



## Effect Of Arm And Core Length On Serve Receiving Accuracy And Court Defending From 2nd Position Of Premier League In Volleyball Players

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### Abstract

**Objectives:** This study aimed to determine the contribution of arm length and torso length to serve reception accuracy and field defense accuracy from position 2 among Premier League volleyball players.

**Materials and Methods:** This study used a descriptive survey method. The population consisted of 140 players from 10 Premier League volleyball clubs. The sample was selected purposively, involving 24 players from 8 clubs. A pilot test was also conducted with 12 players from 2 clubs. Data were collected through anthropometric measurements and volleyball skill tests, then analyzed using descriptive and correlational statistics.

**Results:** The results showed that torso length had a significant relationship with serve reception accuracy. This finding indicates that torso length may support balance and stability during volleyball performance. However, arm length did not show a significant effect on serve reception or field defense accuracy from position 2.

**Conclusions:** Torso length contributed to serve reception accuracy, while arm length was not a strong predictor of serve reception or field defense performance. Field defense from position 2 may be more influenced by agility, reaction speed, balance, and coordination.

**Keywords:** Arm Length, Core Length, Defending, volleyball

## Introduction

Volleyball is one of team sports that has special requirements and specifications that must be available to player in order for him to achieve advanced levels of performance in game (Al-Dabbagh, 2022; AL-Zuhairi, 2023). Therefore, providing a good model for testing and measuring volleyball players requires specific criteria for practicing this game that help raise level of skill performance and player's future development (Amiri et al., 2025; Oliinyk & Doroshenko, 2017). Achieving high sporting results is based on process of selecting appropriate athlete, which represents cornerstone of this process (De Bosscher et al., 2009)

Because it is considered game ball plane from games collective that requires integration between abilities physical and skill and mentality, where he depends performance high in it on group from factors interrelated, from among them properties anthropometry for players, and is considered length arm and core from most important variables morphology that may affect in a way direct in accuracy reception sending defense on stadium especially from center (2) which it is from centers vitality in system play defensive offensive on end whether (Abarghoueinejad et al., 2021; Abusleme-Allimant et al., 2023; Bertills et al., 2018).

Where indicated many from studies modern to that properties physical like length parties Alawite and core it is related close with ability player on control in ball during reception sending, as well as in speed to reply verb during defense on stadium, for example she explained study of zarf (Ahmad et al., 2023). that relationship correlation between length arm and core and between level accuracy reception sending have players ball plane juniors, where it turned out that length forearm for impact positive while length arm and core may it is related negatively accuracy and also showed studies foreign this includes study by (Marques et al., 2016). that extension parties Alawite contributes in to improve corner coverage defensive and increase ability on control on balls fallen one in areas critical and from this starting point, it comes importance search present in attempt discovery on effect length arm and core in accuracy reception sending defense on stadium from center (2) at players league excellent with ball plane, that's to present results scientific maybe that contributes in development programs selection and training, and guidance coaches about investment properties anthropometry for players in what serves performance skillful and defensive.

(González-Silva et al., 2020) Despite significant advancements in volleyball training and selection methods, coaches still face challenges in identifying most influential anthropometric factors affecting defensive and offensive performance, particularly in position (2), which is crucial for receiving serves and defending court. Based on researcher's experience in volleyball and Iraqi Premier League, he observed that some players possess varying arm and torso lengths, which can impact their service accuracy and ability to effectively cover defensive areas. However, applied studies linking these physical variables to skill performance in Premier League remain limited, leaving a gap in scientific and practical research that requires thorough scientific analysis. This highlights research problem: lack of clarity regarding impact of arm and torso length on service accuracy and court defense from position (2) among Premier League volleyball players. This necessitates a scientific study to determine nature of this relationship and to offer practical solutions that coaches can utilize in selection and training (González-Silva et al., 2020; Kerr et al., 2018).

Research Objectives to identifying proportions of arm and torso length to accurately receive serves and defend court from center 2 for Premier League volleyball players. Recognizing effect of arm and torso length accurately on receiving serves and defending court from center 2 For Premier League volleyball players

## Materials and Methods

### *Study Design*

The researcher used descriptive survey method because it was suitable for nature of subject matter. The research community was defined as club players Premier Volleyball League consists of 10 clubs with 140 players. Research sample was determined purposively with 8 clubs with 24 players, and exploratory experiment was conducted on 2 clubs with 6 players for each club. Table (1) shows this.

**Table 1.** Research community and samples

No.	Clubs	Community	Exploratory	Main
1	Police	14		3
2	Northern Refineries	14		3
3	Peshmerga	14		3
4	Al-Muqdadiyah	14		3
5	Erbil	14		3
6	South Gas	14		3
7	Nineveh	14		3
8	Daghara	14		3
9	Central refineries	14	6	-
10	Modern	14	6	-
<b>Total</b>		140	12	24
<b>Percentage</b>		100%	16.8%	33.6%

### *Data collection methods*

The researcher used following data collection methods: Analysis of content of scientific sources. Selected tests and measurements. Data collection form (Appendix 1).

### *Identifying research variables*

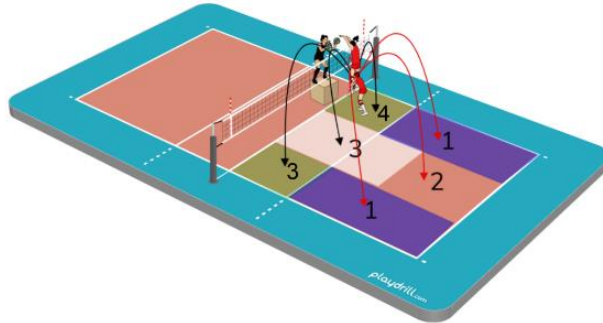
The researcher reviewed and analyzed numerous scientific sources and references. (Ali Ibrahim Saleh, 2012, 14), (Mohamed Sobhi Hassanin, Hamdi Abdel Moneim, 1997, 20), (Muhammad Subhi Hassanin, 2003, 358), (Amer Meshaal Faihan, 2008, 77), (Shahmal Salah Al-Din Ahmed, 2013, 2), (Amjad Hamed Badr Hussein Al-Majma'i, 2020) related to research topic for purpose of selecting tests specific to study according to scientific methods and steps followed for this purpose.

#### *Presentation of specifications for test accuracy of receiving serve and defending court from center 2 For Premier League volleyball players*

Specifications for accuracy test of receiving thrown balls (Baqquer Testing defense of court from position of blocking wall for position (2) for Premier League volleyball players: Testing accuracy of receiving thrown balls (Baqquer) (Mohamed Sobhi Hassanin, Hamdi Abdel Moneim, 1997, 204) Purpose / Measures reception accuracy. Performance specifications / mat is placed on a box in center (3). tester stands in center (6). Another player standing in center (6) from other half of field throws ball to tester, who in turn passes it to ball to fall on mat . player is given 10 attempts. Scoring / 4 points if ball lands inside box or on mat. 3 points if you touch box. 1 point within attack zone.

Court defense test from position of blocking wall for center (2): Test Name: Court Defense Test from Blocking Wall Position for Center (2). purpose of test: To measure accuracy of defending court from position of blocking wall for center (2). Equipment: Volleyball court, (5) legal volleyballs, whistle, (1) meter high standing platform. Procedures: player's playing area is defined as (6) areas, with three front areas and three back areas. two middle areas are of equal size, while right and left side areas are same size as center area in which they are located. standing platform is placed on opposite side of playing area in front of player being tested. Performance description : player stands in position (2), and on opposite side of court, on standing platform, stands a person holding two balls. Upon hearing whistle, ball holder throws ball to test player, who in turn forms a blocking wall. As defender descends, ball holder throws second ball to test player, who then directs

ball to one of areas of his court. Scoring: Each player is given (5) attempts, and total points for five attempts are calculated. points are recorded as follows: (4) points are given when ball is directed towards center area (2). (3) points are given when directing ball towards two areas, center (3) and center (4). Two points are given when ball is directed towards center area (6). One point is given when ball is directed to two areas: center (1) and center (5). (Zero) points are given if player fails to perform or does not direct ball out of bounds.



**Figure 1.** court defense test demonstrates blocking position of position (2) for Premier League volleyball players

### *Exploratory Experiment*

The researcher applied research variables to a sample of 12 players from Al-Masafi Al-Wasat and Haditha clubs on Sunday, April 16, 2024, in People's Indoor Hall before match between two teams. Purpose of pilot study was as follows: Training support staff on how to perform test (Appendix 2). Check dimensions and distances for test. Ensuring test is suitable for research sample. Ensuring efficiency of tools used in research. Determine time required to perform test.

### *Final Application*

Main research experiment was implemented from 23/4/2024 to 24/6/2024 on a sample of 24 players from research population representing players from clubs selected for this purpose. following were taken into consideration during implementation: Preparing registration forms. Allow time for warm-up. Emphasizing to players importance of taking test seriously.

### *Statistical methods*

Mean. Standard deviation. Mode. Square root. Torsion coefficient. Percentage. Simple correlation coefficient (Pearson's). Standard grade (6 CCMA)

## **Results**

The descriptive and statistical results are presented in Tables 2–4.

**Table 2.** Description and contribution of body length to serve reception accuracy

No.	Variables	Mean	SD	r	Sig.	R	R Square	F Change	Sig. F
1	Serve reception accuracy	26.08	4.92	—	—	—	—	—	—
2	Torso length	75.00	4.06	0.546	0.003	0.547	0.299	4.48	0.024

3	Arm length	89.33	3.47	0.281	0.092	—	—	—	—
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Table 2 shows that torso length had a significant positive relationship with serve reception accuracy, with a correlation value of 0.546 and a significance value of 0.003. The model summary also showed an R Square value of 0.299, indicating that body length variables explained 29.9% of the variance in serve reception accuracy. Meanwhile, arm length showed a positive but non-significant relationship with serve reception accuracy.

**Table 3.** Regression analysis of body length on serve reception accuracy

Source / Variable	Sum of Squares	Mean Square	B	Std. Error	t	Sig.
Regression	166.12	83.058	—	—	—	—
Residual	389.72	18.558	—	—	—	—
Total	555.83	—	—	—	—	—
Constant	—	—	-21.25	23.58	0.901	0.378
Torso length	—	—	0.680	0.265	2.57	0.018
Arm length	—	—	-0.041	0.310	0.132	0.896

Table 3 shows that torso length had a significant effect on serve reception accuracy, with a regression coefficient of 0.680 and a significance value of 0.018. In contrast, arm length did not show a significant effect, with a significance value of 0.896.

**Table 4.** Description and contribution of body length to field defense from position 2

No.	Variables	Mean	SD	r	Sig.	R	R Square	F Change	Sig. F
1	Field defense from position 2	11.96	1.78	—	—	—	—	—	—
2	Torso length	75.00	4.06	0.162	0.225	0.332	0.110	1.30	0.293
3	Arm length	89.33	3.47	-0.152	0.239	—	—	—	—

Table 4 shows that torso length and arm length did not have a significant relationship with field defense from position 2. The R Square value of 0.110 indicates that the body length variables explained only 11.0% of the variance in field defense performance. Therefore, body length was not a dominant contributor to field defense from position 2 among Premier League volleyball players.

## Discussion

The findings of this study showed that torso length had a significant relationship with serve reception accuracy among Premier League volleyball players. Players with greater torso length tended to demonstrate better balance and body stability during serve reception movements. A stable body position is important in volleyball because players must quickly adjust their posture and maintain control when receiving the ball. Similar findings were reported by Malina et al. (2004), who explained that anthropometric characteristics are closely related to sport performance, particularly in skills requiring body control and movement efficiency. Stamm et al. (2003) also found that elite volleyball players generally possess physical characteristics that support effective serve reception performance.

The regression analysis further indicated that torso length significantly influenced serve reception accuracy, while arm length did not show a significant effect. This result suggests that serve reception performance is not determined solely by limb length, but also by functional movement ability, balance, coordination, and neuromuscular control. Gabbett (2008) reported that volleyball performance is strongly influenced by physical and motor abilities such as balance, movement control, and

positioning during defensive actions. Similarly, Ahmed Abdel Hamid (2020) emphasized the importance of core stability in maintaining athletic balance and improving technical performance in volleyball.

For field defense from position 2, the results showed that torso length and arm length did not significantly contribute to defensive performance. This finding indicates that field defense may depend more on functional physical abilities than on anthropometric measurements. Defensive actions in volleyball require rapid reactions, agility, anticipation, and the ability to read the direction of the ball. Stamm et al. (2003) explained that defensive volleyball performance is more strongly associated with agility and change-of-direction ability than with body dimensions alone. In addition, Amjad Hamed Badr (2020) stated that reaction speed and motor coordination are more important predictors of defensive efficiency than anthropometric factors.

Based on these findings, volleyball training programs should not focus only on body measurements, but also prioritize the development of agility, reaction speed, coordination, balance, and core strength. Such training approaches may help improve serve reception and defensive performance more effectively among volleyball players.

## Conclusions

Core length showed a significant correlation and influence on accuracy of receiving serve, indicating its importance in achieving balance and stability during defensive and offensive performance. Length of arm did not show a significant effect on receiving serve or defending, which means that length of limbs alone does not explain skill performance. Defense in position (2) depends more on functional physical factors such as agility and reaction speed, than on anthropometric lengths.

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