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A comparative study on selected Physical variables of University level Handball, Volleyball and Football players.

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Introduction

Sports now-a-days has changed with a lot of characteristics e.g. more scientific and mass oriented, well organized and mostly health directed, elevate mental and physical fitness of the participants, increase mental concentration, bring honor and social dignity to the successful participants **Sandeep (2012).**Sports are essentially that aspect of human activity, which strengthens the integration of the body and the mind. Sports activities provides stimulation to the Central Nervous System to such an extent that the under developed, dead or dying cell will either be rehabilitated or their function will be assumed by other or newly generated cells.

Today's sports persons face some unique challenges. The standards are higher, the competition is tougher the stakes are greater attention in these days. Coaches, physical educationists and sports scientists have always expressed a great need to know more about those physical and physiological variables, which are helpful in improving the physical fitness of the players. Today's world is a world of competition, the rivalry to reach top and excel each other is so much that every aspect that contributes for the excellence is carefully looked in it one of such aspects is the selection of the right person for the right event in sports and games, normally a choice of selection is given to that the player or the athletes. The players without knowing their inherent potential make wrong choices because of his wrong selection the individual concerned cannot reach the top of the ladder.

Fitness is important at all levels of the game, whilst being essential for top level players; it is beneficial for beginners who will improve both their effectiveness and enjoyment through good standards of fitness. Fitness enables a player to cope with the physical demands of the game as well as allowing the efficient use of his/ her various technical and tactical competencies throughout the match.

Physical fitness is the ability to carry out daily tasks vigour and alertness, without undue fatigue, and with ample energy to engage in a leisure time pursuits and to meet the

above average physical stresses encountered in emergency situations. Physical fitness is the capacity to carry out reasonably well various forms of physical activities without being unduly tired and includes qualities important to the individual's health and well-being.

Statement of the Problem: The present study is considered with various physical variables, so as to compare the physical characteristics of three games players namely Volleyball, Handball and Football. The following physical variables were taken into consideration: Speed, Explosive Power, Cardiovascular Endurance and Agility.

It is always great task for coaches to specify the characteristics of ball game players for learning of fundamentals of games. The purpose of present study is to conduct a comparative analysis on physical and physiological variables of university players of different disciplines.

Sports performance is the sum of numerous factors which can vary from individual to individual. A few centimetres and fraction of seconds decide between record performance, victory or defeat in tough international competitions.

Review of Literature

Reddy, Satyanarayana&Netha(2013)examined the relationship between skill performance and selected physical fitness variables of basketball players of JNTU, Hyderabad, India. A sample size of 40 basketball players was randomly selected from the players undergoing rigorous training camp for the South Zone Inter University tournament. The age of the subjects taken between 18 to 22 years. Dribbling ability, passing ability and defensive ability were taken as independent variables under the skill performance. For physical fitness variables, agility, explosive power, speed, cardio-respiratory endurance, and flexibility were taken into consideration. Defensive ability, passing ability, and dribbling ability was assessed by defense movement test, passing test, and control dribbling test. The tests selected for the physical fitness variables are Speed 50m run, for explosive power sergeant jump, for agility 6 x 10m shuttle run, for cardio respiratory endurance 12 min run/walk test and for flexibility bend & reach test. The statistical tool used was Pearson Product Moment correlation. The data indicated some interesting results. Defensive ability had positive correlation with speed and agility whereas explosive power, cardio-respiratory endurance, and flexibility had a negative correlation. The passing ability had a negative correlation with speed and agility and a positive correlation with explosive power, cardio respiratory endurance, and flexibility. The skill of dribbling had a positive correlation with speed and agility, a negative correlation with explosive power and was insignificantly correlated to cardio respiratory endurance and flexibility. The results showed that defensive ability performance can be improved by good speed and agility. A player can excel in passing if he has a better explosive power, cardio

respiratory endurance, and flexibility. The skill of dribbling can be taken care if a player has speed and agility.

Taware, Bhutkar&Surdi (2013) studied on profile of fitness parameters and performance of Volleyball players. The study was aimed to assess flexibility, muscular endurance, power and cardio-respiratory endurance of Volleyball players and to compare the results with age matched controls and also, to compare the findings of the Volleyball players with that of the international norms from the available literature and to make some suggestions for the improvement in their performance level. The study was carried out on 40 male Volleyball players aged between 17 to 26 years and 40 ages matched male controls. Physical fitness parameters namely flexibility, muscular endurance, power and cardio-respiratory endurance were measured; data was analyzed using unpaired t-test. It was observed that all physical fitness parameters were significantly more in players as compared to their aged-matched controls but when values of the subjects were compared to international standards; our subjects were behind the recommended norms for the elite Volleyball players. The Volleyball players have more advantage of flexibility, muscular endurance, power and cardio-respiratory endurance.

Thakur & Kumar (2013) compared selected physical fitness components among state level Footballers and volleyballers. Total sixty (N=60) male state level performers, i.e. thirty Footballers (n=30) and thirty Volleyballers (n=30) were selected at randomly from Murshidabad District. Age limit of the subjects was from 17 years to 19 years. Physical fitness test was employed for all the subjects of both the groups in twice and best performance was taken. This test consists of six items. These test items are 50 yard dash; 600 meters run and walk; shuttle run; medicine ball throw; standing board jump and sit ups etc. All the six tests were analysed by t-test and significant was set at 0.05 level of significance. Football group were superior to Volleyball group in 50 meters dash, 600meters run and walk and shuttle run. Volleyball group were superior to Football group in medicine ball throw and standing broad jump. No superiority was observed among Football group and Volleyball group in sit-up test.

Methodology

The purpose of the present study is to compare the selected physical variables among selected university level Football, Handball and Volleyball players of Andhra Pradesh. To achieve the purpose of the study, one hundred male players were selected at random from each category

of Football, Handball and Volleyball players, a total of 300 players in Andhra Pradesh state, India, who had their credit in participating inter-university tournaments during the academic years 2009-10 and 2010-11 in their respective games. The subjects were selected from universities in Andhra Pradesh namely Andhra University Vishakapatnam, Acharya Nagarjuna University Guntur, Sri Venkateswara University Tirupati, Sri Krishnadevaraya University Ananthapur and Osmania University Hyderabad only.

The researcher explained the purpose and the significance of the study to all the selected subjects before conducting the tests to ensure maximum cooperation from the subjects.In all sports, speed and agility are important qualities. Generally it requires developing performance in sports and games. Speed is a magic work in sports. The person who can run faster, throw harder and more quickly is likely to be a better athlete and win more contests. Power is an essential quality in many sports, for it represents the effective combination of agility and speed. Increase in agility or speed will increase power, and when power increases, more work can be done in less time with the help of cardiovascular endurance.

Physical Fitness Variables

Physical fitness variables have been defined as the present acquired and innate ability to perform motor skills of a general or fundamental nature exclusive of highly specialized sports techniques. Taking into consideration of the view, the following physical abilities were selected for this study.

1. Speed
2. Explosive Power
3. Cardiovascular Endurance
4. Agility

SELECTION OF TESTS

The present study was undertaken primarily to compare the selected physical fitness variables among selected university level Football, Handball, Volleyball players of Andhra Pradesh. As per the available literatures, the following standardized tests were used to collect relevant data on the selected dependent variables and they were presented in the Table-I.(a).

Table-I(a)
Tests Selection

Sl. No.	Criterion Variables	Test Items	Unit of Measurement
1.	Speed	50 Meters Run	Seconds

2.	Explosive power	Standing Broad Jump	Meters
3.	Cardiovascular Endurance	12 Min Cooper Test	Meters
4.	Agility	Semo Agility Test	Seconds

Analysis of Data

The continuous variables selected for this study were Speed, Explosive power, Cardiovascular Endurance and Agility. All the subjects were tested on the selected dependent variables. The obtained data from the three groups were statistically analyzed with One-way Analysis of Variance (ANOVA). Whenever the F-ratio for means was found to be significant, the Scheffe'S test was applied as post-hoc test to determine the paired mean differences. The level of confidence was fixed at 0.05 level for all the cases to find out the significance.

TABLE-III
ANALYSIS OF VARIANCE FOR THE DATA ON SPEED AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS (Seconds)

Test	Players of Different Disciplines			Source of Variance	Sum of Squares	df	Mean Squares	F Ratio
	Football	Handball	Volleyball					
Mean Scores	7.375	7.130	7.202	Between Groups	3.188	2	1.594	481.68 *
Standard Deviation	0.066	0.040	0.063	Within Groups	0.983	297	0.003	

**** Significant at 0.05 level of confidence***

The table value for significance at 0.05 level with df 2 and 297 is 3.03

TABLE-III (A)
SCHEFFE'S POST HOC TEST FOR SIGNIFICANT DIFFERENCE IN THE SPEED AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS

Players of Different Disciplines			Mean Difference and Sig. Level	Confidence Interval
Football	Handball	Volleyball		

7.375	7.130	-	0.245*	0.019
-	7.130	7.202	0.072*	
7.375	-	7.202	0.173*	

Significant at 0.05 level of confidence.

TABLE-IV

ANALYSIS OF VARIANCE FOR THE DATA ON EXPLOSIVE POWER AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS(Meters)

Test	Players of Different Disciplines			Source of Variance	Sum of Squares	df	Mean Square	F Ratio
	Football	Handball	Volleyball					
Mean Scores	1.954	2.093	2.000	Between Groups	1.014	2	0.507	341.34*
Standard Deviation	0.022	0.054	0.033	Within Groups	0.441	297	0.001	

**** Significant at 0.05 level of confidence,***

The table value for significance at 0.05 level with df 2 and 297 is 3.03

TABLE-IV(A)

SCHEFFE'S POST HOC TEST FOR SIGNIFICANT DIFFERENCE IN THE EXPLOSIVE POWER AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS

Players of Different Disciplines			Mean Difference and Sig. Level	Confidence Interval
Football	Handball	Volleyball		
1.954	2.093	-	0.139*	0.011
-	2.093	2.000	0.093*	
1.954	-	2.000	0.046*	

****Significant at 0.05 level of confidence***

TABLE-V

ANALYSIS OF VARIANCE FOR THE DATA ON CARDIOVASCULAR ENDURANCE AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS (Scores in Meters)

Test	Players of Different Disciplines			Source of Variance	Sum of Squares	df	Mean Squares	F Ratio
	Football	Handball	Volleyball					
Mean Scores	2717.000	2574.000	2449.000	Between Groups	3596600.00	2	1798300.000	125.60*
Standard Deviation	119.600	120.496	118.913	Within Groups	4253400.00	297	14321.212	

**** Significant at 0.05 level of confidence,***

The table value for significance at 0.05 level with df 2 and 297 is 3.03

TABLE–V (A)

SCHEFFE'S POST HOC TEST FOR SIGNIFICANT DIFFERENCE IN THE CARDIOVASCULAR ENDURANCE AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS

Players of Different Disciplines			Mean Difference and Sig. Level	Confidence Interval
Football	Handball	Volleyball		
2717.000	2574.000	-	143.000*	41.667
-	2574.000	2449.000	125.000*	
2717.000	-	2449.000	268.000*	

****Significant at 0.05 level of confidence.***

TABLE-VI

ANALYSIS OF VARIANCE FOR THE DATA ON AGILITY AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS (Scores in seconds)

Test	Players of Different Disciplines			Source of Variance	Sum of Squares	df	Mean Square	F Ratio
	Football	Handball	Volleyball					
Mean Scores	11.146	11.100	11.161	Between Groups	0.198	2	0.099	61.38*
Standard Deviation	0.057	0.024	0.032	Within Groups	0.478	297	0.002	

**** Significant at 0.05 level of confidence,***

The table value for significance at 0.05 level with df 2 and 297 is 3.03

TABLE-VI(A)

SCHEFFE'S POST HOC TEST FOR SIGNIFICANT DIFFERENCE IN THE AGILITY AMONG FOOTBALL, HANDBALL AND VOLLEYBALL PLAYERS

Players of Different Disciplines			Mean Difference and Sig. Level	Confidence Interval
Football	Handball	Volleyball		
11.146	11.100	-	0.046*	0.014
-	11.100	11.161	0.061*	
11.146	-	11.161	0.015*	

****Significant at 0.05 level of confidence.***

Results & Discussion

The results of the study showed that there was significant difference in the selected physical variables among university players of football, handball and volleyball games. The detailed discussion with each variable as follows:

SPEED

The results of the study produced significant difference among university players of football (M=7.375), handball (M=7.130) and volleyball (M=7.202) games on speed. A significant difference exists on speed between football & handball players (MD=0.245); handball & volleyball players (MD=0.072) and football & volleyball players (MD=0.173). The handball players have better speed than volleyball and football players.

The 50 meter run was used to determine the speed, the handball players completed the 50 meter run with the mean time of 7.130 seconds while the volleyball players completed their mean time of 7.202 seconds and football players completed their mean time of 7.375 seconds. This shows a significant difference in their speed test; the handball players are more speed than the volleyball and football players. Similar results supported by Vishaw Gaurav (2011) compared selected physical variables of school level football and handball players. Total sixty subjects were randomly selected (football players: N=30and handball players: N=30) from various Schools of Gurdaspur District of Punjab were taken as a sample. Their age ranged between 14-16 years, He found significant difference found in Speed between football and handball players and Aruna Rani (2012) studied 20 female players each for volleyball and Handball were selected who had played at college level from Punjabi University, Patiala She found handball players are superior to Volleyball players on Speed Variable.

EXPLOSIVE POWER

The results of the study produced significant difference among university players of football (M=1.954), handball (M=2.093) and volleyball (M=2.000) games on explosive power. A significant difference exists on explosive power between football & handball players (MD=0.139); handball & volleyball players (MD=0.093) and football & volleyball players (MD=0.046). The handball players have more jumping ability than volleyball and football players.

In terms of explosive power among the different game players using standing broad jump test, handball players jumped with the mean time of 2.093 meters, while the volleyball players completed their jumping in the mean time of 2.000 meters and football players completed their jumping in the mean time of 1.954 meters, this shows a significant difference in their explosive power, handball players are greater explosive power than the volleyball and football players.

CARDIOVASCULAR ENDURANCE

The results of the study produced significant difference among university players of football (M=2717.000), handball (M=2574.000) and volleyball (M=2449.000) games on cardiovascular endurance. A significant difference exists on cardiovascular endurance between football & handball players (MD=143.000); handball & volleyball players

(MD=125.000) and football & volleyball players (MD=268.000). The football players have better endurance than handball and volleyball players.

On the cardiovascular endurance of the three game players using a 12 minute run or walk, the football players covered a mean distance of 2717m and the handball players covered a mean distance of 2574.000m and volleyball players covered a mean distance of 2449.000 m. This shows a significant difference in their cardiovascular endurance; the football players have greater cardiovascular endurance than the handball and volleyball players.

AGILITY

The results of the study produced significant difference among university players of football (M=11.146), handball (M=11.100) and volleyball (M=11.161) games on agility. A significant difference exists on agility between football & handball players (MD=0.046); handball & volleyball players (MD=0.061) and football & volleyball players (MD=0.015). The handball players have more agile than football and volleyball players.

The semo agility test was used to measure the agility, the handball players completed the semo agility run with the mean time of 11.100 seconds, while the football players completed their semo agility run in the mean time of 11.146 seconds and volleyball players completed their semo agility run in the mean time of 11.161 seconds. This shows a significant difference in their agility test, handball players are more agile than the football and volleyball players,

The statistical analysis indicates four differentiate establishments, that is, speed, agility, explosive power and cardiovascular endurance can exactly characterize and discriminate the three selected games. The present results shows that handball players seem to be good at agility speed and explosive power, football players appear to be cardiovascular endurance. The results illustrate that a certain level of the three fitness constitutions characterizing the three game sports are the fundamentals to a selected ability in the related sport.

Results and Discussions

Within the limitations of the present study the following conclusion are drawn:

1. There was significant difference in the Speed component of Physical variable among university players of different disciplines (football, handball and volleyball)

('F'=481.68; P<0.05). Further significant paired mean differences exists on speed between football & handball players (MD=0.245); handball & volleyball players (MD=0.072) and football & volleyball players (0.173). The handball players have better speed than volleyball and football players.

2. There was a significant difference in the Explosive Power component of Physical variable among university players of different disciplines (football, handball and volleyball ('F'=341.34; P<0.05). Further significant paired mean difference exists on Explosive Power between football & handball players (MD=0.139); handball & volleyball players (MD=0.093) and football & volleyball players (MD=0.046). The football players have more jumping ability than volleyball and football players.
3. There was significant difference in the Cardiovascular Endurance component of Physical variable among university players of different disciplines (football, handball and volleyball) ('F'=125.60; P<0.05). Further significant paired mean difference exists on Cardiovascular Endurance between football & handball players (MD=143.000); handball & volleyball players (MD=125.000) and football & volleyball players (MD-268.000). The football players have better endurance than handball and volleyball players.
4. There was significant difference in the Agility component of Physical variable among university players of different disciplines (football, handball and volleyball) ('F'=61.38; P<0.05). Further significant paired mean differences exists on Agility between football & handball players (MD=0.245); handball & volleyball players (MD=0.072) and football & volleyball players (MD=0.173). The Handball players have more agility than football and volleyball players.

RECOMMENDATIONS

The following recommendations for future research are based on the results of this investigation and the related literature.

1. The study recommends the use of these findings to coaches, physical education teachers and sports specialists for training and assisting in preparing players for competitions
2. Certified coaches should be made available to handle the teams so that proper or well organized programme will be planned and followed. This will promote better

physical fitness level cum optimal level of performance. Also constant purposeful training and practice with dedication will be enhanced.

3. University sports programme should be well harnessed with the academic programme so that interests and zeal for excellence performance will be sought for by the school/college athletes in the selected games.
4. Speed, Agility, Explosive Power and Cardiovascular Endurance should be taken into consideration as seen in the comparative sports. Thus team selectors should be conscious of the kinds of players they select for good output.
5. It is recommended that the findings of the study may be used as a screening tool for selecting the players for various team sports.

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