

A COMPARATIVE STUDY ON SOME SELECTED MOTOR PERFORMANCE, ANTHROPOMETRY AND BODY COMPOSITION VARIABLES AMONG *KATTHAK* DANCERS, ATHLETES AND SEDENTARY FEMALEES

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ABSTRACT: Games and sports are mainly used in physical education programs. In many countries dance has been included also as a physical education activity. In our county this is not yet done. Indian classical dances provide vigorous movements in addition to gracefulness and rhythm. By regular participating and practicing classical dances are aerobic activities some changes happens in some body composition variable. Among motor performance variables hand reaction time, foot reaction time and speed of movement and among anthropometry and body composition variables like Standing height, Body weight, Lean body mass, Body density and Percentage of body fat were taken into consideration for the present study. Present study was planned to study are analyze the selected anthropometry and body composition variables of female *Katthak* dancers and compare them with those of the athletes and sedentaryfemales.

Twenty-five *Katthak* dancers, twenty-five athletes and twenty-five sedentary females were selected as subjects for the present study. The subjects of all the groups were within the age ranged from 16 to 19 years. The mean heights of subjects were 154.77 cm for Dance group, 163.95 cm for athlete group and 152.10 cm for sedentary group. Mean body weights of the subjects were 47.325 kg for dance group, 46.150 kg for athlete and 45.825 kg for sedentary group.

According to the results of the study the athlete group was significantly better in standing height, lean body mass and percentage of body fat than the dance group and sedentary group. On the other hand the dance group was found little bit higher in body weight than athletic and sedentary group. In case of motor performance variables, dance group was better in hand and foot reaction time. So Indian classical dance –*Katthak* might be effective to reduce fat, for better concentration, reaction time and make someone fit.

Key words: Lean body mass, Percentage of body fat, Concentration, Reaction Time, *Katthak* Dance.

INTRODUCTION

Physical education activities are big muscular activities. Games and sports are mainly used in physical education programs. In many countries dance has been included also as a physical education activity. In our county this is not yet done. Indian classical dances provide vigorous movements in addition to gracefulness and rhythm [1-3]. A few attempts have been made to study the exercise value of some forms of Indian classical dance. But many more of such attempts are required to unveil the nature of such forms of movement activities before their formal inclusion in the physical education program.

By regular participating and practicing classical dances are aerobic activities some changes happens in some body composition variables [1-5]. They include motor performance variables like hand reaction time, foot reaction time and speed of movement and among anthropometry and body composition variables like Standing height, Body weight, Lean body mass, Body density and Percentage of body fat. Present study was planned to study are analyze the selected anthropometry and body composition variables of female *Katthak* dancers and compare them with those of the athletes and sedentary females.

METHODOLOGY

Twenty-five *Katthak* dancers, twenty-five athletes and twenty-five sedentary females were selected as subjects for the present study. The subjects of all the groups were within the age ranged from 16 to 19 years. The mean heights of subjects were $154.77 + 4.87$ cm for Dance group, $163.95 + 6.97$ cm for athlete group and $152.10 + 4.48$ cm for sedentary group. Mean body weights of the subjects were $47.325 + 7.770$ kg for dance group, $46.150 + 6.177$ kg for athlete and $45.825 + 6.991$ kg for sedentary group.

The selected anthropometry and body composition variables for the present investigation, were Standing height, Body weight, Lean body mass, Body density and Percentage of body fat.

The Standing height was measured by standard anthrop metre, Body weight by digital owing machine, Lean body mass by Lohman. T.G., Boilcan R. A., Mossey. B. H. (1975), Body density was found out by using formula given by Durin (1975) and Percentage of body fat by Siri (1956). Among motor performance variables hand reaction was measured by Nelson hand reaction test, foot reaction time by Nelson foot reaction test and speed of movement by Nelson speed of movement test.

The data were analyzed for mean and standard deviation. The significance of inter group mean difference was judged by Analysis of Variance and the exact location of the mean difference was identified by post hoc test.

RESULTS AND DISCUSSION

The mean values and standard deviation and range of different Anthropometry and Body composition variables of different groups of subjects have been presented in Table-1.

Table – 1

Mean, SD and Range of Different Anthropometry and Body composition variables.

| Sl. No. | Parameter | | Group | | |
|---------|-----------------------|-------|-----------|-----------|-----------|
| | | | Dance | Athlete | Sedentary |
| 1. | Standing Height (cm.) | Mean | 154.77500 | 163.09500 | 152.10000 |
| | | S. D. | 4.87603 | 6.9791 | 4.48850 |
| | | Range | 16.50000 | 24.5000 | 20.00000 |
| 2. | Body Weight (K G) | Mean | 47.32500 | 46.15000 | 45.82500 |
| | | S. D. | 7.77018 | 6.17742 | 6.99111 |
| | | Range | 23.00000 | 27.50000 | 24.00000 |
| 3. | Lean Body Mass (KG) | Mean | 24.53350 | 37.03250 | 33.22820 |
| | | S. D. | 7.35203 | 5.03516 | 3.630470 |
| | | Range | 26.54000 | 22.04500 | 11.750000 |
| 4. | Body | Mean | 1.0423 | 1.05730 | 1.042300 |

| | | | | | |
|----|------------------------|-------|---------|----------|-----------|
| | Density (grams/cc) | S. D. | 0.0090 | 0.00546 | 0.009000 |
| | | Range | | | |
| 5. | Percentage of Body Fat | Mean | 24.9474 | 18.18590 | 24.947400 |
| | | S. D. | 4.2325 | 2.48934 | 4.232500 |
| | | Range | 14.1500 | 8.87800 | 14.10000 |

It is seen from the mean values presented in above table that different groups of subjects had different scores. In standing height the athlete group had highest mean value but the other two groups were almost similar. In body weight the dance group had the highest mean value and again the other two groups were almost similar. In lean body mass the highest value was for athlete group and lowest in dance group. In case of body density all the values for all the groups were almost similar. The athlete group appeared to be the lowest in case of percentage of body fat and other two groups appear to be same value this respect.

The significance of the difference among mean values of different physical fitness parameters was tested by Analysis of Variance. The results have been presented in Table-2

Table – 2
ANOVA for Mean Differences of Different Anthropometry and Body composition variables.

| Sl. No. | Parameters | F- Value | Required values of „F“ to be significant of 0.05 level of freedom. | Remarks |
|---------|------------------------|-----------|--|---------------------------|
| 1. | Standing Height (cm.) | 25.0089** | 3.00 | Significant at 0.01 level |
| 2. | Body Weight (K G) | 0.2535 | 3.00 | Not Significant |
| 3. | Lean Body Mass (KG) | 2.4217 | 3.00 | Not Significant |
| 4. | Percentage of Body Fat | 21.7550** | 3.00 | Significant at 0.01 level |

It is seen from the F-values in above table that the inter group difference in body weight and lean body mass were not statistically significant. In other parameters, the F-values were higher than the required table value and so, the inter group mean differences were statistically significant. In order to identify the exact location of the difference among mean value, the post hoc test was used. The results have been presented in Table-3.

Table-3
LSD of Inter-group differences of Different Anthropometry and Body composition variables.

| Sl no | Variables | LSD difference between means of | | | |
|-------|------------------------|---------------------------------|----------------------------------|--------------------------------|----------|
| | | Dance Group Vs Athlete Group | Athlete Group Vs Sedentary Group | Dance Group Vs Sedentary Group | CD level |
| 1. | Standing Height (cm.) | 183.5** | 237** | 53.5 | 96.665 |
| 2. | Percentage of Body Fat | 135.228** | 135.228** | 0 | 65.098 |

**** Significant at 0.01 level.**

It is seen from the above table values that the significant differences in measurement of standing height was existed between dance and athlete group, athletic and sedentary group. In both the cases the athletic group was higher in measurement of standing high and the dance group was better than sedentary group from this table the significant difference also seen in percentage of body fat was existed between dance and athletic group, athletic and sedentary group. Here also both the cases the athletic group was better in percentage of body fat and the other two groups were equal.

The mean values and standard deviation and range of different motor performance variables of different groups of subjects have been presented in Table-4.

Table – 4
Mean, SD and Range of Different Motor performance variables.

| Sl. No. | Parameters | | Group | | |
|---------|-----------------------|-------|--------|---------|-----------|
| | | | Dance | Athlete | Sedentary |
| 1. | Hand Reaction Time(S) | Mean | 0.1840 | 0.2220 | 0.2090 |
| | | S. D. | 0.0156 | 0.0142 | 0.0121 |
| | | Range | 0.0540 | 0.0450 | 0.0430 |
| 2. | Foot Reaction Time(S) | Mean | 0.2296 | 0.2443 | 0.2567 |
| | | S. D. | 0.0082 | 0.0141 | 0.0176 |
| | | Range | 0.0340 | 0.0430 | 0.0830 |
| 3. | Speed of movement (S) | Mean | 0.2510 | 0.2450 | 0.3004 |
| | | S. D. | 0.0201 | 0.0286 | 0.0272 |
| | | Range | 0.0930 | 0.0890 | 0.1030 |

It is seen from the above table that various groups differed from one another in different parameters. In hand and foot reaction time dance group was better but in case of speed of movement athlete group shows better result, dance group was very close. In order to know whether these differences were statistically significant, inter group differences was computed in various measurements by the method of analysis of variances.

The significance of the difference among mean values of different motor performance variables were tested by Analysis of Variance. The results have been presented in Table-5.

Table – 5
ANOVA for Mean Differences of Different Motor performance variables.

| Sl. No. | Parameters | F- Value | Required values of „F“ to be significant of 0.05 level of freedom. | Remarks |
|---------|-----------------------|-----------|--|---------------------------|
| 1. | Hand Reaction Time(S) | 23.2793** | 3.00 | Significant at 0.01 level |
| 2. | Foot Reaction Time(S) | 19.1100** | 3.00 | Significant at 0.01 level |
| 3. | Speed of movement(S) | 28.5375** | 3.00 | Significant at 0.01 level |

It is seen from the table that the significant difference at 0.01 level was appear in all the parameters.

In order to identify the exact location of the difference among mean value, the post hoc test was used. The results have been presented in Table-6.

Table-6
LSD of Inter-group differences of Different Motor performance variables.

| Sl no | Variables | LSD difference between means of | | | | |
|-------|-----------------------|---------------------------------|----------------------------------|--------------------------------|----------|-----|
| | | Dance Group Vs Athlete Group | Athlete Group Vs Sedentary Group | Dance Group Vs Sedentary Group | CD level | |
| | | | | | .05 | .01 |
| 1. | Hand Reaction Time(S) | 0.757** | 0.246** | 0.511** | .23 | .31 |
| 2. | Foot Reaction Time(S) | 0.294** | 0.249** | 0.543** | .18 | .24 |
| 3. | Speed of movement (S) | 0.117* | 1.114** | 0.997** | .33 | .45 |

* Significant at 0.05 level.

** Significant at 0.01 level.

From the above table it is clearly seen that the significant differences in hand reaction time was existed between all the groups. The dance group was better than other two groups but sedentary group was better than athletic group. In case of foot reaction time significant difference was existed also among all the groups. Here in case of foot reaction time dance group was best but the athletic group was better than sedentary group. In case of speed of movement significant difference was existed between athletic and sedentary group, dance and sedentary group. Here in case of speed of movement athletic group was best and dance group was better than sedentary group.

According to the results of the study the athlete group was significantly better in standing height, lean body mass and percentage of body fat than the dance group and sedentary group. This result might be due to the specific nature of the athletic training. On the other hand the dance group was found little bit higher in body weight than athletic and sedentary group. This might be due to the less practice of dancing activity, less number of subjects in the present study. In case of motor performance variables, dance group was better in hand and foot reaction time. This might be due to the quickest movements and much more concentration in dance activity. It may be concluded that regular practice of Indian classical dance –*Katthak* might be effective to reduce fat, for better concentration, reaction time and make someone fit.

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