A study on somatotypical and dermatoglyphic characteristics and on physical qualities of Physical Education students

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INTRODUCTION

The basic physical qualities have been widely studied in various populations (elderly, children and college students). However, a great number of scientific investigations aim to define the relation between athletes’ performance and physical qualities, especially those of greater relevance to a given modality. Glaner (1998) carried out a diagnosis of physical aptitude related to health for college students, observing that they had little physical aptitude. While during the school times, Matsudo (1990) compared the levels of aptitude in different socio-economical evels, concluding that there was no difference.

Fernandes Filho (2003) considered that “the process of physical evaluation (…), the results obtained through a test battery carried out are important so that it is possible to develop a good program of physical work”. However, it can also be of great importance when they are associated with other factors. And thus, the study was carried out by means of cognitive devices which point out some ways or strategies which the individuals may interpret from it, as follow: phenomenological, axiological pre-comprehension and phenomenological analysis, characterizing a dialectical and hermeneutic cycle.

Fernandes Filho (1997) affirms that the patterns formed by digital papillary on the internal face of phalanx of the fingers of both hands distinguished each human being from his/her alike. Hence, it is deduced a safe principles for the perfection identification of individuals, without the possibility of errors or doubts. And therefore, it is all about an unquestionable mark linked to the individuals’ genotype.

Reiterating one of the ideas on which this study is rooted, it is reported that the Fingerprint Index (FI) (Fernandes Filho, 1997) is...
established in the month three of the fetal life, together with the nervous system of the blastogenic layer of ectoderm: the fingerprints do not change during one’s lifetime and “they include a pattern type: the quantity of line in the fingers of the hand”.

Most authors distinguish three groups of patterns: arch, (A), loop, (L) and together whorl and the S-pattern, (W). The form of patterns is a qualitative characteristic. The quantity of lines (QL) is the summation of the total quantity of lines (STQL). The quantity of skinfolds within a pattern represents the quantitative characteristic.

When observed the behavior of some of the items evaluated in profile of high performance athletes of volleyball (MEDINA, 2000), it is noticed that some of them bear some resemblance ratifying the very tendency for other sports modalities, as indicated: high performance volleyball – arch (A)=0.1 ± 0.29, loop (L)=6.5 ± 2.94, whorl (W)=3.4 ± 2.97, STQL=125.6 ± 39.12 and in the Delta Index (D10)=13.4 ± 3.11. It is evidenced the established differentiations for some particularities related to each of the finger and total amplitudes. For futsal (Dantas, 2001), the results are – arch (A)=0.0 ± 0.17, loop (L)=6.6 ± 2.89, whorl (W)=3.5 ± 2.90, STQL=147.4 ± 32.88 and the Delta Index (D10)=13.5 ± 2.93.

According to Weineck (1991), the cardiorespiratory endurance aims to improve the functional capacity of cardiopulmonary system. A stronger and more efficient heart can eject more quantities of blood both into the systemic and pulmonary cycles, in the benefit of energetic metabolism and gaseous exchanges, respectively. The debility of this system implies the organism malfunction, impaired as a whole, due to cardiorespiratory importance as a means of transportation organic functions.

Manso (1996) presented indicating factors of the strength variation during the sports practice, dividing them in four groups: biological, mechanical, functional, sexual factors. Continuing his considerations, the said authors are based on a model of terminology proposed by Vittori (1990) and M. Vélez (1991). They believe that strength manifestation take place in different ways, in terms of action needs, and which its rating should be based on reasons which cause muscular twitch. And, they consider (Delvillar, 1992) indispensable for a good performance the concern about reaction velocity, displacement, throwing and, yet, mental decision, among others. The rapidness of movement has an intimate relation to twitch velocity of each muscular fiber and/or muscular group.

Dantas (2003) affirm that agility is “physical valency which enables to change the body position or movement direction in less time as possible”. It seems that agility is physical valency intimately linked to velocity, using a basic concept of displacement, reaction, resistance velocity, especially as regards the metabolic aspect and decision velocity (Manso and collab., 1996).

Tubino (1987) believes that coordination is “the physical quality which allow man to be aware and active, triggering some progressive integration which favors an optimum action of several muscular groups in the performance of a sequence movement with maximum efficiency and economy”.

Isak (2000) have been demonstrating that the current stage of Somatotypology guarantees not only objectivity, but also trustworthiness, as the theoretical principles and practice prove to be. Among other applications, it is employed the somatotype for: describing and comparing sportsperson in different levels; characterizing changes in the body structure, during the body growth, aging and training; comparing the relative form of male and females players; besides applying them as a tool for the analysis for body image. The somatotypical analysis is carried out by means of anthropometric measurements, as stature, body mass, thickness of skinfolds (tricipital, subescapular, supraspinatus and medial calf), osseous diameter of the femur and humerus, and corrected circumferences of the arm and leg.

**OBJECTIVE**

The aim of this study is to find out more knowledge about dermato graphic and somatotypical characteristics of college students and respective distributions of frequency with basic physical qualities (agility, velocity, coordination, VO₂max, and strength).

**METHODOLOGY**

**Model and Study Typology**

The investigation herein is of descriptive nature with typology of profile.

Graph 1 - All normatized items – women

Graph 2 - All normatized items – men
Sample
It consisted of a group of volunteers formed by Physical Education College Students, seeing that 40 men and 55 women, aged 23.1 ± 3.7-24.9 ± 3.7 years, respectively; body mass of 75.8 ± 11.0 kg- 29.43 ± 8.3 kg; and stature of 176.2 ± 8.5 cm-162.9 ± 6.0 cm.

Procedure for the data collection
It was employed the following set of instruments for the respective gauges:

- Scales – to determine the body mass it was used a Filizola Scales, duly calibrated and gauged, with precision of 100g and a scale from 0 to 150 kg.
- Tape-measure – it was made of a flexible metal, manufactured by Lufkyn (w606pm), with 200cm of length and precision of 0.1 cm.
- Skinfolds compass – to measure the thickness of skinfolds, whose precision was of 0,1mm (Lange skinfold caliper 3006239 made in Maryland).
- Frequencymeter – for checking the heart frequency (Polar beat patent ce0537).
- Portable Stadiometer – with 200cm and divisions in millimeters (Sanny).
- Caliper rule – for evaluationg of diameter (Sanny).
- Marking court of 20m.

For obtaining the data necessary for the study, it was used the following protocols: Cummins and Midlo’s protocol on dermatoglyphics (1942); Heath e Carter’s somatotypologic protocol (ISAK, 2001); velocity, 50m test (Matsudo, 1987); explosive strength, vertical impulse test (Fernandes Filho, 2003); coordination, Burpee (Marins and Giannichi, 1996); agility, Suttle Run test (Matsudo, 1987); e VO2max (Fernandes Filho, 2003).

Statistical Treatment
It was employed the cross frequency analysis between the dermatoglyphic variables and others for men and women separately, aiming to describe the groups through the quantity of individuals in each class of the respective tables of frequency.

Presentation and Discussion of Results
The mean values and their derivatives, referring to pattern types A, L, W and the STQL and D10 for women and men were presented of the following manner:

In the literature, it is notices that the found results differ from the standards of sports with velocity resistance, high level of D10, lack of arch (A), increase of (W) and the increase of STQL characterize the sports modalities. This difference was expected, once the group studied was not that of athletes, but college students.

Guba and Tchernova (1995), quoted by Fernandes Filho (1997), observed the complexity of patterns may indicate some marks of prognosis of definite complexion and increase of lines, otherwise, referring the development of the qualities velocity and strength.

Table 1 - Women

<table>
<thead>
<tr>
<th>VO2max</th>
<th>Vertical impulse</th>
<th>Shuttle rum</th>
<th>50m</th>
<th>Burppee</th>
</tr>
</thead>
<tbody>
<tr>
<td>34.27 ± 7.04ml.(kg.min)-1</td>
<td>34.73 ± 5.68cm</td>
<td>12.01 ± 1.00s</td>
<td>10.62 ± 1.13s</td>
<td>4.98 ± 0.65rep</td>
</tr>
</tbody>
</table>

Table 2 - Men

<table>
<thead>
<tr>
<th>VO2max</th>
<th>Vertical impulse</th>
<th>Shuttle rum</th>
<th>50m</th>
<th>Burppee</th>
</tr>
</thead>
<tbody>
<tr>
<td>43.12 ±10.04ml.(kg.min)-1,</td>
<td>50.08 ± 7.18cm</td>
<td>10.31 ± 0.67s</td>
<td>8.62 ± 1.1s</td>
<td>5.95 ± 0.88rep</td>
</tr>
</tbody>
</table>

Table 5

<table>
<thead>
<tr>
<th>endomorphy</th>
<th>mesomorphy</th>
<th>ectomorphy</th>
<th>classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>women</td>
<td>5.16 ± 1.48</td>
<td>3.90 ± 1.36</td>
<td>2.32 ± 1.16</td>
</tr>
<tr>
<td>men</td>
<td>3.05 ± 1.40</td>
<td>4.70 ± 1.39</td>
<td>2.20 ± 1.18</td>
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Table 6 - 50m Test (MALE)

<table>
<thead>
<tr>
<th>Time (s)</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.60 - 7.61</td>
<td>2.70% (1)</td>
<td>16.22% (6)</td>
<td>16.22% (6)</td>
<td>18.92% (7)</td>
<td></td>
</tr>
<tr>
<td>7.61 - 8.62</td>
<td>2.70% (1)</td>
<td>16.22% (6)</td>
<td>8.11% (3)</td>
<td>8.11% (3)</td>
<td>35.14% (13)</td>
</tr>
<tr>
<td>8.62 - 9.63</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>2.70% (1)</td>
<td>8.11% (3)</td>
<td>21.62% (8)</td>
</tr>
<tr>
<td>9.63 - 10.64</td>
<td>5.41% (2)</td>
<td>13.51% (5)</td>
<td>5.41% (2)</td>
<td>24.32% (9)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
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</table>
### Table 7 - Suttle Run test (MALE)

<table>
<thead>
<tr>
<th>Time(s)</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.06 – 9.69</td>
<td>8.11% (3)</td>
<td>8.11% (3)</td>
<td>16.22% (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.69 – 10.33</td>
<td>10.81% (4)</td>
<td>21.62% (8)</td>
<td>2.70% (1)</td>
<td>40.54% (15)</td>
<td></td>
</tr>
<tr>
<td>10.33 – 10.96</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>24.32% (9)</td>
<td></td>
</tr>
<tr>
<td>10.96 – 11.60</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>18.92% (7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
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</table>

### Table 8 - VO$_2$max (MALE)

<table>
<thead>
<tr>
<th>VO$_2$(ml(kg.min)</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>25.90 – 34.92</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>10.81% (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34.92 – 43.94</td>
<td>8.11% (3)</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>13.51% (5)</td>
<td>59.46% (22)</td>
</tr>
<tr>
<td>43.94 – 52.96</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>8.11% (3)</td>
<td>13.51% (5)</td>
<td></td>
</tr>
<tr>
<td>52.96 – 61.98</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61.98 – 71.00</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>21.62% (8)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
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</table>

### Table 9 - Burpee (MALE)

<table>
<thead>
<tr>
<th>Repetitions</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
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<tbody>
<tr>
<td>4</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>21.62% (8)</td>
</tr>
<tr>
<td>6</td>
<td>8.11% (3)</td>
<td>10.81% (4)</td>
<td>18.92% (7)</td>
<td>10.81% (4)</td>
<td>48.65% (18)</td>
</tr>
<tr>
<td>7</td>
<td>5.41% (2)</td>
<td>10.81% (4)</td>
<td>5.41% (2)</td>
<td>10.81% (4)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>2.70% (1)</td>
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</table>

### Table 10 - IV Total (MALE)

<table>
<thead>
<tr>
<th>Vert.Imp. (cm)</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>40.0 – 45.8</td>
<td>10.81% (4)</td>
<td>2.70% (1)</td>
<td>10.81% (4)</td>
<td>8.11% (3)</td>
<td>32.43% (12)</td>
</tr>
<tr>
<td>45.8 – 51.6</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>16.22% (6)</td>
<td>2.70% (1)</td>
<td>27.03% (10)</td>
</tr>
<tr>
<td>51.6 – 57.4</td>
<td>2.70% (1)</td>
<td>10.81% (4)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>24.32% (9)</td>
</tr>
<tr>
<td>57.4 – 63.2</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>10.81% (4)</td>
<td></td>
</tr>
<tr>
<td>63.2 – 69.0</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
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</table>

### Table 11 - Endomorphy (MALE)

<table>
<thead>
<tr>
<th>Class</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 – 1.94</td>
<td>5.41% (2)</td>
<td>8.11% (3)</td>
<td>5.41% (2)</td>
<td>18.92% (7)</td>
<td></td>
</tr>
<tr>
<td>1.94 - 3.58</td>
<td>13.51% (5)</td>
<td>8.11% (3)</td>
<td>18.92% (7)</td>
<td>2.70% (1)</td>
<td>43.24% (16)</td>
</tr>
<tr>
<td>3.58 - 5.22</td>
<td>2.70% (1)</td>
<td>8.11% (3)</td>
<td>10.81% (4)</td>
<td>35.14% (13)</td>
<td></td>
</tr>
<tr>
<td>5.22 - 6.86</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>2.70% (1)</td>
<td></td>
</tr>
<tr>
<td>6.86 - 8.50</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>2.70% (1)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
</tr>
</tbody>
</table>

### Table 12 - Mesomorphy (MALE)

<table>
<thead>
<tr>
<th>Class</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.30 – 2.85</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td></td>
</tr>
<tr>
<td>2.85 – 4.40</td>
<td>5.41% (2)</td>
<td>8.11% (3)</td>
<td>13.51% (5)</td>
<td>32.43% (12)</td>
<td></td>
</tr>
<tr>
<td>4.40 – 5.95</td>
<td>8.11% (3)</td>
<td>8.11% (3)</td>
<td>18.92% (7)</td>
<td>45.95% (17)</td>
<td></td>
</tr>
<tr>
<td>5.95 – 7.50</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>8.11% (3)</td>
<td>16.22% (6)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
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### Table 13 - Ectomorphy (MALE)

<table>
<thead>
<tr>
<th>Class</th>
<th>ALW</th>
<th>10L</th>
<th>L &gt; W</th>
<th>W &gt; L</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.60 – 1.64</td>
<td>8.11% (3)</td>
<td>10.81% (4)</td>
<td>13.51% (5)</td>
<td>43.24% (16)</td>
<td></td>
</tr>
<tr>
<td>1.64 – 2.68</td>
<td>5.41% (2)</td>
<td>13.51% (5)</td>
<td>2.70% (1)</td>
<td>21.62% (8)</td>
<td></td>
</tr>
<tr>
<td>2.68 – 3.72</td>
<td>8.11% (3)</td>
<td>10.81% (4)</td>
<td>5.41% (2)</td>
<td>24.32% (9)</td>
<td></td>
</tr>
<tr>
<td>3.72 – 4.76</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td></td>
</tr>
<tr>
<td>4.76 – 5.80</td>
<td>2.70% (1)</td>
<td>2.70% (1)</td>
<td>5.41% (2)</td>
<td>5.41% (2)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>16.22% (6)</td>
<td>21.62% (8)</td>
<td>40.54% (15)</td>
<td>21.62% (8)</td>
<td>100.00% (37)</td>
</tr>
</tbody>
</table>
In term of the results observed in our study, it was observed that the number of delta (D10) was smaller than the ones for high performance athletes. This fact was expected, because the literature shows that a high Delta Index is a characteristic of athletes. The mean values and their derivatives, referring to physical aptitude presented:

Analyzing the obtained results as regards the physical qualities, we observed that for the vertical impulse test the women presented excellent values in relation to the performance; whereas the mean presented reasonably good values. The obtained result for the 12-minute test for men and women was considered regular according to the performance table, presenting a standard deviation of 7.04 for women and 10.04 for men. The coordination test presented a mean of 4.9 repetitions and a standard deviation of 0.65 for women and 5.9 repetitions with standard deviation of 0.88 for men. The velocity test presented a mean of 10.6 s with standard deviation of 1.13 for women and 8.6s and standard deviation of 1.11 for men. The agility test presented a mean of 12 s with standard deviation of 1.00 for women and 10.3 s with standard deviation of 0.67 for men.

Mancilla (2001), in Chile, correlated the dermatoglyphic characteristics with physical qualities of pedagogy undergraduate students of the Tarapacá University, as a result a high correlation both for men and women. The obtained results presented within the normalcy for this population. And, the mean values and their derivatives, referring to somatotypical, presented as follows:

The table 7 demonstrates that 21.62% of L>W shows the time of 9.6 – 10.3s, once again confirming the velocity as a predominant factor in the type I D (L) loop and indicating that the distribution of other digital pattern vary between 5.4% and 10.81%. And, 40.54% of sample obtained indexes of velocity between 9.69 and 10.33.

In the table 8, 59.46% of the group is between 34.92% and 43.94% of VO2max and it is noticed still some balance between L > W (21.62%) and 10 L (16.22%). However, it is noticed some high in the digital formula W > L (13.51%). Even so, the analyzed group is between the mean values of VO2max (Fernandes Filho, 2003).

In the table 9, it is observed the digital formulas in the following order: L > W (18.92%), 10L (10.81%) and W > L (10.81%), totaling 48.65% of the evaluated group with 6 repetitions, which evaluates the physical qualities coordination and agility

### Table 14 - Test de 50m (FEMALE)

<table>
<thead>
<tr>
<th>Velocity T'</th>
<th>ALW</th>
<th>10L</th>
<th>L&gt;W</th>
<th>W&gt;L</th>
<th>10W</th>
<th>L=W</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.17 – 9.49</td>
<td>10.20% (5)</td>
<td>2.04% (1)</td>
<td>2.04% (1)</td>
<td>14.29% (7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.49 – 10.81</td>
<td>2.04% (1)</td>
<td>22.45% (11)</td>
<td>12.24% (6)</td>
<td>4.08% (2)</td>
<td>2.04% (1)</td>
<td>42.86% (21)</td>
<td></td>
</tr>
<tr>
<td>10.81 – 12.13</td>
<td>4.08% (2)</td>
<td>10.20% (5)</td>
<td>6.12% (3)</td>
<td>12.24% (6)</td>
<td>2.04% (1)</td>
<td>34.69% (17)</td>
<td></td>
</tr>
<tr>
<td>12.13 – 13.45</td>
<td>2.04% (1)</td>
<td>2.04% (1)</td>
<td>4.08% (2)</td>
<td>8.16% (4)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6.12% (3)</td>
<td>14.29% (7)</td>
<td>42.86% (21)</td>
<td>26.53% (13)</td>
<td>4.08% (2)</td>
<td>6.12% (3)</td>
<td>100.00% (49)</td>
</tr>
</tbody>
</table>

### Table 15 - Suttle Run Test (FEMALE)

<table>
<thead>
<tr>
<th>Velocity T'</th>
<th>ALW</th>
<th>10L</th>
<th>L&gt;W</th>
<th>W&gt;L</th>
<th>10W</th>
<th>L=W</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.41 – 11.22</td>
<td>2.04% (1)</td>
<td>14.29% (7)</td>
<td>8.16% (4)</td>
<td>2.04% (1)</td>
<td>26.53% (13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11.22 -12.04</td>
<td>2.04% (1)</td>
<td>2.04% (1)</td>
<td>16.33% (8)</td>
<td>4.08% (2)</td>
<td>2.04% (1)</td>
<td>6.12% (3)</td>
<td>32.66% (16)</td>
</tr>
<tr>
<td>12.04 -12.86</td>
<td>2.04% (1)</td>
<td>6.12% (3)</td>
<td>4.08% (2)</td>
<td>8.16% (4)</td>
<td>20.41% (10)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.86-13.68</td>
<td>2.04% (1)</td>
<td>4.08% (2)</td>
<td>4.08% (2)</td>
<td>6.12% (3)</td>
<td>16.33% (8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.68-14.50</td>
<td>4.08% (2)</td>
<td>8.16% (4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6.12% (3)</td>
<td>14.29% (7)</td>
<td>42.86% (21)</td>
<td>26.53% (13)</td>
<td>4.08% (2)</td>
<td>6.12% (3)</td>
<td>100.00% (49)</td>
</tr>
</tbody>
</table>

### Table 16 - VO2max (FEMALE)

<table>
<thead>
<tr>
<th>VO2(ml.kg.min)</th>
<th>ALW</th>
<th>10L</th>
<th>L&gt;W</th>
<th>W&gt;L</th>
<th>10W</th>
<th>L=W</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.10 – 21.97</td>
<td>2.04% (1)</td>
<td>2.04% (1)</td>
<td>12.24% (6)</td>
<td>12.24% (6)</td>
<td>2.04% (1)</td>
<td>4.08% (2)</td>
<td></td>
</tr>
<tr>
<td>21.97 -30.84</td>
<td>2.04% (1)</td>
<td>2.04% (1)</td>
<td>16.33% (8)</td>
<td>8.16% (4)</td>
<td>4.08% (2)</td>
<td>2.04% (1)</td>
<td>46.94% (23)</td>
</tr>
<tr>
<td>30.84-39.71</td>
<td>4.08% (2)</td>
<td>12.24% (6)</td>
<td>4.08% (2)</td>
<td>8.16% (4)</td>
<td>2.04% (1)</td>
<td>18.37% (9)</td>
<td></td>
</tr>
<tr>
<td>39.71 – 48.58</td>
<td>12.24% (6)</td>
<td>4.08% (2)</td>
<td>4.08% (2)</td>
<td>4.08% (2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>6.12% (3)</td>
<td>14.29% (7)</td>
<td>42.86% (21)</td>
<td>26.53% (13)</td>
<td>4.08% (2)</td>
<td>6.12% (3)</td>
<td>100.00% (49)</td>
</tr>
</tbody>
</table>

### Table 17 - Burpee (FEMALE)

<table>
<thead>
<tr>
<th>Repetitions</th>
<th>ALW</th>
<th>10L</th>
<th>L&gt;W</th>
<th>W&gt;L</th>
<th>10W</th>
<th>L=W</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2.04% (1)</td>
<td>4.08% (2)</td>
<td>8.16% (4)</td>
<td>4.08% (2)</td>
<td>2.04% (1)</td>
<td>20.41% (10)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>4.08% (2)</td>
<td>10.20% (5)</td>
<td>18.37% (9)</td>
<td>22.45% (11)</td>
<td>4.08% (2)</td>
<td>63.26% (31)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>16.33% (8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>6.12% (3)</td>
<td>14.29% (7)</td>
<td>42.86% (21)</td>
<td>26.53% (13)</td>
<td>4.08% (2)</td>
<td>6.12% (3)</td>
<td>100.00% (49)</td>
</tr>
</tbody>
</table>
(Marins and Giannichi, 1996) and shows some increase in the ID (W) whorl.

In this table, it is observed the balance in the digital formulae. It is noticed still that the obtained results presented a higher variation, but even so, the values were from mean to high (40 to 63.2 cm), according to Fernandes Filho (2003), indicating again the predominance of ID (L) loop (NIKITIUK, 2001).

The table 11 shows that 43.24% of the group has an endomorphic component (1.94 – 3.58) which, according to Carter (1980), is considered from low to moderate; another group (37.84%) has a component, presented values from 3.58 to 8.50, considered high and risky for health.

The table 12 shows that almost 80% of the group presents a mesomorphic component between 2.85 and 5.95, considered moderate to high by Carter (1980), characterizing this group with moderate and high musculoskeletal development: osseous diameters of higher to greater volume and articulations, and higher to greater dimensions.

The table 13 shows that 43.24% of the group presents an ectomorphic component between 0.60 and 1.64, considered low by Carter (1980), with relative linearity of great volume by unit of height and extremities relatively voluminous. And, 45.64% of the group presents the ectomorphic component low and moderate: 1.64 – 3.72.

This table 14 shows the predominance of L>W in the best results, with 10.20% between the times from 8.17 to 9.49s and 22.45% between the times from 9.49 to 10.81s, demonstrating then that within the energetic and metabolic ways the type of ID (L) loop is predominant in the velocity test (NIKITIUK, 2001).

In the general result L>W, 40.54% confirms the velocity of the evaluated group.

The table 15 demonstrates that 30.62% of L>W registers times between 10.41 and 12.04s, confirming the velocity as a predominant factor in the type of ID (L) and indicating that the distribution of other digital form vary between 2.04% and 6.12%. And, 59.19% of the sample obtained the velocity between 10.41 and 12.04s. In this table 46.94% of the group is between 30.84 and 39.71 of VO2max and it is noticed still a balance between L > W (16.33%), 10 L (12.24%) and W > L (8.6 %). And thus, the group analyzed is between the mean values of VO2max (Fernandes Filho, 2003).

<table>
<thead>
<tr>
<th>Table 18 - IV Total (FEMALE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imp.ver (cm)</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>22 – 28</td>
</tr>
<tr>
<td>28 – 34</td>
</tr>
<tr>
<td>34 – 40</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 19 - Endomorphy (FEMALE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>2.10 - 3.24</td>
</tr>
<tr>
<td>3.24 – 4.38</td>
</tr>
<tr>
<td>4.38 – 5.52</td>
</tr>
<tr>
<td>5.52 – 6.66</td>
</tr>
<tr>
<td>6.66 – 7.80</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 20 - Mesomorphy (FEMALE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>0.50 – 1.72</td>
</tr>
<tr>
<td>1.72 – 2.94</td>
</tr>
<tr>
<td>2.94 – 4.16</td>
</tr>
<tr>
<td>4.16 – 5.38</td>
</tr>
<tr>
<td>5.38 – 6.60</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 21 - Ectomorphy (FEMALE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>0.30 – 1.32</td>
</tr>
<tr>
<td>1.32 – 2.34</td>
</tr>
<tr>
<td>2.34 – 3.36</td>
</tr>
<tr>
<td>3.36 – 4.38</td>
</tr>
<tr>
<td>4.38 – 5.40</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>
In the table 17, it is observed digital formulae in the following order: W > L (22.45%), L > W (18.37%), 10L (10.20%), ALW (4.08%) and L=W (4.08%), totaling 63.26% of the evaluated group with 5 repetitions, which evaluates the physical qualities coordination and agility (Marins and Giannichi, 1996) and shows some increase in the I D (W) whorl.

In this table, it is observed a balance in the digital formulae. It is noticed still that the obtained results presented greater variation, L>W (14.29%), W>L (10.20%), 10L (8.16%), 10W (4.08%) and ALW (2.04%), totaling 40.82% of the evaluated group with a result from 34 to 40 cm. Even so, there was the predominance of I D (L) loop.

In the table 19, 32.66% of group has an endomorphic component class (5.52 – 6.66) and 24.49%, (4.38 – 5.52), totaling 57.15% of the evaluated group. According to Carter (1980), this is considered moderate with moderate relative adiposity: subcutaneous fat cover the muscular and osseous contours; softer appearance.

This table shows that 36.73% of the group presents a mesomorphic component between 4.16 to 5.38, considered moderate by Carter (1980); and presented as characteristic a moderate muscle-skeletal development relative: greater muscular and osseous volume and articulations of greater dimensions. 42.86% of group present a mesomorphic component between 1.72 to 4.16, considered low to moderate by Carter (1980).

The table 21 presents 36.73% of group with ectomorphic component between 1.32 to 2.34, considered low by Carter (1980), with linearity characteristic relative to the great volume per unit of height and extremities relatively voluminous; 24.49% presents an ectomorphic component between 2.34 to 3.36m. 20.41% between 0.30 to 1.32 and 16.33% between 3.36 to 4.38.

**General considerations**

This study was conducted using Physical Education college students. We concluded that their physical aptitude was not good, showing that, despite being students of the area, the group did not present much concern about their own aptitude.

Upon observing the literature we noticed that the results differ from the standards for sports of game and velocity resistance, the high level of D10, the lack of arch (A), increase of W and STQL are characteristic of sports modalities. In it, we observed the number delta (D10) was smaller than for high performance athletes and the endomorphic component was greater for the similar studies.

We conclude that the result of the study corresponds to the need of further investigation: the acknowledgement of somatotypical and dermatoglyphic characteristics and physical qualities. Further investigation is needed to enlarge the theme, in a sense that other sports modalities are included.

**REFERENCES**


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