed that the best attacking performance was only 62.55%, and the best defense was only 46.18% (Salafiyah, 2013).

Sport science is essential for enhancing volleyball performance by analyzing basic techniques and gameplay. Research has shown that sport science plays a crucial role in volleyball (Verhagen, 2004). For example, prospective cohort studies on volleyball injuries have indicated that reliable information from season-long studies is limited, highlighting the need for more comprehensive research (Verhagen, 2004). Additionally,

studies have emphasized the importance of mental energy and a calm demeanor for optimal performance in volleyball competitions, aligning with elite sport psychology findings (Shieh et al., 2023). Moreover, the development of competitive sports requires volleyball players to have physical fitness and a deep understanding of advanced techniques and tactics (Yang, 2022).

Research has demonstrated that perceptual vision training in non-sport-specific contexts can improve performance skills and cognition in athletes, emphasizing the impact of the training environment on skill enhancement (Formenti et al., 2019). The use of Bayesian hierarchical models to analyze volleyball data has been crucial in predicting game outcomes and team rankings, highlighting the significance of data analysis in sports (Gabrio, 2020). Advancements in technology, such as intelligent video analysis systems, show promise in enhancing volleyball training and performance analysis (Zhang, 2021). So, integrating various studies underscores the multidimensional approach required in sport science to optimize volleyball performance. From injury prevention to mental preparedness and technological advancements, incorporating these findings can significantly contribute to the progress and success of volleyball as a sport.

The analysis of the women's volleyball team at the 2018 Sea Games shows that the Indonesian women's volleyball team's failure was largely due to defensive shortcomings, with a 48.1% failure rate (Rahayu, 2018). Mastery of technique in volleyball matches is a crucial factor that cannot be ignored, as teams with superior technique and fewer errors are more likely to win (Silva et al., 2014). Mistakes in mastering certain skills on elite volleyball teams can lead to high risks or defeat (Bergeles et al., 2009; Buscà & Febrer, 2012). Other research indicates that effective serving and attacking can generate points in a match (Castro et al., 2011; Drikos et al., 2009).

The conceptual analysis and description of real conditions mentioned above highlight the importance of further studies on the technical abilities of Indonesian female volleyball athletes, particularly at the 2023 Sea Games event. The technical skills under consideration include serving, serve reception, blocking, defense, and attacking. These skills are categorized into two groups: attacking techniques (serving, blocking, and attacking) due to their potential to score direct points, and defen-

sive techniques (serve reception and defense) (Marcelino et al., 2010).

This research aimed to provide valuable insights and feedback for the Indonesian women's national volleyball team, serving as an evaluation tool to improve their performance. The ultimate goal is to enhance the Indonesian national volleyball team's capabilities and elevate the achievements of Indonesian women's volleyball on the international stage.

METHODS

This research is a qualitative descriptive study aimed at describing the playing technical abilities of Indonesian female volleyball athletes at the 2023 Sea Games event.

Participants

The population and sample of this research consisted of all 14 Indonesian female volleyball athletes who were members of the 2023 Sea Games team. The sampling technique used was total sampling, where the entire population was sampled, resulting in a sample size equal to the population (Sugiyono, 2019; Fraenkel, Wallen, & Hyun, 2023). Each athlete had the same opportunity to demonstrate their volleyball-playing abilities.

Data collection

The data of this research were collected through documentation studies by observing videos of the Indonesian women's volleyball team matches during the Sea Games event, from the preliminary round to the final round. The team played five matches: three in the preliminary round (Indonesia vs. Thailand, Indonesia vs. Malaysia, and Indonesia vs. Myanmar), one semifinal match (Indonesia vs. Vietnam), and one third-place match (Indonesia vs. the Philippines).

Instruments

The research instrument used to collect data was developed by the author, adapted from instruments by Inkinen, Häyrynen, and Linnamo (2013) and Poor, Fellingham, & Florence (2010). All collected data is processed and analyzed using descriptive statistical analysis techniques in the form of percentages (Field, 2023). Table 2 presents a blue print of the instruments used. In this table it is known that the instrument for assessing

volleyball technical abilities in matches is compiled by two behavioral dimensions, namely attack techniques and defensive techniques. The attack techniques dimension consists of 3 behavioral indicators, namely service, attack and block technical skills. The defensive techniques dimension is compiled by two behavioral indicators, namely serve reception and defense technical skills.

Statistical Analysis

Descriptive statistical analysis techniques, specifically percentages, were used to process and analyze the collected data. Percentages are a common method to summarize and interpret data, especially useful for comparing different groups or categories within a dataset. Calculating proportions and percentages helped describe the distribution of categorical variables.

Table 1. Instrument for Assessing Volleyball Technical Abilities in Matches

Code	Description
Attack Techniques	
Service	
S-1	Service results in an immediate point
S-2	Service is acceptable, but does not result in an attack on the opponent
S-3	Service is acceptable, and results in an attack for the opponent
S-4	Service failed
Attack	
A-1	Direct attack points
A-2	Attack hit block but point
A-3	Attack is blocked, points for opponent
A-4	Attack failed
Block	
B-1	Block generates points
B-2	Block generates attack
B-3	Block failed, point for opponent
Defence techniques	
Serve Reception	
SR-1	Serve reception results in an attack
SR-2	Serve reception results in limited attack
SR-3	Serve reception past the net
SR-4	Serve reception failed point for opponent
Defense	
D-1	Defense generates attack
D-2	Defense produces limited attacks
D-3	Defense fails, point for opponent

Source: Adaptation and modification from Inkinen, Häyrinen, & Linnamo (2013); Poor, Fellingham, & Florence (2010).

RESULT

After observing the video of the Indonesian women's volleyball team's match at the 2023 Sea Games

event from the preliminary round to the final round, using assessment instruments such as table 1, the following results were obtained:

Table 2. Attack Technical Ability of The Indonesian Women's Volleyball Team at the 2023 Sea Games

Code	Description	Level of success	
		Σ	%
Attack Techniques			
Total Service for 5 matches: 159			
S-1	Service results in an immediate point	42	26.42%
S-2	Service is acceptable, but does not result in an attack on the opponent	41	25.79%
S-3	Service is acceptable, and results in an attack for the opponent	28	17.61%
S-4	Service failed	48	30.19%
Total Attack for 5 matches: 193			
A-1	Direct attack points	71	36.79%
A-2	Attack hit block but point	88	45.60%
A-3	Attack is blocked, points for opponent	1	0.52%
A-4	Attack failed	33	17.10%
Total Blocks for 5 matches: 76			
B-1	Block generates points	28	36.84%
B-2	Block generates attack	3	3.95%
B-3	Block failed, point for opponent	45	59.21%

Table 3. Defense Technical Capabilities of the Indonesian Women's Volleyball Team at the 2023 Sea Games

Code	Description	Level of success	
		Σ	%
Defence techniques			
Total Serve Reception for 5 matches: 164			
SR-1	Serve reception results in an attack	88	53.66%
SR-2	Serve reception results in limited attack	49	29.88%
SR-3	Serve reception past the net	4	2.44%
SR-4	Serve reception failed point for opponent	23	14.02%
Total Defense for 5 matches: 127			
D-1	Defense generates attack	14	11.02%
D-2	Defense produces limited attacks	21	16.54%
D-3	Defense fails, point for opponent	92	72.44%

In accordance with the analysis results in Table 2, from the results of five matches, it is known that the Indonesian women's volleyball team performed 159 services. From the 159 services, it was found that 26.42% of the services produced direct points (S-1), the service was acceptable but did not result in an attack for the opponent (S-2) of 25.79%, the service was acceptable but resulted in an attack for the opponent (S-3) of 17.61%, and service failure (S-4) of 30.19%. Meanwhile, for attack technique skills, the Indonesian women's volleyball team performed 193 times and obtained direct attack points (A-1) of 36.79%. Attacks were blocked, but points (A-2) were 45.60%, resulting in attacks for the opponent. (A-3) was 0.52%, and failed

attacks (A-4) were 17.10%. As for blocking technique skills, the Indonesian women's volleyball team succeeded in doing it 76 times, with successful block points (B-1) of 36.84%, blocks resulting in attacks (B-2) of 3.95%, and failed blocks (B-3) of 59.21%. [See figure 1].

technical skills were carried out by the Indonesian women's volleyball team 127 times. There was defence, which resulted in attacks (D-1) of 11.02%, defence, which resulted in limited attacks (D-2) of 16.54%, and defence failed, resulting in points for the opponent

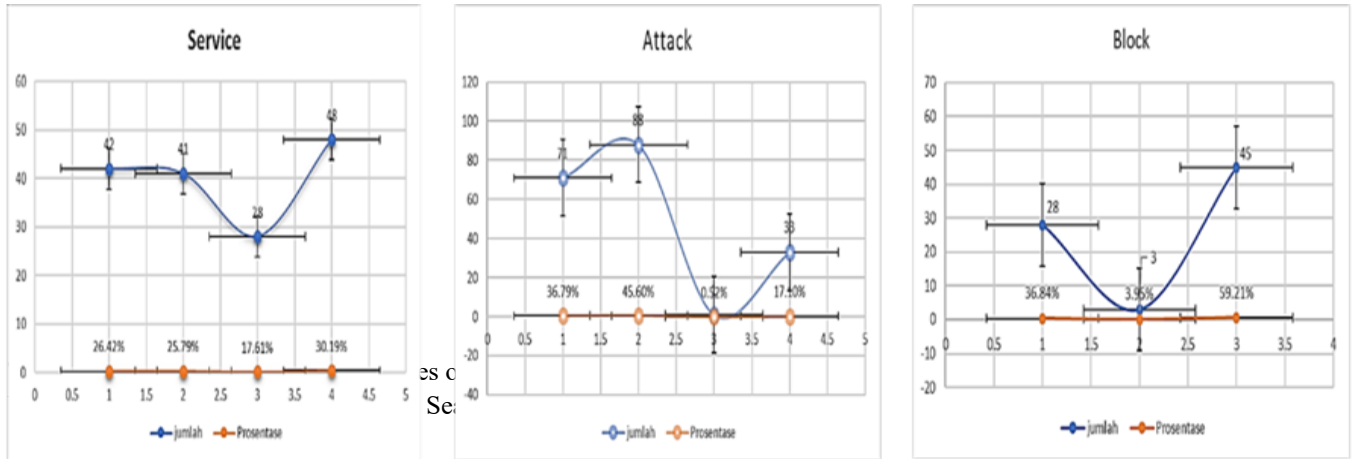


Figure 1. Graphic of Attacking Technical Performance of the Indonesian Women's Volleyball Team

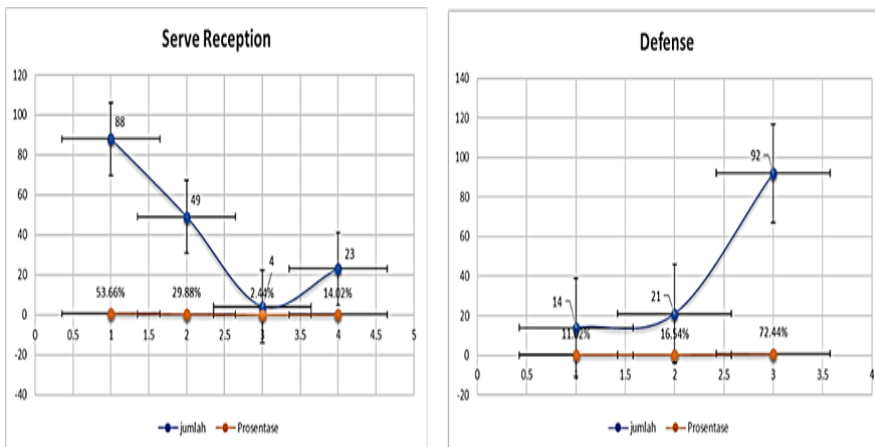


Figure 2. Graphic of Defense Technical Performance of the Indonesian Women's Volleyball Team

Based on the analysis results in Table 3, it is known that the defensive ability of the Indonesian women's volleyball team at the 2023 Sea Games is compiled by serve reception and defence technical skills. From 5 matches, the Indonesian women's volleyball team carried out serve reception 164 times, where serve reception resulted in attacks (SR-1) of 53.66%, serve reception produced limited attacks (SR-2) of 29.88%, serve reception passed through the net (SR-3) was 2.44%, and serve reception failed points for the opponent (SR-4) was 14.02%. Meanwhile, defence

(D-3) of 72.44%. Figure 2 presents information on the achievements of the women's volleyball team on the behavioural indicators of serve reception and defence technical skills.

DISCUSSION

The results of this research show that the Indonesian women's volleyball team at the 2023 Sea Games played five matches from the preliminary round to the final round. In the preliminary round, there were three

matches: Indonesia vs. Thailand with a score of 0-3; Indonesia vs. Malaysia with a score of 3-0; and Indonesia vs. Myanmar with a score of 3-0. In the semi-finals, Indonesia faced Vietnam and lost with a score of 0-3. In the match for third place, Indonesia played against the Philippines and won with a score of 3-1. Based on these results, the Indonesian women's team was ranked 3rd.

Judging from the attacking techniques, which include service, attack, and block technical skills, the Indonesian women's volleyball team needs fundamental improvements, especially in service and block. During the matches, the Indonesian women's volleyball team performed 259 services. Of these, services that resulted in direct points or aces (S-1) were 42 times, or 26.42%, while services that failed (S-4) were 48 times, or 30.19%. Additionally, services that were received and resulted in an attack for the opponent (S-3) constituted 17.61%. This means that 47.80% of the services produced points for the opponent. In modern volleyball games, serving is the main attack technique which is a fundamental aspect of modern elite volleyball that can produce points equivalent to those from attacking and blocking (Quiroga et al., 2010). A successful service that produces direct points or aces is a determining factor for a team's victory (Silva et al., 2014; Zetou, 2007). Therefore, the ability to serve effectively plays a significant role in determining the outcome of women's volleyball matches (Quiroga et al., 2010; García-Tormo et al., 2015).

Similarly, the blocking technique needs attention. The Indonesian women's volleyball team attempted 76 blocks, with successful block points (B-1) at 36.84%, while failed blocks (B-3) were at 59.21%. The high percentage of failed blocks indicates a significant weakness in this area, contributing to the losses experienced by the Indonesian women's volleyball team in various championships. Blocking is the first line of defense in a volleyball team (Ackerman, 2014) and can directly produce points. Improving this skill is essential for enhancing the team's overall performance.

The research revealed some interesting findings regarding the Indonesian women's volleyball team's performance. Notably, their attack ability was found to be very good. Out of 193 attacks, 71 attacks, or 36.79%, resulted in direct points (A-1), and 88 attacks, or 45.60%, were blocked but still resulted in points (A-2). However, to reduce failures (A-4), which constituted

17.10%, the team needs to improve its attack techniques. The team that wins a set is determined by having a higher percentage of successful attacks compared to errors. Hence, a strong attack is crucial for achieving victory in elite-level women's volleyball (Häyrinen et al., 2010; Palao et al., 2004).

The defensive techniques of the Indonesian women's volleyball team were assessed based on serve reception and defense skills during the Sea Games matches. Throughout the matches, the team executed a total of 164 serve receptions. Among these receptions, 53.66% resulted in successful attacks (SR-1), while 29.88% led to limited attacks (SR-2). This indicates a strong performance in serve receptions by the Indonesian team, with only 16.42% resulting in failure. Service reception holds significant importance as it acts as a defensive tool to neutralize the opponent's service, considering service as an offensive weapon. Literature corroborates that the success of an attack relies heavily on the effectiveness of service reception (Callejón & Hernández, 2009). Studies, such as one conducted on the Turkish women's volleyball team, further emphasize the critical role of serve reception in constructing successful attacks that yield points (Zirhlioglu, 2013).

During the Sea Games matches, the Indonesian women's volleyball team executed 127 defensive technical skills. Among these defensive actions, 92 instances, or 72.44%, resulted in failed defences (D-3), while only 11.02% led to successful attacks (D-1). This means that the Indonesian women's volleyball team is very weak at defending its field. In volleyball, good defensive performance can turn defence into attack (Adin-Marian & Marilena, 2021). Therefore, defence must be possessed by volleyball athletes. The concept of defense techniques in volleyball revolves around the athlete's ability to prevent the opponent's spiked ball from touching the floor (Inkinen et al., 2013). Techniques for executing defense include reading the direction of the opponent's spike, positioning oneself to face directly towards the spike's angle while maintaining a low defensive stance to easily retrieve sharp spiked balls. Courage and self-confidence are essential traits for defenders, as they often face powerful spikes without fear (Adin-Marian & Marilena, 2021). Additionally, defense serves to anticipate and counter opponent's plays effectively. Defensive strategies encompass a variety of moves such as dives, rolls, collapses, and over-

hand digs, all aimed at predicting the ball's trajectory (Hebert, 2013).

The strengths and limitations of the study on the technical ability of Indonesian women's volleyball can be assessed based on the provided references. For future research, integrating findings from studies on muscle function, biomechanics, body composition, and training programs can provide a comprehensive understanding of performance factors, injury prevention strategies, and optimization of training regimens for Indonesian women's volleyball players.

CONCLUSION

The results of the analysis showed that, regarding the attacking technique, the Indonesian women's volleyball team had quite good attack abilities but was very weak in service and block abilities. Many services and blocks failed and resulted in points for the opponent. In the defensive technique dimension, the ability of the serve reception was very good. Some serve receptions produced attacks that either produced points or limited attacks. The defense ability of the Indonesian women's volleyball team mostly failed and resulted in points for the opponent. It can be concluded that the poor performance of the Indonesian women's volleyball team was caused by service, blocking, and defense, which were still very weak. For this reason, an improvement is needed.

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CONFLICT OF INTEREST

The authors declared no conflict of interest.

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