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## PHYSICAL AND PHYSIOLOGICAL PROFILES OF DIFFERENT LEVELS OF HANDBALL PLAYERS

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### ABSTRACT

The purpose of the study was to know the physical and physiological profiles of different levels of male Handball players. Ninety male Handball players from different universities those who participate in intercollegiate, interuniversity and inter zonal tournament. Standardized test was applied to measure physical variable i.e. standing height, sitting height, leg length, upper arm length, forearm length, hand length, body composition and physiological variable i.e. resting pulse rate, resting B.P., vital capacity, resting respiratory rate, maximum breath holding time, air flow rate and cardio-vascular efficiency. Analysis of variance and LSD Post hoc test was applied to assess the significance difference among the group means. The level of significance was set at 0.05. The result of study showed that the entire physical variable of Handball players of different levels of achievement except hand length was different significantly. But, no significance difference in physiological variables of Handball players of different levels of achievement was found.

**KEY WORDS:** Physical variable, Physiological variable, Handball.

### INTRODUCTION

Today the preparation of an athlete for top notch achievement is a completely dynamic state characterized by a high level of physical and physiological efficiency and degree of perfection of the necessary skills and knowledge, technique and tactical preparation. Due to it's a cyclical nature and intensity, Handball is classified as a high intensity intermittent team sport. During competitive soccer match play, elite players cover a distance of about 05–06 km at an average intensity close to the anaerobic threshold, being 80–90% of maximal heart frequency ( $Hf_{max}$ ) or 70–80% of maximal oxygen uptake ( $VO_{2max}$ ). It is estimated that aerobic metabolism provides 90% of the energy cost of Handball match play.



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Therefore, it is a prerequisite in the modern game for the elite Handball player to have high aerobic endurance fitness. Anthropometry included the measurement of age, weight, height, specific segment lengths, skeletal breadths, limb circumferences and skin fold thickness.

Purpose of the study was to know the physical and physiological profiles of intercollegiate, interuniversity and inter-zonal level of male Handball players.

## **OBJECTIVE**

1. To evaluate the physical profile of different levels of Handball players.
2. To evaluate the physiological profile of different levels of Handball players.

## **METHODOLOGY**

In case of all the selected physiological variables resting pulse rate, resting blood pressure (systolic and diastolic), vital capacity resting respiratory rate, maximum breath holding time, air flow rate and cardiovascular efficiency, no significant difference existed between the means of Inter College, Inter University and Inter Zone Handball players. All the groups proved to be equal. This might be attributed to the fact that change in the physiological variables depends on the training age of the individual. The subjects of the present study were having the same age group i.e. 18-25 years. They were having more or less training age in all the three selected groups. This categorization is only on the basis of performance, technical level and fitness level.



**Table- A**

**Analysis of Variance of Physical and Physiological variables of different levels of Handball players**

Variables	Source of Variance	DF	SS	MSS	F-Ratio	Required F-Ratio
Standing height	Between group	2	1070.10	535.05	37.98	3.11
	With in group	87	1225.63	14.09		
Sitting height	Between group	2	186.12	93.05	9.95	3.11
	With in group	87	813.48	9.35		
Leg length	Between group	2	716.16	358.08	3.31	3.11
	With in group	87	9399.43	9399.4		
Upper arm length	Between group	2	69.65	34.82	17.17	3.11
	With in group	87	176.49	2.03		
Forearm length	Between group	2	32.28	16.14	6.62	3.11
	With in group	87	212.18	2.44		
Hand length	Between group	2	3.517	1.758	2.8	3.11
	With in group	87	54.61	0.628		
Fat percentage	Between group	2	283.86	141.93	18.89	3.11
	With in group	87	653.76	7.51		
Pulse rate	Between group	2	94.45	47.23	1.07	3.11
	With in group	87	3855.91	44.32		
Systolic blood pressure	Between group	2	200.62	100.31	2.89	3.11
	With in group	87	3017.70	37.69		
Diastolic blood pressure	Between group	2	93.73	46.86	3.01	3.11
	With in group	87	1354.96	15.57		
Vital capacity	Between group	2	0.036	0.018	1.917	3.11
	With in group	87	6.492	0.075		
Resting respiratory rate	Between group	2	10.422	5.211	1.19	3.11
	With in group	87	236.47	2.718		
Maximum breath holding rate	Between group	2	188.16	94.08	0.674	3.11
	With in group	87	12138.83	139.53		
Air flow rate	Between group	2	0.009	0.005	0.084	3.11
	With in group	87	4.809	0.005		
Cardio vascular efficiency	Between group	2	111.52	55.76	1.87	3.11
	With in group	87	2589.13	29.76		



**Table - B**

Post HOC test of significance for physical variables and difference among means of different groups

Variables	Inter College	Inter University	Inter Zonal	M.D.	C.D.
Standing height	173.9	179.84	182.07	5.95	1.1133
	173.9	179.84	182.07	8.17 2.22	
Sitting height	87.03	88.62	90.55	1.59	0.907
	87.03	88.62	90.55	3.52 1.93	
Leg length	90.02	92.78	96.88	2.76	3.0834
	90.02	92.78	96.88	6.86 4.1	
Upper arm length	35.63	36.83	37.78	1.2	0.4226
	35.63	36.83	37.78	2.15 0.95	
Forearm length	46.91	47.75	48.37	0.54	0.4633
	46.91	47.75	48.37	1.46 0.92	
Fat percentage	16	12.41	12.08	3.59	0.8129
	16	12.41	12.08	3.92 0.33	



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## RESULTS AND DISCUSSION

It is evident from Table A that Physical and Physiological parameters i.e. standing height, sitting height, leg length, upper arm length, fore arm length, fat percentage of Handball players of different levels of achievement differed significantly as the obtained 'F' values among the group were  $>$  the required 'F' value at 0.05 level.

It is revealed that there was no significant difference in selected groups of Handball players in relation to hand length, pulse rate, systolic blood pressure, diastolic B.P., vital capacity, resting respiratory rate, maximum breath holding time, air flow rate and cardio vascular efficiency.

Table B revealed that the differences in the means of Inter College and Inter University, Inter College and Inter Zonal and Inter University and Inter Zonal were found significant in standing height. Inter Zonal group proved to be superior as compared to all other groups. Differences in the means of Inter College and Inter University, Inter College and Inter Zonal and Inter University and Inter Zonal were significant in sitting height. The Inter-Zonal group proved to be superior as compared to both the groups. Leg length in the above table reveals that the difference in the means of inter college and Inter Zonal, interuniversity and inter-zonal were found significant, but Inter College and Inter University group was not statistically significant. Inter-Zonal group proved to be superior as compared to other groups. Differences in the means of Inter College and Inter University, Inter College and Inter-Zonal and Inter University and Inter-Zonal groups were significant. Inter-Zonal group proved to be superior as compared to other groups in upper arm length. Differences in the means of Inter College and Inter University, Inter College and Inter-Zonal and Inter University and Inter-Zonal groups were significant in fore arm length. Inter-Zonal group proved to be superior as compared to other groups. Fat Percentage in the above table reveals that the differences in the means of Inter College and Inter University, Inter College and Inter-Zonal and Inter University and Inter Zonal groups were significant. Lower percentage of fat found in Inter-zonal group as compared to the other groups.



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In case of all the selected physiological variables namely resting pulse rate, resting blood pressure (both, systolic and diastolic), vital capacity resting respiratory rate, maximum breath holding time, air flow rate and cardiovascular efficiency, no significant difference existed between the means of Inter College, Inter University and Inter-Zone Handball players. All the groups proved to be equal. This might be attributed to the fact that change in the physiological variables depends on the training age of the individual. The subjects of the present study were having the same age group i.e. 18-25 years. They were having more or less training age in all the three selected groups. This categorization is only on the basis of performance, technical level and fitness level.

## CONCLUSIONS

1. Variability exists among the male Handball players of different groups with respect to their standing height, sitting height, leg length, upper arm length, fore arm length and total body fat percentage.
2. Variability does not exist among the male Handball players of different groups with respect to their Hand length.
3. The observed sequence of performance in standing height, sitting height, leg length, upper arm length, forearm length and total body fat is Inter Zone>Inter University>Inter College.
4. Variability does not exist among the male Handball players of different groups with respect to their selected Physiological Variables i.e. Resting Pulse Rate, Resting Systolic Blood Pressure, Diastolic Blood Pressure, Vital Capacity, Resting Respiratory Rate, Maximum Breathe Holding Time, Air-flow Rate and Cardio-Vascular Efficiency.

## REFERENCES

1. Bangsbo J. The physiology of Handball - with special reference to intense intermittent exercise. Acta Physiol Scand 1994; 151:S619.
2. Bangsbo J, Nørregaard L, Thorsøe F. Activity profile of competition Handball. Can J Sport Sci 1991; 16:110-6.



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3. Bell, W., & Rhodes, G. The morphological Characteristics of the association Handball player. *British Journal of Sports Medicine* 1975. 9, 196-200.
4. Chin, M. K., So, R. C. H., Yuan, Y. W. Y., Li, R. C. T., & Wong, A. S. K. Cardio respiratory fitness and isokinetic muscle strength of elite Asian junior Handball Players. *Journal of Sports Medicine and Physical Fitness* 1994, 34, 250-257.
5. Dey Atindra nath. Study of Anthropometric Measurement and Body Composition of High and Low Cardio-respiratory Fitness Boys. Unpublished Ph.D. Thesis, Jiwaji University, Gwalior, 1985.
6. Helgerud J, Engen LC, Wisloff U, et al. Aerobic endurance training improves Handball performance. *Med Sci Sports Exerc* 2001; 11:1925–31.
7. Malina, R. M. Physical anthropology. In T.G., Lohman, A.F., Roche, & R., Martorell (Eds), *Anthropometric Standardization Reference Manual*. Champaign, IL: Human Kinetics. 1988; 99-102.
8. Ohashi J, Togari H, Isokawa M, et al. Measuring movement speeds and distances covered during Handball match-play. In: Reilly T, Lees A, Davids K, et al, eds. *Science and Handball*. London: E & FN Spon, 1988:329–33.
9. Reilly T. Physiological profile of the player. In: Ekblom B, ed. *Handball*. London: Blackwell, 1994:78-95.
10. Reilly, T., & Secher, N. Physiology of sports: an overview. In T., Reilly, N., Secher, P., Snell, & C., 1990.
11. Van Gool D, Van Gerven D, Boutmans J. The physiological load imposed on Handball players during real match-play. In: Reilly T, Lees A, Davids K, et al, eds. *Science and Handball*. London: E & FN Spon, 1988:51–9.
12. Withers RT. Match analyses of Australian professional Handball players. *J Hum Mov Stud* 1982; 8:159–76.