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Differences in Selected Performance Indicators among Top Four Teams in Dubai Men's World Rugby Sevens Series 2019/20

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Abstract
The main objective of this investigation is to differentiate the performance of the four best teams in men's rugby seven based on 13 performance indicators (Higham, Hopkins, Pyne, & Anson, 2014), Observational study (hand notational analysis) is performed to collect the data from the recorded video. Data were analyzed using SPSS (ver. 26) with a significant value set at p≤ 0.05. Based on the analysis, two PIs show a significant difference among the top four, and 11 PIs show vice versa results. Based on the data on PI's, all top-four teams used different gameplay. The findings from this research may give some insight for rugby seven players and coaches to prepare for respective tournaments.

Keywords: Performance Analysis, Performance Indicators, Rugby Seven

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1.0 Introduction

International seven rugby tournaments run annually by World Rugby with seven national teams are arranged in the World Rugby Sevens Format. Organized as the IRB World Sevens Series for the first time in the 1999-2000 season, the tournament was created to foster an elite level of international rugby sevens and turn the game into a profitable competing entity. The tournament has also been funded since 2014 by the banking company HSBC. The circuit for the season consists of 10 matches that generally start in November or December yet last till May. The locations are organized around ten countries, and five of the six inhabited continents are visited. Each event hosts one event in South Africa, United Arab Emirates, New Zealand, Australia, Canada, USA, Hong Kong, France, England, and Singapore. There are 16 teams for each competition-15 core teams that play for each tournament and one regional representative. The tournament calls off after the sixth series (Canada) due to the COVID-19 pandemic.

The increase in performance for each team that competes in the series takes rugby seven to another level of tournament, especially when the International Olympic Committee in 2009 has agreed to include rugby sevens in the 2016 Summer Olympics. Since then, Rugby sevens popularity increased and has been played in 93 countries around the globe (Carreras, Kraak, Planas, Martín & Luis Vaz, 2013). Despite the increase in popularity, limited scientific data on the game (Van Den Berg, 2013) and research need to be done. Since the match is only seven min each half, every team has an opportunity to beat their opponent regardless of their team rankings.This research

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focuses on tactical analysis to investigate the difference in selected performance indicators among the top four teams in Dubai Men's World Rugby Sevens Series 2019/20. Thus, it is essential to investigate the differences in selected performance indicators between top-four teams in the tournament.

2.0. Method

The objective of this study is to investigate the differences in selected performance indicators (PI) among the top for teams in Dubai Men's World Rugby Sevens Series 2019/20. The selected performance indicators focus on tactical analysis instead of other compound factors related to the performance of rugby sevens athletes. An observational study adapts 13 indicators by previous research (Higham, Hopkins, Pyne, & Anson, 2014). The indicators are as; 1. Passes; 2. Passes per minute possession; 3. Passes per try score; 4. Ruck; 5. Ruck per try scored; 6. Maul; 7. Maul and ruck per minute possession; 8. Kick; 9. Kick per minute possession; 10. Kick per pass; 11. Ruck and maul per kick; 12. Turnover conceded and; 13. Turnover conceded per minute possession.

Data is collected by using the notational analysis from the match footage from the HSBC Rugby sevens official website. All the videos for the top four teams (24 videos) from the group stage and knockout stage are analyzed. The data analysis is using Statistical Package for Social Science (ver. 26) and the significance level is set at 95% of confident interval ($p \leq 0.05$).

3.0. Research Sampling

The purposive sampling technique is used to decide the sample and the data collected from top four teams of the tournaments.

4.0. Research Instrumentation

4.1. Video

The study was conducted using a video of the tournament of seven-minute halves with or without a maximum of two minutes half-time.

4.2. Hand Notational Analysis

The data collection process was performed by researchers by using an observation table and a paper-pen-based method. The observation is based on 13 selected performance indicators for every match.

4.3. Intra-observer reliability

The reliability of the data for this research is controlled by limiting to only two observers form the research team to collect the data. Before they are allowed to perform the data collections, they have to perform intra-observer and inter-observer reliability test procedures. They must observe one selected match two times and the interval between observer is 7 days. The value stated at $r \leq 0.85$ and all the observers meet the criterial stated.

5.0. Findings

5.1. Descriptive statistic

Generally, this research compared between top four teams in Dubai rugby seven championships. The detail analysis is as below:

Table 1: *Descriptive statistics of top 4 teams* in Dubai rugby seven championship

Team	PI	Mean	Std. Deviation
New Zealand	Passes	43.50	3.87
	Passes Per Min Possession	11.59	2.10
	Passes Per Try Scored	20.25	16.55
	Ruck	8.25	2.06
	Ruck Per Try Scored	4.25	4.50
	Mauls	0.00	0.00
	Ruck and Mauls Per Min Possession	2.23	0.85
	Kick	2.00	1.15
	Kick Per Min Possession	0.48	0.32
	Kick Per Pass	0.05	0.02
	Ruck and Mauls Per Kick	5.08	2.39
	Turnovers Conceded	3.00	2.71
	Turnovers Conceded Per Min Possession	0.71	0.46
United States	Passes	57.00	11.66
	Passes Per Min Possession	15.00	2.55
	Passes Per Try Scored	27.88	24.84
	Ruck	7.60	1.14
	Ruck Per Try Scored	3.13	2.74
	Mauls	0.00	0.00
	Ruck and Mauls Per Min Possession	2.09	0.82
	Kick	2.80	2.17
	Kick Per Min Possession	0.70	0.93

	Kick Per Pass	0.00	0.00
	Ruck and Mauls Per Kick	4.10	2.41
	Turnovers Conceded	3.20	2.77
	Turnovers Conceded Per Min Possession	0.99	1.19
England	Passes	53.00	18.02
	Passes Per Min Possession	11.00	1.83
	Passes Per Try Scored	27.09	32.76
	Ruck	13.00	8.76
	Ruck Per Try Scored	7.31	9.93
	Mauls	0.00	0.00
	Ruck and Mauls Per Min Possession	2.50	1.24
	Kick	1.75	1.71
	Kick Per Min Possession	0.32	0.26
	Kick Per Pass	0.13	0.19
	Ruck and Mauls Per Kick	5.75	8.89
	Turnovers Conceded	2.50	1.29
	Turnovers Conceded Per Min Possession	0.58	0.40
Australia	Passes	36.40	13.39
	Passes Per Min Possession	10.04	1.72
	Passes Per Try Scored	10.48	6.42
	Ruck	8.40	3.36
	Ruck Per Try Scored	2.30	1.25
	Mauls	0.00	0.00
	Ruck and Mauls Per Min Possession	2.18	0.39
	Kick	2.40	1.14
	Kick Per Min Possession	0.44	0.47
	Kick Per Pass	0.08	0.06
	Ruck and Mauls Per Kick	4.62	4.29
	Turnovers Conceded	2.60	2.07
	Turnovers Conceded Per Min Possession	0.87	0.88

Table 1 shows the descriptive statistics of top 4 teams in Male Rugby Sevens Series during Dubai 2018. The researcher in this study chooses 13 performance indicators. Based on the table, the United States has the highest rate of passes (Mean±SD, 57±11.66), followed by England (53±18.02), then New Zealand with passes which is (43.50±3.87), and Australia has the lowest rate of passes which is (36.40±13.39). Then for passes per min of possession, New Zealand has the second highest rate which is (11.59±2.10) and followed by United States, which has the highest rate which is (15±2.55), Australia has the lowest rate of passes per min of possession (10.04±1.72) and England (11.00±1.83). On top of that, for passes per try scored, the United States recorded the highest passing sequence (27.88±24.84) followed by England (27.09±32.76), New Zealand (20.25±16.55) and Australia (10.48±6.42).

England recorded the highest rate of ruck (13.00±8.76) followed by Australia (8.40±3.36), New Zealand (8.25±2.06) and the United States (7.60±1.14). Then for rucks per try scored the teams that has highest rate is England (Mean = 7.31 and SD = 9.93) followed by New Zealand (Mean = 4.25 and SD = 4.50, after that United States (Mean = 3.13 and SD = 2.74) and with lowest rate in Australia (Mean = 2.30 and SD = 1.25). Next performance indicators are mauls, but all teams in top 4 did not record any rate because the players do not perform these indicators during the game (Mean = 0.00 and SD = 0.00). Moreover, for rucks and mauls per min of possession, England came at the first place which is the highest rate (Mean = 2.50 and SD = 1.24) then the second highest in New Zealand (Mean = 2.23 and SD = 0.85) followed by Australia (Mean = 2.18 and SD = 0.39) and lastly is United States (Mean = 2.09 and SD = 0.82).

4.4 Inferential Statistics

The researcher aimed to determine the differences in team performance based on selected performance indicators between the top 4 teams in the Dubai Sevens tournament. A normality test is performed to identify the normality of the data from 13 selected performance indicators. Two performance indicators are normally distributed (passes, passes per min possession) and 11 PI is not normally distributed (ruck, ruck and mauls per min possession, kick and ruck and mauls per kick passes per try scored, ruck per try scored, kick per min possession, kick per pass, turnovers conceded, and turnovers conceded per min possession), Based on the normality test, the researcher used parametric (One-way ANOVA) for the PI which generally distributed and non-parametric (Kruskal-Wallis Test) for the PI which not normally distributed. Based on the normality test, PIs that are normally distributed are analyzed by One-way ANOVA and not customarily distributed PIs are analyzed using Kruskal-Wallis Test. The detail is as below:

Table 2: *One-way ANOVA of top 4 teams* in Dubai rugby seven championship

		Sum of Squares	df	Mean Square	F	Sig.
Passes	Between Groups	1252.078	3	417.359	2.563	.097
	Within Groups	2280.200	14	162.871		
	Total	3532.278	17			
Passes Per Min Possession	Between Groups	68.777	3	22.926	5.253	**.012**
	Within Groups	61.104	14	4.365		
	Total	129.881	17			

Table 2 is the analysis of normally distributed data by using one-way ANOVA. Based on the analysis, passes show a non-significant difference among teams (F= 2.563, p= 0.097), and passes per minute of plays show a significant difference among teams (F= 5.235, p=0.12).

Table 3: *Test Statistics of Kruskal-Wallis Test*

	Passes Per Try Scored	Ruck	Ruck Per Try Scored	Mauls	Ruck and Mauls Per Min Possession	Kick	Kick Per Min Possession	Kick Per Pass	Ruck and Mauls Per Kick	Turnovers conceded	Turnovers concede per min possession
Kruskal-Wallis H	1.774	.263	.340	.000	1.047	.909	.471	9.486	1.446	.241	.190
df	3	3	3	3	3	3	3	3	3	3	3
Asymp. Sig.	.621	.967	.952	1.000	.790	.823	.925	**.023**	.695	.971	.979

Table 3 shows the analysis of non-normally data using the test statistics of the Kruskal-Willis Test. Based on the analysis, only kick per pass shows a significant difference between teams (p=0.023, p≤ 0.05). Other PI's shows there is no significant different among top four team (passes per try scored, p=0.621; ruck, p=0.967; ruck per try scored showed, p=0.952; maul, p= 1.00; ruck and mauls per min possession p=0.790; kick, p= 0.823; kick per min possession, p=0.925; ruck and mauls per kick, p=0.695; turnovers conceded, p=0.971; turnovers concede per min possession, p=0.979)

5.0 Discussion

All four top teams play different game tactical. New Zealand, as a champion played less passing game compared to the runner-up and third placing team. United States of America (USA) played the most open game when they complete 57 passes per game, followed by England with 53 passes per game. New Zealand and Australia played a bit similar gameplay where they played a direct style of rugby seven.

England played a thighs game where they engaged with 13 times of rucking. New Zealand and Australia engaged 8.25 times and 8.4 times, respectively. The USA engaged 7.6 times, the most less contact among the top four teams. The USA played an open game that implemented more passes and less engagement.

In-term of kicking, the USA played the most kicking game with an average of 2.8 times per game. Followed by Australia and New Zealand with an average of 2.4 and 2.0 times per game. England Played less kicking average per match (1.75 times) and involved more in rucking. New Zealand as a champion shows a consistence performance in all PI in which they played less passing and a thigh game pattern with an average of 8.5 times rucking per game.

6.0 Conclusion and Recommendation

Throughout the entire HSBC World Rugby Sevens Series Dubai 2018, the review of each competition demonstrates the technical elements of play associated with performance at the highest level of international rugby sevens. Researchers identified many teams PI's relevant to tournament results by studying a vast number of international tournaments. The results underline the significance of performance in international tournaments of quality in offensive and defensive play components. To measure success and advise team readiness, the comparison standards for these indicators should be helpful (Higham et al., 2014). Coaches should improve squad tactics and players' tactical skills to retain ball control to maximize the probability of success in competitions by reducing mistakes and turnovers, improving offensive performance, and increasing the rate of practical completion of the tackle. These techniques will improve the scoring chances of a squad and reduce the opponents' capacity to handle the ball and gain points. The finding of this study is just based on one tournament, which is the Dubai men's Rugby Seven Series Dubai, 2018. The study might be expanded to compare or to find the mean values for PI between tournaments. Perhaps the finding from this research are able to give an inside on the important PI for a coach to plan training or team tactical for future tournaments.

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