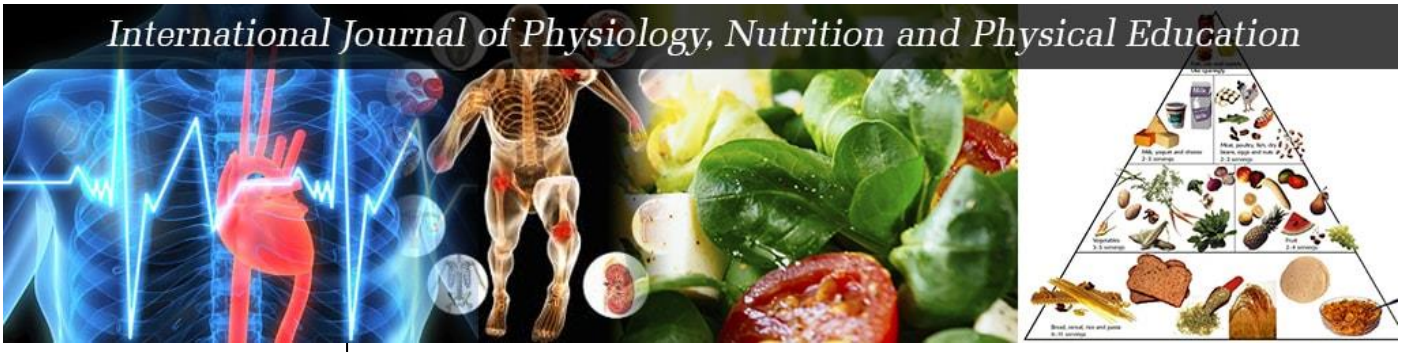

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Relationship between selected kinanthropometric variables and playing ability among intercollegiate volleyball players

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Abstract
The purpose of the study was to find out the relationship between selected kinanthropometric variables and playing ability among intercollegiate Volleyball players. To achieve the purpose of this study the investigator selected one hundred intercollegiate level men Volleyball players from the affiliated colleges of Tamil Nadu Physical Education and Sports University, at random and their age ranged between 18 and 25 years. The following Kinanthropometric variables were selected such as Weight, Height, Biacromial Diameter (Shoulder Width), Bicristal Diameter (Abdominal Width), Bitrochanteric diameter (Hip width), Humerus Bicondyler width (Elbow width), Wrist diameter, Femur Bicondyler diameter (Knee width), Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width and Calf Skinfold width. Obtained data were analyzed to find out the relationship with Pearson product moment correlation. The conclusion of the study indicates that there was a significant relationship between playing ability and kinanthropometric variables of Height, Biacromial Diameter, Bicristal Diameter, Wrist diameter, Ankle diameter, Biceps Skinfold width, Subscapular skinfold width, Suprailiac Skinfold width and Calf Skinfold width among intercollegiate Volleyball players.

Keywords: Kinanthropometric variables, playing, intercollegiate volleyball players

Introduction
Kinanthropometry is the study about the human body measurements, alignment, proportion, composition, maturation, gross function which helps to understand physical growth, activity, performance and nutrition aspects (Davinder K. Kansal, 2008) [1]
Playing Ability is the ability of individuals perform particular event or games which are usually measured by the expert of the particular specialization.

Methodology
The purpose of the study was to find out the relationship between selected kinanthropometric variables and playing ability among intercollegiate Volleyball players. To achieve the purpose of this study the investigator selected one hundred college men Volleyball players from the affiliated colleges of Tamil Nadu Physical Education and Sports University at randomly and their age ranged between 18 and 25 years. The following Kinanthropometric Variables were selected to this study. Weight, Height, Biacromial Diameter (Shoulder Width), Bicristal Diameter (Abdominal Width), Bitrochanteric diameter (Hip width), Humerus Bicondyler width (Elbow width), Wrist diameter, Femur Bicondyler diameter (Knee width), Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width, Calf Skinfold width. Obtained data were analyzed with the Pearson product moment correlation.

Result and Discussion

Table 1: Shows Mean Standard Deviation and Range of Kinanthropometric variables and Playing Ability of intercollegiate level Volleyball players

S. No	Variables	Sample size	Mean	S D	Range
1	Height	100	179.31	6.32	195 – 165
2	Body Weight		68.5	6.49	85 – 55
3	Biacromial Diameter		78.7	10.99	94 – 57
4	Bicristal Diameter		51.1	3.64	56 – 43
5	Bitrochanteric diameter		56.8	2.92	62 – 50
6	Humerus Bicondyler width		14.15	2.66	25 – 12
7	Wrist diameter		11.65	1.2	14 – 10
8	Femur Bicondyler diameter		18.4	0.87	20 – 17
9	Ankle diameter		15.	1.15	17 – 13
10	Biceps Skinfold width		4.28	0.75	5.4 - 2.1
11	Triceps Skinfold width		7.73	2.71	13.4 – 4
12	Fore-Arm Skinfold width		4.21	0.49	5.1 - 3.4
13	Subscapular Skinfold width		12.05	4.68	25 – 6
14	Suprailiac Skinfold width		10.12	3.76	17 – 5
15	Thigh Skinfold width		12.03	4.46	5.9 – 26.9
16	Calf Skinfold width		14.75	4.91	28 – 8
17	Playing Ability		86.91	3.45	91 – 78

Table 2: Shows Coefficient Correlation Values of Kinanthropometric Variables and Performance of Intercollegiate Volleyball players

Variables / Variables	Height	Weight	Biacromial diameter	Bicristal diameter	Bitrochanteric diameter	Humerus Bicondyler width	Wrist diameter	Femur Bicondyler diameter	Ankle diameter	Biceps skinfold width	Triceps skinfold width	Fore-arm skinfold width	Subscapular skinfold width	Suprailiac skinfold width	Thigh skinfold width	Calf skinfold width	Playing Ability
Height	1	0.02	0.17	0.05	0.01	0.09	0.13	0.15	0.03	0.11	0.02	0.12	0.03	0.001	0.06	0.003	0.22*
Weight	0.02	1	0.13	0.59*	0.62*	0.18	0.15	0.34*	0.12	0.36*	0.06	0.34*	0.38*	0.49*	0.18	0.18	0.09
Biacromial Diameter	0.17	0.13	1	0.37*	0.25*	0.07	0.29*	0.29*	0.03	0.14	0.28*	0.10	0.06	0.33	0.09	0.13	0.21*
Bicristal Diameter	0.05	0.59*	0.37*	1	0.59*	0.28*	0.04	0.38*	0.30*	0.01	0.26*	0.16	0.08	0.08	0.19	0.23*	0.28*
Bitrochanteric diameter	0.01	0.62*	0.25*	0.59*	1	0.28*	0.27*	0.21*	0.08	0.08	0.28*	0.13	0.13	0.19	0.43*	0.11	0.08
Humerus Bicondyler width	0.09	0.18	0.07	0.28*	0.28*	1	0.55*	0.35*	0.07	0.26*	0.20*	0.11	0.43*	0.26*	0.22*	0.16	0.03
Wrist diameter	0.13	0.15	0.29*	0.04	0.27*	0.55*	1	0.04	0.07	0.10	0.36*	0.19	0.45*	0.36*	0.03	0.33*	0.21*
Femur Bicondyler diameter	0.15	0.34*	0.29*	0.38*	0.21*	0.35*	0.04	1	0.41*	0.38*	0.09	0.07	0.18	0.27*	0.17	0.16	0.17
Ankle diameter	0.03	0.12	0.03	0.30*	0.08	0.07	0.07	0.41*	1	0.14	0.15	0.31*	0.33*	0.47*	0.35*	0.49*	0.21*
Biceps Skinfold width	0.11	0.36*	0.14	0.01	0.08	0.26*	0.10	0.38*	0.14	1	0.09	0.26*	0.44*	0.41*	0.27*	0.21*	0.30*
Triceps Skinfold width	0.02	0.06	0.28*	0.26*	0.28*	0.20*	0.36*	0.09	0.15	0.09	1	0.47*	0.43*	0.43*	0.37*	0.62*	0.17
Fore-Arm Skinfold width	0.12	0.34*	0.10	0.16	0.13	0.11	0.19	0.07	0.31*	0.26*	0.47*	1	0.56*	0.44*	0.55*	0.65*	0.08
Subscapular Skinfold width	0.03	0.38*	0.06	0.08	0.13	0.43*	0.45*	0.18	0.33*	0.44*	0.43*	0.56*	1	0.78*	0.24*	0.77*	0.46*
Suprailiac Skinfold width	0.001	0.49*	0.33*	0.08	0.19	0.26*	0.36*	0.27*	0.47*	0.41*	0.43*	0.44*	0.78*	1	0.44*	0.79*	0.20*
Thigh Skinfold width	0.06	0.18	0.09	0.19	0.43*	0.22*	0.03	0.17	0.35*	0.27*	0.37*	0.55*	0.24*	0.44*	1	0.57*	0.12
Calf Skinfold width	0.003	0.18	0.13	0.23*	0.11	0.16	0.33*	0.16	0.49*	0.21*	0.62*	0.65*	0.77*	0.79*	0.57*	1	0.33*
Playing Ability	0.22*	0.09	0.21*	0.28*	0.08	0.03	0.21*	0.17	0.21*	0.30*	0.17	0.08	0.46*	0.20*	0.12	0.33*	1

*significant the required table value r (99) = 0.19 at 0.05 level of significance

In table II shows pair wise correlation(r) values of playing ability with Weight=0.09, Height=0.22, Biacromial Diameter = 0.21, Bicristal Diameter = 0.28, Bitrochanteric diameter = 0.08, Humerus Bicondyler width = 0.03, Wrist diameter=0.21, Femur Bicondyler diameter = 0.17, Ankle diameter=0.21, Biceps Skinfold width=0.30, Triceps Skinfold width=0.17, Fore-Arm Skinfold width=0.08, Subscapular Skinfold width=0.46, Suprailiac Skinfold width=0.20, Thigh Skinfold width=0.12 and Calf Skinfold width=0.33.

The result of this study there was a significant relationship

between playing ability and kinanthropometric variables of Height =0.22, Biacromial Diameter = 0.21, Bicristal Diameter = 0.28, Wrist diameter=0.21, Ankle diameter = 0.21, Biceps Skinfold width=0.30, Subscapular skinfold width =0.46, Suprailiac Skinfold width=0.20 and Calf Skinfold width=0.33. This values was greater than the required table value of 0.19. So the null hypothesis was rejected and alternative hypothesis was accepted at 0.05 level of significance.

The result of this study there was a significant relationship within kinanthropometric variables of Weight with Bicristal Diameter = 59, Bitrochanteric diameter = 0.62, Femur Bicondyler diameter = 0.34, Biceps Skinfold width=0.36, Fore-Arm Skinfold width=0.34, Subscapular Skinfold width=0.38, Suprailiac Skinfold width=0.49. Biacromial Diameter with Height=0.55, Bicristal Diameter = 0.37, Bitrochanteric diameter = 0.25, Wrist diameter=0.29, Femur Bicondyler diameter = 0.29, Triceps Skinfold width=0.28, Suprailiac Skinfold width=0.33. Bicristal Diameter with Weight=0. 59, Bitrochanteric diameter = 0. 59, Humerus Bicondyler width = 0.28, Femur Bicondyler diameter = 0.38, Ankle diameter=0.30, Triceps Skinfold width=0.26, Calf Skinfold width=0.23. Bitrochanteric diameter with Weight=0.62, Biacromial Diameter = 0.25, Bicristal Diameter = 0.59, Humerus Bicondyler width = 0.28, Wrist diameter=0.27, Femur Bicondyler diameter = 0.21, Triceps Skinfold width=0.28, Thigh Skinfold width=0.43. Humerus Bicondyler width with Bicristal Diameter = 0.28, Bitrochanteric diameter = 0.28, Wrist diameter=0.55, Femur Bicondyler diameter = 0.35, Biceps Skinfold width=0.26, Triceps Skinfold width=0.20, Subscapular Skinfold width=0.43, Suprailiac Skinfold width=0.26, Thigh Skinfold width=0.22. Wrist diameter with Biacromial Diameter = 0.29, Bitrochanteric diameter = 0.27, Humerus Bicondyler width = 0.55, Triceps Skinfold width=0.36, Subscapular Skinfold width=0.45, Suprailiac Skinfold width=0.36, Calf Skinfold width=0.33. Femur Bicondyler diameter with Weight =0.34, Biacromial Diameter = 0.29, Bicristal Diameter = 0.38, Bitrochanteric diameter = 0.21, Humerus Bicondyler width = 0.35, Ankle diameter=0.41, Biceps Skinfold width=0.38, Suprailiac Skinfold width=0.27. Ankle diameter with Bicristal Diameter = 0.30, Femur Bicondyler diameter = 0.41, Fore-Arm Skinfold width=0.31, Subscapular Skinfold width=0.33, Suprailiac Skinfold width=0.47, Thigh Skinfold width=0.35, Calf Skinfold width=0.49. Biceps Skinfold width with Weight=0.36, Humerus Bicondyler width = 0.26, Femur Bicondyler diameter = 0.38, Fore-Arm Skinfold width=0.26, Subscapular Skinfold width=0.44, Suprailiac Skinfold width=0.41, Thigh Skinfold width=0.27, Calf Skinfold width=0.21. Triceps Skinfold width with Biacromial Diameter = 0.28, Bicristal Diameter = 0.26, Bitrochanteric diameter = 0.28, Humerus Bicondyler width = 0.20, Wrist diameter=0.36, Fore-Arm Skinfold width=0.47, Subscapular Skinfold width=0.43, Suprailiac Skinfold width=0.43, Thigh Skinfold width=0.37, Calf Skinfold width=0.62. Fore-Arm Skinfold width with Weight=0.34, Ankle diameter=0.31, Biceps Skinfold width=0.26, Triceps Skinfold width=0.47, Subscapular Skinfold width=0.56, Suprailiac Skinfold width=0.44, Thigh Skinfold width=0.55, Calf Skinfold width=0.65. Subscapular Skinfold width with Weight =0.38, Height=0.31, Humerus Bicondyler width = 0.43, Wrist diameter=0.45, Ankle diameter=0.33, Biceps Skinfold width=0.44, Triceps Skinfold width=0.43, Fore-Arm Skinfold width=0.56, Suprailiac Skinfold width=0.78, Thigh Skinfold width=0.24, Calf Skinfold width=0.77. Suprailiac Skinfold width with Weight=0.49, Biacromial Diameter = 0.33, Humerus Bicondyler width = 0.26, Wrist diameter=0.36, Femur Bicondyler diameter = 0.27, Ankle diameter=0.47, Biceps Skinfold width=0.41, Triceps Skinfold width=0.43, Fore-Arm Skinfold width=0.44, Subscapular Skinfold width=0.78, Thigh Skinfold width=0.44, Calf Skinfold width=0.79. Thigh Skinfold width with Bitrochanteric diameter = 0.43, Humerus Bicondyler width = 0.22, Ankle diameter=0.35, Biceps Skinfold width=0.27, Triceps Skinfold width=0.37, Fore-Arm Skinfold width=0.55, Subscapular Skinfold width=0.24, Suprailiac Skinfold width=0.44, Calf Skinfold width=0.57. Calf Skinfold width with Height=0.25, Bicristal Diameter = 0.23, Wrist diameter=0.33, Ankle diameter=0.49, Biceps Skinfold width=0.21, Triceps Skinfold width=0.62, Fore-Arm Skinfold width=0.65, Subscapular Skinfold width=0.77, Suprailiac Skinfold width=0.79, Thigh Skinfold width=0.57. This values was greater than the required table value of 0.19. So the null hypothesis was rejected and alternative hypothesis was accepted at 0.05 level of significance.

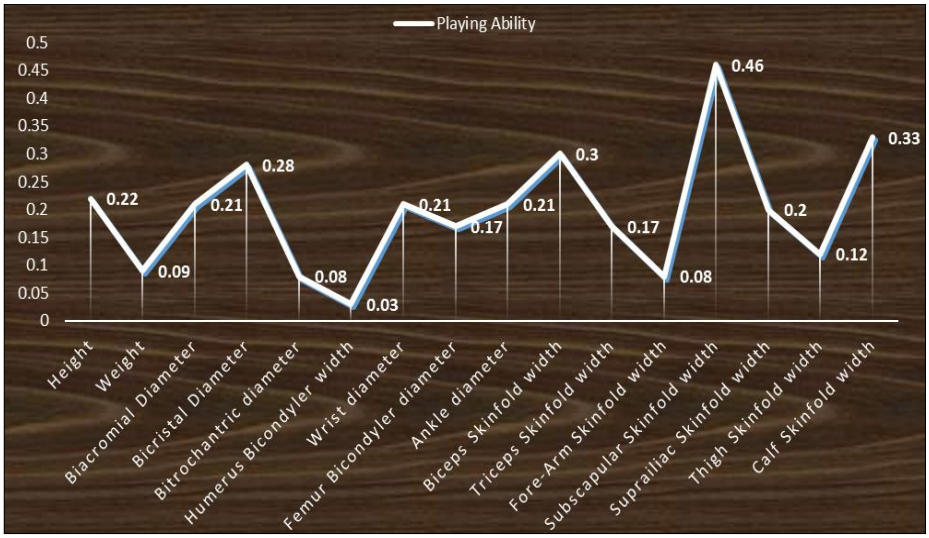

Fig 1: shows Relationship between Playing Ability and Kinanthropometric Variables

Conclusions

1. The conclusion of the study there was a significant relationship between playing ability and kinanthropometric variables of Height, Biacromial Diameter, Bicristal Diameter, Wrist diameter, Ankle diameter, Biceps Skinfold width, Subscapular skinfold width, Suprailiac Skinfold width and Calf Skinfold width among intercollegiate Volleyball players.
2. The conclusion of the study there was a significant relationship within kinanthropometric variables of Weight with Bicristal Diameter, Bitrochanteric diameter, Femur Bicondyler diameter, Biceps Skinfold width, Fore-Arm Skinfold width, Subscapular Skinfold width and Suprailiac Skinfold width.
3. The conclusion of the study there was a significant relationship within kinanthropometric variables of Biacromial Diameter with Height, Bicristal Diameter, Bitrochanteric diameter, Wrist diameter, Femur Bicondyler diameter, Triceps Skinfold width and Suprailiac Skinfold width.
4. The conclusion of the study there was a significant relationship within kinanthropometric variables of Bicristal Diameter with Weight, Bitrochanteric diameter, Humerus Bicondyler width, Femur Bicondyler diameter, Ankle diameter, Triceps Skinfold width and Calf Skinfold width.
5. The conclusion of the study there was a significant relationship within kinanthropometric variables of Bitrochanteric diameter with Weight, Biacromial Diameter, Bicristal Diameter, Humerus Bicondyler width, Wrist diameter, Femur Bicondyler diameter, Triceps Skinfold width and Thigh Skinfold width.
6. The conclusion of the study there was a significant relationship within kinanthropometric variables of Humerus Bicondyler width with Bicristal Diameter, Bitrochanteric diameter, Wrist diameter, Femur Bicondyler diameter, Biceps Skinfold width, Triceps Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width and Thigh Skinfold width.
7. The conclusion of the study there was a significant relationship within kinanthropometric variables of Wrist diameter with Biacromial Diameter, Bitrochanteric diameter, Humerus Bicondyler width, Triceps Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width and Calf Skinfold width.
8. The conclusion of the study there was a significant relationship within kinanthropometric variables of Femur Bicondyler diameter with Weight, Biacromial Diameter, Bicristal, Bitrochanteric diameter, Humerus Bicondyler width, Ankle diameter, Biceps Skinfold width and Suprailiac Skinfold width.
9. The conclusion of the study there was a significant relationship within kinanthropometric variables of Ankle diameter with Bicristal Diameter, Femur Bicondyler diameter, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width and Calf Skinfold width.
10. The conclusion of the study there was a significant relationship within kinanthropometric variables of Biceps Skinfold width with Weight, Humerus Bicondyler width, Femur Bicondyler diameter, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width and Calf Skinfold width.
11. The conclusion of the study there was a significant relationship within kinanthropometric variables of Triceps Skinfold width with Biacromial Diameter, Bicristal Diameter, Bitrochanteric diameter, Humerus Bicondyler width, Wrist diameter, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width and Calf Skinfold width.
12. The conclusion of the study there was a significant relationship within kinanthropometric variables of Fore-Arm Skinfold width with Weight, Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width and Calf Skinfold width.
13. The conclusion of the study there was a significant relationship within kinanthropometric variables of Subscapular Skinfold width with Weight, Height, Humerus Bicondyler width, Wrist diameter, Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Fore-Arm Skinfold width, Suprailiac Skinfold width, Thigh Skinfold width and Calf Skinfold width.
14. The conclusion of the study there was a significant relationship within kinanthropometric variables of Suprailiac Skinfold width with Weight, Biacromial Diameter, Humerus Bicondyler width, Wrist diameter, Femur Bicondyler diameter, Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Fore-Arm Skinfold width, Subscapular Skinfold width, Thigh Skinfold width and Calf Skinfold width.
15. The conclusion of the study there was a significant relationship within kinanthropometric variables of Thigh Skinfold width with Bitrochanteric diameter, Humerus Bicondyler width, Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width and Calf Skinfold width.
16. The conclusion of the study there was a significant relationship within kinanthropometric variables of Calf Skinfold width with Height, Bicristal Diameter, Wrist diameter, Ankle diameter, Biceps Skinfold width, Triceps Skinfold width, Fore-Arm Skinfold width, Subscapular Skinfold width, Suprailiac Skinfold width and Thigh Skinfold width.

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