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Coordinative Abilities of Volleyball in Different Age Groups: A Comparative Study

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Abstract: The purpose of the study was to characterize elite Gujarat volleyball players to standard human performance measures by their selected coordinative abilities. The purpose of the study was to compare sub-junior, junior and senior players of volleyball by their selected coordinative abilities. The subjects were tested on selected coordinative abilities i.e. Reaction ability, Orientation ability, Differentiation ability, Balance ability and Rhythm ability. To characterize elite state volleyball players to their standard human performance measures by selected coordinative abilities, mean and standard deviation were used. To compare the selected coordinative abilities among sportsmen belonging to three levels (Sub-Juniors, Juniors and Senior), one way analysis of variance (ANOVA) and post hoc (Least significant difference) test was used and the level of significance was set at 0.05 levels. The analysis of variance showed that there was significant difference between sub-juniors, juniors and seniors in relation to Reaction ability, Orientation ability, Balance ability and Rhythmic ability as "F" Values were found to be significant (99.65, 9.60, 9.39 and 176.44) where these were required to be 3.92 at 0.05 level of confidence. In relation to differentiation ability there was not any significant difference between sub-juniors, juniors and seniors as "F" value was not found to be significant (0.021), where this was required to be 3.92 at 0.05 level of confidence. After applying the post-hoc (least significant difference) test it was observed that in relation to Reaction ability mean differences of sub-juniors and juniors; sub-juniors and seniors; juniors and seniors was found to be significant at 0.05 level of significance. In relation to orientation ability mean differences of sub-juniors and junior; sub-juniors and seniors; juniors and seniors was found to be significant at 0.05 level of significance. In relation to Balance ability mean differences of sub-juniors and juniors; sub-juniors and seniors; juniors and seniors was found to be significant at 0.05 level of significance. In relation to Rhythmic ability mean differences of sub-juniors and juniors; sub-juniors and seniors; was found to be significant at 0.05 level of significance. Mean difference of juniors and seniors was found to be insignificant.

Keywords: *Players, Volleyball and Coordinative Ability.*

Introduction:

The purpose of the study was to compare the coordinative abilities of volleyball players among different age groups.

Methodology:

For the purpose of this study 120 volleyball players of school level girls from states of who participated in inter variety competitions, like state and national Championship and inter-university level in table tennis. A total of 120 subjects were selected 40 from each level i.e. Sub-Junior, Junior and Senior:

- For Sub-Juniors, the age of the subjects was 14 years and below (last day of the year) and up to Index 220.
- For Juniors, the age of the subjects was 18 years and below (last day of the year) and up to Index 250.
- For seniors the age of the subjects was above 18 years. Index formula used in the study was:

Index point = age of years + Height in centimetres + weight in Kg.

Variables-

Keeping the feasibility criterion in mind, especially in the case of availability of instruments, the following coordinative abilities were selected:

(1) Orientation Ability

(2) Differentiation Ability

(3) Reaction Ability

(4) Balance Ability

(5) Rhythm Ability.

Administration of Tests-

The necessary data was collected by administering coordinative abilities tests as suggested by Peter Hirtz (1985).

Statistical Analysis-

To compare the coordinative abilities of volleyball among different age categories, analysis of Variance (ANOVA) was employed at 0.05 level of significance.

Findings and Conclusions:

To observe the difference between volleyball players of all age categories on their selected coordinative abilities, the analysis of variance was adopted and data pertaining to these has been presented in table 1 to 9. It observe the difference between three groups (Sub-Juniors,

Juniors and Seniors) of volleyball players on their Reaction Ability, the analysis of variance was adopted and data pertaining to them have been presented in Table - 1.

Table -1: Analysis of Variance of the Means of Reaction Ability among Players of Three Different Levels of Participation.

Source of Variation	Df	Sum of square	Mean square	F-value
Within Group	2	28196.35	14098.17	99.65*
Between Groups	117	16552.98	141.47	99.65*

* Significant at 0.05 level F 0.05 (2, 117) = 3.92

It is evident from table 1 that significant difference was found among the volleyball players of three different levels as the F-value of 99.65 is higher than the tabulated value of 3.92 with 2, 117 df at 0.05 level of significance. Since the one way analysis of variance was found significant in relation to Reaction Ability, the least significant difference (LSD) test was applied to find out which of the differences of the means amongst the different groups (Sub-Juniors, Juniors and Seniors) were statistically significant (Table-2).

Table – 2: Least Significant Difference Post-HOC Test for Means of the Sub-Juniors, Juniors and Seniors in Relation to Reaction Ability.

Groups (Means)			M.D.	C.D.
Sub-Juniors	**Juniors**	**Seniors**	**M.D.**	**C.D.**
186.1	164.4		21.7 *	5.26
186.1		155.42	30.68 *	5.26
	164.4	155.42	8.98 *	5.26

* Significant at 0.05 level

It's evident from table 2 that mean differences of Sub-Juniors and Juniors, Sub-Juniors and Seniors, Juniors and Seniors was found to be significant at 0.05 level of significance in relation to Reaction ability. To observe the difference between three groups (Sub-Junior, Junior and Seniors) of volleyball players on their Orientation ability the analysis of variance was adopted and data pertaining to them have been presented in Table-3.

Table -3: Analysis Of Variance of the Means of Orientation Ability among Players of Three Different Levels of Participations.

Source of Variation	df	Sum of Squares	Means squares	F-value
Within group	2	26.53	13.26	9.60*
Between Groups	117	162.60	1.38	9.60*

*Significant at 0.05 levels F 0.05 (2, 117) = 3.07

It is evident from table 3 that significant difference was found among the volleyball players of three different levels as the F-value of 9.60 is higher than the tabulated value of 3.07 with 2, 117 df at 0.05 level of significance.Since the one way analysis of variance was found significant in relation to Orientation ability, the least significant (LSD) test was applied to find out which of the difference of the means amongst the different groups (Sub-Junior, Juniors and Seniors) were statistically significant (Table-4).

Table -4: Least Significant Difference Post-Hoc Test for Means of the Sub Juniors, Juniors and Seniors In Relation To Orientation Ability.

Groups			M.D.	C.D.
Sub-Juniors	**Juniors**	**Seniors**	**M.D.**	**C.D.**
7.27	8.54		1.27 *	.52
7.27		10.12	2.85 *	.52
	8.54	10.12	1.58*	.52

* Significant at 0.05 level

It is evident from table 4 that mean differences of sub-juniors and juniors; sub-juniors and seniors; juniors and seniors was found to be significant at 0.05 level of significance in relation to Orientation ability of volleyball players on their Differentiation Ability, the analysis of variance was adopted and data pertaining to them have been presented in Table-5.

Table – 5: Analysis of Variance of the Means of Differentiation Ability among Players of Three Different Levels of Participation.

Source of Variation	df	Sum of Squares	Means squares	F-value
Within group	2	0.32	0.16	0.021
Between Groups	117	886.4	7.57	0.021

To observe the difference between three groups (Sub-Juniors, Juniors and Seniors) of volleyball players on their Differentiation Ability, the analysis of Insignificant at 0.05 level F 0.05 (2, 117) = 3.07.

It is evident from table 5 that insignificant difference was found among the volleyball players of three different levels as the F-value of 0.021 is lower than the tabulated value of 3.07 with 2, 117 df at 0.05 level of significance. To observe the difference between three groups (Sub-Juniors, Juniors and Seniors) of volleyball players on their Balance Ability, the analysis of variance was adopted and data pertaining to them have been presented in Table-6.

Table-6: Analysis Of Variance of the Means of Balance Ability among Players of Three Different Levels of Participations.

Source of Variation	df	Sum of Squares	Means squares	F-value
Within group	2	25.75	12.87	9.39*
Between Groups	117	160.75	1.37	9.39*

* Significant at 0.05 level F 0.05 (2, 117) = 3.07

It is evident from table 6 that significant difference was found among the volleyball players of three different levels as the F-value of 9.39 is higher than the tabulated value of 3.07 with 2, 117 df at 0.05 level of significance.

Since the one way analysis of variance was found significant in relation to Balance Ability, the least significant (LSD) test was applied to find out which of the differences of the means amongst the different groups (Sub-Juniors, Juniors and Seniors) were statistically significant (Table-7).

Least Significant Difference Post-Hoc Test For Means Of The Sub Juniors, Juniors And Seniors In Relation To Balance Ability. Groups			**M.D.**	**C.D.**
Sub-Juniors	Juniors	Seniors	M.D.	C.D.
10.075	8.635		1.44*	0.51
10.075		7.24	2.835*	0.51
	8.635	7.24	1.395*	0.51

* Significant at 0.05 level

It is evident from Table 7 that mean differences of Sub-Juniors and Juniors; Sub-Juniors and Seniors; Juniors and Seniors was found to be significant at 0.05 level of significance in relation to Balance ability.

To observe the difference between three groups (Sub-Junior, Junior and seniors) of volleyball players on their Rhythmic Ability the analysis of variance was adopted and data pertaining to them have been presented in Table-8.

Table -8: Analysis of Variance of the Means of Rhythmic Ability among Players of Three Different Levels of Participations.

Source of Variation	df	Sum of Squares	Means squares	F-value
Within group	2	31.77	15.88	176.44*
Between Groups	117	11.08	0.09	176.44*

*Significant at 0.05 level F 0.05 (2, 117) = 3.07

It is evident from table 8 that significant difference was found among the volleyball players of three different levels as the F-value of 176.44 is higher than the tabulated value of 3.07 with 2, 117 df at 0.05 level of significance. Since the one way analysis of variance was found significant in relation to Rhythmic Ability, the least significant (LSD) test was applied to find out which of the difference of the means amongst the different groups (Sub-Juniors, Juniors and Seniors) were statistically significant (Table -9).

Table -9: Analysis of Variance of the Means of Rhythmic Ability among Players of Three Different Levels of Participations.

Source of Variation	df	Sum of Squares	Means squares	F-value
Within group	2	31.77	15.88	176.44*
Between Groups	117	11.08	0.09	176.44*

*Significant at 0.05 level F 0.05 (2, 117) = 3.07

It is evident from table 8 that significant difference was found among the volleyball players of three different levels as the F-value of 176.44 is higher than the tabulated value of 3.07 with 2, 117 df at 0.05 level of significance. Since the one way analysis of variance was found significant in relation to Rhythmic Ability, the least significant (LSD) test was applied to find out which of the difference of the means amongst the different groups (Sub-Juniors, Juniors and Seniors) were statistically significant (Table -9).

Table – 10: Least Significant Difference Post-HOC Test for Means of the Sub Junior, Junior and Senior in Relation to Rhythmic Ability.

Groups	Groups	Groups	M.D.	C.D.
Sub-Juniors	Juniors	Seniors	M.D.	C.D.
1.64	1.05		0.59 *	0.13
1.64		1.005	0.635*	0.13
	1.05	1.005	0.045	0.13

It is evident from Table 9 that mean differences of Sub-Juniors and Juniors, Sub-Juniors and Seniors; was found to be significant at 0.05 level of significance in relation to Rhythmic ability. On the other hand significant difference was not found among Juniors and Seniors in relation to Rhythmic ability.

Discussions

Significant difference was found between the volleyball players of three different levels in relation to Reaction Ability at 0.05 level, Orientation ability, Balance Ability and Rhythmic Ability. On the other hand insignificant difference was found between the volleyball players of three different levels in the relation to Differentiation ability at 0.05 level. In all the four Coordinative i.e. Reaction ability, Orientation ability, Balance ability and Rhythmic ability, the sequence of performance in all the four coordinative abilities has Seniors> Juniors > Sub-Juniors.

This might be due the reason that senior volleyball players development Coordinative abilities by the long duration of participation and by the help of general and specific exercises, Additional means for improving motor since organs, variation of exercises, variation of movement execution, variation in external conditions, combination of movement, change in information uptake, practice against time and due to practice a under fatigue.

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