Role of Technical Diversification Ability and Somatotypes in Accuracy and Precision of Skills of Female Volleyball Players of Jammu & Kashmir

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1.0 Introduction

The ideal of a good and perfect life is to have a sound mind in a sound body. For this one must engage in games like volleyball. Volleyball is a very dynamic sport characterized by various sprints, jumps (blocking and spiking) and high-intensity court movements that occur repeatedly during competition. Successful performance of these movement structures depends greatly on anthropometric and physical performance variables. Moreover, to achieve best performance in the volleyball game, one needs to possess a specific type of body structure. Body size refers to the person's height and weight. The ideal size for a sportsperson depends on the sport or event and sometimes the position they play in their sport. Specifically, body composition refers to the athlete's body fat. In most sports, the athlete will try to keep his/her levels of body fat to a minimum. In general the higher the percentage of body fat the poorer the performance. One of the most widely used metric or measurement system used to assign body structure of a person is somatotyping.

1.1 Somatotypes, Somatotyping and Sports

Somatotype is the word used by the famous psychologist William Sheldon to describe a body-type using his method of classifying the human physique. Success as a sports person comes from a combination of their ability and body build. The three components of body build are type, size and composition. A system, developed by W.H. Sheldon (1940), uses the terms ectomorph, endomorph, or mesomorph to describe the body build of an individual.

- *Ectomorph***:** A predominantly ectomorphic individual is long, slender and thin, and therefore power and strength sports are perhaps not suitable as their slight build leaves them susceptible to injuries. Ectomorphs dominate endurance sports and gymnastics.
- *Endomorph*: An endomorphic individual typically has short arms and legs and a large amount of mass on their frame. Their mass hampers their ability to compete in sports requiring high levels of agility or speed and perform sustained weight bearing aerobic activities such as running. Sports of pure strength, like power lifting, are perfect for an endomorph. They can gain weight easily and lose condition quickly if training stops.
- *Mesomorph*: A mesomorphic individual excels in strength, agility, and speed. Their medium structure and height, along with their tendency to gain muscle and strength easily makes them a strong candidate for a top athlete in any sport. They can sustain low body fat levels and find it easy to lose and gain weight.

1.2 Sports scenario in the state of J&K

The Sports scenario in the state of J&K is lagging far behind to even that of Nation's standard. Today, when enormous talent from all the states is competing at international platforms and bringing laurels to the state, there's barely a name from Jammu or Kashmir in spite of having enormous talent. This is perhaps contributed to the lack of proper infrastructure and coaching facilities that the athletes require to develop and compete at important platforms. The ailing

services and facilities that are available from J&K Sports council are not enough for the proper development of different sports in the state. Hence, it is necessary that the government should take a serious note of this and help develop the proper facilities to be provided in order to develop a classic sports culture in the state.

It has also been suggested that somatotyping is superior to linear anthropometric measures in differentiating between different competitive sport populations, as it combines adiposity, musculoskeletal robustness, and linearity into one rating. In the same way Technical Diversification Abilities also play an important role in improving sports performance of the players. Athletes' kinanthropometric profiles are widely addressed in the scientific literature. Such profiles are particularly important in volleyball because absolute size contributes a significant percentage of total variance associated with athletic success.

2.0 Research Methodology

2.1 Sample Selection

In this study, total 200 college going female volleyball players from 4 districts of Jammu region i.e. Kathua, Jammu, Samba and Udhampur were selected.

2.2 Criterion measures (variables):

Somatotyping rating was done by using Health-Carter somatotype rating form. In order to obtain three somatotype components, the following measurements were recorded. For this purpose, data pertaining Height, Weight, Skinfolds (Triceps, Sub scapular, Surprailiac and Calf), Bone Width (Humerus and Femur), Girths (Upper Arm and Calf) were measured. Determination of accuracy and precision of skills of volleyball players was studied in relation to Serving, Setting and Passing (Bump) skills. Moreover, the attitude of volleyball players towards technical diversification ability was also studied. All the data was collected for each variable as per the standard procedure.

2.3 Statistical Analysis of Data and Significance Level

Analysis of data was done with the help of different statistical tests. The descriptive statistics, such as mean, standard deviation, mode, frequency, percentage, minimum and maximum, etc. were determined from the data. The comparative assessment was done using one way ANOVA procedure. The relationships between various parameters have been studied using Pearson's product moment correlation coefficient test. The significance level was chosen to be 0.05 (or equivalently, 5%). The data generated during the study was processed using various statistical tests with the aid of SPSS 18.0 software.

3.0 Results of the Study

3.1 Somatotypes

Table 1: Somatotypes of the female Volleyball players

Somatotype	Kathua		Jammu		Samba		Udhampur	
	No	**Per**	**No**	**Per**	**No**	**Per**	**No**	**Per**
Endomorphs	6	12	12	24	9	18	10	20
Mesomorphs	18	36	20	40	31	62	28	56
Ectomorphs	26	52	18	36	10	20	12	24
Total	**50**	**100**	**50**	**100**	**50**	**100**	**50**	**100**

$\chi^2_{calculated} = 16.235$; df: 6 $\chi^2_{critical} = 12.59$; $p < 0.05$

Above **Table 1** presents results pertaining to the somatotypes of the female volleyball players of Jammu and Kashmir. The results indicated that the endomorph of the players of Kathua region is 12% whereas endomorph of the players of Jammu region is 24%. In addition to it Endomorph of the female volleyball players of Samba and Udhampur region are 18% and 20% respectively. Mesomorph of the female volleyball players of Kathua region is 36% whereas emesomorph of the players of Jammu region is 40%. In addition to it mesomorph of the female volleyball players of Samba and Udhampur region are 62% and 56% respectively. Ectomorph of the female volleyball players of Kathua region is 52% whereas ectomorph of the players of Jammu region is 36%. In addition to it ectomorph of the female volleyball players of Samba and Udhampur region are 20% and 24% respectively.

3.2 Technical Diversification Ability (TD Ability)

Table 2: Technical Diversification ability of the female Volleyball players

	Kathua		Jammu		Samba		Udhampur	
	No	**Per**	**No**	**Per**	**No**	**Per**	**No**	**Per**
High	18	36	29	58	16	32	14	28
Moderate	23	46	14	28	25	50	20	40
Poor	9	18	7	14	9	18	16	32
Total	**50**	**100**	**50**	**100**	**50**	**100**	**50**	**100**

Chi-Square value: 14.927; **df**: 6; **critical value**: 12.59;**P**=<0.05

Table 2 presents results regarding the technical diversification ability of the female volleyball players of Jammu and Kashmir. The results indicated that 36% volleyball players of Kathua region have high level technical diversification ability whereas 46% have moderate and 18% players have poor technical diversification ability. In addition to it 58% volleyball players of Jammu region have high level of technical diversification ability whereas 28% have moderate and 14% players have poor technical diversification ability. Furthermore 52% volleyball players of Samba region have high level of technical diversification ability whereas 50% have moderate and 18% players have poor technical diversification ability. Moreover 28% volleyball players of Udhampur region have high level of technical diversification ability whereas 40% have moderate and 32% players have poor technical diversification ability.

3.3 Relationship between Skill, Somatotypes and Technical Diversification Ability of Volleyball Players

Table 3: Relationship between Accuracy and Precision of Skills with Somatotypes and Technical Diversification Ability of Volleyball Players

Independent parameters	Correlation Coefficient (r^2)					
	Serving		**Setting**		**Passing (Bump)**	
	Accuracy	**Precision**	**Accuracy**	**Precision**	**Accuracy**	**Precision**
Somatotypes	0.679**	0.604*	0.664**	0.543*	0.607*	0.667*
TD Ability	0.897**	0.946**	0.843**	0.904**	0.846**	0.897**

* : Significant at p<0.05; **: Significant at p<0.01

Above **Table 3** presents results of the relationships between Accuracy and Precision of Skill (Serving, Setting and Passing skills) with Somatotypes and Technical Diversification Ability of Volleyball Players.

- **Somatotypes:** The study results show that there is positive relationship between somatotypes and accuracy (r^2=0.679, p<0.01) and precision (r^2=0.604, p<0.05) of the volleyball players with respect to their serving skills. Moreover, results indicate that there is positive relationship between somatotypes and accuracy (r^2=0.664, p<0.01) and precision (r^2=0.543, p<0.05) of the volleyball players with respect to their setting skills. Also, there is positive relationship between somatotypes and accuracy (r^2=0.607, p<0.05) and precision (r^2=0.667, p<0.05) of the volleyball players with respect to their passing bump skills.
- **Technical Diversification Ability:** The study results show that there is positive relationship between technical diversification ability and accuracy (r^2=0.897, p<0.01) and precision (r^2=0.946, p<0.01) of the volleyball players with respect to their serving skills. The data also shows that there is positive relationship between technical diversification ability and accuracy (r^2=0.843, p<0.01) and precision (r^2=0.904, p<0.01) of the volleyball players with respect to their setting skills. In addition to above, the study results show that there is positive relationship between technical diversification ability and accuracy (r^2=0.846, p<0.01) and precision (r^2=0.897, p<0.01) of the volleyball players with respect to their passing skills.

4.0 Conclusions

On the basis of study results, the specific conclusions have been delineated and are presented hereunder

4.1 Somatotypes

From the study results it is concluded that there is significant (p <0.05) difference in the somatotypes of female Volleyball players from various regions of Jammu & Kashmir.

4.2 Technical Diversification Ability

From the study results revealed that majority of the female volleyball players of Jammu region have high level of technical diversification ability.

4.3 Relationship between Skills, Somatotypes and Technical Diversification Ability of Volleyball Players

- **Somatotypes:** The study results show that there is significant positive relationship between somatotypes and accuracy and precision of the volleyball players with respect to their serving, setting and passing skills.
- **Technical Diversification Ability:** The study results show that there is significant positive relationship between technical diversification ability and accuracy and precision of the volleyball players with respect to their serving, setting and passing skills.

5.0 Bibliography

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