EFFECT OF HEIGHT ON VITAL CAPACITY OF ADOLESCENT BOYS

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Abstract: This study was designed to compare the effect of height on the Vital Capacity of the adolescent boys. 60 Boys from Senior Secondary school (boys) A.M.U Aligarh, with age group of 14-17 years were selected through random sampling technique. Vital Capacity was measured using Spirometry technique and Stadiometer was used to determine height of the subjects. The subjects were divided into 2 Groups based on their Height (Group-A average height =163.7cm; Group-B average height =170.04cm) and each Group comprised of 30 Subjects. Mean and SD were calculated, Group-A M=3.30, SD=0.89 and Group-B M= 3.80, SD=0.82. Independent Samples t-test was performed to test the hypotheses. There was significant difference between the groups t (58) = 3.12, p>0.05. It was concluded that group-B Boys had better Vital Capacity than group-A Boys and Height had significant effect on Vital Capacity.

Key Words: Vital Capacity, Height, Spirometer, Adolescent, Stadiometer.

Introduction

Vital capacity is the maximum amount of air a person can expel from the lungs after a maximum inhalation. It is equal to the sum of inspiratory reserve volume, tidal volume, and expiratory reserve volume (Miller Keane, 2003). A person’s vital capacity can be measured by a wet or regular Spirometer. In combination with other physiological measurements, the vital capacity can help make a diagnosis of underlying lung disease (Yuki, et. al., 2012). Furthermore, a normal boy has a vital capacity between 3-5 litres. A human being’s vital capacity depends on age, sex, height, mass, and ethnicity (Pellegrino R., et. al., 2005).

Vital Capacity is very effective factor to the physiological parameters of human body organ and system such as respiratory functions. A person’s Vital Capacity level determines his/her Physical Fitness to a greater extent. Research suggested that height is the best predictor for the measurement of vital capacity (Pinaki Chatterjee, et. al., 2010). In line of that, the purpose of the present study was to compare the Height based vital capacity of boys.

Methodology

To fulfil the purpose of the study 60 boys were selected randomly and their age and, height was recorded. The subjects were from Senior Secondary school (boys) A.M.U Aligarh, of the age group of 14-17 years. Height was measured by Stadiometer and Vital Capacity was measured using Spirometer (12-1710 Baseline Spirometer). Subjects were given proper instructions and after making them handy and comfortable for the formal test, three trials were taken and recorded accordingly. Only the best trail recorded was considered as Vital Capacity of the subjects, respectively.

Statistical Analysis
Considering the objectives of the study, The subjects were divided into two groups, group A consist of 30 subjects of average height of 163.7 cm and group B consist of 30 subjects for more than average height of 170.04 cm and their Vital Capacity was recorded accordingly. The mean and standard deviation was calculated by using Microsoft excel-07 and t-test was applied to find the statistical difference, if any, between the two groups.

Result

Mean and SD were calculated, Group-A (M=3.30, SD=0.89) and Group-B (M= 3.80, SD=0.82). Independent Samples t-test was performed to test the hypotheses. Statistically significant Difference was found, t (58) = 3.12, p >0.05.

Table1:

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>t-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group-A</td>
<td>3.30</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>Group-B</td>
<td>3.80</td>
<td>0.82</td>
<td>3.12</td>
</tr>
</tbody>
</table>

Figure1:

Graphical representation of Mean Vital Capacity of Group-A and Group-B.

Discussion

The vital capacity of group A and group B boys was measure Mean, standard deviation was drawn and found out that the obtained t-test value is greater than the table value at 0.05 level of significance for df (58). The results showed that Group-B have more vital capacity than Group-A. Hence the null hypothesis was rejected. Vital Capacity is dependent on other factors besides age and height. Therefore, the recorded values can be considered normal (Pinaki Chatterjee, et. al., 2010; Farida Munawar, et. al., 2011; Bhatti U, et. al., 2014).

Conclusion
The findings show that Group-B students have better Vital Capacity than Group-A Boys. The study leads to conclusion that height plays a pivot role for the development of Vital Capacity.

Reference

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