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Comparative study of anthropometric indices among swimmers and non-swimmers

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Abstract
The close relationship between performance and the body's anthropometric characteristics has been known since the end of the last century, but it was not until the fifties that research in the area intensified. 80 people were screened for our study and 30 people were selected as subjects. Some of the measurements were done in our lab while most were done at swimming pool, as most of the subjects were busy in the working hours of our department. The mean body surface area in sq.m in swimmers was 1.69+0.12 and in controls was 1.71+0.11. There was no statistically significant difference between the two groups.

Keywords: anthropometric indices, BMI, Swimmers

Introduction
There are a number of factors on which pulmonary functions depend in normal individuals. Besides the balance between lung recoil and chest elasticity that determine the mid-position at the end of spontaneous expiration and the coordinated neuro-muscular function of maintenance of effort; the thoracic and abdominal muscle strength play an important role in most of the pulmonary functions. Swimming involves both the total body muscular activity and excessive use of chest and abdominal muscles following period of breath holding which is a part of training for competitive swimmers.

The close relationship between performance and the body's anthropometric characteristics has been known since the end of the last century, but it was not until the fifties that research in the area intensified. Since then, many anthropometric characteristics of the human body have been investigated and related to performance in sports, especially in swimming. Lowenstein *et al.* (1994) [1] studied the effects on swimming performance of artificially simulated increases in body fat levels of 2%. Fat levels were simulated with latex pads stuck to the bodies of swimmers. Swimmers with latex pads swam significantly slower than those who swam without them. There was also a significant correlation between, on the one hand, the difference in swimming times and, on the other hand, the percentage increase in simulated fat. Keskinen *et al.* (1989) [2] investigated the influence of height, span, mass, total height and body density on performance in short swimming events. Smith (1978) [3] investigated the relationship between performance and the following anthropometric characteristics: mass, height length of arms and legs. He found negative correlations between swimming time and weight and also between swimming time and leg and arm length. Sprague (1976) [4] measured 25 anthropometric variables and concluded that only the measures of foot, biceps and skinfold showed significant correlations with performance in freestyle swimming.

Methodology
80 people were screened for our study and 30 people were selected as subjects. Some of the measurements were done in our lab while most were done at swimming pool, as most of the subjects were busy in the working hours of our department.

All the subjects and controls selected were males only, A similar number of age and sex matched persons were selected as controls, they were similar in all respects except that they were not involved in swimming or any other athletic activity.

Inclusion criteria for subjects: Males aged between 18 and 30 years who were swimming regularly for at least 3days in a week for a period of 1yr and above were selected as subjects.

Exclusion criteria: Persons who had history of chronic respiratory disease, hypertension and any congenital cardiorespiratory disease were excluded after studying their history and thorough clinical examination. Swimmers involved in other athletic activities were excluded

The following vital data was collected from both controls and subjects:
Name, Age, Sex.
Height-standing height was measured without footwear with the subject's body in contact with the wall.
Weight-was recorded in shorts and Banians with a digital weighing machine

Results

Table 1: Anthropometric data of swimmers and controls

Parameter	Swimmers	Controls	't' value	'p' value	Significance
	Mean + SD	Mean + SD			
Age (yrs.)	22.63+3.38	22.53 + 2.99	0.121	>0.05	NS
Height (cms)	165.93+6.64	168.43 + 4.88	1.661	>0.05	NS
Weight (kgs)	61.53+7.51	62.73 + 7.23	0.630	>0.05	NS
Body surface area (sqm)	1.69+0.12	1.71 + 0.11	0.672	>0.05	NS
Body mass index (wt./ ht^2)	22.34+2.05	22.27 + 2.46	0.119	>0.05	NS
NS – Nothing Significant					

Age: The mean age in swimmers was 22.63+3.38 years and in controls was 22.53+2.99 years. There was no statistically significant difference between the two groups.

Height: The mean height in swimmers was 165.93+6.64 cm and in controls was 168.43+4.48 cm. There was no statistically significant difference between the two groups.

Weight: The mean weight in swimmers was 61.53+7.51 kg and in controls was 62.73+7.23 Kg. There was no statistically significant difference between the two groups.

Body surface area: The mean body surface area in sq.m in swimmers was 1.69+0.12 and in controls was 1.71+0.11. There was no statistically significant difference between the two groups.

Body mass index: The mean body mass index (kg/mt2) in swimmers was 22.34+2.05 and in controls was 22.27+2.46. There was no statistically significant difference between the two groups.

Discussion

The subjects for the study were taken from corporation swimming pool. The study group comprised of 30 swimmers in the age group of 18to 30 years who were involved in swimming for a period of more than 1 year and 30 subjects who were non swimmers were selected as controls from within the campus Both subjects and controls were not involved in any other athletic activity. Both groups were of similar age, sex, height and weight

Positive and significant correlations between SL and the variables span, height and corporal mass were found in the study by Keskinen, Tilli & Komi (1989) [2]. No significant and positive correlations were found between SR and height and corporal mass, and a negative but not significant relationship was found between SF and span. These results could not be confirmed in this study, probably due to the gender differences between the investigated groups. A broader comparison of these results with the results of the current literature cannot be made, mainly in virtue of the differences of the protocols employed in the anthropometric measures. Other important differences which prevent us from making further comparisons include: gender and level of performance of the groups, and the statistical procedures employed in the data analyses [5, 6].

Conclusion

Both groups were well matched in anthropometric measurements.

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