

The Study of Pedagogical Anthropometry of the Goan Students.

Statistical Summary.

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THE Liceu Central of Nova-Goa is a College for secondary education, having more than 600 students, 517 of whom were studied in the Medical Propedeutics Laboratory of the Medical College of Nova-Goa, and are here reported.

These students were divided in 3 groups (Indian Hindus, Indian Christians and Luso-Descendentes) and examined biometrically and medically.

This is a summary of our report which will be published in the "*Arquivos da Escola Medico-Cirurgica de Nova-Goa*".

Biometric Examination.

By this method we examined only normal students, after having scrupulously excluded ricketts.

The following tables show figures of the measurements taken by me in students from 11 to 18 years :

TABLE I.
Height.

Age	Indian Hindus	Indian Christians	Luso-descendentes
	cms.	cms.	cms.
11	..	130,1	..
12	137,2	135,1	138,7
13	143	143,7	144
14	146,9	150,7	146,8
15	111,6	156,9	155
16	157	158,6	159,4
17	160	162,4	164
18	159,2	163,9	164,5

TABLE II.
Chest.

Age	Indian Hindus	Indian Christians	Luso-descendentes
	cms.	cms.	cms.
11	..	65,3	..
12	67,5	66,7	69,4
13	72,5	71,1	72,3
14	73	74,1	74,9
15	75,6	77,6	77,3
16	79	78,2	81,3
17	81,1	81,7	83,4
18	81,4	82,9	84,4

TABLE III.
Weight.

Age	Indian Hindus	Indian Christians	Luso-descendentes
	Kgs.	Kgs.	Kgs.
11	..	25,740	..
12	30,297	27,690	30,380
13	33,086	32,330	34,280
14	34,738	36,980	38,450
15	38,837	40,980	41,000
16	41,928	43,000	49,000
17	42,000	47,900	49,700
18	45,324	47,460	50,630

TABLE IV.
Thoracic Circumferences.
(Axillar)*

Age	Indian Hindus			Indian Christians			Luso-descendentes		
	Max. mm.	Min. mm.	Dif. mm.	Max. mm.	Min. mm.	Dif. mm.	Max. mm.	Min. mm.	Dif. mm.
11	..	..	..	625	608	17	..	..	..
12	656	633	23	641	615	26	648	630	18
13	673	652	21	677	648	29	682	649	33
14	701	675	26	714	680	34	727	664	63
15	726	700	26	751	728	23	737	697	40
16	763	737	26	760	740	20	790	758	32
17	800	774	26	816	779	47	823	778	45
18	808	760	48	804	759	45	813	787	26

* Across the armpits.

TABLE IV (b).
Thoracic Circumferences.¹
(Maximum and Minimum.)²

Age	Indian Hindus			Indian Christians			Luso-descendentes		
	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.	mm.
11	..	..	..	608	580	28	..	..	..
12	650	618	32	634	592	42	649	608	41
13	653	620	33	662	620	42	686	636	50
14	683	646	37	690	641	49	717	662	55
15	700	666	34	720	672	42	722	670	52
16	730	687	43	736	687	49	770	716	54
17	757	719	38	778	720	58	788	730	58
18	742	704	38	754	698	56	810	734	76

¹ At the level of xyphoid process.

TABLE V.
*Abdominal Circumferences.*²

Age	Indian Hindus	Indian Christians	Luso-descendentes
	mm.	mm.	mm.
11	..	538	..
12	561	557	569
13	565	577	596
14	587	588	622
15	605	603	613
16	606	619	654
17	638	640	662
18	624	624	648

² At the level of navel.

TABLE VI.
*Iliac Circumference.**

Age	Indian Hindus	Indian Christians	Luso-descendentes
	mm.	mm.	mm.
11	..	578	..
12	605	586	598
13	598	612	621
14	619	615	648
15	636	647	648
16	651	650	677
17	653	678	690
18	666	676	687

* At the level of the iliac crest.

TABLE VII (a).
Thoracic Diameters.
(*Axillary.*)

Age	Indian Hindus					
	A. Post			Transversal		
	Max.	Min.	Dif.	Max.	Min.	Dif.
11	..	..	..	..	..	..
12	134	122	12	191	178	13
13	139	125	14	192	176	16
14	138	122	16	205	188	17
15	153	139	15	206	191	15
16	152	137	15	215	201	14
17	154	140	14	227	212	15
18	157	140	17	222	205	17

Age	Indian Christians					
	A. Post.			Transversal		
	Max.	Min.	Dif.	Max.	Min.	Dif.
11	135	123	12	176	165	11
12	134	119	15	183	168	15
13	140	122	18	195	175	20
14	145	130	15	200	178	22
15	153	134	19	216	196	20
16	152	139	13	219	198	21
17	156	138	18	233	210	23
18	158	136	22	237	209	28

Age	Luso-descendentes					
	A. Post.			Transversal		
	Max.	Min.	Dif.	Max.	Min.	Dif.
11	..	..	..	..	..	..
12	143	124	19	184	160	24
13	143	124	19	202	179	23
14	158	138	20	204	175	29
15	151	130	21	213	179	34
16	163	138	25	219	194	25
17	166	145	21	235	206	29
18	165	138	27	243	208	35

TABLE VII (b).
*Thoracic Diameters.*¹

Age	Indian Hindus					
	A. Post			Transversal		
	Max.	Min.	Dif.	Max.	Min.	Dif.
11	..	..	..	..	..	..
12	148	137	11	214	198	16
13	155	142	13	215	201	14
14	163	148	15	220	200	20
15	170	152	18	225	202	23
16	170	153	17	226	211	15
17	175	158	17	247	228	19
18	172	153	19	238	216	22

Age	Indian Christians					
	A. Post			Transversal		
	Max.	Min.	Dif.	Max.	Min.	Dif.
11	156	146	10	201	188	13
12	150	135	15	209	191	18
13	151	137	14	219	197	22
14	171	151	20	226	202	24
15	170	151	19	239	215	24
16	166	147	19	244	215	31
17	172	150	22	254	226	28
18	170	146	24	245	217	28

Age	Luso-descendentes					
	A. Post			Transversal		
	Max.	Min.	Dif.	Max.	Min.	Dif.
11	..	..	..	..	..	..
12	159	139	20	219	164	55
13	166	143	23	230	206	24
14	171	150	21	239	207	32
15	180	152	28	244	209	35
16	186	153	28	250	211	39
17	188	160	28	252	221	31
18	169	155	14	270	219	51

¹ At the level of xyphoid process.

TABLE VIII.
Bi-Acromial Diameter.

Age	Indian Hindus	Indian Christians	Luso-descendentes
	mm.	mm.	mm.
11	..	273	..
12	297	284	294
13	300	307	297
14	318	318	317
15	326	335	317
16	344	352	340
17	359	357	349
18	350	355	351

TABLE IX.
Antero-Posterior Diameter of Abdomen.

Age	Indian Hindus	Indian Christians	Luso-descendentes
11	..	140	..
12	144	146	140
13	145	152	152
14	147	150	157
15	155	154	160
16	152	159	163
17	161	156	159
18	155	151	160

TABLE X.
Bi-iliac Diameter.

Age	Indian Hindus	Indian Christians	Luso-descendentes
	mm.	mm.	mm.
11	..	195	..
12	207	195	215
13	213	215	222
14	214	222	231
15	229	236	237
16	240	245	245
17	244	241	250
18	237	242	246

TABLE XI (a).

Circumference of Fore-arm.
(*Maximum.*)

Age	Indian Hindus		Indian Christians		Luso-descendentes	
	right	left	right	left	right	left
	mm.	mm.	mm.	mm.	mm.	mm.
11	..	..	180	172	..	..
12	185	180	180	177	187	182
13	191	185	190	180	191	187
14	197	193	202	197	205	200
15	216	200	210	204	207	203
16	220	211	213	210	232	226
17	227	225	227	222	233	224
18	224	221	224	220	236	228

TABLE XI (b).

Circumference of Fore-arm.
(*Minimum.*)

Age	Indian Hindus		Indian Christians		Luso-descendentes	
	right	left	right	left	right	left
	mm.	mm.	mm.	mm.	mm.	mm.
11	..	..	117	114	..	..
12	124	122	118	117	121	118
13	124	123	124	122	127	125
14	128	128	133	132	137	134
15	132	132	136	134	135	134
16	137	136	138	136	150	147
17	143	142	145	144	148	143
18	141	141	143	141	150	147

TABLE XII.

Dynamometry.

Age	Indian Hindus arm		Indian Christians arm		Luso-descendentes arm	
	right	left	right	left	right	left
	Kg.gr.	Kg.gr.	Kg.gr.	Kg.gr.	Kg.gr.	Kg.gr.
11	..	..	12,300	10,600	..	..
12	18,800	16,100	16,400	13,300	16,200	15,000
13	19,500	17,200	17,300	16,100	19,300	16,000
14	20,300	17,000	24,000	20,000	20,700	18,500
15	25,500	23,300	27,600	23,300	27,200	24,000
16	30,400	25,700	29,600	26,200	31,600	27,200
17	33,100	28,500	37,300	31,500	41,000	32,500
18	33,900	29,600	34,600	27,000	41,800	34,500

TABLE XIII.

Spirometry.

Age	Indian Hindus	Indian Christians	Luso-descendentes
	L. cl.	L. cl.	L. cl.
11	..	1, 38	..
12	1, 59	1, 67	1, 86
13	2, 1	1, 98	2, 18
14	2, 22	2, 81	2, 39
15	2, 44	2, 71	2, 90
16	2, 76	2, 92	3, 16
17	2, 89	3, 07	3, 49
18	2, 91	3, 28	3, 97

MEDICAL EXAMINATION.

(1) HEREDITY.

No elucidating data were obtained.

(2) PREVIOUS HISTORY.

The incidence of infectious diseases in the 3 groups is as shown below:—

Diseases	Hindus	Indian Christians	Luso-descendentes
Measles ..	73,39%	77,87%	72,72
Small-pox ..	4,92%	2,65%	1,13%
Whooping-cough ..	45,81%	58,85%	60,22%
Diphtheria ..	1,47%	2,21%	5,68%
Parotites ..	31,62%	30,08%	31,81%
Typhoid-Paratyphoid infections	28,05%	24,33%	14,77%
Malaria ..	16,74%	23,00%	35,22%

The incidence of Infectious diseases in the total number of the students examined:

Percentages.

Measles	74.85%
Small-pox	3.28%
Whooping Cough	53.96%
Diphtheria	2.51%
Parotites.....	30.94%
Typhoid-Paratyphoid	
infections	24.33%
Malaria	22.63%

(3) DIET.

The following were the percentages of different diets:

Vegetarian diet: 3.28. Vegetarian and fish diet: 8.31. Mixed diet: 88.39.

The high percentage of mixed diet is due to the inclusion of Hindu students in this group who, though rarely, eat flesh.

(4) DIGESTIVE SYSTEM.

(a) *Examination of the mouth.*—We inspected the roof of the mouth and the condition of teeth. We did not find students with ogival vaults. After carefully examining the teeth we adopted our own classification in which the letter C represents dental caries, the letter F the missing parts, the indices indicate their respective numbers.

Good.—Teeth without signs of caries and well attended to.

Regular.—Teeth with tartar, caries or missing parts not exceeding 2.

This group contains the following formulas: C^1, C^2, F^2, C^1F^1 .

Bad.—Teeth with caries or missing parts, not exceeding 5 in all.

In this group there are the following formulas:— $C^3, C^4, C^5, C^2F^1, C^1F^3, C^2F^2, C^2F^3, C^3F^1, C^3F^2, C^4F^1$.

Very bad.—Teeth with pyorrhea, with caries or missing parts exceeding 5 in all.

In this group there are the following formulas:— $C^6, C^3F^3, C^4F^2, C^4F^3, C^5F^1, C^5F^2, C^5F^3, C^5F^4, C^6F^1, C^6F^2, C^6F^1, C^6F^2, C^6F^7, C^8F^1$.

Based on our classification we found the following condition of teeth: *Good* 38.10; *regular* 32.30; *bad* 22.63; *very bad* 6.97.

Here is the comparative table of the percentages in the 3 groups:—

Groups	Normal teeth	Teeth with caries, missing parts or tartar
Hindus ..	47,78	52,22
Indian Christians ..	34,95	65,05
Luso-descendentes	23,86	76,13
Total examined ..	38,10	61,90

(b) *Examination of pharynx and of the tonsils.*— This examination resulted in the following observations: (1) Unilateral hypertrophy of tonsils, (2) Bilateral hypertrophy of tonsils, (3) Adenoids, (4) Other diseases of pharynx.

The following are the percentages of each group:

Groups	Hypertrophy of the tonsils		Ade-noid vegetations	Other diseases of Rhinopharynx
	Unilateral	Bilateral		
Hindus ..	19,21	12,80	5,91	..
Indian Christians ..	20,79	11,06	7,52	..
Luso descendentes	30,68	22,72	5,68	1,13

Here are the percentages in the total number examined :

<i>Hypertrophy of the tonsils (Unilateral)</i>	21,95%
<i>Hypertrophy of the tonsils (Bilateral)</i>	13,34%
<i>Adenoid vegetations</i>	6,57%
<i>Other diseases</i>	0,19%

(c) *Examination of the Intestines.*—We aimed at finding out the incidence of constipation and diarrhoea. Here are the results :

Groups	Normal	Constipation	Diarrhoea
Hindus ..	98,57	1,47	..
Indian Christians ..	93,36	6,63	..
Luso-descendentes	90,90	9,09	..

(d) *Hernia Regions.*—We found only one student, Luso-descendente, with inguinal hernia.

(5) RESPIRATORY SYSTEM.

Beyond the thoracic measurements nothing noteworthy of mention.

(6) CIRCULATORY SYSTEM.

(a) *Examination of the pulse.*—This examination was conducted with the student lying in bed.

The percentage of tachicardia was of 18.71 in Hindus, 22.56 in Indian Christians and 21.59 in Luso-descendentes, the percentage in relation to the total number examined being 20.88. The percentage of bradi-cardias was 3.09.

(b) *Heart examination.*—This examination consisted of auscultation and determination by palpation and percussion the position of the apex. The students were observed in both standing and dorsal positions. The following was the percentage of abnormalities (murmurs, extra-systoles,

hypertrophies) found: *Hindus*, 13.3; *Indian Christians*, 5.79; *Luso-descendentes*, 5.68. In our report we discussed and analysed the cause of these hypertrophies which can be generally attributed to (1) Athletic exercises and to sports without previous physical training. (2) Excessive cycling. (3) The staircase of the Liceu of 140 steps which the students must climb everyday. (4) Intellectual overwork. (5) Infectious diseases. (Typhoid fever and rheumatism.)

(c) *Efficiency of the Heart.*—The test which we made use of was the step-proof of Lian used with brilliant success in French methods. We found 4 Indian Christian students and 1 Hindu with fair cardiac sufficiency.

(d) *Blood Pressure.*—We determined the blood pressure of all the students by Boullite-Korotkow spygmanometer. The blood pressure is, in general, higher in Hindus. The normal range in Indian Christians and Luso-descendentes, of 12 to 20 years, is of 10 to 12 cm. Hg. to P. mx. and 6 to 8 cm. Hg. P mn. while in Hindus it oscillates between 11 to 13 P. mx. and 7 to 9 P.mn. The predominant differences of the pressures are 4 to 5 cm. Hg. in all three groups:—

(7) GENITO-URINARY SYSTEM.

The following is the table of the percentages of general diseases.

Groups	Varicoceles	Hydroceles	Orchitis
Hindus ..	1,97	0,98	1,96
Indian Christians ..	3,54	0,44	1,32
Luso-descendentes	4,54	1,13	1,13
Total examined ..	3,09	0,77	1,54

We noted also some congenital malformations: two cases of undescended testicles in the inguinal canal; one case of the testicular atrophy; one case of triorchidia; two cases of infantile penis with prominent pubis and rudimentary labia majora.

(8) SKIN DISEASES.

The following was the distribution of skin diseases: *Hindus*, 8.86. *Indian Christians*, 7.08. *Luso-descendentes*, 2.27. In relation to the total number examined: *Sane*, 93.03, *Skin diseases*, 6.93.

(9) LYMPHATIC SYSTEM.

The table with the distribution of gangli-ary hypertrophy is the following:—

Groups	Normal	Cervi- cal	Epitro- clears	Ingui- nal
Hindus ..	38,42	17,22	6,40	11,33
Indian Christians ..	26,10	23,89	2,21	12,83
Luso-descendentes	32,95	26,13	3,40	6,81
Total examined ..	32,10	21,66	4,06	11,21

Groups	Cervical & Epitro- clears	Cervical & Ingui- nal	Epitro- clears & Ingui- nal	Cervical Epitro- clears & Inguinal
Hindus ..	4,43	12,80	3,44	5,91
Indian Christians ..	1,77	27,43	1,32	4,42
Luso-descendentes	3,40	14,77	3,40	9,09
Total examined ..	3,09	19,53	2,51	5,80

(10) SKELETON.

(a) *Deviation of Vertebral Column.*—The Table of the distribution of the percentages is the following:—

Groups	Normal	Kypho- sis	Scolio- sis	Lordo- sis
Hindus ..	52,21	22,16	25,61	..
Indian Christians ..	51,32	23,89	24,33	0,44
Luso-descendentes	53,40	20,45	26,13	..
Total examined ..	52,03	22,44	25,14	0,19

(b) *Deformities of the Bones.*—The most common deformities we found were rachitic thorax. Its distribution was: Hindus 5.91; Indian Christians 11.50; And Luso-descendentes 7.95. Total examined 8.70.

(c) *Anomalies.*—We registered an interest-
ing case of second stage of hectrodactillea with the absence of metacarpals and fingers.

(11) EYES.

The examination of sight was made by the Vicker's optometric scale. Here is the Table:—

Groups	Short-sighted	Without correc- tion of sight
Hindus ..	24,77	66,07
Indian Christians ..	16,74	79,44
Luso-descendentes	18,18	68,75
Total examined ..	20,05	70,74

(12) EARS.

The examination of auditory acuteness was made with a "Longines" clock. Consider-
ing that the majority of students hear the tic-tac of the clock at a distance of 45 to 70 cms. and taking this ear as a normal one, we established the following classification:

cms.

<i>Excellent:</i> ear,	hearing at a dist. of 100 to 75
<i>Normal</i> ..	70 to 45
<i>Weak</i> ..	40 to 15
<i>Bad</i> ..	10 to 0

The table with the distribution of the percentages according to our classification is the following:—

Hearing Capacity	Hindus		Indian Christians		Luso-descen- dentes	
	ear		ear		ear	
	right	left	right	left	right	left
Excel- lent	13,79	12,80	14,16	15,48	25,00	22,73
Nor- mal	48,28	47,79	48,67	51,78	52,28	56,82
Weak	35,46	35,96	33,62	30,97	19,32	20,45
Bad	2,47	3,45	3,55	1,77	3,40	0