

Bio-cultural Aspects of the Meitei Women Football Players of Manipur

H. Sorojini Devi¹ and K. Saratchandra Singh²

D.M. College of Science, Imphal 795 001, Manipur, India

E-mail: drsorojini_dmc@rediffmail.com

**Department of Anthropology, Manipur University, Canchipur, Imphal 795 003, Manipur, India*

E-mail: sarat_kon@rediffmail.com

KEYWORDS Biology. Anthropometry. Female Football Players. Socio-economic Status

ABSTRACT This paper attempts to study the bio-cultural aspects of the Meitei women football players of Manipur based on 27 anthropometric variables and some socio-economic parameters from a total of 138 women of whom 38 individuals are regular playing football players of state to international level, while the rest 100 were the non-athlete controlled group. A trend of higher number of players from the bigger family size groups and moreover, maximum of them being belonged to the lowest income group have been observed. The football players have significantly broader bi-trochanteric, bi-iliocristale breadths and much larger girths of neck, upper arm, fore arm, thigh and calf, and also lean body mass than the controlled group. Discussions have been made on the football players in the light of their physical structure, exercise, and the socio-cultural background of the Meitei society.

INTRODUCTION

The impact of culture as a determinant of support for participation of women in the field of games and sports has been increasing. The women of the contemporary modern societies are taking more opportunity to participate in the high level competitive national and international games than those in which cultural believes in many countries continue to limit the role of women. The games and sports are held normally for the purpose of diplomacy, fraternity, cultural awareness, health consciousness and for personal prestige. The performance of an athlete has become important due to various national, international and Olympic games. It is reported that in every sports events, top level performers require a particular body size and shape, while other aspects being similar (de Garay et al., 1974). However, the skill, practice, motivation, cultural value, socio-economy and other environmental factors are also being considered as supporting factors for better performance.

Post independence India has witnessed the Manipuri girls participating in games and sports of various events at the state, national and even at international level. In football particularly, the Meitei women team of Manipur have won 10 times and 2 times runnersup out of 12 national football championships held in different parts of India and these have shown excellent performance. More than 20 players, so far, have

been qualified as international players. Profuse sports and cultural activities may be witnessed in every locality and villages during the 5 days of Doljatra festival, which may be regarded as a testimony for the Manipuris' keen interest in both sports and culture. Such sports events are now even extended among some groups of the tribals of Manipur, especially during Christmas.

Many sports Scientists studied among the national and international football players. Wiley (1963), from among the football players and non-athletes of 12 years has shown that the two groups did not differ in mean somatotypes but only that the players were taller and heavier than the non-athletes. Gray's (1936) study among the 1179 football players in relation to the field positions in which they played, observed that both height and body weight increases in successive positions from the centers to the guards but only with the exception that the tackles being slightly heavier than guards by only a margin of 1.1kg. Heat (1963) also rated 66 university footballers and as per his estimation, it has been suggested that the players were endomorphic and even mesomorphic but less ectomorphic than the college students. Sodhi and Sidhu (1984) found among the Indian national football players played in various positions that they were shorter than the stoppers and goal keepers. No data on the women football players could be obtained at the moment. The present study envisages for understanding how far socio-

economy and or physical structure may influence the performance of the athletes.

MATERIAL AND METHODS

For the present study, a total sample of 38 Meitei women football players and another 100 non- athlete women individuals, who have at least attained 18 years of age were collected. Majority of the football players (71.05%) were national and international level players, while the rest (28.95%) were state level players. The data of the athletes were collected from different playgrounds of the Imphal east and Imphal west districts, and the data of the non- athletes were collected from the 4 valley districts of Manipur, namely Imphal East, Imphal West, Thoubal and Bishnupur districts during the field works conducted in the year 1995. Some of the players belonged to 32 years. No consideration in respect of the player's field position in which they play had been made as they claimed that they could play in any position as the situation demands.

Information on age, family size and monthly family income of the subjects were collected by using questionnaire proforma. The family income so collected has been assessed and necessary devaluation has been converted into 1995 rate, following Prosad's classification (1970). The social classes according to Prosad are - class I (professional workers of high status, well to do trading and agricultural class), class II (professional workers, intermediate trading and agricultural class), class III (service class like clerical workers, small traders and agriculturists), class IV (skill artisan and analogous workers etc.) and class V (petty agriculturists, labourers and other unskill workers).

A total of 27 anthropometric measurements (Table 3) have been collected, following the norms of Weiner and Lourie (1969). Out of the 27 anthropometric measurements, 16 parameters (Table 4) which are closely related with the bio-mechanical factors as per Carter (1982) have been considered for calculating Z values (proportionality value). The Z values of the above 16 variables of each individual have been computed by Z score formula of the Phantom Stratagem method (Ross and Wilson, 1974), and revised by Ross and Ward (1982). From the skinfold measurements, fat percent has been calculated using the equation of Slaughter et al. (1988). From this fat percent, the total body fat

and lean body mass have also been assessed for each individual.

Statistical constants such as mean ($\bar{X}$) and its standard error (SE), and standard deviation (SD) of each variable have been calculated. t-test has been applied for bi-variate comparisons.

RESULTS AND DISCUSSION

It has been observed from table 1 that maximum number of women football players of Manipur belonged to the families having 8 members (31.58 %), while maximum of the controlled group belonged to the families of 7 members (26.0%). When the frequency percentages of the different family sizes have been regrouped only into two, it has evident that at least 63.15% of the athletes are belonged to the family size having 8 members and above, but in case of the non-athletes, only 43.0% belonged to the said family size group. Statistically, the distribution of the players and non-athletes in respect of their family size groups are significantly different ($\chi^2 = 4.06$, $p < 0.05$, $df = 1$).

Table 2 has shown that maximum number of the players (57.89%) and non-athletes (58.0%) as well, are belonged to the social class IV. The next higher number of the players are represented from class V with 21.4% and for the non- athletes in class III with 22.0%. Still, when the frequencies of the class IV and V are combined together, the number of the players have been

Table 1: Frequency percentage distribution of the family size of the players and controlled group

S. No.	Family size	Players (n = 38)		Controlled group (n = 100)		Total	
		f	p.c.	f	p.c.	f	p.c.
1	3	1	2.63	2	2.00	3	2.17
2	4	2	5.26	3	3.00	5	3.62
3	5	1	2.63	8	8.00	9	6.52
4	6	6	15.79	17	17.00	23	16.67
5	7	4	10.53	26	26.00	30	21.74
6	8	12	31.58	21	21.00	33	23.91
7	9	4	10.53	9	9.00	13	9.42
8	10	2	5.26	5	5.00	7	5.07
9	11	3	7.89	3	3.00	6	4.35
10	12	2	5.26	5	5.00	7	5.07
11	13+	1	2.63	1	1.00	2	1.46
Total		38	99.99	100	100.00	138	100.00

$\chi^2 = 4.06$, $P < 0.05$, $df = 1$

Note: For calculating χ^2 value two groups of family sizes, say 3-7 and 8-13+ have been grouped together.

found approximately higher than that of the non-athletes, being 78.94% and 75.0% respectively. Statistically, no significant difference has been shown between the players and non-athletes in respect of per – capita monthly income ($\chi^2 = 0.24$, $p > 0.05$, $df = 1$).

Among the 27 anthropometric parameters

considered for the present study, homogenous distributions have been observed in as much as 20 linear and dimensional body measurements including stature, upper and lower limb measurements and also the three skinfold measurements between the players and the controlled group (Table 3). It may be pointed out

Table 2: Frequency percentage distribution of the per capita monthly income of the families in which the players and the controlled group belonged

Family occupation	Per Capita income	Players (n = 38)		Controlled group (n = 100)		Total	
		f	%	f	%	f	%
Social Class I	Rs. 2790 /- and above	-	-	-	-	-	-
Social Class II	Rs. 1390 – 2789 /-	1	2.63	3	3.00	4	2.90
Social Class III	Rs. 650 – 1389 /-	7	18.42	22	22.00	29	21.01
Social Class IV	Rs. 280 – 649 /-	22	57.89	58	58.00	80	57.98
Social Class V	Below – Rs. 280 /-	8	21.05	17	17.00	25	18.12
Total		38	99.99	100	100.00	138	100.00

$\chi^2 = 0.24$, $P > 0.05$, $d.f = 1$

Note: For calculating χ^2 value two groups of social classes, say class II-III, and class IV-V have been grouped together.

Table 3: Distribution of mean ($\bar{X}$), standard error of mean (se), standard deviation (sd) and t-values for anthropometric variables of the players and the controlled group

S. . No.	Variable (cm)	Players (n=38)			Controlled Group (n=100)			t-value
		$\bar{X}$	S.E. $\bar{X}$	S.D	$\bar{X}$	S.E. $\bar{X}$	S.D	
1	Body weight (kg)	49.87	0.92	5.66	47.86	0.56	5.63	1.86
2	Stature	153.84	0.65	3.89	153.94	0.46	4.61	-0.12
3	Sitting height vertex	78.61	0.35	2.17	77.97	0.23	2.30	1.53
4	Height acromion	125.29	0.56	3.48	124.98	0.39	3.88	0.45
5	Height iliocristale	90.44	0.63	3.89	90.62	0.37	3.74	-0.24
6	Trunk length	52.07	0.33	2.05	51.90	0.23	2.30	0.41
7	Height tibiale	38.75	0.28	1.73	39.13	0.17	1.66	-1.17
8	Arm length without hand	52.21	0.41	2.53	52.13	0.18	1.75	0.18
9	Upper arm length	28.59	0.24	1.46	28.92	0.11	1.12	-1.25
10	Fore arm length	23.11	0.16	0.96	23.16	0.09	0.88	-0.29
11	Hand length	17.07	0.12	0.74	17.12	0.06	0.57	-0.41
12	Thigh Length	36.83	0.22	1.36	37.01	0.16	0.56	-0.67
13	Lower leg length	34.39	0.19	1.20	34.54	0.15	0.49	-0.61
14	Leg length without foot	71.05	0.35	2.15	71.16	0.34	3.36	-0.21
15	Hand breadth	7.00	0.06	0.37	6.32	0.04	0.38	1.15
16	Bi-acromial breadth	34.74	0.23	1.40	34.66	0.13	1.34	0.29
17	Bi-trochanteric breadth	31.19	0.19	1.16	30.57	0.13	1.27	2.76*
18	Bi-iliocristale breadth	27.06	0.31	1.92	26.35	0.16	1.57	2.05*
19	Chest girth	81.37	0.55	3.39	81.53	0.54	5.41	-0.22
20	Neck girth	30.89	0.21	1.32	29.90	0.13	1.28	3.98**
21	Upper arm girth	25.11	0.29	1.76	24.05	0.21	2.09	2.99**
22	Fore arm girth	22.32	0.19	1.18	21.77	0.16	1.55	2.25*
23	Thigh girth	52.89	0.44	2.71	46.72	0.31	3.09	11.48**
24	Calf girth	33.37	0.29	1.79	30.81	0.18	1.79	7.48**
25	Bicep skinfold (mm)	4.74	0.23	1.30	5.14	0.14	1.36	-1.52
26	Tricep skinfold (mm)	11.59	0.47	2.91	12.16	0.31	3.05	-1.02
27	Sub-scapular skinfold (mm)	12.45	0.57	3.51	13.29	0.36	3.63	-1.25

Note: * $p < 0.05$ ** $p < 0.01$

that the stature of both the players and non-athletes belonged to medium stature with respective mean values of 153.84 cm and 153.94 cm. In all the remaining 7 measurements which includes 2 breadth measurements viz, bi-trochanteric and bi-iliocristale breadths and 5 girth measurements (neck, upper arm, fore arm, thigh and calf) the players have higher readings than those of the non-athlete subjects. As an exception, the non-athletes, on the other hand, show slightly higher mean values in all the 3 skinfold measurements, i.e., bicep, tricep and sub-scapular. Statistically, significant differences have been found in all the above 7 measurements i.e., 2 breadth and 5 girth measurements at different levels (Table 3; Fig. 1, 2).

From the distribution of the mean and t-values of body proportions or Z values of the 16 variables, quite a homogenous body proportion type has been observed between the players and the non-athletes in at least 10 variables (Table 4). Statistically, significant differences have been observed in 6 variables such as bi-iliocristale breadth, sitting height vertex and 4 measurements of upper arm girth, fore arm girth, thigh girth and calf girth (Table 4).

On evaluating the body composition components (Table 5) such as fat percent, total body fat and lean body mass, the non-athletes show slightly higher mean values in respect of fat percent (22.51%) and the total body fat (10.90

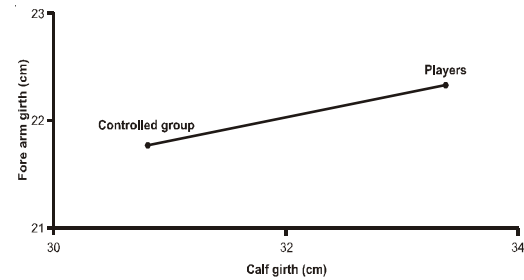


Fig. 1. Relationship between forearm girth and calf girth of the players and controlled group

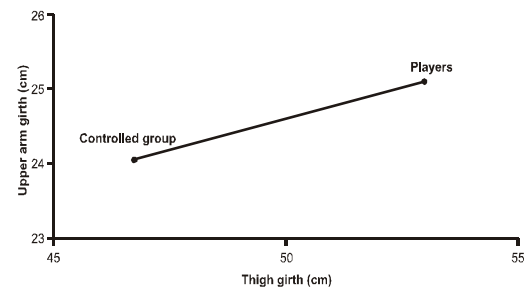


Fig. 2. Relationship between upper arm girth and thigh girth of the players and controlled group

kg) than the football players, who have respective values of 21.59% and 10.84 kg. In contrast, the football players have higher mean value in lean body mass (39.03kg.) than the non-athletes (36.96kg). Statistically significant difference has been found between the athletes and non-athletes

Table 4: Distribution of mean (X), standard error of mean (se), standard deviation (sd) and t-value for body proportional variables (z values) of the players and the controlled group

S. No.	Variable	Players (n=38)			Controlled Group (n=100)			t-value
		X	S.E. X	S.D	X	S.E. X	S.D	
1	Body weight	0.34	0.14	0.84	0.02	0.09	0.91	1.95
2	Sitting height vertex	-0.66	0.05	0.33	-0.82	0.04	0.38	2.56*
3	Upper arm length	-0.51	0.12	0.75	-0.31	0.06	0.64	1.45
4	Fore arm length	0.73	0.11	0.66	0.76	0.06	0.55	0.27
5	Hand length	0.04	0.12	0.75	0.10	0.08	0.76	0.47
6	Thigh length	2.50	0.11	0.65	2.58	0.05	0.53	-0.65
7	Lower leg length	-2.65	0.06	0.38	-2.58	0.05	0.50	0.70
8	Bi-trochanteric breadth	0.20	0.11	0.68	0.15	0.07	1.72	0.39
9	Bi-iliocristale breadth	0.63	0.19	1.18	0.18	0.10	0.04	2.11*
10	Chest girth	0.42	0.11	0.68	0.45	0.12	1.22	0.20
11	Upper arm girth	0.38	0.13	0.81	-0.12	0.10	1.03	3.00**
12	Fore arm girth	-0.31	0.14	0.87	-0.75	0.12	1.22	2.36*
13	Thigh girth	0.64	0.11	0.66	-0.98	0.08	0.80	12.13**
14	Calf girth	0.73	0.14	0.87	-0.51	0.08	0.84	7.56**
15	Tricep skinfold	-0.58	0.11	0.70	-0.44	0.07	0.75	1.04
16	Sub-scapular skinfold	-0.68	0.12	0.75	-0.49	0.08	0.79	1.27

*p<0.05

**p<0.01

Table 5: Distribution of mean ($\bar{X}$), standard error of mean (se), standard deviation (sd) and t-values for body composition of the players and the controlled group

S. No.	Variable	Players (n =38)			Controlled Group (n =100)			t-value
		$\bar{X}$	S.E. $\bar{X}$	S.D	$\bar{X}$	S.E. $\bar{X}$	S.D	
1	Fat percent	21.59	0.59	3.63	22.51	0.40	3.96	1.29
2	Total body fat (kg)	10.84	0.43	2.65	10.90	0.29	2.86	0.10
3	Lean body mass (kg)	39.03	0.65	4.04	36.96	0.36	3.60	2.76**

**p<0.01

in lean body mass (t=2.76, P<0.05) but not in fat percent and total body fat.

SUMMARY AND CONCLUSION

Several studies have suggested that top level performers, besides, the skill, practice, motivation, cultural value, socio-economy and other environmental factors, require a particular body size and shape. The present paper on the bio-cultural study of the 38 Meitei women football players of state, national and international level and 100 controlled group of Manipur, based on 27 anthropometric variables inclusive of 3 skinfold measurements, reports for the first time, on women football players, specially of India. Winning 10 times, out of 12 national women football championships and 2 times as runners up by Manipur women team has been a point of special consideration for the study.

With 21.82 years mean age of the players, a few players continued to play the game till they attain 32 years of age (Devi, 2002). At large, the football players with 153.84 cm as mean stature show quite similar features in linear and limb measurements with the controlled group who also have a mean stature of 153.94 cm, except that of the former have significantly larger bi-trochanteric and bi-iliocristale breadths and of neck, upper arm girth, fore arm girth and thigh and calf girth measurements. Moreover, the players too show larger proportions or mean Z values in the same above 4 limb girth measurements, bi-iliocristale breadths and lean body mass, than the controlled group and the differences are significant.

Having with structurally larger physical features and body proportions, specially, of upper arm, fore arm, thigh and calf girth measurements, bi-trochanteric and bi-iliocristale breadths and heavier body weight from the non athletes, when many other linear and limb measurements are found to be similar between the two groups of

the Meitei women sample, may be due to the course of development which took place after the long term regular and rigorous physical exercise and nutritional intake pattern among the players. Such larger dimensional body breadths, girth circumferences and heavier body weight among the players should be advantageous factor in playing football.

In fact, it has earlier stated that the football players have taller stature and heavier body weight (Wiley, 1963) and also the larger thigh and calf girth measurements (Sharma and Shukla, 1990) than the non-athletes. Taller goal keepers than the other field position players (Sodhi and Sidhu, 1984) has also been observed by Devi (2002) from among the same group of players.

Drawing of athlete and the non-athlete samples in bigger size comparatively from the larger families and also from the lower social class status families, may be in consonant with the general socio-demographic and economic background of the population of the state which belonged to the lower per capita income of Rs 12,228/- against Rs 17,530/- for all India (Finance Department, Govt. of Manipur, 2002). The trend of producing more athletes of team games such as football, hockey and basketball etc. not from the higher social class groups have also been observed even in western societies (Roy and Uday, 1996).

Apart from all, encouragement and the apparent socio-cultural sanction of the women in games and sports like in the field of arts and culture, seems to have contributed profoundly in enhancing sports pursuits of the Meitei women.

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