



COMPARATIVE ANALYSIS OF HANDBALL SKILL PERFORMANCE OF THE LEAGUE QUALIFIED AND NON QUALIFIED TEAMS AT THE INTER COLLEGE TOURNAMENT

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ABSTRACT The purpose of this study was to determine differences related to the skill performance of the league qualified and non qualified teams in the inter collegiate handball tournament of Tamil Nadu Physical Education and Sports University. The key indicators used in this study were the offensive skill performance in wing position attempt and success, pivot position attempt and success, defensive skill performance in defense attempt and success. Pool A and pool B league qualified and non qualified teams were analyzed and compared using Mean median and standard deviation in descriptive statistics. The proportion of wing position success, pivot position success and defense success were compared by applying Kruskal Walli's Test analysis as recommended by (Ali GOK 2016). The confidence interval was 95% and alpha level was fixed at 0.05 levels. The pool-A winner and runner up team performed better in pivot position success and pool B winner and runner up team performed better in wing position success. The results obtained in the present study can help coaches and practitioners to achieve better performances by adjusting the training process according to the performance indicators of the present study.

KEYWORDS : Match analysis, performance analysis, observational methodology, team sports, handball analysis

INTRODUCTION

Handball is a ball game categorized under team sports. The physical abilities, technical skills and tactical knowledge are required as that of other major games. It has undergone in terms of technique, tactics, strategy, rules and regulation to suit the modern days of spectator expectation. The main is to score a goal and obstruct scoring of goal by the opponent. As a team sport it started gaining more popularity. One of the main advantages of this game is that it is based on variety of action to overcome the direct conflict with an opponent. Such conflict demanded physical and mental preparedness it demanded a good stature with coordinate action of all body and efficient movements with adequate rang of moments around the joints of upper and lower limbs. A very good coordination of central nervous system.

Handball is intermittent game and requires a well developed aerobic and anaerobic endurance (Dudley & Diamil, 1995, Fleck et al.). Intermittent jumping, spirting, throwing are to be executed throughout the game for high performance of the team (Fogelholm, 1994, Gelgerud et al., 2001, Houston et al., 1981). Of courses the requirements a better anthropometric characteristic also play a supportive role in the competitive handball (Muijen et al., Ramsey et al., 1990). Some of the most important support role played anthropometric variables are height, body mass and palm length (Muijen et al., 1991, Torranin et al., 1979). It is considered that to execute some basic movements like dribble, passing, catching throwing the wider palm spa, and longer palm length may play an important role to have good control over the ball. With regard to tem position handball can be broadly classified as goalkeepers, first lone players and second line player (Jensen et al., 1997, loftine et al., 1996) as the game developed and modified certain position have been classified based on the specific individual playing position (Bosco et al., 1983, Houston et al., 1981, Mikkelsen and Olesae 1976). Thus formed positions are back players, wing players, pivots, centre backs and goalkeepers.

The position of the players demands certain activities (Delamarche et al., 1987, Mikkelsen and Olesen 1976). Out of these positions the wing players normally cover the longest and total distance in sprinting during the game. (Hakkinen and Sinnemaki, 1991, Mikkelsen and Olesen, 1976. The back players normally execute largest number of throws (Hickson,1980)

METHODOLOGY

The subjects chosen for the investigation were the handball teams of the colleges of Tamil Nadu physical education and Sports University for the inter collegiate handball tournament held at Koviloor Andavar College Of Physical Education and Sports Science during the year 2019. The participating teams were divided in two pools each consisting of 5 teams. Each team played four matches in their pools respectively.

The two teams which secure first two places in each pool have taken to the semifinals and the winner of each semifinal played their finals.

QUALIFIED TEAMS

Pool -A Qualified Team

- YMCA College of Physical Education in, Chennai Pool-A winner (YMCA)
- Maruthi College of Physical Education, Coimbatore Pool A runner (MCPE)

Pool -B Qualified Teams

- Koviloor andavar college of physical education in karaikudi Pool-B winner (KACPE)
- Selvam College of Physical Education, Namakkal -Pool A runner (SCOPE)

NON QUALIFIED TEAMS

Pool -A

- Meenatchi Physical Education College, Ariyalur. (MPEC)
- St. John's College of Physical Education. Tirunelveli. (St.JOHN'S)
- Pasumpon Muthuramalinga Thevar College of physical education, Madurai.(PMT)

Pool -B

- Cheran College of Physical Education in karur. (CCPE)
- Tamil nadu physical education and sports university, Chennai (TNPEU)
- Dr. Sivanthi Aditanar College of Physical Education in Tiruchendu (Dr.SACPE)

The statistical analysis was made with SPSS.

RESULTS

The study examined the selected dependent variables namely wing position attempts, pivot position attempts and defense attempts in pool -A which consisted of five teams in which each team played four league matches.

The mean, median and standard deviation of each team in pool -A five teams namely YMCA, MCPE, MPEC, St.JOHN'S and PMT on the three parameters collected in the Tamil Nadu physical education and sports university intercollegiate tournament held in the year 2019 is presented in table 1.

Table 1 Descriptive statistics for three parameters related number of attempt each pool-A teams in five matches.

Variables	YMCA			MCPE			MPEC			St.SHONS			PMT		
	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD
Wing position attempts	7	7.5	2.2	10.3	12	6.7	6	5	4.2	4.8	5	1.5	5.3	4.5	1.9

Pivot position attempts	7.8	7.5	2.8	3.3	3	1.5	3	3	2.6	2.8	3	2.2	3.3	3.5	1.7
Defense attempts	35	31	17.5	35	29	22.5	31.8	26.5	13.1	29.5	27.5	7.1	32.3	34	7.2

M=Mean, MD= Median and SD = Standard deviation

Table 1 indicates that the mean, median and standard deviation for total number of attempt made by each team (N = 5). In the wing position attempts, the MCPE had the highest mean value of 10.3 followed by YMCA with the mean value of 7; In the pivot position attempts, the YMCA had secured highest mean value of 7.8 than the rest of the teams; Number of defense attempt, the YMCA and the MCPE had the highest same mean value of 35 followed by PMT with a mean value of 32.3 and followed by the MPEC with 31.8 and the St. John's with 29.5.

The study examined the selected dependent variables namely wing position success goals, pivot position success goals and defense success in pool –A which consist of five in which each team played four league matches. The mean, median and standard deviation of each team in pool –A namely YMCA, MCPE, MPEC, St.JOHNS, and PMT on the three parameters collected in the Tamil Nadu physical education and sports university intercollegiate tournament held in the year 2019 is presented in table 2

Table-2 Descriptive statistics for three parameters related number of success each pool-A teams in five matches.

PARAMETERS	YMCA			MCPE			MPEC			St.JOHNS			PMT		
	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD
Wing Position success Goals	4.2	4	2.2	5.2	5	4.1	1.7	1.5	1.7	1.2	1.5	0.9	1.2	1	0.5
Pivot Position success Goals	6.5	6	2.6	2	2	1.1	1	1	0.8	0.7	0.5	0.9	1.5	1.5	0.5
Defense Success	26.5	27	12.79	20.75	15	12.97	14	13.5	3.5	14	13	6.8	13	13	1.7

M=Mean, MD= Median and SD = Standard deviation

Table-2 indicates that the mean, median and standard deviation for total number of success by each team (N = 5). In the wing position success, the MCPE had the highest mean value of 5.25 followed by YMCA with the mean value of 4.25; In the pivot position success, the YMCA had secured highest mean value of 6.50 than the rest of the teams; In the number of defense success, the YMCA had the highest mean value of 26.50 followed by MCPE with the mean value of 20.75 and the St. John's with the mean value of 14.50 respectively.

The study examined the selected dependent variables namely wing position success goals, pivot position success goals, defense success in pool –A which consist of five in which each team played four league matches. The H' value and p' value of each team in pool –A namely YMCA, MCPE, MPEC, St.JOHNS, and PMT on the three parameters collected in the Tamil Nadu physical education and sports university intercollegiate tournament held in the year 2019 is presented in table -3.

Table – 3 Kruskal Walli's Test Result on Selected Dependent Variables among five teams in four matches of pool –A.

Dependent variables	Pool – A teams	Attempts,	Success	Success percentage	H' value	p' value
Wing position	YMCA	28	17	60.71	6.872	.143
	MCPE	41	21	51.22		
	MPEC	24	7	29.17		
	St.JOHNS	19	5	26.32		
	PMT	21	5	23.81		
Pivot position	YMCA	31	26	83.87	11.820	.019*
	MCPE	13	8	61.54		
	MPEC	12	4	33.33		
	St.JOHNS	11	3	27.27		
	PMT	13	6	46.15		

Defense	YMCA	140	106	75.71	3.532	.473
	MCPE	140	83	59.29		
	MPEC	127	56	44.09		
	St.JOHNS	118	58	49.15		
	PMT	129	54	41.86		

Asymptotic significances ($p < 0.05$ with DF (4))

Table –3 shows the Kruskal Walli's Test results on the selected dependent variables among the five teams in Pool: A.

For all the obtained H value, the p value is greater than the 0.05 level indicating that there was no significant mean difference except the pivot position success goals where $p < 0.05$.

The study measured by Kruskal Wallis Test in three dependent variables in which one variable the pivot position was significance.

Pair wise Comparisons of The output it was built below in table-4.

Table -4 Pair wise Comparisons of Pivot Position Success among Five Teams of Pool-A Matches.

Sample 1-Sample 2	Pivot percentage	Test Statistic	Std. Error	Std. Test Statistic	Sig.
St.JOHNS-MPEC	25 - 33	1.250	4.070	.307	.759
St.JOHNS-PMT	40 - 40	-3.875	4.070	-.952	.341
St.JOHNS-MCPE	0 - 50	5.375	4.070	1.321	.187
St.JOHNS-YMCA	0 - 80	12.625	4.070	3.102	.002*
MPEC -PMT	50 - 100	-2.625	4.070	-.645	.519
MPEC -MCPE	0 - 50	4.125	4.070	1.013	.311
MPEC -YMCA	25 - 78	11.375	4.070	2.795	.005*
PMT-MCPE	33 - 60	1.500	4.070	.369	.712
PMT-YMCA	50 - 91	8.750	4.070	2.150	.032*
MCPE-YMCA	75 - 83	7.250	4.070	1.781	.075

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is .05.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Indicates that the success goals scored from pivot position was significance better for the YMCA College the first position in the pool-A as compared St.JOHNS, MPEC and PMT college.

Where it was not significance as compared with MCPE the second position holder in pool –A matches. All other paired comparisons were not significant.

Testing of Hypothesis –I

Null Hypothesis – I stated that the distributions of number of success on selected dependent variables are same across the categories of Group – Pool A teams.

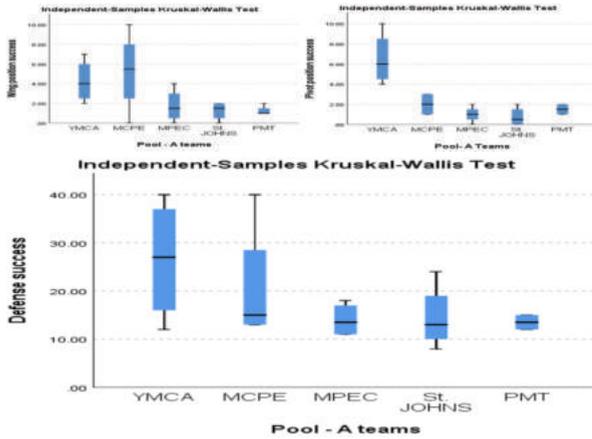
Based on test statistic result, the p values for all the dependent variables were greater than 0.05 levels and hence the null hypotheses for all the dependent variables were accepted.

Table – 5 Testing of Hypothesis on success of Selected Dependent Variables among five teams in Pool: A matches.

Hypothesis Test Summary				
Sino	Null Hypothesis	Test	Sig.	Decision
3	The distribution of wing position success goals is the same across categories of group.	Independent-samples kruskal-wallis test	.143	Fail to reject the null hypothesis.
4	The distribution of pivot position success goals is the same across categories of group.		.019*	Reject the null hypothesis.
6	The distribution of defense success is the same across categories of group.		.383	Fail to reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure – 1 Box Plot showing the Minimum, Maximum and Mean Values on Success of Selected Dependent Variables among Groups (Pool – A Teams).



The study examined the selected dependent variables namely wing position attempts, pivot position attempts and defense attempts in pool –B which consisted of five in which each team played four league matches. The mean, median and standard deviation of each team in pool –B namely KACPE, SCOPE, CCPE, TNPESU, and Dr. SACPE on the three parameters collected in the Tamil Nadu physical education and sports university intercollegiate tournament held in the year 2019 is presented in table -6.

Table – 6 Descriptive Statistics on Selected Dependent Variables among five teams in Pool: B matches

PERA METE RS	KACPE			SCOPE			CCPE			TNPESU			Dr.SACPE		
	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD
Wing position attempts	5.75	5.50	0.96	10.25	10.75	3.27	3.00	0.50	4.00	4.00	1.63	3.50	3.50	0.00	0.00
Pivot position attempts	9.25	8.50	3.59	7.75	7.00	2.99	7.25	7.50	4.27	4.50	2.38	5.25	1.50	6.00	6.00
Defense attempts	40.00	36.50	19.82	55.50	56.50	8.74	55.00	53.00	14.47	42.00	43.00	13.64	41.75	9.00	40.00

M=Mean, MD= Median and SD = Standard deviation

Table 1.1 indicates that the mean, median and standard deviation for total number of attempt made by each team (N = 5). In the wing position attempts, the SCOPE had the highest mean value of 10.25 followed by KACPE with the mean value of 5.75; In the pivot position attempts, the KACPE had secured highest mean value of 9.25 followed by SCOPE with the mean value of 7.75; In the number of defense attempt, the SCOPE had the highest mean value of 55.50 followed by CCPE with the mean value of 55 and then the TNPESU with the mean value of 42 respectively.

The study examined the selected dependent variables namely wing position success goals, pivot position success goals and defense success in pool –B which consist of five in which each team played four league matches. The mean, median and standard deviation of each pool –B five teams namely KACPE, SCOPE, CCPE, TNPESU, and Dr. SACPE on the three parameters collected in the Tamil Nadu physical education and sports university intercollegiate tournament held in the year 2019 are presented in table -7.

Table -7 Descriptive statistics for seven parameters related number of success each pool-B five teams in four matches.

PERA METE RS	KACPE			SCOPE			CCPE			TNPESU			Dr.SACPE		
	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD	M	MD	SD
Wing Position success Goals	4.50	4.50	1.29	4.75	4.00	4.10	0.50	0.50	0.50	1.50	1.50	1.20	1.00	0.50	1.40
Pivot Position success Goals	5.75	5.50	1.74	4.25	4.00	1.26	3.75	4.00	2.06	3.50	4.00	1.73	3.50	3.50	0.50
Defense Success	27.00	27.00	14.47	30.00	3.00	8.68	25.00	29.00	15.12	20.00	20.00	10.33	23.50	23.00	9.81

M=Mean, MD= Median and SD = Standard deviation

Table 1.1 indicates that the mean, median and standard deviation for total number of success by each team (N = 5). In the wing position success, the SCOPE had the highest mean value of 4.75 followed by KACPE with the mean value of 4.50; In the pivot position success, the KACPE had secured highest mean value of 5.25 than the rest of the teams; In the number of defense success, the SCOPE had the highest mean value of 30, and followed by KACPE with the mean value of 27 and the CCPE with the mean value of 25.75 respectively.

The study examined the selected dependent variables namely back court position success goals, fast break success goals, wing position success goals, pivot position success goals, penalty success goals, defense success and number of goal keeper saves in pool –B which consist of five in which each team played four league matches. The H' value and p' value of each team in pool –B namely KACPE, SCOPE, CCPE, TNPESU and Dr.SACPE on the three parameters collected in the Tamil Nadu Physical Education and sports university intercollegiate tournament held in the year 2019 is presented in table 8.

Table – 8 Kruskal Walli's Test Result on Selected Dependent Variables among five teams in four matches of pool – B.

Dependent variables	Pool – B teams	Attem pts,	Succe ss	Success percentage	H' value	p' value
Wing position	KACPE	44	27	61.36	10.61	.031*
	SCOPE	41	19	46.34		
	CCPE	13	2	15.38		
	TNPESU	16	6	37.5		
	Dr.SACPE	15	4	26.67		
Pivot position	KACPE	37	23	62.16	5.459	.243
	SCOPE	31	17	54.84		
	CCPE	29	15	51.72		
	TNPESU	18	14	77.78		
	Dr.SACPE	21	14	66.67		
Defense	KACPE	160	108	67.5	1.400	.844
	SCOPE	222	120	54.05		
	CCPE	220	103	46.82		
	TNPESU	168	80	47.62		
	Dr.SACPE	167	94	56.29		

*Asymptotic significances (p < 0.05 with df (4))

Table – 8 shows the Kruskal Walli's Test results on the selected dependent Variables among five teams in Pool: A. For all the obtained H value, the p value is greater than the 0.05 level indicates that there was no significant mean difference exist on attempts of all the selected dependent variables among the groups (N = 5 teams) in Pool – B.

The study measured by Kruskal Wallis Test in three dependent variables in which one variable the wing position was significance. Pair wise Comparisons of The output it was built below in table-9.

Table -9 Pair Wise Comparisons of wing position success among five teams of Pool-B Matches.

Sample 1-Sample 2	Wing position percentages	Test Statistic	Std. Error	Std. Test Statistic	Sig.
CCPE-Dr.SACPE	0-0	-1.500	4.110	-.365	.715
CCPE-TNPESU	25-50	-3.625	4.110	-.882	.378
CCPE-SCOPE	33-33	9.000	4.110	2.190	.029*
CCPE-KACPE	0-80	10.875	4.110	2.646	.008*
Dr.SACPE-TNPESU	13-0	2.125	4.110	.517	.605
Dr.SACPE-SCOPE	0-40	7.500	4.110	1.825	.068
Dr.SACPE-KACPE	60-100	9.375	4.110	2.281	.023*
TNPESU-SCOPE	75-62	5.375	4.110	1.308	.191
TNPESU-KACPE	17-60	7.250	4.110	1.764	.078
SCOPE-KACPE	35-71	1.875	4.110	.456	.648

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is .05.

a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Indicates that the success goals scored from wing position was significance better for the SCOPE College the second position in the pool-B as compared CCPE, College. Wing position was significance better for the KACPE College the first position in the pool-B as compared CCPE and Dr.SACPE College. All other paired comparisons were not significant.

Testing of Hypothesis – I

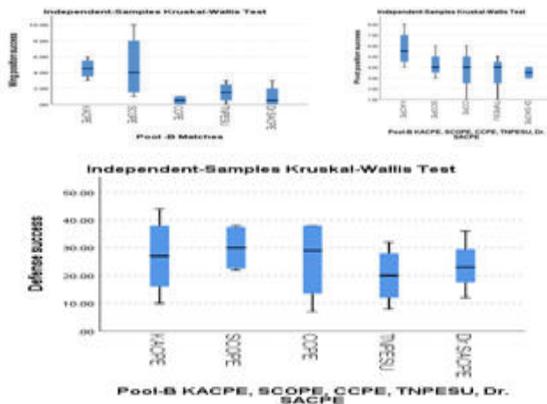
Null Hypothesis – I stated that the distribution of number of success on selected dependent variables is same across the categories of Group – Pool B teams. Based on test statistic result, the p value for all the dependent variables was greater than 0.05 level and hence the null hypothesis for all the dependent variables were accepted.

Table – 10. Testing of Hypothesis on Attempt of Selected Dependent Variables among Groups – Pool: B Teams.

Hypothesis Test Summary				
S.No	Null Hypothesis	Test	Sig.	Decision
3	The distribution of wing position success goals is the same across categories of group.	Independent-samples kruskal	.031*	Fail to reject the null hypothesis.
4	The distribution of pivot position success goals is the same across categories of group.	-wallis test	.243	Fail to reject the null hypothesis.
6	The distribution of defense success is the same across categories of group.		.844	Fail to reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Figure – 2 Box Plot showing the Minimum, Maximum and Mean Values on Success of Selected Dependent Variables among Groups (Pool – B Teams)



DISCUSSION

The aim of the present study was to analyze the differences in the offensive and defensive skills between league qualified and non qualified teams that participated in the TNPESU inter collegiate tournament of men's handball. Results showed that the proportion of success percentage was significantly better for the winner and runner up teams as compared to non qualified team in pivot position success.

This performance indicator has been associated in previous studies (Murat Bilge 2012) the ratio of pivot position goals to all goals in Olympic Games and World Championships was higher than in European Championships.

However in the present study attack was not taken into consideration. The wing position success of qualified teams' was in highly effective than the non qualified teams. This result was supported by (Skoufas Dimitrios 2019) efficiency of the wing position throws (Wing Goals) and there were small differences without being statistically significant between the above years of the world championships.

Defensive performance was better in the qualified teams and this result was supported by (Duarte Sousa et al., 2016) the defensive retreat started after losing the ball by technical fault is associated with an active retreat and with the counter attack interruption without the ball recovery, the inhibiting a passive retreat.

Defensive success was better for the qualified teams this result was supported by the previous study of (Karol Gryko et al., 2018) The analysis of the two-year cycle of the World Championships has revealed changes in the characteristics of defensive play, which should have an impact on specific Training so that the highest level of sport performance can be achieved.

Pivot position performance was better in the qualified teams and this result was supported by (Gille.Php et al., 2012) this study are no percentages below 50% - Only 4 times the percentage is between 50% and 60%, 13 - 22 times the percentage is above 75% sometimes even 85% (!). Generally the pivot has the best percentage of all positions. These statistics show the concrete contribution in terms of pivot's goals.

CONCLUSIONS

From the results analysis of the study, the following conclusions were drawn.

- 1) The pivot position was significance better for the YMCA and MCPE College the winner and runner up position in the pool-A as compared with St.JOHNS, MPEC and PMT college.
- 2) The Wing position was significance better for the KACPE and SCOPE College the winner and runner up position in the pool-B as compared CCPE, TNPESU and Dr.SACPE College.
- 3) All other paired comparisons were not significant so pool-A three teams and pool-B three teams not enter the semifinals.

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