11- COMPARATIVE STUDY OF THE BUOYANCY BETWEEN MEN AND WOMEN

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INTRODUCTION

The principle of Archimedes tells us that an immersed body in a liquid receives from this liquid an equal force and contrary in direction, to the weight of the liquid dislocated by it, to this force we call push. The differential between the density of the liquid and the density of an immersed body in this liquid is what we call buoyancy , where gravity and thrust oppose. When the gravity wins this fight, we say the body is negative and when the push is stronger we call the body positive. A neutral body is founded when these forces are equal.

For a long time, it was claimed the idea that women floated more than men, in the courses of scuba diving around of the world, lessons has been given without a clear understanding of the relation between the human body and its buoyancy.

Fontoura (2005) states that "in accordance with the refined data, probably there is no relation between the percentual of corporal fat or the corporal weight and the used amount of ballast in the scuba diving" what means that the buoyancy is not directly correlation to the percentual of fat or the corporeal weight. Then a comparative study between men and women and its buoyancy was developed.

OBJECTIVE

Carrying through a comparative study of the buoyancy between men and women considering its capacity floating, objectifying to prove definitively that the factors that determine the buoyancy degree do not depend on the gender to which the individual belong.

JUSTIFICATION

There was not located a research in the past years about this subject, and it is clear that the importance of scientific clarify the existence or not of this buoyancy relation.

CRITERIA OF INCLUSION

The research was carried with individuals, not athletes, of both the gender with age between 16 and 60 years old of a group of 44 pupils customers of Tridente Diving Center.

CRITERIA OF EXCLUSION

It had not been accepted individuals without this specifications.

METHODOLOGY

The employed methodology were a descriptive study of the conditions of buoyancy of each individual and its comparation between gender. For this it was established that the test people would be submitted to a measurement of potential of buoyancy with full lungs since all the individuals of the research with emptier lung as possible, had submerged without ballast necessity. To get such measurement while the individual "floated" in the swimming pool it were added weights of lead (ballast) until they sank.

COLLECTION OF DATA

It is based in the collection of data carried through with customers of Tridente Diving Center during the period of 01/02/05 and 30/09/05. Both gender had been searched.

A file of physical evaluation for collection of data was created . All individual before leaving for the diving and all pupil before initiating the practical classes were invited to participate of the physical evaluation with measurement of the cutaneous folds, the test of buoyancy and static apnea. Important to say, that the test of static apnea was implemented to premake the participants . They were stimulated to the apnea test during the evaluation of the buoyancy. It was used fat pacmeter of the mark Creative Health model Slim Guide, a common ruler, one estadiometer connected to a Ballmar scale and a metric flex metal ribbon.

Of each participant of the research three measurements were taken of the cutaneous folds in the methodology and the described points for Fernandes Filho(2003) and had been effected the respective mesearuments averages, this procedure had been after applied the refined averages of the cutaneous folds, in formulas proposals for Jackson & Pollock (apud Marins, Giannichi, 2003, p.50) for the definition of the cutaneous fold of men and women who had been public target of this research. After the definition of the cutaneous folds was applied in this value found in the formula of Siri (MARINS apud GIANNICHI, 2003, p.50) for definition of the percentage of fat of the participants.

Each participant was submitted to a buoyancy test, where it was measured the amount of ballast necessary to submerge the individual with the full lung.

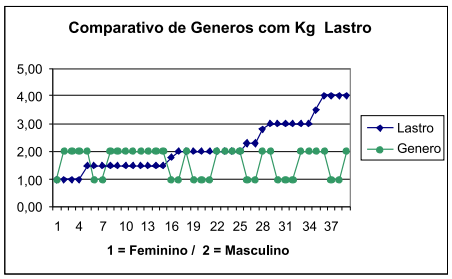
Through the use of a calculation spread sheet as presented the relations foreseen in this document had been below defined.

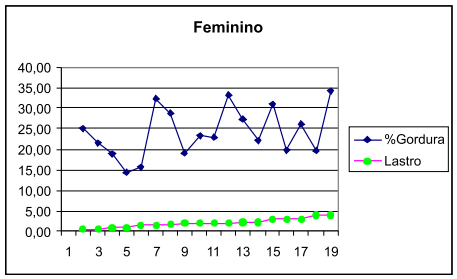
Quarrel of the Results

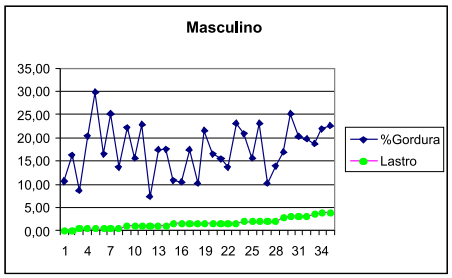
Through the exposition of the results below was observed the comparative variation between the corporal largenesses below and the ballast necessary to sink, in a fresh water swimming pool with 1,80m of depth.

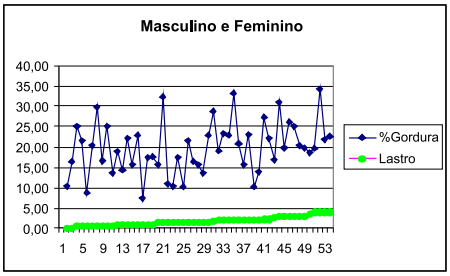
Gender	Age	Height	Weight	% Fat	Fat Weight	Non Fat Weight	Body Mass	Ballast
M	58,00	1,81	83,00	20,87	17,32	65,67	25,30	2,00
M	35,00	1,72	73,30	16,54	12,12	61,17	24,70	0,50
M	15,00	1,75	71,00	20,25	14,38	56,61	23,10	3,00
M	22,00	1,91	85,50	10,49	8,97	76,52	23,50	1,50
F	32,00	1,59	50,00	23,25	11,62	38,37	19,70	2,00
F	23,00	1,51	42,10	15,62	6,57	35,52	18,40	1,50
F	22,00	1,65	67,70	28,76	19,47	48,22	24,70	1,80
F	18,00	1,80	72,20	27,43	19,80	52,39	22,20	2,30
M	22,00	1,66	65,80	15,60	10,26	55,53	23,80	2,00
F	27,00	1,65	62,60	22,88	14,32	48,27	22,90	2,00
F	35,00	1,60	50,00	21,50	10,75	39,24	19,50	0,50
F	31,00	1,60	52,10	25,20	13,13	38,96	20,30	0,50
M	28,00	1,90	90,00	16,85	16,85	74,82	25,00	2,80
M	16,00	1,80	76,60	23,07	17,67	58,92	23,60	2,00
F	37,00	1,64	69,40	30,94	21,47	47,92	25,80	3,00
F	22,00	1,52	62,00	19,20	11,90	50,09	26,80	2,00
F	27,00	1,54	43,80	14,36	6,29	37,51	18,50	1,00
M	49,00	1,76	65,70	17,46	11,47	54,22	21,20	1,50
M	32,00	1,70	64,60	25,19	22,74	67,55	26,10	0,50
M	19,00	1,83	74,00	8,77	6,49	67,50	22,00	0,50
F	23,00	1,58	53,50	19,83	10,61	42,88	21,40	3,00
M	42,00	1,81	71,50	29,83	37,59	88,40	33,80	0,50
M	26,00	1,80	68,00	7,49	5,09	62,90	20,90	1,00
M	19,00	1,77	73,50	15,55	11,43	62,06	23,40	1,00
M	42,00	1,68	71,80	22,57	16,20	55,59	25,40	4,00
F	45,00	1,67	58,00	19,72	11,43	46,56	20,70	4,00
M	33,00	1,80	74,50	19,76	14,72	59,77	23,10	3,00
M	19,00	1,65	52,70	10,28	6,99	61,00	20,30	1,50
M	20,00	1,84	68,00	10,28	6,99	61,00	20,30	2,00
M	34,00	1,55	52,70	22,80	12,02	40,68	21,90	1,00
M	22,00	1,72	80,00	20,47	16,37	63,62	27,00	0,50
F	24,00	1,72	64,00	18,95	12,13	51,86	21,10	1,00
M	41,00	1,86	90,30	25,19	22,74	67,55	26,10	3,00
M	33,00	1,60	62,30	17,32	10,79	51,50	24,30	1,00
M	27,00	1,73	81,00	17,62	14,27	66,72	27,20	1,00
M	43,00	1,81	80,00	22,14	17,71	62,28	24,40	1,00
M	23,00	1,75	90,00	21,56	19,40	70,59	29,70	1,50
F	22,00	1,62	54,00	26,21	14,15	39,84	20,50	3,00
M	50,00	1,74	81,00	18,72	15,16	65,83	27,00	3,50

The most atentitive observation of the spread sheet and the graphs for it generated demonstrates a lack of evolutive pattern standard between the largenesses.









Conclusion

Was concluded in accordance with the refined data that a probable relation do not exist between the sort and the buoyancy was praised previously. The curves of variation of the ballast necessity to sink (that they imply directly in the buoyancy) had not followed proportionally the curves of porcentual of fat nor the variation of gender. All the individuals of the research when with the emptiest lung than it it was possible, had submerged without ballast necessity.

We suggest further study to establish the factors on the condition of buoyancy of each individual.

Note

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COMPARATIVE STUDY OF THE BUOYANCY BETWEEN MEN AND WOMEN

SUMMARY

During much time the idea that women floated more than men was claimed in the courses of scuba diving and leisure diving, around of the world, lessons has been given without a clear understanding of the relation between the human body and its buoyancy.

Fontoura (2005) states that "in accordance with the refined data that there is not a probable relation between the percentual of corporal fat or the corporal weight and the used amount of ballast in the independent diving" what means that the buoyancy is not directly related to the percentual of fat or the corporeal weight.

A comparative study between men and women and its buoyancy has been developed and it proved that it does not have a specific relation between the gender and the modification of the buoyancies.

WORDS KEYS: Diving, Buoyancy, Gendre

L'CÉTUDE COMPARATIVE DE LA FLOTTABILITÉ ENTRE LES HOMMES ET LES FEMMES

SOMMAIRE

Pendant beaucoup d'heure l'idée que les femmes ont flotté davantage que des hommes a été réclamée dans les cours de la plongée de scaphandre et la plongée de loisirs, autour du monde, leçons a été donnée sans compréhension claire de la relation entre le corps humain et sa flottabilité.

Fontoura (2005) déclare que "selon les données de raffinage qu'il n'y a pas une relation probable entre le percentual de gros corporel ou le poids corporel et la quantité utilisée de ballast dans la plongée" ce qui signifie que la flottabilité n'est pas directement liée au percentual de la graisse ou du poids corporel.

Une étude comparative entre les hommes et les femmes et sa flottabilité a été développée et elle a montré qu'elle n'a pas une relation spécifique entre le genre et la modification des buoyancies.

CLEFS DE MOTS: Plongée, Flottabilité, Gendre

EI ESTUDIO COMPARATIVO DE LA FLOTABILIDAD ENTRE LOS HOMBRES Y LAS MUJERES

RESUMEN

Durante mucha hora fue demandado la idea que de eso las mujeres flotaron más que hombres, en los cursos del buceo scuba, alrededor del mundo, lecciones le han dado sin una comprensión clara de la relación entre el cuerpo humano y su relación de la flotabilidad.

Fontoura (2005) cita que "de acuerdo con los datos refinados no ay una relación probable entre el percentual de gordo corporal o el peso corporal y la cantidad usada de lastre en el buceo scuba" qué significa que la flotabilidad no tiene directamente correlación al percentual de la grasa o del peso corpóreo.

Un estudio comparativo entre los hombres y las mujeres y su flotabilidad fue desarrollado donde si probó que no tiene relación específica entre el gendero y la modificación de la flotabilidad.

LLAVES DE LAS PALABRAS: Salto, Flotabilidad, Gendero

ESTUDO COMPARATIVO DA FLUTUABILIDADE ENTRE HOMENS E MULHERES

RESUMO

Durante muito tempo foi postulada a idéia de que mulheres flutuavam mais que homens, nos cursos de mergulho autônomo recreativo turístico e de lazer, ao redor do mundo, aulas tem sido ministradas sem uma compreensão clara da relação entre o corpo humano e sua relação de flutuabilidade.

Fontoura (2005) cita que “de acordo com os dados apurados que não há uma provável relação entre o porcentual de gordura corpórea ou o peso corporal e a quantidade de lastro utilizada no mergulho autônomo” o que significa que a flutuabilidade não está atrelada diretamente ao porcentual de gordura ou ao peso corpóreo.

Foi desenvolvido um estudo comparativo entre homens e mulheres e sua flutuabilidade onde se comprovou que não há relação específica entre o gênero e a modificação das flutuabilidades.

PALAVRAS CHAVES : Mergulho, Flutuabilidade, Gênero.