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Relationship of Gross Motor Proficiency with Volleyball Skill

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Abstract – The purpose of this study is to examine the relationship of gross motor proficiency with volleyball skill underarm pass. For the purpose of present study sixty (N=60) male district level volleyball players between the age group of 17-28 years (Mean ± SD: age 21.33±1.43 years, body mass 62.50 ± 3.55 kg, height 1.67 ± 0.036 m) were selected as subjects. Gross motor proficiency variables (muscular strength, muscular power, muscular endurance, cardio-respiratory endurance, running speed, running agility, jumping ability and throwing ability, flexibility, Balance and Kinesthetic Perception) were selected to find out its relationship with volleyball skills.The results were subjected to Pearson's product Moment Correlation Coefficient (r) method. In all the analyses, the 5% critical level (p≤0.05) was considered to indicate statistical significance. The finding of the study showed with regards to serve skill was significantly related to gross motor proficiency variables i.e., muscular power and balance, whereas fore-arm pass skill and set-up skill was significantly related to muscular endurance and running agility was significantly related to gross motor proficiency.

Keywords: Volleyball, Skills, Gross Motor Proficiency.

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INTRODUCTION:-

Volleyball is the most popular sport in the world. People of all ages and skill levels play volleyball in over 200 countries around the world. William G. Morgan at the YMCA in Springfield, Massachusetts, invented volleyball in 1895. The goal was to create a game that would be less stressful on the bodies of young athletes, yet enjoyable and competitive enough to keep young people fit (Shamus & Shamus, 2001). While most of us envision volleyball as a fun game played occasionally at beach parties or the park, it is a sport with varsity school teams and travelling professional teams. Volleyball is a sport with a simple object: the ability to deliver a ball over a net against the efforts of an opposing team. The manner in which this object is achieved is defined by rather rigorous rules as to how the ball may be struck and handled by a player. A premium is placed on the offensive team's ball-handling efficiency by the limitations on touching the ball, particularly the maximum of three hits (including unintentional contacts) for returning the ball over the net.

The set and spike mechanism is the most effective offensive series that can be executed in volleyball. The set and spike are a progression from the simple return of that ball safely to the opposing side of the net. The set and spike are designed as an aggressive sequence of maneuvers, with the goal of striking the ball with sufficient force into the opposing court that it cannot be returned. In volleyball, technical and tactical skills, anthropometric characteristics and individual physical performance capacities are most important factors that contribute to the success of a team in competitions (Hakkinen, 1993). Physiologically, a volleyball game is an intermittent exercise that requires the players to perform frequently short bouts of high-intensity activities such as jump and spike, followed by periods of low-intensity activities (Kuenstlinger et al., 1987, Viitasalo et al., 1987). Therefore the players should possess both high aerobic and anaerobic power. The instant and explosive spiking and blocking over the net are intense enough to trigger anaerobic metabolism which means lactic acid may accumulate in the blood. Moreover, since the match time is not restricted, a match sometimes may last for more than two hours. Therefore, it also requires a high level of aerobic fitness (Chen, 2005, & Tian, 2006).

Volleyball players require well-developed muscular strength, power and endurance, speed, agility, and flexibility, and have a high level of jumping ability, fast reaction time and swift movements (She, 1999). Considerable demand is also placed on the neuromuscular system during sprints, jumps (blocking and spiking), and high-intensity court

movements that occur repeatedly during competition (Hakkinen, 1993). So considering these factors volleyball game is based on some quick motor movements. So this study is carried out to analyses whether these abilities have some relationship with volleyball skills or not.

MATERIAL AND METHODS

SUBJECTS

For the purpose of present study, One hundred Twenty (N=120) male volleyball players between the age group of 17-28 years (Mean ± SD: age 21.33±1.43 years, body mass 62.50 ± 3.55 kg, height 1.67 ± 0.036 m) were selected as subjects. The subjects were purposively assigned: Group-A: District Volleyball Players (N_1=60).

METHODOLOGY

Handgrip strength test was used to measure the maximum isometric strength of the hand and forearm muscles. The reading of dynamometer was recorded. Vertical Jump Test was usedto measure power the power of legs. The athlete's stands away from the wall and jump vertically high and touch the wall Difference in distance between the standing reach height and the jump height is measured. Pull-Up**/**Chin up Test was usedto measures upper body muscle strength and endurance. The pull-ups should be done in a smooth motion without Jerky motion, swinging the body, and kicking or bending the legs. The total number of correctly completed pull-ups is recorded. 800 meter Run Testto measure the cardiorespiratory fitness. The total time taken to run 800m is recorded. 20 meter dash test measure acceleration and running speed, and also a reliable indicator of speed, agility and quickness. Illinois Agility Test was used to measure the running agility of the subjects. Standing long jump testto measure the explosive power of the legs. Overhead medicine ball throw test used to measures upper body strength and explosive power. Sit and reach flexibility test was used to measure the flexibility of the back and leg hamstring muscle. Stork Balance stand test was used to assess the ability to balance on the ball of the foot. Horizontal space test was used to measure the kinesthetic perception of the subject.

STATISTICAL ANALYSIS

The Statistical Package for the Social Sciences (SPSS) version 14.0 was used for all analyses. The results were subjected to Pearson's product Moment Correlation Coefficient (r) method. In all the analyses, the 5% critical level (p≤0.05) was considered to indicate statistical significance

RESULTS

Table 1: Relationship of gross motor proficiency with the performance of district volleyball player in serve

Sr. No.	Variables	Coefficient of Correlation (r)
1.	Muscular Strength	-0.05112
2.	Muscular Power	**0.2566***
3.	Muscular Endurance	-0.1062
4.	Cardio-Respiratory Endurance	0.08920
5.	Running Speed	0.04016
6.	Running Agility	-0.1665
7.	Jumping Ability	-0.06091
8.	Throwing Ability	-0.08055
9.	Flexibility	0.1678
10.	Balance	**-0.2563***
11.	Kinesthetic Perception	0.1592

Significant at .05 level of significance
r.05 (118) = 0.195

An examination of table 1 indicates that serve skill was significantly related to gross motor proficiency variables i.e., muscular power (r=0.2566*) and balance (r=-0.2563*) as obtained value of correlation coefficient of these variables were greater than the tabulated value 0.195 required for the correlation to be statistically significant at 0.05 level of confidence. The table further reveals that correlation coefficients obtained between gross motor proficiency variables i.e., muscular strength (r=-0.05112), muscular endurance (r=-0.1062), cardio-respiratory endurance (r=0.08920), running speed (r=0.04016), running agility (r=-0.1665), jumping ability (r=-0.06091), throwing ability (r=0.08055), flexibility (r=0.1678) and kinesthetic perception (r=0.1592) were not statistically significant related as the obtained value in these variables were less than the tabulated value 0.195 for the correlation to be insignificant at 0.05 level of confidence.

Table 2: Relationship of gross motor proficiency with the performance of district volleyball player in fore-arm pass

Sr. No.	Variables	Coefficient of Correlation (r)
1.	Muscular Strength	-0.1623
2.	Muscular Power	0.07605
3.	Muscular Endurance	**0.2491***
4.	Cardio-Respiratory Endurance	0.1234
5.	Running Speed	-0.007090
6.	Running Agility	-0.02698
7.	Jumping Ability	-0.3431
8.	Throwing Ability	0.1450
9.	Flexibility	-0.1058
10.	Balance	**0.2461***
11.	Kinesthetic Perception	-0.1273

Significant at .05 level of significance
r.05 (118) = 0.195

An examination of table 2 indicates that fore-arm pass skill was significantly related to gross motor proficiency variables i.e., muscular endurance (r=0.2491*) and balance (r=-0.2461*) as obtained value of correlation coefficient of these variables were greater than the tabulated value 0.195 required for the correlation to be statistically significant at 0.05 level of confidence. The table further reveals that correlation coefficients obtained between gross motor proficiency variables i.e., muscular strength (r=-0.1623), muscular power (r=0.07605), cardio-respiratory endurance (r=0.1234), running speed (r=-0.007090), running agility (r=-0.02698), jumping ability (r=-0.3431), throwing ability (r=0.1450), flexibility (r=-0.1058) and kinesthetic perception (r=-0.1273) were not statistically significant related as the obtained value in these variables were less than the tabulated value 0.195 for the correlation to be insignificant at 0.05 level of confidence.

Table 3: Relationship of gross motor proficiency with the performance of district volleyball player in set-up

Sr. No.	Variables	Coefficient of Correlation (r)
1.	Muscular Strength	-0.1371
2.	Muscular Power	-0.005072
3.	Muscular Endurance	-0.09524
4.	Cardio-Respiratory Endurance	-0.1292
5.	Running Speed	-0.1181
6.	Running Agility	**0.2043***
7.	Jumping Ability	-0.07318
8.	Throwing Ability	-0.03468
9.	Flexibility	-0.04345
10.	Balance	-0.1667
11.	Kinesthetic Perception	-0.03120

Significant at .05 level of significance
r.05 (118) = 0.195

An examination of table 3 indicates that set-up skill was significantly related to gross motor proficiency variables i.e., running agility (r=0.2043*) as obtained value of correlation coefficient of these variables were greater than the tabulated value 0.195 required for the correlation to be statistically significant at 0.05 level of confidence. The table further reveals that correlation coefficients obtained between gross motor proficiency variables i.e., muscular strength (r=-0.1371), muscular power (r=-0.005072), muscular endurance (r=-0.09524), cardio-respiratory endurance (r=-0.1292), running speed (r=-0.1181), jumping ability (r=-0.07318), throwing ability (r=-0.03468), flexibility (r=-0.04345) balance (r=-0.1667), and kinesthetic perception (r=-0.03120) were not statistically significant related as the obtained value in these variables were less than the tabulated value 0.195 for the correlation to be insignificant at 0.05 level of confidence.

DISCUSSION

The analysis of data in regards to relationship of gross motor proficiency, coordinative abilities and motor educability with selected volleyball skills of district level volleyball players. It is evident from the findings of table-1 with regards to gross motor proficiency with the performance of district volleyball player in serve skill was significantly related to gross motor proficiency variables i.e., muscular power and balance whereas correlation coefficients obtained between gross motor proficiency variables i.e., muscular strength, muscular endurance, cardio-respiratory endurance, running speed, running agility, jumping ability, throwing ability, flexibility and kinesthetic perception were not statistically significant. A glance at table 2 showed with regards to fore-arm pass skill was significantly related to gross motor proficiency variables i.e., muscular endurance and balance whereas correlation coefficients obtained between gross motor proficiency variables i.e., muscular strength,muscular power, cardio-respiratory endurance, running speed, running agility, jumping ability, throwing ability, flexibility and kinesthetic perception were not statistically significant.

It is evident from table-3 indicates that set-up skill was significantly related to gross motor proficiency variables i.e., running agility whereas correlation coefficients obtained between gross motor proficiency variables i.e., muscular strength, muscular power, muscular endurance, cardio-respiratory endurance, running speed, jumping ability, throwing ability, flexibility, balance and kinesthetic perception were not statistically significant. It is observed from the findings of table-4 with regard to serve skill was significantly related to coordinative abilities variables i.e., orientation ability whereas correlation coefficients obtained between coordinative abilities variables i.e., differentiation ability, reaction ability, balance ability and rhythm ability were not statistically significant. These findings substantiate the assertion of Singh (2005) hat the strongest associations between selected muscular strength, flexibility and body composition of state and national level football, volleyball and handball players of Manipur. Significant difference obtained on muscular strength (abdominal strength) among state level football, volleyball and handball players and no significant difference were obtained in the shoulder strength, back strength, explosive leg strength, and flexibility. No significant different obtain among national level football, volleyball and handball players. No significance differences obtained among state and national level football players. Significant different obtained on back strength among state and national level volleyball player. Whereas no significant different were obtain in abdominal strength, shoulder strength, explosive leg strength, flexibility and total body fat. Significant difference obtained on back strength, flexibility,

among state and national level handball players whereas no significant differences obtained in abdominal strength, shoulder strength, explosive leg strength and flexibility.

CONCLUSION

In conclusion we can say that in volleyball game the players have to bend their knees again and again to lift the ball with forearm. They need static bending posture to perform this movement. So muscular endurance is closely related with forearm pass. This is the reason that emphasis on muscular endurance work of legs, balance and running agility should be given for those who are learning the technique of forearm pass.

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