

Muhamad Noor Mohamed . Raja Nurul Jannat Raja Hussain .
Mardiana Mazaulan . Noor Azila Azreen Md Radzi .
Nurul Ain Abu Kasim . Nur Hani Syazwani Bakri .
Umami Khaltum Mohd Mokhtar . Mohd Aizzat Adnan .

Editors

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The Effect of Reception Quality on the Selection of Setting Zone



Muhammad Aniq Amsyar Azmin, Noor Azila Azreen Md Radzi*, Muhamad Noor Mohamed, Raja Nurul Jannat Raja Hussain, Nurul Ain Abu Kassi, Mardiana Mazaulan, Sharifah Maimunah Syed Mud Puad, and Maisarah Shari.

Abstract | In volleyball, reception is the first action, followed by setting. The quality of reception is crucial for winning a volleyball match because it can affect setting zone selection. This study aimed to determine the effect of reception quality on the selection of setting zones in volleyball. A total of 64 matches from the top four teams in two tournaments were selected: Sooka Super Series Volleyball 2022 ($n = 32$) and the PKNS Invitational Volleyball League 2023 ($n = 32$). Reception quality was categorized using a 5-point numerical rating scale, ranging from 0 to 4 (0 = no reception/error, 1 = poor, 2 = average, 3 = good, 4 = excellent). Next, setting zone selection was categorized according to the consequent attacking areas in zones 1, 2, 3, 4, 5, and 6. Results showed that out of 24 variables of reception quality on the setting zone between Sooka Super Series Volleyball 2022 and the PKNS Invitational Volleyball League 2023, there are 14 variables that had significant differences ($p < 0.05$). The Sooka Super Series Volleyball had higher scores in reception quality (4), while the PKNS Invitational Volleyball League 2023 had higher scores in reception quality (3). This difference is attributed to the presence of professional teams that have raised the level of play to a higher level in terms of reception. This is likely due to their technique of keeping their arm platform parallel to the floor during contact with the ball. In both tournaments, setting zone 4 was the most frequently selected setting zone. Thus, zone 4 is considered the best option for attack zones due to the ample space it provides for attackers to perform spikes.

Keywords: *Volleyball, reception quality, setting zone.*

M.A.A., Azmin, N.A.A., Md Radzi* () , M.N., Mohamed, R.N.J., Raja Hussain, N.A., Abu Kasim, M., Mazaulan, and S.M., Syed Mud Puad.

Faculty of Sports Science and Recreation, Universiti Teknologi MARA Negeri Sembilan Branch, Seremban Campus, Malaysia.

*Corresponding author: azila_azreen71712@uitm.edu.my

M., Shari.

Faculty of Sports Science and Recreation, Universiti Teknologi MARA, Shah Alam Campus, Selangor, Malaysia.

I. INTRODUCTION

Volleyball is a dynamic sport characterized by fast-paced action and complex movements, with each team comprising six players who employ techniques such as serving, reception, setting, spiking, and blocking [1]. Effective teamwork is crucial, as players must communicate and coordinate their actions to execute plays and overcome opponents. Beyond skill techniques, understanding court zones is also vital, as the required abilities and actions during competition depend significantly on a player's position on the court [8]. Among these techniques, spiking is essential for quickly securing points, while the effectiveness of reception plays a significant role in determining match outcomes [6]. Setting, which follows reception, is crucial for the success of subsequent actions and influences the final game result [5]. This interdependence highlights that spiking effectiveness relies on the quality of the set, which in turn depends on the quality of reception. Reception, as the initial action in volleyball, is fundamental for enabling organized play and facilitating powerful attacks, although it may affect game continuity. The quality of reception directly impacts the effectiveness of subsequent attacks [4]. This study explores the relationship between reception quality and setting zone selection, aiming to elucidate how effective reception can guide strategic setting decisions and thereby influence overall game performance.

II. METHODS

This study analyzed a total of 64 matches from two volleyball tournaments: 32 matches from the Sooka Super Series Volleyball 2022 and 32 matches from the PKNS Invitational Volleyball League 2023. All video recordings were of full matches, with durations ranging from 50 to 120 minutes. Prior to analysis, the video footage was meticulously identified and collected. Nacsport Video Analysis Software was employed for the analysis. Reception quality was assessed and categorized using a 5-point numerical rating scale, where performance was rated from 0 to 4 (0 = error, 1 = poor, 2 = average, 3 = good, 4 = excellent). Additionally, setting zones were analyzed and categorized based on the subsequent attacking areas: zone 1 (right-back), zone 2 (right-front), zone 3 (middle-front), zone 4 (left-front), zone 5 (left-back), and zone 6 (middle-back) [1]. Statistical analysis was used to describe the demographic data, with descriptive statistics detailing reception quality in relation to setting zone selection. To compare reception quality across different setting zones in the Sooka Super Series Volleyball 2022 and the PKNS Invitational Volleyball League 2023, an independent t-test was conducted. The analysis was performed using Jamovi version 2.3.28.0, with a significance level set at $p < 0.05$.

III. RESULTS AND DISCUSSION

According to Table 1, the independent t-test analysis revealed significant differences in 14 out of 24 variables related to reception quality and setting zone selection between the Sooka Super Series Volleyball 2022 and the PKNS Invitational Volleyball League 2023 ($p < 0.05$). The remaining ten variables did not show significant differences, as their p-values were greater than 0.05. Additionally, Figure 1 presents a bar graph illustrating the reception quality and setting zone selection for both the Sooka Super Series Volleyball 2022 and the PKNS Invitational Volleyball League 2023.

TABLE 1
ANALYSIS OF RECEPTION QUALITY AND SETTING ZONE

Variable Reception Quality	Setting Zone	Tournament	<i>t</i>	<i>df</i>	<i>p</i>	Mean	SD
Poor	2	SOOKA	3.178	62	0.002*	1.844	0.805
		PKNS				1.156	0.920
Average	1	SOOKA	-2.844	62	0.006*	3.625	1.233
		PKNS				2.875	1.238
	2	SOOKA	-4.200	62	< 0.001*	2.900	1.208
		PKNS				1.531	1.233
	4	SOOKA	-4.636	62	< 0.001*	3.375	2.664
		PKNS				1.000	0.775
	6	SOOKA	-7.459	62	< 0.001*	2.500	1.531
		PKNS				1.156	0.975
Good	1	SOOKA	-9.178	62	< 0.001*	9.156	3.488
		PKNS				3.500	1.248
	2	SOOKA	-8.446	62	< 0.001*	12.063	2.662
		PKNS				2.875	1.282
	4	SOOKA	6.449	62	< 0.001*	11.750	4.141
		PKNS				1.406	1.564
	6	SOOKA	-4.449	62	< 0.001*	11.688	3.508
		PKNS				3.000	1.312
Excellent	1	SOOKA	11.923	62	< 0.001*	7.406	1.391
		PKNS				3.250	1.363
	2	SOOKA	20.292	62	< 0.001*	9.813	1.593
		PKNS				3.250	1.525
	4	SOOKA	20.449	62	< 0.001*	7.813	1.551
		PKNS				2.063	1.093
	6	SOOKA	3.215	62	0.002*	4.438	1.480
		PKNS				3.281	1.397

* $p < 0.05$

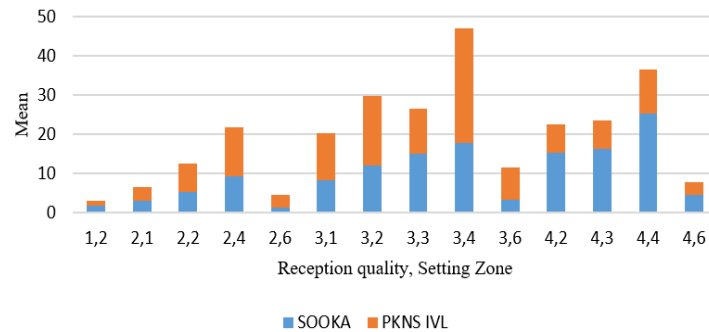


Fig. 1: Comparison between Sooka Super Series Volleyball 2022 and PKNS IVL 2023 on reception quality and setting zone

The study's findings indicate that the Sooka Super Series Volleyball tournament demonstrated superior reception quality compared to the PKNS Invitational Volleyball League, as evidenced by a higher frequency of excellent receptions (4) in the Sooka Super Series. In contrast, the PKNS Invitational League exhibited a higher frequency of good receptions (3). Despite these differences, the most frequently selected setting zone in both tournaments was zone 4 (left-front), consistent with previous research that identifies zone 4 as the dominant setting zone [7]. The setter's strategy often involves targeting the left side of the net to counteract the opponent's blocking strategy [1]. Additionally, zone 4 is considered a safe attack zone, providing the left outside hitter—typically viewed as a reliable player—with ample space to perform spikes.

Previous studies suggest that higher levels of competition correlate with improved reception performance [3]. Enhanced upper limb strength contributes to better arm positioning during ball contact and more accurate reception techniques. Conversely, uncontrolled movements or improper arm positioning can lead to errors, underscoring that athletes with greater motor control and precision tend to perform better in serve reception. Additionally, professional players have been found to exhibit less variability and greater sagittal symmetry in their receptions compared to amateur players. Professionals consistently maintain their arm platform parallel to the floor during contact, a technique less frequently employed by amateurs [2].

IV. CONCLUSIONS

The significant differences in reception quality and setting zone selection observed in this study provide valuable insights into volleyball gameplay dynamics. The findings emphasize the critical role of strong reception skills in facilitating effective offensive plays and reveal tactical variations between the Sooka Super Series and the PKNS Invitational. These insights can inform coaching strategies and training programs, enabling teams to enhance performance by prioritizing reception quality and optimizing setting strategies to capitalize on their players' strengths.

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