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## **Relationship of Anthropometric measurement and physical fitness with performance of intercollegiate Korfball players**

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### **Abstract**

The main Purpose of the study is to find out the Relationship of Anthropometric measurement and physical fitness with performance of intercollegiate Korfball players of Sant Gadge Baba Amravati University, Amravati. This study was hypothesized that the positive relationship between anthropometric measurement and physical fitness with performance of Korfball players. The sources of data were collected from intercollegiate korfball players during the intercollegiate Korfball tournament organized by Sant Gadge Baba Amravati University, Amravati. The researcher had selected 45 Korfball players representing the intercollegiate Korfball tournament were taken as the subject for the study. The subjects were selected by using simple random sampling method. In this study the following equipment and test which were used for data collection Stadiometer were used to measure Height, Weighing machine were used to measure Weight, Still measuring tape was used to measure Arm length, Leg length and Foot length and AAPHER youth Physical Fitness Test were used to measure Physical Fitness. The data were analyzed and interpreted by using multiple regression correlation and the level of significance at 0.05 was adequate for testing the hypothesis. Conclusion: There was positive relationship in between the anthropometric measurement and fitness level with the performance of korfball players.

**Keywords:** Anthropometric measurement, intercollegiate Korfball players, physical fitness

### **Introduction**

One of the values related to sports and games in the educational setting is sportsmanship. While sportsmanship is a somewhat controversial and nebulous concept meaning different things to different people and groups in general most persons see in it these three aspects. Fair play, modesty in victory, and self contrail in defeat, it is presumably a general quality but when analyzed. It breaks down into a number of specific traits such as honesty, Fair play, self discipline, sacrifice, modesty and others. The sports and play area is replete with situation that test not only the physical Prowers and mettle of the participations, but also their vales and subsequent behavior. sports process require. Ultimately, however, students must internalize the values and their actions must be reflected within the confines of the game rules and acceptable code of personal conduct. Children are not born good winners or looser. They develop these qualities as they ascend the social continuum to the point where they can gracefully accept either.

### **Methodology**

The sources of data were collected from intercollegiate korfball players during the intercollegiate Korfball tournament organized by Sant Gadge Baba Amravati University, Amravati. The researcher had selected 45 Korfball players representing the intercollegiate Korfball tournament were taken as the subject for the study. The subjects were selected by using simple random sampling method. In this study the following equipment and test which were used for data collection (1) Stadiometer were used to measure Height, (2) Weighing machine were used to measure Weight, (3) Still measuring tape was used to measure Arm length, Leg length and Foot length and (4) AAPHER youth Physical Fitness Test were used to measure Physical Fitness.

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**Collection of data**

The necessary data was collected by administrating the tests for measuring the selected Anthropometric measurement and Physical fitness. Before collecting the data, the subjects was given a chance to practice the prescribed test so that they should become familiar with tests and know exactly what is to be done. To ensure the uniform testing conditions. The tests for obtaining the required data were conducted during the time of intercollegiate Korfball tournament.

**Analysis of the data**

The statistical analysis of the data gathered for the Relationship of Anthropometric measurement and Physical fitness with Performance. The data collected qualitatively on different test of anthropometric measurement, physical fitness and performance. The data were analyzed and interpreted by using multiple regression correlation statistical technique and the level of significance at 0.05 was adequate for testing the hypothesis. Multiple regression analysis tables had been given below:

**Table 1: Inter Correlation Matrix**

	Ht.	Wt.	A.L.	L.L.	F.L.	Shooting	Passing	Guarding	Pefor.
Ht.	1000								
Wt.	0.25	1.000							
A.L.	-0.055	-0.308	1.000						
L. L.	0.037	-0.137	0.017	1.000					
F.L.	0.0069	0.102	0.060	0.058	1.000				
Shooting	-0.323	0.105	-0.268	-0.058	0.006	1.000			
Passing	-0.028	0.106	-0.335	0.228	0.031	-0.038	1.000		
Guarding	-0.138	-0.076	0.066	0.059	0.123	0.085	-0.114	1.000	
Perfor.	-0.266	0.067	-0.307	0.155	0.122	0.568	0.534	0.582	1.000

From the above tables the under mentioned summary had drawn in respect of the interrelationship of each component to other. The results which were statistically analysis with the help of multiple regression analysis formula were verified up to which how extent they were interrelated to each other with the help of standard norms propounded by “GLASS AND HOPKINS” (1996) for interpreting the data which are analysis with multiple regression correlation equation method. The following standard norms are as follows:-

Coefficient(r)	Relationship
.00 to .20	Negligible
.20 to .40	Low
.40 to .60	Moderate
.60 to .80	Substantial
.80 to 1.00	High to very high

**Summary of the Inter correlation Matrix (Table-1)**

Sr. No.	Variable	Calculated r	Relationship
1	Weight-Height	0.025	Negligible
2	A. length -Height	-0.055	Negligible
3	L. Length -Height	0.037	Negligible
4	F. Length -Height	0.069	Negligible
5	Shooting - Height	-0.323	Low
6	Passing - Height	-0.028	Negligible
7	Guarding- Height	-0.138	Negligible
8	Performance- Height	-0.266	Low
9	A. Length -Weight	-0.308	Low
10	L. Length -Weight	-0.137	Negligible
11	F. Length -Weight	-0.102	Negligible
12	Shooting - Weight	0.102	Negligible
13	Passing - Weight	0.105	Negligible
14	Guarding -Weight	0.106	Negligible
15	Performance-Weight	-0.076	Negligible
16	Leg Length - Weight	0.067	Negligible
17	F. length - Arm length	0.060	Negligible
18	Shooting - Arm length	-0.0268	Low
19	Passing - A. length	-0.335	Low
20	Guarding - A. length	0.066	Negligible
21	Performance-A. length	0.307	Low
22	Foot length - L. length	0.058	Negligible
23	Shooting - L. length	-0.053	Negligible
24	Passing - Leg Length	0.228	Low
25	Guarding- Leg Length	0.059	Negligible
26	Performance- L. Length	0.155	Negligible
27	Shooting - F. Length	0.006	Negligible
28	Passing - F. Length	0.031	Negligible
29	Guarding- F. Length	0.123	Negligible
30	Performance- F. Length	0.122	Negligible
31	Passing - Shooting	-0.038	Negligible
32	Guarding- Shooting	0.085	Negligible
33	Performance- Shooting	0.568	Moderate
34	Guarding- Passing	-0.114	Negligible
35	Performance- Passing	0.534	Negligible
36	Performance- Guarding	0.582	Moderate

From the above given table-1 after doing its minutely observation, it is clear that the relationship of weight with height (0.025) is Negligible, Arm Length with height (-0.055) is negligible, Leg length with height (0.037) is negligible, foot length with Height (0.069) is negligible, shooting with height (-0.325) is low, Passing with Height (-0.028) is negligible, Guarding with Height (-0.138) is negligible, performance with height (-0.266) is low, Arm length with weight (-0.308) is low, length with weight (-0.131) is negligible, Foot length with weight (-0.102) is negligible, shooting with weight (0.102) is negligible, Passing with weight (0.105) is negligible guarding with weight (106) is negligible, Performance with weight (-0.076) is negligible, leg length with weight (0.067) is negligible, foot length with Arm Length (0.060) is negligible. Shooting with Arm Length (-0.0268) in low, Passing with Arm length (-0.335) in low, Guarding with Arm Length (0.060) is negligible, Performance with Arm Length (0.307) is low, Foot Length with Length (0.058) is negligible. Shooting with leg Length (-0.053) is negligible, Passing with leg length (0,228) is Low guarding with leg length (0.059) is negligible,

Performance with leg length (0.155) is negligible, Shooting with Foot Ball (0.006) is negligible, Passing Foot Length (0.031) is negligible, Guarding with Foot Length (0.123) is negligible, Performance with foot length (0.122) is negligible Passing with shooting (-0.38) is negligible. Performance with shooting ((0.568) is Moderate, Guarding with passing (-0.114) is Negligible, Performance with Passing (0.534) is Moderate and performance with Passing (0.582) is Moderate.

**Table 2:** Summary of Different Correlation

Multiple R	0.996
R Square	0.993
Adjusted R	0.992
Standard E	0.146

From the above given table – 2 after doing its minute observation, it is clear that the multiple R (0,996), R Square (0,993), Adjusted R (0,992) and Standard E of the scores of Korfball Players is (0,146).

**Table 3:** Regression equation Analysis

	Coefficients	S.E.	t-test	P-Value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0 %
Intercept	-0.225	1.112	-0.203	0.841	-2.481	2.031	-2.481	2.031
Height	0.003	0.004	0.740	0.464	-0.005	0.010	-0.005	0.010
Weight	-0.003	0.004	-0.883	0.383	-0.011	0.004	-0.011	0.004
A. Length	0.001	0.005	0.206	0.838	-0.009	0.0012	-0.009	0.012
L. Length	0.001	0.005	0.171	0.865	-0.010	0.0012	-0.010	0.012
F. Length	0.016	0.008	1.891	0.067	-0.010	0.032	-0.001	0.032
Shooting	0.968	0.026	37.458	0.000	-0.001	1.021	0.916	1.021
Passing	0.986	0.023	43.061	0.000	0.916	1.032	0.939	1.032
Guarding	0.981	0.022	45.231	0.000	0.957	1.025	0.937	1.025

From the above table it is clear that the  $\gamma$ -intercept i.e.  $\alpha = -0.225$ ,  $\beta_1 = 0.003$ ,  $\beta_2 = -0.003$ ,  $\beta_3 = 0.001$ ,  $\beta_4 = 0.001$ ,  $\beta_5 = 0.016$ ,  $\beta_6 = 0.968$ ,  $\beta_7 = 0.986$  and  $\beta_8 = 0.981$ . Hence the perdition equation is given as

$$\gamma = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8$$

Which can be written in numerical form as given below:-

$$\gamma = -0.225 + 0.003 * 176 + -0.003 * 62 + 0.001 * 77 = 0.001 * 95 + 0.016 * 22 + 0.968 * 8 + 0.986 * 7 + 0.981 * 8$$

**Table 4:** Inter Correlation Matrix

	PU	BKSU	SBJ	FYSR	50YD	SYRW	Shooting	Passing	Guarding	perfor
PU	1.000									
BKSU	-0.105	1.000								
SBJ	0.261	0.389	1.000							
FYSR	-0.337	-0.122	-0.339	1.000						
SOYD	0.178	-0.083	0.170	-0.157	1.000					
SYRW	0.055	0.116	0.356	-0.434	-0.037	1.000				
Shooting	0.142	-0.084	0.165	-0.196	0.002	0.304	1.000			
Passing	-0.114	-0.065	-0.043	0.139	-0.090	-0.086	-0.038	1.000		
Guarding	0.118	-0.091	0.024	0.097	0.141	-0.002	0.085	-0.114	1.000	
Perfor.	0.071	-0.128	0.087	0.020	0.038	0.121	0.568	0.534	0.582	1.000

From the above tables the under mentioned summary had drawn in respect of the interrelationship of each component to other. The results which were statistically analysis with the help of multiple regression analysis formula were verified up to which how extent they were interrelated to each other with the help of standard norms propounded by “GLASS AND HOPKINS” (1996) for interpreting the data which are analysis with multiple regression correlation equation method. The following standard norms are as follows:-

Coefficient(r)	Relationship
.00 to .20	Negligible
.20 to .40	Low
.40 to .60	Moderate
.60 to .80	Substantial
.80 to 1.00	High to very high

**Summary of Inter Correlation Matrix (Table-4)**

Sr. No.	Variable	Calculated	Relationship
1	Bent Knee Sit Up – Pull Ups	-0.105	Negligible
2	Standing Broad Jump – Pull Ups	0.261	Low
3	Forty Yard Shuttle Run – Pull Ups	-0.337	Low
4	50 Yard – Pull Ups	0.178	Negligible
5	600 Run and Walk – Pull Ups	0.055	Negligible
6	Shooting - Pull Ups	-0.142	Negligible
7	Passing – Pull Ups	-0.114	Negligible
8	Guarding – Pull Ups	0.118	Negligible
9	Performance – Pull Ups	0.071	Negligible
10	Standing Broad Jump – BKSU	0.389	Low
11	Forty Yard Shuttle Run – BKSU	-0.122	Negligible
12	50 Yard – BKSU	-0.083	Negligible
13	600 Run and Walk – BKSU	0.116	Negligible
14	Shooting - BKSU	-0.084	Negligible
15	Passing – BKSU	-0.065	Negligible
16	Guarding – BKSU	-0.091	Negligible
17	Performance – BKSU	-0.128	Negligible
18	Forty Yard Shuttle Run – SBJ	-0.339	Low
19	50 Yard – SBJ	0.170	Negligible
20	600 Run and Walk – SBJ	0.356	Low
21	Shooting - SBJ	0.165	Negligible
22	Passing – SBJ	-1.043	Negligible
23	Guarding – SBJ	0.024	Negligible
24	Performance – SBJ	0.087	Negligible
25	50 Yard – FYSR	-0.157	Negligible
26	600 Run and Walk – FYSR	-0.434	Moderate
27	Shooting -FYSR	-0.196	Negligible
28	Passing – FYSR	0.139	Negligible
29	Guarding – FYSR	0.097	Negligible
30	Performance – FYSR	0.020	Negligible
31	600 Yard Run and Walk – 50 Yd	-0.37	Negligible
32	Shooting - 50 Yd	0.002	Negligible
33	Passing – 50 Yd	-0.090	Negligible
34	Guarding – 50 Yd	0.141	Negligible
35	Performance – 50 Yd	0.038	Negligible
36	Shooting - SYRW	0.304	Low
37	Passing – SYRW	-0.086	Negligible
38	Guarding – SYRW	-0.002	Negligible
39	Performance – SYRW	0.121	Negligible
40	Passing – Shooting	-0.038	Negligible
41	Guarding – Shooting	0.085	Negligible
42	Performance – Shooting	0.568	Moderate
43	Guarding – Passing	-0.114	Negligible
44	Performance – Passing	0.534	Moderate
45	Performance – Guarding	0.582	Moderate

From the above given table-4 after doing its minutely observation, it is clear that the relationship of Bend Knee Sit Ups with Pull-up (-0.105) is Negligible, Standing Broad Jump with Pull-ups (-0.261) is Low, 40 Yard with Pull-ups, (-0.337) is Negligible, 50 Yard with Pull ups (0.178) is Negligible, 600 yard with pull-ups (0.055). Shooting with Pull ups (0.142) is Negligible, Passing with Pull-ups (-0.114) is Negligible, Guarding with Pull ups (-0.118) is Negligible, Performance with Pull ups (0.071) is Negligible, Standing Board jump with Bend Knee Sit ups (0.389) is Negligible, Forty Yard Shuttle Run with Bend Knee Sit ups (-0.122) is Negligible, 50 Yard with Bend Knee Sit ups (-0.083) is Negligible, 600 Yard Run & Walk with Bend Knee Sit ups (0.116) is Negligible, Shooting with Band Knee Sit ups (-0.084) is Negligible, Passing with Bend Knee Sit ups (-0.065) is Negligible, Guarding with Bend Knee Sit ups (-0.091) is Negligible, Performance with Bend Knee Sit ups (-0.128) is Negligible, Forty Yard Shuttle Run with Standing Broad Jump (-0.339) is Negligible, 50 Yard with Standing Broad Jump (-0.170) is Negligible, 600 Yard Run and Walk with Standing Broad Jump (0.356) is Negligible, Shooting with Standing Broad Jump (0.165) is Negligible, Passing with Standing Broad Jump (-0.043) is Negligible, Guarding with Standing Broad Jump (0.024) is Negligible, Performance with Standing Broad Jump (0.087) is Negligible, 50 Yard with Forty Yard Shuttle Run (-0.157) is Negligible, 600 Yard Run and Walk with Forty Yard Shuttle Run (-0.434) is Negligible, Shooting with Forty Yard Shuttle Run (-0.196) is Negligible, Passing with Forty Yard Shuttle Run (0.139) is Negligible, Guarding with Forty Yard Shuttle Run (0.097) is Negligible, Performance with Forty Yard Shuttle Run (0.020) is Negligible, 600 Yard Run and Walk with 50 Yard (-0.037) is Negligible, Shooting with 50 Yard (0.002) is Negligible, Passing with 50 Yard (-0.090) is Negligible, Guarding with 50 Yard (0.141) is Negligible, Performance with 50 Yard (0.038) is Negligible, Shooting with 600 Yard Run & Walk (0.304) is Negligible, Passing with 600 Yard Run and Walk (0.086) is Negligible, Guarding with 600 Yard Run and Walk (-0.002) is Negligible, Performance with 600 Yard Run and Walk (0.121) is Negligible, Passing with Shooting (-0.038) is Negligible, Guarding with Shooting (0.083) is Negligible, Performance with Shooting (0.568) is Negligible, Guarding with Passing (0.114) is Negligible, Performance with Passing (0.534) is Negligible and performance with guarding (0.582).

**Table 5:** Summary of Different Correlation

Multiple R	0.996
R Square	0.993
Adjusted R	0.992
Standard E	0.149

From the above given table-5 after doing its minute observation, it is clear that the multiple R (0.996), R Square (0.993), Adjusted R (0.992) and Standard Error (0.149) and Observation of the score of Korfbal Players is (45).

**Table 6:** Regression equation Analysis

	Coefficients	S.E.	t-test	P-Value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0 %
Intercept	0.728	0.896	0.813	0.422	-1.090	2.546	-1.090	2.546
Pull ups	-0.114	0.014	-0.957	0.345	-0.043	0.016	-0.043	0.016
B.K. Sit-up	0.003	0.004	0.647	0.522	-0.006	0.012	-0.006	0.012
SBJ	0.003	0.070	0.040	0.968	-0.139	0.144	-0.139	0.144
FYSR	-0.046	0.034	-1.360	0.183	-0.114	0.023	-0.114	0.023
50 Yard	0.041	0.078	0.524	0.604	-0.117	0.198	-0.117	0.198
SYRW	0.023	0.130	0.181	0.857	-0.240	0.287	-0.240	0.287
Shooting	0.953	0.025	37.820	0.000	0.902	1.004	0.902	1.004
Passing	0.989	0.021	46.209	0.000	0.946	1.033	0.946	1.033
Guarding	0.993	0.022	44.416	0.000	0.948	1.039	0.948	1.039

From the above table it is clear that the  $\gamma$  intercept  $\alpha = 0.728$ ,  $\beta_1 = -0.014$ ,  $\beta_2 = 0.003$ ,  $\beta_3 = 0.003$ ,  $\beta_4 = -0.046$ ,  $\beta_5 = 0.041$ ,  $\beta_6 = 0.023$ ,  $\beta_7 = 0.953$ ,  $\beta_8 = 0.989$  and  $\beta_9 = 0.993$ .

Hence the Predication Equation is given as.

$$\gamma \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

Which can be written in numerical form as given below:-

$$\gamma = 0.728 + -0.014 * 9 + 0.003 * 32 + 0.003 * 7.7 + -0.046 * 10.2 + 0.041 * 7.2 + 0.023 * 2.2 + 0.953 * 8 + 0.989 * 7 + 0.993 * 8.$$

**Table 7:** Inter Correlation Matrix

	Shooting	Passing	Guarding	Performance
Shooting	1.000			
Passing	-0.038	1.000		
Guarding	0.085	-0.114	1.000	
Performance	0.568	0.534	0.582	1.000

From the above tables the under mentioned summary had drawn in respect of the interrelationship of each component to other. The results which were statistically analysis with the help of multiple regression analysis formula were verified up to which how extent they were interrelated to each other with the help of standard norms propounded by "GLASS AND HOPKINS" (1996) for interpreting the data which are analysis with multiple regression correlation

**Table 8:** Summary of Different Correlation

<b>Multiple R</b>	<b>0.996</b>
R Square	0.993
Adjusted R	0.992
Standard E	0.146

From the above given table – 8 after doing its minute observation, it is clear that the multiple R (0.996), R Square

equation method. The following standard norms are as follows:-

Coefficient(r)	Relationship
.00 to .20	Negligible
.20 to .40	Low
.40 to .60	Moderate
.60 to .80	Substantial
.80 to 1.00	High to very high

**Summary of Inter Correlation Matrix (Table -7)**

Sr. No.	Variable	Calculated r	Relationship
1	Passing -Shooting	-0.038	Negligible
2	Guarding - Shooting	0.085	Negligible
3	Performance – Shooting	0.568	Moderate
4	Guarding – Passing	-0.114	Negligible
5	Performance – Passing	0.534	Moderate
6	Performance – Guarding	0.582	Moderate

Form the above table No. 1 after doing it's minutely observation, it is clear that the relationship of Passing with shooting (-0.038) is Negligible, Guarding with Shooting (0.085) is Negligible, Performance with Shooting (0.568) is moderate, Guarding with Passing (-0.114) is Negligible, Performance with Passing (0.534) is moderate and Performance with Guarding (0.582) is moderate.

(0.993), Adjusted R (0.992), Standard Error of the score of Korfball Players is 0.146.

**Table 9:** Regression equation Analysis

	Coefficients	S.E.	t-test	P-Value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0 %
Intercept	0.577	0.295	1.957	0.057	-0.018	1.172	-0.018	0.172
Shooting	0.958	0.023	41.512	0.000	0.911	1.005	0.911	1.005
Passing	0.984	0.021	47.814	0.000	0.942	1.025	0.942	1.025
Guarding	0.986	0.021	46.464	0.000	0.943	1.029	0.943	1.029

From the above table it is clear that the  $\gamma$  intercept  $\alpha = 0.577$ ,  $\beta_1 = 0.958$ ,  $\beta_2 = 0.984$ , and  $\beta_3 = 0.986$ .

Hence the Predication equation is given as

$$\gamma \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$$

Which can be written as numerical form as given below:-

$$\gamma = 0.577 + 0.958 * 9 + 0.984 * 8 + 0.986 * 7.$$

**Testing of Hypothesis**

It was hypothesized that there might be positive relationship between the anthropometric measurements and the physical fitness level of the korfball players with their performance in korfball. In overall numerical and statistical analysis of the anthropometric and fitness components of the korfball players, there was found positive relationships between the

anthropometric and fitness measures with the performance of the players. Thus the hypothesis of the researcher was accepted.

### **Conclusion**

On the basis of the result drawn with the mentioned methodology the following conclusion were sougheed out. There was positive relationship in between the anthropometric measurement and fitness level with the performance of korfbal players.

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