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# Anthropometric differences between race walkers and marathon runners: A cross sectional study

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**Abstract:**

The purpose of the present study was to assess anthropometric and body physiological differences in walk racers and marathon runners. Total sixty athletes were selected, further the athletes were divided in to two group i.e. walk racers group (N=30) and marathon runners group (N=30) their aged ranged from 20 to 27 years. The subjects were selected from Punjab, who have participated in either in interuniversity or represented in National. The guidelines issued by International Society for the Advancement of Kinanthropometry (ISAK) were followed for Anthropometric measurements. To test the significant difference of selected physiological and anthropometric variables between walk racer and marathon runners, independent T-test method was employed. The level of significance chosen to test the hypotheses will be 0.05, $P < 0.05$.Statistical significant differences found in certain anthropometric characteristics in walk racers and marathon runner. The results indicate walk racers have greater leg and foot length, have more calf circumferences than marathon runners.

**Keywords:** anthropometric, physiological, marathon runner, walk racer

**Introduction:**

Track and field is the oldest organised activity, having evolved from the most fundamental human actions of running, walking, jumping, and throwing. Athletics has become the most truly international of sports, with competitions taking place in practically every country on the planet. The majority of countries send men's and women's track and field teams to the quadrennial Olympic Games and the recognised World Championships. The European, Commonwealth, African, Pan-American, and Asian championships are among the continental and intercontinental championships held (World Athletics Home Page | World Athletics, 2022).Nikolaidis Pantelis T.

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(2021) examined the physiological and training characteristics in marathon runners with different sport experiences. The results indicated that long-term marathon training might induce adaptations in endurance performance, body composition, and flexibility. A study conducted by Cristobal Sanchez Munoz et al.(2020) on anthropometric features, body structure, and somato type of elite male young runners and exposed while comparing middle distance runners with long distance runners that significant differences were observed in height, weight, relaxed upper arm girth, flexed and tensed upper arm girth, total upper arm area, upper arm muscle area, and thigh muscle area when MDR and LDR were compared. Carter-Thuillier B et al., 2019 compared the anthropometric parameters and fitness of female athletes to those of male athletes. Weight, height, body mass index, lower and upper body power, agility, and endurance were measured in college athletes. It was found that that the female and male athletes' anthropometric traits have varied effects on fitness. Singh et al., 2020, stated that certain anthropometric characteristics are predictor of cycling performance. There is paucity of literature regarding about anthropometric characteristics differences in race walkers and marathon runners. Present study will make easier to note down the various physical traits or anthropometric profiles that would reflect whether a player is capable of competing at the highest level in a certain sport.

**Methods**

**Subjects**

Total sixty (n = 60) athletes were selected. Further the athletes were divided in to two group walk racers group (N=30) and marathon runners group (N=30) their aged ranged from 20 to 27 years. The subjects were selected from Punjab, who have participated in either in interuniversity or represented in National. The guidelines issued by International Society for the Advancement of Kinanthropometry (ISAK) were followed for Anthropometric measurements. The details protocol of the study was informed and the written consent was taken from subjects.

**Measurements**

Stadiometer was used to measure height of the subjects; measurements were recorded to the nearest 1.0 cm. Electronic weighing scale was used to assessed the bodyweight; measurements were recorded to the nearest 0.1 kg. The length of body parts was measured by the anthropometric rod. Harpenden caliper was used to assess the skinfold thickness. The circumference of body parts was assessed by using a flexible measuring tape.

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**Statistical analysis**

To test the significant difference of selected physiological and anthropometric variables between race walks and marathon runners, independent T-test method was employed. The level of significance chosen to test the hypotheses set at 0.05, $P < 0.05$.

**Results:**

***Table- 1: Statistical analysis of anthropometric characteristics of walk racers and marathon runners.***

| Variable | Group | Mean | SD | Std. Error Mean | Std. Error Mean | T Value | Sig. value |
|---|---|---|---|---|---|---|---|
| **Body Weight (kg)** | Walk Racer | 30 | 61.03 | 4.386 | .801 | .363 | .718 |
| | Marathon Runner | 30 | 60.59 | 4.979 | .909 | | |
| **Height (cm)** | Walk Racer | 30 | 172.567 | 6.996 | 1.277 | .697 | .489 |
| | Marathon Runner | 30 | 171.367 | 6.321 | 1.154 | | |
| **Arm Length (cm)** | Walk Racer | 30 | 59.646 | 2.070 | .378 | .197 | .844 |
| | Marathon Runner | 30 | 59.520 | 2.785 | .508 | | |
| **Chest Circumference (cm)** | Walk Racer | 30 | 86.529 | 3.509 | .640 | .281 | .780 |
| | Marathon Runner | 30 | 86.783 | 3.487 | .636 | | |
| **Biceps Circumference (cm)** | Walk Racer | 30 | 28.960 | 2.099 | .383 | 1.396 | .168 |
| | Marathon Runner | 30 | 28.143 | 2.420 | .442 | | |
| **Abdominal Skinfold (mm)** | Walk Racer | 30 | 7.40 | 2.724 | .497 | 1.236 | .221 |
| | Marathon Runner | 30 | 6.60 | 2.268 | .414 | | |
| **Leg Length (cm)** | Walk Racer | 30 | 96.543 | 5.53 | 1.009 | 3.072 | .003 |
| | Marathon Runner | 30 | 92.320 | 5.11 | .933 | | |
| **Gluteal Circumference (cm)** | Walk Racer | 30 | 86.283 | 2.808 | .513 | .144 | .886 |
| | Marathon Runner | 30 | 86.167 | 3.475 | .634 | | |
| **Calf Circumference (cm)** | Walk Racer | 30 | 35.00 | 1.819 | .332 | 3.312 | .002 |
| | Marathon Runner | 30 | 33.42 | 1.880 | .343 | | |
| **Thigh Circumference** | Walk Racer | 30 | 50.633 | 2.52 | .461 | 1.893 | .063 |
| | Marathon Runner | 30 | 49.445 | 2.33 | .425 | | |

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Foot Length (cm)** | Walk Racer | 30 | 25.916 | .694 | .127 | 3.246 | .002 |
| | Marathon Runner | 30 | 26.517 | .736 | .134 | | |

The body weight of walk racers and marathon runners are given intable-1. The average body weight of walk racers and marathon runners was 61.03 and 60.59 respectively. The standard deviation of values of body weight of walk racers and marathon runners was 4.386 and 4.979. The walk racers and marathon runners were not differed significantly in body weight (t=.363, p>0.05).The average height of walk racers and marathon runners are 172.567and 171.367 respectively. The standard deviation values of height of walk racers and marathon runners are 6.996 and 6.321 respectively. The walk racers and marathon runners were not differed significantly in height (t=.697, p>0.05).The average arm length of walk racers and marathon runners was 59.646 and 59.520 respectively. The standard deviation value of arm length of walk racers and marathon runners was 2.070 and 2.785 respectively. The walk racers and marathon runners were not differed significantly in arm length (t=.197, p>0.05).The average chest circumference of walk racers and marathon runners was 86.529 and 86.783 respectively. The standard deviation value of chest circumference of walk racers and marathon runners was 3.487 and 3.509 respectively. The walk racers and marathon runners were not differed significantly in chest circumference (t=.281, p>0.05).The average bicep circumference of walk racers and marathon runners was 28.960 and 28.143 respectively. The standard deviation value of bicep circumference of walk racers and marathon runners was 2.099 and 2.420 respectively. The walk racers and marathon runners were not differed significantly in bicep circumference (t=1.396, p>0.05).The average abdominal skinfold of walk racers and marathon runners was 7.40 and 6.60 respectively. The standard deviation value of abdominal skinfold of walk racers and marathon runners was 2.724 and 2.268 respectively. The walk racers and marathon runners were not differed significantly in abdominal skinfold (t=1.236, p>0.05).The average leg length of walk racers and marathon runners was 96.543 and 92.320 respectively. The standard deviation value of leg length of walk racers and marathon runners was 5.53 and 5.11 respectively. The walk racers and marathon runners were differed significantly in leg length(t=3.072, p<0.05).The average gluteal circumference of walk racers and marathon runners was 86.283 and 86.167 respectively. The standard deviation value of gluteal circumference of walk racers and marathon

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runners was 2.808 and 3.475 respectively. The walk racers and marathon runners were not differed significantly in gluteal circumference (t=.144, p>0.05).The average calf circumference of walk racers and marathon runners was 35.00 and 33.42 respectively. The standard deviation value of calf circumference of walk racers and marathon runners was 1.819 and 1.880 respectively. The walk racers and marathon runners were differed significantly in calf circumference(t= 3.312, p<0.05).The average thigh circumference of walk racers and marathon runners was 50.633 and 49.445 respectively. The standard deviation value of thigh circumference of walk racers and marathon runners was 2.52 and 2.33 respectively. The walk racers and marathon runners were not differed significantly in thigh circumference(t=1.893, p>0.05).The average foot length of walk racers and marathon runners was 25.916 and 26.517 respectively. The standard deviation values of foot length of walk racers and marathon runners was .694 and .736 respectively. The walk racers and marathon runners were differed significantly in foot length(t=-3.246, p<0.05).

**Discussion and Conclusion**

The purpose of the study was investigated anthropometric difference in walk racers and marathon runners. This study is imperative for physical educationist and trainer who are engaging in nurturing young potentials for upcoming competition. There are statistical significant differences found in certain anthropometric characteristics betweenwalk racers and marathon runner. The results indicate walk racers have greater leg and foot length, have more calf circumferences than marathon runners these results are similar to the results stated by McLean, B.D. (2014) and Foley, J.P. *et al.* (1989) exposed that there were certain differences in anthropometric characteristics in different group of cyclists. The walk racers and marathon runners' events have different biomechanical and anthropometrical requirements.Kumar & Singh, (2019). The coaches and physical educationist must take into consideration these differences and training must be event specific.

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