G Selvakumar
Ph. D, Scholar, Department of
Physical Education, Annamalai
University, New Delhi, India

Dr. S Vijay
Assistant Professor, Department
of Physical Education,
Annamalai University, New
Delhi, India

Analysis on bio motor variables among women Netball players

G Selvakumar and Dr. S Vijay

Abstract
The purpose of the present study was to analyze on bio-motor among women netball players. The data were collected from one hundred and fifty women netball players. Under 16 age, under 19 age and above 19 age women netball players were selected. Each categories fifty players were selected. The bio-motor variables are reaction and accuracy were measured by ruler test and ball throw test respectively. The data on selected criterion variables were statistically analyzed by analysis to variance (ANOVA) was use to find out the significant difference among netball players on selected criterion variables on different age category. The Turkey post hoc test will apply to know the paired mean difference between groups, if they obtained 'f' value found significant on criterion variable. The results reveals that there is statistically significant difference at test period among the under 16 age, under 19 age and above 19 age groups of women netball players on reaction and accuracy.

Keywords: Bio-motor, Reaction, Accuracy and Netball

Introduction
Fitness has been defined as how well a person is adapted to and capable of living a certain lifestyle. The athlete obviously has greater fitness than the non-athlete because of his training for a chosen event or events. The law of specificity states that there is a specific response to the specific nature of a training load. This specific response will tend to emphasise one or more of the abilities that make up fitness. These abilities are basic and respond well to training. Since these abilities affect how the body moves they are given the name "biomotor abilities".

Each exercise in training will tend to develop particular biomotor ability. For example, when the load of an exercise is maximal it is a strength exercise. Quickness and frequency of movement would give a speed exercise. If distance or duration is maximal the exercise becomes endurance based. Exercises that have relatively complex movements are called coordination exercises. This is a simplified view and in practice exercises usually develop two or more biomotor abilities. Different events have different demands on fitness. The fitness of the marathon runner is obviously very different to the fitness of the shot putter. The table illustrates the relative needs for strength, endurance, speed, flexibility and coordination in these events. The individuals are prepared to develop the skills through competition is not only to develop proficiency but also to develop the spirit of sportsmanship with which they play and perform their best in the competition (Agyajit, 1992) [1].

Methodology
The purpose of the present study was to analyze on bio-motor among women netball players. The data were collected from one hundred and fifty women netball players. Under 16 age, under 19 age and above 19 age women netball players were selected. Each categories fifty players were selected. The bio-motor variables are reaction and accuracy were measured by ruler test and ball throw test respectively. The data on selected criterion variables were statistically analyzed by analysis to variance (ANOVA) was use to find out the significant difference among netball players on selected criterion variables on different age category. The Turkey post hoc test will apply to know the paired mean difference between groups, if they obtained 'f' value found significant on criterion variable.

Correspondence
G Selvakumar
Ph. D, Scholar, Department of
Physical Education, Annamalai
University, New Delhi, India

Results

Table 1: Analysis of variance on reaction of different age groups netball players

	Under 16 Age	Under 19 Age	Above 19 Age	S O V	Sum of Squares	df	Mean squares	'F' ratio
Mean	0.22	0.20	0.18	B	0.038	2	0.019	117.89*
SD	0.01	0.01	0.01	W	0.24	147	0.001	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 2 and 147 is 3.06)
*Significant at.05 level of confidence

Table-1 shows that the test mean and standard deviation on reaction of different age group of women netball players are 0.22 ± 0.01, 0.20 ± 0.01 and 0.18 ± 0.01 respectively. The obtained 'F' ratio value of 108.64 for test means on reaction of different age groups (under 16 age, under 19 age and above 19 age) were higher than the required table value of 3.06 for the degrees of freedom 2 and 147 at 0.05 level of confidence. It reveals that there is statistically significant difference at test period among the under 16 age, under 19 age and above 19 age groups of women netball players on reaction.

Table 2: Turkey Post Hoc Test on Reaction of Different Age Groups of Netball Players

(I) group	(J) group	Mean Difference (I-J)	Sig.
1.00 (Under16)	2.00	.02380*	.000
	3.00	.03880*	.000
2.00(Under19)	1.00	-.02380*	.000
	3.00	.01500*	.000
3.00(Above19)	1.00	-.03880*	.000
	2.00	-.01500*	.000

*. The mean difference is significant at the 0.05 level.

Table-2 shows the Turkey Post Hoc test results that there are significant differences between the means values of under 16 age and under 19 age groups women netball players; under 16 age and above 19 age groups women netball players; under 19 age and above 19 age groups women netball players on reaction. The result found that above 19 age group of netball players had higher reaction than under 16 age and under 19 age groups players.
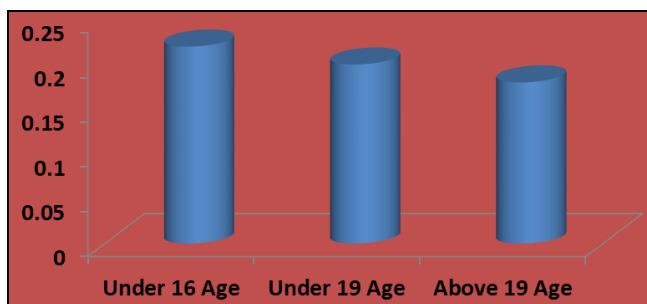

Fig 1: Cylinder diagram showing the mean value on reaction of different age groups netball players

Table 3: Analysis of variance on accuracy of different age groups netball players

	Under 16 Age	Under 19 Age	Above 19 Age	S O V	Sum of Squares	df	Mean squares	'F' ratio
Mean	18.40	20.78	24.28	B	874.81	2	437.40	269.41*
SD	1.43	1.28	1.06	W	238.66	147	1.62	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 2 and 147 is 3.06)
*Significant at.05 level of confidence

Table-3 shows that the test mean and standard deviation on accuracy of different age group of women netball players are 18.40 ± 1.43, 20.78 ± 1.28 and 24.28 ± 1.06 respectively. The obtained 'F' ratio value of 269.41 for test means on accuracy of different age groups (under 16 age, under 19 age and above 19 age) were higher than the required table value of 3.06 for the degrees of freedom 2 and 147 at 0.05 level of confidence. It reveals that there is statistically significant difference at test period among the under 16 age, under 19 age and above 19 age groups of women netball players on accuracy.

Table 4: Turkey Post Hoc Test on Accuracy of Different Age Groups of Netball Players

(I) group	(J) group	Mean Difference (I-J)	Sig.
1.00 (Under16)	2.00	-2.38000*	.000
	3.00	-5.88000*	.000
2.00(Under19)	1.00	2.38000*	.000
	3.00	-3.50000*	.000
3.00(Above19)	1.00	5.88000*	.000
	2.00	3.50000*	.000

*. The mean difference is significant at the 0.05 level.

Table-4 shows the Turkey Post Hoc test results that there are significant differences between the means values of under 16 age and under 19 age groups women netball players; under 16 age and above 19 age groups women netball players; under 19 age and above 19 age groups women netball players on accuracy. The result found that above 19 age group of netball players had higher accuracy than under 16 age and under 19 age groups players.
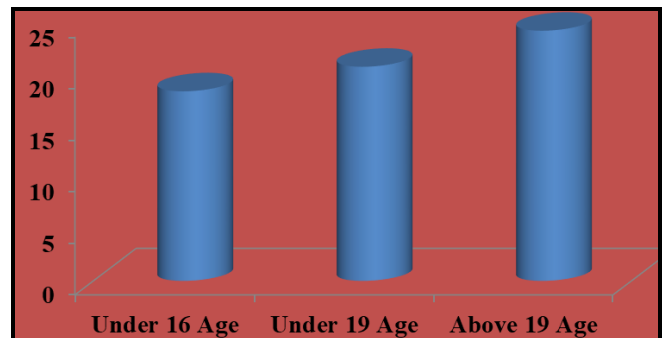

Fig 2: Cylinder diagram showing the mean value on accuracy of different age groups netball players

Discussion and Conclusion
Reaction
Finding reveals that there is statistically significant difference at test period among the under 16 age, under 19 age and above 19 age groups of women netball players on reaction. The result found that above 19 age group of netball players had higher reaction than under 16 age and under 19 age groups players. The following studies are supporting our results. Fox *et al*., (2013) [3] examined the activity profiles of the Australian female netball team players during international competition: implications for training practice. Results suggest that differences in the current game exist when compared to the previous analysis. Positional differences were also found with regard to player activity confirming the need for an individualised component of training based on player position. Diana (1997) [2] investigated the relation between somatotype, performance characteristics, and the incidence of injury during the Australian Netball Championships. Result stated that three dependent somatotype variables, there were no main effects

between endomorphy, mesomorphy, and ectopmorphy and the incidence of injury. However, for the mesomorphy and ectomorphy variables, significant main effects for the playing position were found. No main effects existed between the somatotype variables and levels of competition.

Accuracy

Finding reveals that there is statistically significant difference at test period among the under 16 age, under 19 age and above 19 age groups of women netball players on accuracy. The result found that above 19 age group of netball players had higher accuracy than under 16 age and under 19 age groups players. The following studies are supporting our results. Fox *et al.*, (2013) [3] examined the activity profiles of the Australian female netball team players during international competition: implications for training practice. Results suggest that differences in the current game exist when compared to the previous analysis. Positional differences were also found with regard to player activity confirming the need for an individualised component of training based on player position. Diana (1997) [2] investigated the relation between somatotype, performance characteristics, and the incidence of injury during the Australian Netball Championships. Result stated that three dependent somatotype variables, there were no main effects between endomorphy, mesomorphy, and ectopmorphy and the incidence of injury. However, for the mesomorphy and ectomorphy variables, significant main effects for the playing position were found. No main effects existed between the somatotype variables and levels of competition.

References

1. Agyajit Sing. Sports Psychology. Delhi Friends Publications, 1992, 50.
2. Diana Hopper M. To investigate the relation between somatotype, performance characteristics, and the incidence of injury during the Australian Netball Championships. Br J Sports Med. 1997; 31(3):197-199.
3. Fox Aaron, Spittle Michael, Otago Leonie, Saunders Natalie., Activity profiles of the Australian female netball team players during international competition: implications for training practice. J Sports Sci. 2013; 31(14):1588-95.