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ORIGINAL

PERFORMANCE COEFFICIENT OF THE MASTER VOLLEYBALL SKILLS ACCORDING TO THE CLASSIFICATION

Coeficiente de rendimiento de las acciones de juego del voleibol master de acuerdo con la clasificación

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ABSTRACT

The objective of the study was to determine the performance coefficient (PC) of the male master volleyball skills according to the classification. The study was composed by 15 matches of the male master volleyball of the category 35 years or more. The match analysis was practiced of 4 matches of the volleyball team 1st and 2nd place of the Carioca Championship and of 12 matches of the volleyball team 3th to last place. The data were collected with the camera in gymnasium. After the data collect, the researcher practiced the match analysis with a scout prepared in the Excel®. Mann Whitney U test (U = 8329, p = 0,0002) detected statistical difference of the PC of the defense between the volleyball team 1st and 2nd place (PC of 1,86±1,01) versus the volleyball team 3rd to last place (PC of 1,37±1,01). The new statistic of Cumming (2014) detected statistical difference of the defense, Overlap = -0,35, p = 0,001. In conclusion, the study of the volleyball skills of the male master volleyball of the category 35 years or more is important for guide the coach during the training prescription.
Key words: volleyball, match analysis, sport, performance, skills, sport technique.

RESUMEN

El objetivo del estudio fue determinar el coeficiente de rendimiento (CR) de las acciones de juego del voleibol master. El estudio fue compuesto por 15 partidos del voleibol master masculino de la categoría de 35 años o más. El análisis del partido se practicó de 4 partidos del equipo de voleibol 1° y 2° lugar del Campeonato Carioca y de 12 partidos del equipo de voleibol 3° a último lugar. Los datos fueron recogidos con la cámara en el gimnasio. Después de la recolección de datos, el investigador practicó el *match analysis* con un *scout* elaborado en el Excel®. La prueba U de Mann Whitney (U = 8329, p = 0,0002) detectó diferencia estadística del

CR de la defensa entre el equipo de voleibol 1° y 2° lugar (PC of 1,86±1,01) versus el equipo de voleibol 3° a último lugar (PC of 1,37±1,01). La nueva estadística de Cumming (2014) detectó diferencia estadística de la defensa, Overlap = -0,35, p = 0,001. En conclusión, el estudio de las habilidades del voleibol master masculino de la categoría de 35 años o más es importante para guiar al entrenador durante la prescripción de entrenamiento.

Palabras clave: voleibol, análisis del juego, deporte, rendimiento, habilidades, técnica deportiva.

INTRODUCTION

Match analysis is an important activity during the volleyball match or after of the game with the objective of study the technique and the tactics of the volleyball team (Marcelino, Mesquita, Sampaio and Moraes, 2010; Marelic, Resetar and Jankovic, 2004). The serve, the attack and the block are the skills with the objective of cause a point or hamper the actions of the opponent (Cieminski, 2017). The reception and the set are skills with the objective of the offensive construction and the defense has the objective of avoid the point and enable the counterattack.

Actually the majority of the studies about the performance of the volleyball skills were practiced on professional volleyball (Marcelino, Mesquita, Sampaio and Anguerra, 2009; Ruiz, Quiroga, Miralles, Sarmiento, Saá and Manso, 2011; Silva, Lacerda and João, 2014). The volleyball literature determined the attack as the skill more decisive in the victory of the professional volleyball and in second the block (Marques Junior, 2015). The serve is the third skill more decisive in the victory. But the reception, the set and the defense are the skills important for a good attack of the professional volleyball because there is a relation between these skills (Costa, Barbosa and Gama Filho, 2013).

However, study about the male master volleyball of the category 35 years or more the volleyball literature practiced only one research (Marques Junior, 2017). Then, a study of the skills according to the classification of the category 35 years or more is important for the volleyball coach.

What is the skill performance of the two best master volleyball skills versus the 3th place to the last?

The volleyball literature did not have information about these results (Conjero, Claver, Silva, Echeverría and Moreno, 2017; Costa, Sousa, Silva, Araújo, Neto and Batista, 2017).

The objective of the study was to determine the performance coefficient of the male master volleyball skills according to the classification.

POPULATION AND SAMPLE

The study was composed by 15 matches of the male master volleyball of the category 35 years or more during the Carioca Championship of 2016 (n = 9 matches) and of 2017 (n = 6 matches). The study had 15 matches during the 1st set, 15 matches during the 2nd set and 4 matches during the 3rd sets – total of 34 sets.

The first and second of the Carioca Championship of 2016 (n = 2 matches) and of 2017 (n = 2 matches) had 4 matches – total of 8 sets. The 3th to last place of the Carioca Championship of 2016 (n = 7 matches) and of 2017 (n = 5 matches) had 12 matches – total of 26 sets.

The first and second of the Carioca Championship of 2016 and 2017 were the champion and the second place of the Brazilian championship of 2016 and 2017.

Methods used in the Research

The matches of the master volleyball were filmed with the camera Sony® handycam, model DCR-SX20 on the tripod Mirage®.

After the data collect, the researcher practiced the match analysis with a scout prepared in the Excel® of Marques Junior and Arruda (2017) with the objective of determine the performance coefficient. The materials used during the match analysis were the following: a Compaq Presario CQ43 notebook was used with the scout, an Acer Aspire 4320 notebook was used to pass the image of the matches to the Philips 42 LCD television for this instrument reproduce the image of the matches.

The master volleyball is practiced with two sets of 25 points or two points of difference for the winner. When each team wins one set, the tie break (3rd set) is practiced with a set of 15 points or two points of difference for the winner.

The data were collected with the camera in gymnasium, at a distance of 2 meters (m) and a height of 2 m. All the matches were filmed in the Canto Rio gymnasium, club in Niterói, Rio de

Janeiro, Brazil. The researcher positioned back of the court for filmed the match. Then, only a master volleyball team was analyzed with the scout prepared in the Excel®.

The researcher practiced the match analysis at a distance of 1 m from the television. The scout prepared in the Excel® was standardized for collect the data of the matches with the norms of Marques Junior and Arruda (2017).

The analysis time of each set with the scout prepared in the Excel® was as follows: 1st set with 43 minutes to 1 hour and 55 minutes, 2nd set with 20 minutes and 55 seconds to 1 hour and 55 minutes and 3rd set with 33 minutes to 1 hour and 15 minutes.

The classification of the performance coefficient of the skills for the master volleyball of the category 35 years or more was as follows: 0 to 1 is a low performance, 1,1 to 2 is a medium performance and 2,1 to 3 or more is a high performance (Marques Junior, 2017).

Data Analysis

The results were expressed as mean and standard deviation, minimum and maximum, confidence interval of 95%. The effect size (ES) of Hedges and Olkin (1985) was calculated in the Excel®. The classification of the ES was based in Cano-Corres, Sánchez-Álvarez and Fuentes-Arderiu (2012), the classification was as follows: 0,20 or less is very small the effect, 0,21 to 0,49 is small the effect, 0,50 to 0,79 is medium the effect and 0,80 or more is great the effect.

The researcher verified the performance coefficient of the skills of the volleyball team 1st and 2nd place versus 3rd to last place. Then, the normality of the data was assessed by the Shapiro Wilk test ($n = 50$, p $p \leq 0.05$) and/or with the Kolmogorov Smirnov test ($n > 50$, $p \leq 0.05$), but was observed the normality of the data through of the histogram.

In case of data normal, the difference between the performance coefficient (PC) of the skills of the volleyball team 1st and 2nd place versus 3rd to last place was analyzed using independent t test, with accepted results with significance level of $p \leq 0,05$. In case of data not normal, the difference between the PC of the skills of the volleyball team 1st and 2nd place versus 3rd to last place was analyzed using Mann Whitney U test, with accepted results with significance level of $p \leq 0,05$. All these statistical treatments were performed according to the procedures of the

GraphPad Prism, version 5.0. The histogram and the bar graph were elaborated according to the procedures of the GraphPad Prism, version 5.0.

After the calculation of the significance p, the new statistic of Cumming (2014) was performed for the significance p to be more precise.

ANALYSIS OF THE RESULTS

The data of the performance coefficient (PC) of the skills of each volleyball team were presented in table 1.

Skills	3rd to last place	1st and 2nd place
Serve	1,82±0,53 (medium)	1,85±0,79 (medium)
	0 and 3,33 (min and max)	0 and 4
	1,74 to 1,90 (IC 95%)	1,65 to 2,05
Reception	2,37±0,66 (high)	2,44±0,69 (high)
	0 and 3	0 and 3
	2,27 to 2,46	2,24 to 2,63
Set	2,11±0,68 (high)	2,17±0,73 (high)
	0 and 3	0 and 3
	2,02 to 2,19	1,95 to 2,39
Attack	2,19±1,14 (high)	2,73±1,11 (high)
	0 and 4	0 and 4
	2,06 to 2,32	2,48 to 2,97
Block	1,68±0,87 (medium)	1,86±1,08 (medium)
	0 and 4	0 and 4
	1,59 to 1,78	1,64 to 2,08
Defense	1,37±1,01 (medium)	1,86±1,01 (medium)
	0 and 3	0 and 3
	1,26 to 1,49	1,63 to 2,09

Classification of the PC: 0 to 1 (low), 1,1 to 2 (medium) and 2,1 to 3 or more (high).

Table 1. Performance of the skills of each volleyball team – PC and classification, minimum and maximum (min and max) and confidence interval of 95% (IC 95%).

The Kolmogorov Smirnov test detected data not normal of the performance coefficient of the skills. The Shapiro Wilk test detected data not normal of the performance coefficient of the set. The histogram illustrates the data not normal of some skills.

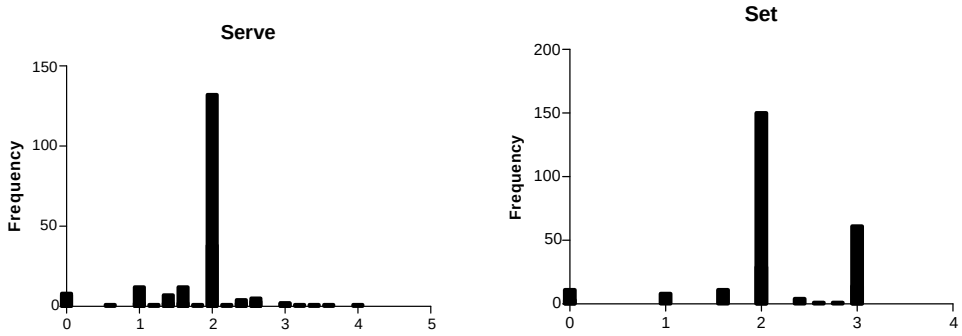

Figure 1. Histogram.

The table 2 shows the results of the Mann Whitney U test of the comparison between the performance coefficient (PC) of the skills of the volleyball team 1st and 2nd place versus 3rd to last place.

Skills	U	p	Effect Size and Classification
Serve	5225	0,13	0,03 (very small)
Reception	4898	0,36	0,07 (very small)
Set	5270	0,37	0,06 (very small)
Attack	8517	0,0003*	0,54 (medium)
Block	15570	0,12	0,18 (very small)
Defense	8329	0,0002*	0,49 (small)

Table 2. Values of the Mann Whitney U test (p≤0,05*) and of the effect size.

The figure 2 illustrates the results with statistical difference (p≤0,05*).

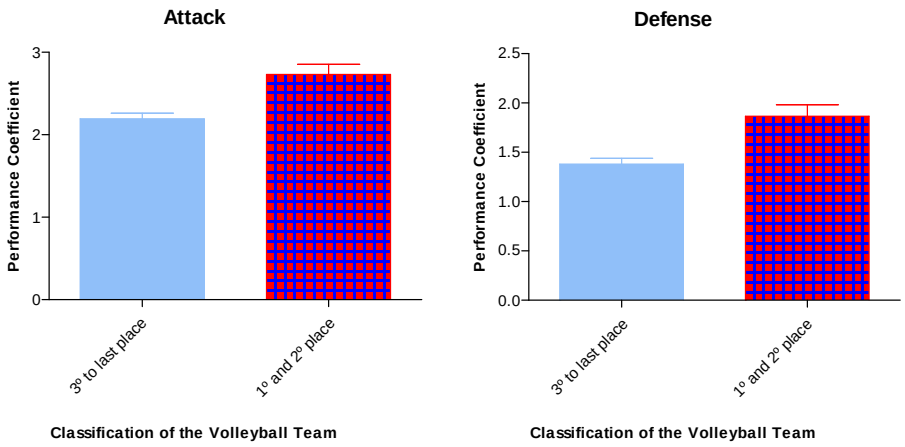

Figure 2. Performance coefficient.

The figure 3 shows in ascending order the performance of the skills of the volleyball team 1st and 2nd place and of the 3rd to last place.

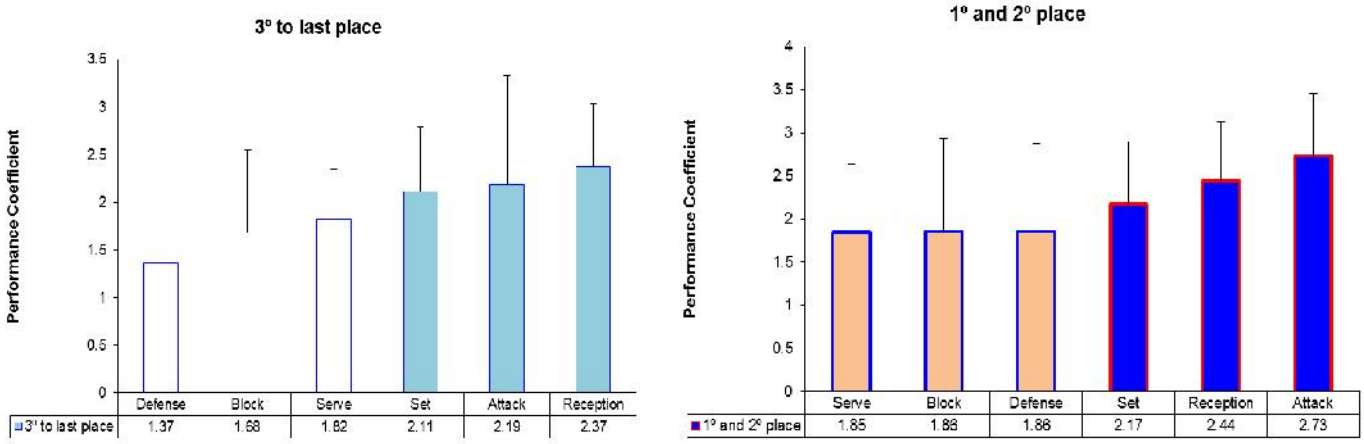

Figure 3. Performance coefficient of the skills.

The table 3 shows the results of the new statistic of Cumming (2014) of the comparison between the performance coefficient (PC) of the skills of the volleyball team 1st and 2nd place versus 3rd to last place.

Skills	Overlap	p
Serve	1,13	1
Reception	1,26	0,30
Set	1,60	1

Coefficient of the master volleyball skills

Attack	-0,85	0,001*
Block	0,89	0,12
Defense	-0,35*	0,001*

n = 10 or more: Overlap of 0,50 or less* and p≤0,05* (statistical difference)

Table 7. Result of the new statistic.

The figure 4 illustrates the results with statistical difference of the new statistical of Cumming (2014).

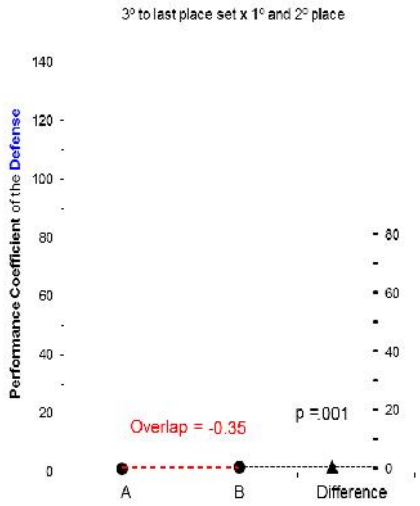

Figure 3. Performance coefficient of the defense.

DISCUSSION

The volleyball team 1st and 2nd place of the Carioca Championship had in all skills values higher than the volleyball team 3rd to last place. This result was similar to the study of Costa et al. (2017) and of Marelic et al. (2004).

But the value of the performance coefficient of the 1st and 2nd place with greater difference of points than the 3rd to last place was the attack, the block and the defense – see table 1 and figure 3. However, only one comparison had statistical difference by significance p (p≤0,05) and with the new statistic of Cumming (2014), was the defense.

Then, volleyball team 3rd to last place needs to train more the skills with worse performance in relation to the volleyball team 1st and 2nd place. The study detected the attack, the block and the

defense. Therefore, volleyball literature determined that the best teams have the attack, the block and the defense with better performance (Conejero et al., 2017).

The performance of the serve was similar between volleyball team 1st and 2nd place versus the volleyball team 3rd to last place – see table 1 and figure 3. This result was similar to the study of Ruiz et al. (2011). But in the study of Silva et al. (2014) the best teams practiced the serve much better than the worst teams. The volleyball team 3rd to last place needs attention in the serve training because this skill has a relation with the block. The improvement of the serve causes a better block. The same recommendation is for the volleyball team 1st and 2nd place because an improvement in the serve may become the victory easier.

The reception and the set had value similar between volleyball team 1st and 2nd place and the volleyball team 3rd to last place. This result was similar to the volleyball studies (Marcelino et al., 2009, 2010). Other similar result were the worst and the best skills of the volleyball team 1st and 2nd place and of the volleyball team 3rd to last place – see figure 3.

CONCLUSIONS

The study detected the performance of the skills according to the classification. The volleyball team 1st and 2nd place needs of more training of the serve because the result was similar to the volleyball team 3rd to last place. But the volleyball team 3rd to last place needs more training of the serve, of the attack, of the block and of the defense with the objective this team has similar performance to the champion and 2nd place.

In conclusion, the study of the volleyball skills of the male master volleyball of the category 35 years or more is important for guide the coach during the training prescription.

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