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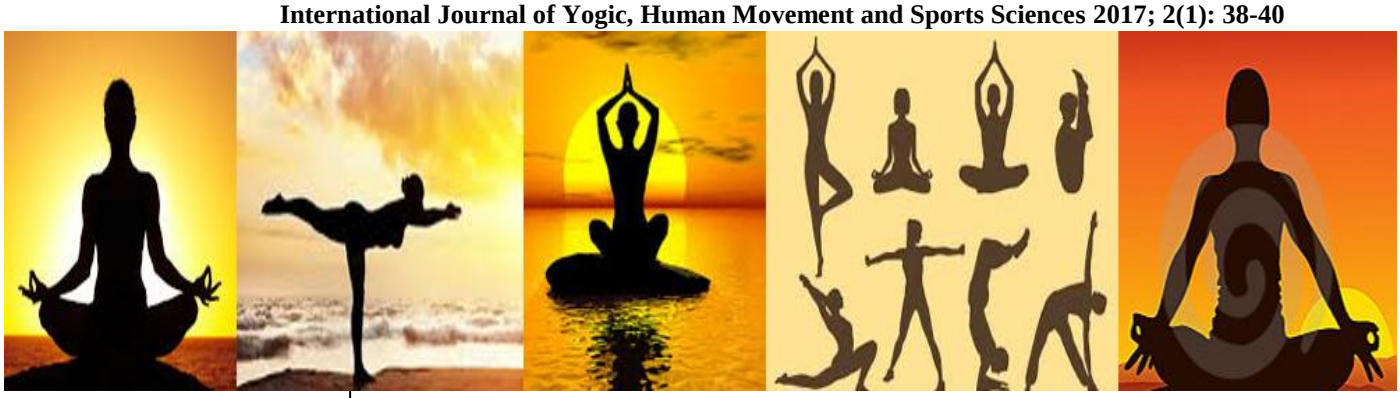

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Comparison of selected anthropometric measurements & body composition between handball players of selected playing positions

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Abstract
The study investigated the difference between forward and defender male handball players related to Anthropometric measurements and Body Composition. The investigation was conducted on 25 forward and 25 defender male handball players from University of Bilaspur, Bilaspur (CG). The total handball players were selected through random sampling technique. Anthropometric measurements were measured according to Weiner and Laurie (1969) procedure by using standardized tools. Body Composition was calculated by using the formulae of Matiegka (1921) and t test was used to find out significance difference between both groups. The Anthropometric results showed forwards were taller as compared to defenders. Defenders have greater diameters and more circumferences but in case of skin folds, forwards have possessed greater supra illiac skin folds as compared to defenders. In the case of body composition defenders possessed greater bone mass and fat percentage as compared to forwards, where as forward possess greater muscle mass as compare to defenders handball players.

Keywords: Anthropometry, body composition, handball players

Introduction
Sport is all forms of competitive physical activity which, through casual or organised participation, aim to use, maintain or improve physical ability and provide entertainment to participants. Hundreds of sports exist, from those requiring only two participants, through to those with hundreds of simultaneous participants, either in teams or competing as individuals. Handball is usually played indoors, but outdoor variants exist in the forms of field handball. The game is quite fast and includes body contact, as the defenders try to stop the attackers from approaching the goal. Contact is allowed only when the defensive player is completely in front of the offensive player; i.e., between the offensive player and the goal. Any contact from the side or especially from behind is considered dangerous and is usually met with penalties. When a defender successfully stops an attacking player (who loses the ball over a line), the play is stopped and restarted by the attacking team from the spot of the infraction or on the 6-metre line.

Body composition make an important contribution to an individual's level of physical fitness, performance that require one to carry one's body weight over distance will be facilitated by a large proportion of active tissue (muscles) in relation to a small proportion of inactive tissue (fat).

Anthropometric measurements used for adults usually include height, weight, body mass index (BMI), waist-to-hip ratio, and percentage of body fat. These measures are then compared to reference standards to assess weight status and the risk for various diseases. Anthropometric measurements require precise measuring techniques to be valid.

The use of accurate and reliable measurement tools to study both height & limb proportion (length, circumference, depth and girth), is a key component in anthropometrical measurement. Fitness Assist provides professional grade measurement tools, many of which meet medical/clinical requirement standards, that will provide years of repeated use and inspire confidence in the knowledge that you and your students/clients are utilising the very best equipment available.

Aim

The aim of the study was to compare the selected anthropometric measurements and body composition of handball player in relation to their playing positions.

Methodology

For the purpose of the study fifty handball players were selected in which twenty five forwards and twenty five defenders were selected from both groups through random sampling technique from Bilaspur University, Bilaspur (CG), their age ranged from 18 to 30 years were divided into their playing positions i.e. forwards and defenders. The variables selected for the study were Standing Height, Ankle Diameter, Forearm Circumference, Triceps Skin fold, and Supra iliac Skin folds and body compositions.

Results: - Anthropometric measurements

Table 1: Comparison of Height between Forward and Defender male Handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	171.60	6.27	48	1.70	p>.05=2.02
Defenders	25	171.24	7.04			

Table 1 show the comparison of height between Forward and Defender male handball players. The mean values of height of Forward and Defender male handball players were 171.60 and 171.24 (cms), respectively. The statistical results were found to be insignificant (t=1.70).

Table 2: Comparison of Ankle diameter between forward and defender male handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	6.43	0.60	48	1.39	p>.05=2-02
Defenders	25	6.54	0.39			

Table 2 show the comparison of Ankle diameter between forward and defender male handball players. The mean values of Ankle diameter of forward and defender male handball players were found to be 6.43 and 6.54 (cms) respectively. The statistically result was found to be insignificant (t=1.39).

Table 3: Comparison of Fore Arm Circumference between Forward and Defender male Handball players

Group	N	Mean	SD	df	t- value	
Forwards	25	25.01	1.78	48	0.24	p>.05=2.02
Defenders	25	25.14	5.88			

Table 3 show the comparison of Fore Arm Circumference between forward and defender male handball players. The mean values of Fore Arm Circumference of Forward and Defender male handball players were found to be 25.01 and 25.14 (cms), respectively. The statistically result was found to be insignificant (t=0.24).

Table 4: Comparison of Triceps Skinfold between Forward and Defender male Handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	4.81	1.54	48	2.78**	P<.02=2.70
Defenders	25	5.76	1.77			

Table 4 show the comparison of triceps skinfold between forward and defender male handball players. The mean values of Forward and Defender male handball players were found to be 4.81 and 5.76 (mm), respectively. The statistically result were found to be significant (t=2.78).

Table 5: Comparison of Suprailiac Skinfold between Forward and Defender male Handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	4.56	1.18	48	0.06	p>.05=2.02
Defenders	25	4.53	1.16			

Table 5 show the comparison of Suprailiac skinfold between forward and defender male handball players. The mean values of suprailiac skinfold of forward and defender male handball players were found to be 4.56 and 4.53 (mm), respectively. The statistically result was found to be insignificant (t=0.06).

Results Pertaining to Body Composition

Table 6: Comparison of Bone Mass between Forward and Defender male Handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	3.23	0.37	48	2.82	**p>.05=2.02
Defenders	25	3.36	0.24			

Table 6 show the comparison of bone mass between forward and defender male handball players. The mean values of bone mass of forward and defender male handball players were found to be 3.23 and 3.36 respectively. The statistically result was found to be insignificant at. 05 level (t=2.02).

Table 7: Comparison of Muscle Mass between Forward and Defender male Handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	30.35	4.92	48	2.04*	*p>.05=2.02
Defenders	25	31.17	3.81			

Table 7 show the comparison of Muscle mass between forward and defender male handball players. The mean values of Musclemass of forward and defender male handball players were found to be 30.35 and 31.17 respectively. The statistically result was found to be significant at. 05 level (t=2.04). The result indicated that defenders have possessed greater Musclemass as compared to Forwards.

Table 8: Comparison of Fat percentage between Forward and Defender male Handball players

Group	N	Mean	SD	df	t-value	
Forwards	25	12.40	2.10	48	4.03*	**p>.05=2.02
Defenders	25	14.22	2.37			

Table 8 show the comparison of fat percentage between forward and defender male handball players. The mean values of fat percentage of forward and defender male handball players were found to be 12.40 and 14.22 respectively. The statistically result was found insignificant at.05 level (t=4.03)

Conclusions

The present study shows selected anthropometric measurements and the body composition with respect to playing position of handball players.

1. Forwards have found taller as compare to defenders.
2. Defenders have greater ankle diameters and forearm and triceps circumferences but in case of suprailliac skin folds, defenders have possessed greater skinfolds as compared to forwards.

3. In the case of body composition defenders have possessed greater bone mass and fat percentage as compared to forwards where as forward possess greater muscle mass as compare to defenders handball players.

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