UNIVERSIDADE FEDERAL FLUMINENSE

FACULDADE DE ODONTOLOGIA

O PERFIL FACIAL DE BRASILEIROS ADULTOS

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TAÍSA FIGUEIREDO CHAGAS

Dissertação apresentada à Faculdade de Odontologia da Universidade Federal Fluminense, como parte dos requisitos para obtenção do título de Mestre, pelo Programa de Pós-Graduação em Odontologia.

Área de Concentração: Ortodontia
Orientador: Dr. José Nelson Mucha
Co-orientadora: Drª. Mariana Martins e Martins

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DEDICATÓRIA

Aos meus pais, Washington e Claudia, pelo apoio em todas as minhas escolhas.

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RESUMO

Chagas, TF. O perfil facial de brasileiros adultos [dissertação]. Niterói: Universidade Federal Fluminense, Faculdade de Odontologia; 2016.

Objetivo: Verificar se há concordância ou não entre as medidas obtidas em indivíduos adultos brasileiros brancos com as medidas das análises para os tecidos moles do perfil facial preconizadas por Holdaway, Merrifield, Burstone, Steiner e Ricketts. **Metodologia:** Foi utilizada uma amostra de 30 radiografias cefalométricas, sendo 15 mulheres (média = 22,67 ± 3,48 anos) e 15 homens (média = 23,93 ± 3,47 anos), com idades entre 18 e 31 anos (média = 23,93 ± 3,47 anos), todos apresentando oclusão excelente. Cefalogramas foram obtidos, juntamente com as medidas das análises do perfil facial, por único avaliador calibrado. Foram realizadas comparações com as medidas propostas pelos autores citados, utilizando-se o teste t e foi testada a correlação entre as medidas ANB e Â-H descrita por Holdaway através do Coeficiente de Correlação de Pearson. Para todos os teste, foi adotado o nível de significância de 5% (p < 0,05). **Resultados:** Das medidas avaliadas, 4 apresentaram diferenças estatisticamente significativas: Â.Z (Merrifield); S-LS e S-LI (Steiner) e E-LI (Ricketts) para os padrões preconizados pelos autores. Para as medidas ANB, Â.H, LB-LS, LB-LI não houve diferença estatisticamente significativa. **Conclusão:** Não houve diferença estatisticamente significativa nas medidas preconizadas Holdaway e Burstone. As medidas preconizadas por Merrifield, Steiner e Ricketts apresentaram diferenças estatísticas, sendo que para o ângulo "Z", os brasileiros apresentam um perfil mais convexo, para Steiner ligeiramente mais côncavo, e para o Plano E (Rickttes), maior protrusão do lábio inferior. Pode-se considerar que os indivíduos brasileiros adultos apresentam o perfil facial ligeiramente mais convexos dos que as normas americanas, mas estas diferenças devem ser vistas com cautela, pois clinicamente são pequenas.

Palavras-chave: cefalometria, perfil facial, normas de referência.

ABSTRACT

Chagas, TF. The facial profile of Brazilian adults [dissertation]. Niterói: Universidade Federal Fluminense, School of Dentistry, 2016.

Objective: To investigate whether or not there is agreement between measurement values obtained for white Brazilian adults and the values recommended by Holdaway, Merrifield, Burstone, Steiner and Ricketts, for facial profile soft tissue analysis. **Methods:** A sample of 30 cephalometric radiographs was used, consisting of 15 women (mean = 22.67 ± 3.48 years), and 15 men (mean = 23.93 ± 3.47 years), aged 18 to 31 years (mean = 23.93 ± 3.47 years), all exhibiting excellent occlusion. Cephalograms were obtained along with the measurement values from an analysis of the facial profile by a single calibrated examiner. Comparisons were made with the measurement values proposed by the aforementioned authors using Student's t-test to determine the correlation between the ANB and Â-H measurement values described by Holdaway, using Pearson's correlation coefficient. A significance level of 5% was adopted for all tests (p <0.05). **Results:** Among the measures evaluated, 4 showed statistically significant differences: Â.Z (Merrifield), S-LS and S-LI (Steiner), and E-LI (Ricketts) relative to the standards recommended by the authors. No statistically significant differences were found for the measurement values of ANB, Â.H, LB-LS and LB-LI. **Conclusions:** No statistically significant differences were found in the measurement values proposed by Holdaway and Burstone. The measurement values advocated by Merrifield, Steiner and Ricketts showed statistical differences, and as for the Z-angle, Brazilians feature a slightly more convex profile, which appeared slightly concave according to Steiner, and according to the E-Plane (Ricketts), it meant an increased protrusion of the lower lip. It could be asserted that adult Brazilians have a slightly more convex facial profile than US standards, but these differences should be viewed with caution, as they are clinically unimportant.

Keywords: Cephalometry, facial profile, reference standards.

1- INTRODUÇÃO

A adoção de medidas padrões para os tecidos moles do perfil facial, constituem-se em poderosas ferramentas para o diagnóstico e tratamento ortodôntico de excelência.

A avaliação do relacionamento das partes que compõem os tecidos moles do perfil facial, principalmente no terço inferior, é extremamente importante no diagnóstico e no planejamento do tratamento ortodôntico,[1, 2-6] pois este tem a capacidade de modificar o relacionamento das bases ósseas e das posições dentárias e consequentemente afetar a estética da face.[7]

Variáveis como sexo e origem étnica apresentam diferentes características de normalidade esqueléticas, dentárias e dos tecidos moles, o que requer conhecimento do normal ou considerado *standard* de cada grupo étnico.[7,8] Além disso, os pacientes esperam resultados que estejam de acordo com normas sociais e culturais de beleza em seu grupo de referência, em sua época e também na sociedade em geral. [9,10]

Para os efeitos de planejamento ortodôntico, deve ser considerada, principalmente, a posição dos lábios neste contorno estético, por ser a área de maior efeito do tratamento ortodôntico.[1] Além de considerar o fenômeno biológico do crescimento, pois pode-se esperar alterações no contorno do perfil facial, até a chegada do individuo a idade adulta, devido ao maior incremento de crescimento mandibular[11] e modificações nos tecidos moles que compõe o perfil tais como nariz,[12] lábios e mento.[13]

Estudos evidenciam características dentofaciais e estéticas específicas em cada grupo étnico, levando os profissionais a considerar essas diferenças no diagnóstico e planejamento do tratamento ortodôntico.[14,15]Deve-se, portanto, planejar os tratamentos visando os resultados destas modificações e o que deveria ser esperado na idade adulta para o perfil facial.

As normas para tecidos duros e moles devem ser consideradas no estabelecimento de uma estética facial harmoniosa e uma oclusão funcional

ideal,[16-18]porém, os valores normativos mais aceitos são baseados em estudos de indivíduos não tratados de origem européia[19-21] ou norte-americana.[22]

Desta forma, os indivíduos adultos brasileiros brancos apresentando oclusão excelente poderiam exibir a posição dos lábios no contorno do perfil facial em uma relação diferente daquelas preconizadas pelos diversos autores para a população norte-americana ou de origem europeia, e que implicaria em decisões de planejamento de tratamento ortodôntico diferentes.

Portanto, teve-se como objetivo verificar a concordância ou não das medidas obtidas em indivíduos adultos brasileiros brancos com as medidas das análises para os tecidos moles do perfil facial preconizadas por Holdaway,[3]Merrifield,[23] Burstone,[24] Steiner[25] e Ricketts.[26]

2- METODOLOGIA

Este estudo foi aprovado pelo Comitê de Ética em Pesquisa da Universidade Federal Fluminense (UFF), sob o parecer de número 868.924 (Anexo).

Foram obtidas medidas cefalométricas dos tecidos moles do perfil facial de 30 radiografias cefalométricas pertencentes aos arquivos de uma amostra de oclusão excelente da Disciplina de Ortodontia da Universidade Federal Fluminense (UFF), composta de indivíduos adultos brasileiros brancos, com idades entre 18 e 31 anos com todos os dentes presentes em oclusão normal ou excelente, sendo 15 mulheres (média de idade = 22,67 ± 3,48) e 15 homens (média de idade = 23,93 ± 3,47).

Os critérios de inclusão foram: indivíduos apresentando todos os dentes presentes em oclusão normal ou excelente. Os casos de divergências quanto a oclusão, foram analisados por três ortodontistas e removidos da amostra, bem como pacientes com histórico de trauma e tratamento ortodôntico prévio.

Os cefalogramas foram traçadas manualmente por um único operador devidamente calibrado (TFC). Foram localizados detalhes anatômicos, pontos, linhas e planos que compõem as análises dos tecidos moles descritas por Holdaway,[3] Merrifield,[23] Burstone,[24] Steiner[25] e Ricketts.[26] (Figura 1).
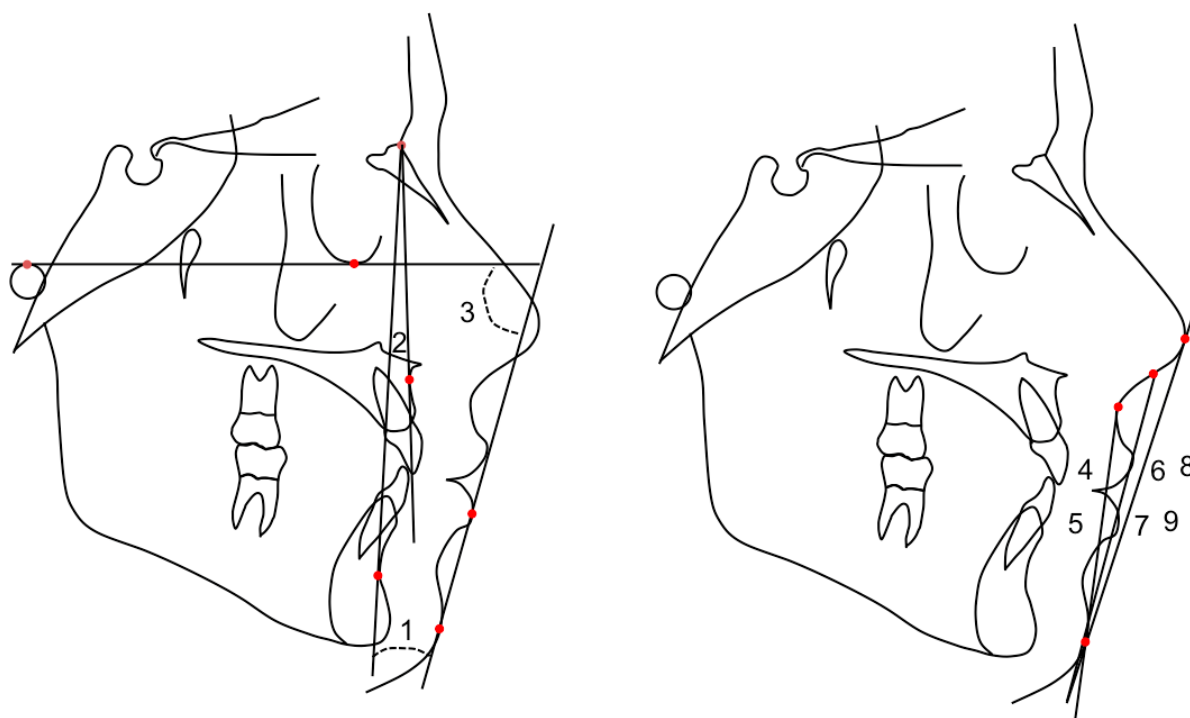
Figura 1. Medidas utilizadas. (1) Ângulo H,[3] (2) Ângulo ANB;[25] (3) Ângulo Z;[23] (4) Medida linear do ponto mais anterior do lábio superior até linha que une os pontos Subnasal e Pogônio; [24] (5) Medida linear do ponto mais anterior do lábio inferior até linha que une os pontos Subnasal e Pogônio;[24] (6) Medida linear do ponto mais anterior do lábio superior até a linha que une os pontos Meio da base do nariz ao Pogônio;[25] (7) Medida linear do ponto mais anterior do lábio inferior até a linha que une os pontos Meio da base do nariz ao Pogônio;[25] (8) Medida linear do ponto mais anterior do lábio superior até a linha que une os pontos ponta do nariz e Pogônio;[26] (9) Medida linear do ponto mais anterior do lábio inferior até a linha que une os pontos ponta do nariz e Pogônio.[26]

As descrições das medidas utilizadas estão dispostas na Tabela 1. Foram atribuídos valores negativos para os pontos localizados aquém (posterior) das linhas e planos e valores positivos para os pontos localizados à frente (anterior) das linhas e planos preconizados.

Tabela 1. Descrição das medidas utilizadas.

Medidas		Descrição
1	Â.H	Ângulo "H". Formado pela união da linha que une o ponto S ao ponto N e da linha que une os pontos Pogônio mole e Lábio Superior
2	ANB	Ângulo formado pela união da linha que une o ponto N ao ponto A e a linha que une o ponto N ao ponto B
3	ÂZ	Ângulo "Z". Formado pela união do Plano Horizontal de Frankfurt e a linha que une os ponto Pogônio mole e Lábio mais proeminente.
4	LB-LS	Medida linear do Lábio Superior até a linha formada pela união dos pontos Subnasal e Pogônio mole
5	LB-LI	Medida linear do Lábio Superior até a linha formada pela união dos pontos Subnasal e Pogônio mole
6	S- LS	Medida Linear do Lábio Superior até a linha que une os pontos Meio da base do nariz (meio do "S") ao Pogônio mole
7	S-LI	Medida Linear do Lábio Inferior até a linha que une os pontos Meio da base do nariz (meio do "S") ao Pogônio mole
8	E-LS	Medida Linear do Lábio Superior até a linha que une os pontos Ponto do nariz ao Pogônio mole
9	E-LI	Medida Linear do Lábio Inferior até a linha que une os pontos Ponto do nariz ao Pogônio mole

Para a avaliação do erro do método intra-examinador, as medidas obtidas de 10 telerradiografias foram avaliadas em dois tempos, com um intervalo mínimo de uma semana. Após a avaliação inicial, foram realizados novos traçados, determinando novos pontos, linhas e planos que compõem as análises dos tecidos moles propostas para o estudo e foi aplicado o Coeficiente de Correlação Intraclasse (ICC).

Após a obtenção das medidas, estas foram organizadas em tabelas, calculadas as médias e variações em torno das médias e realizadas comparações com as medidas propostas pelos autores citados.[3,23-26]

Foi realizado o cálculo amostral para calcular o poder do teste. Foram utilizadas as variáveis S-LI e SL-S por serem consideradas as medidas mais usuais para a avaliação da posição dos lábios.

Foi utilizado o software Biostat 5.3 [27] e calculadas as médias, desvio-padrão, valores mínimos e máximos.

Foram comparadas as diferenças entre os sexos e em relação às médias das idades e foi utilizado o teste de Shapiro-Wilk para análise da normalidade dos dados. Nas variáveis em que a distribuição dos dados foi normal, foi aplicado o teste "t" de Student para comparar médias das características quanto ao sexo, visando a observação da presença ou não de dimorfismo sexual. Nas variáveis em que a distribuição dos dados foi anormal, foi utilizado o teste Mann-Whitney.

Foram comparadas as médias das medidas deste estudo com os valores preconizados pelos autores[3,23-26] utilizando-se o teste t. Foi testada a correlação entre as medidas ANB e Â-H descrita por Holdaway[3] através do Coeficiente de Correlação de Pearson.

Para todos os testes, foi adotado o nível de significância de 5% ($p < 0,05$).

Para o levantamento bibliográfico, foi realizada uma busca eletrônica sistematizada, com o suporte técnico de uma bibliotecária, nas seguintes bases de dados: Medline/Pubmed, Scopus, Web of Science e Cochrane, sem restrição do período da publicação e sem restrição de idioma (figura 2).

Bases de dados	Estratégias de busca
MEDLINE via Pubmed	(((Cephalometry/Standards[mh] OR Cephalometry[tiab] OR "Linear measurements"[tiab] OR "Angular measurements"[tiab] OR Reference Standards[mh] OR Reference Standards[tiab]) AND (Cephalometry/Standards[mh] OR Cephalometry[tiab] OR "Linear measurements"[tiab] OR "Angular measurements"[tiab] OR Reference Standards[mh] OR Reference Standards[tiab]))) AND ((Facial profile[tiab] OR profiles[tiab] OR Face[mh] OR facial analysis[tiab] OR lip[mh] OR lip[tiab])) Total: 339
SCOPUS	(TITLE-ABS-KEY (cephalometry) OR TITLE-ABS-KEY ("Linear measurements") OR TITLE-ABS-KEY ("Angular measurements") OR TITLE-ABS-KEY ("Reference Standard") AND TITLE-ABS-KEY ("facial profile") OR TITLE-ABS-KEY (profiles) OR TITLE-ABS-KEY ("facial analysis") OR TITLE-ABS-KEY (lip)) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (SUBJAREA , "DENT")) AND (EXCLUDE (EXACTKEYWORD , "Child")) 1118 resultados
Web of Science	TS= (cephalometry OR "linear measurements"OR "angular measurements"OR "reference standard") Refined by: RESEARCH AREAS: (DENTISTRY ORAL SURGERY MEDICINE) DocType=All document types; Language=All languages; AND TS=("facial profile" OR profiles OR "facial analysis"OR lip) Refined by: DOCUMENT TYPES: (ARTICLE OR REVIEW) AND RESEARCH AREAS: (DENTISTRY ORAL SURGERY MEDICINE) DocType=All document types; Language=All languages; 284 results
Cochrane	#1cephalometry:ti,ab,kw (Word variations have been searched) #2MeSH descriptor: [Cephalometry] explode all trees #3MeSH descriptor: [Reference Standards] explode all trees #4standards:ti,ab,kw (Word variations have been searched) #5reference standard:ti,ab,kw (Word variations have been searched) #6Linear measurements:ti,ab,kw (Word variations have been searched) #7Angular measurements:ti,ab,kw (Word variations have been searched) #8 #1 or #2 or #3 or #4 or #5 or #6 or #7 #9Facial profile:ti,ab,kw (Word variations have been searched) #10profiles:ti,ab,kw (Word variations have been searched) #11MeSH descriptor: [Face] explode all trees #12face:ti,ab,kw (Word variations have been searched) #13facial analysis:ti,ab,kw (Word variations have been searched) #14 #9 or #10 or #11 or #12 or #13 #15lip:ti,ab,kw (Word variations have been searched) #16 MeSH descriptor [Lip] explode all trees #17 #15 or #16 #18 #8 and #14 and #17 Total: 77 results

Figura 2 - Estratégias de busca utilizadas para as bases de dados

3- ARTIGO PRODUZIDO

The facial profile in brazilian adults

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ABSTRACT

Objective: To investigate whether or not there is agreement between measurement values obtained for white Brazilian adults and the values recommended by Holdaway, Merrifield, Burstone, Steiner and Ricketts, for facial profile soft tissue analysis. **Methods:** A sample of 30 cephalometric radiographs was used, consisting of 15 women (mean = 22.67 ± 3.48 years), and 15 men (mean = 23.93 ± 3.47 years), aged 18 to 31 years (mean = 23.93 ± 3.47 years), all exhibiting excellent occlusion. Cephalograms were obtained along with the measurement values from an analysis of the facial profile by a single calibrated examiner. Comparisons were made with the measurement values proposed by the aforementioned authors using Student's t-test to determine the correlation between the ANB and Â-H measurement values described by Holdaway, using Pearson's correlation coefficient. A significance level of 5% was adopted for all tests ($p < 0.05$). **Results:** Among the measures evaluated, 4 showed statistically significant differences: Â.Z (Merrifield), S-LS and S-LI (Steiner), and E-LI (Ricketts) relative to the standards recommended

by the authors. No statistically significant differences were found for the measurement values of ANB, Â.H, LB-LS and LB-LI. **Conclusions:** No statistically significant differences were found in the measurement values proposed by Holdaway and Burstone. The measurement values advocated by Merrifield, Steiner and Ricketts showed statistical differences, and as for the Z-angle, Brazilians feature a slightly more convex profile, which appeared slightly concave according to Steiner, and according to the E-Plane (Ricketts), it meant an increased protrusion of the lower lip. It could be asserted that adult Brazilians have a slightly more convex facial profile than US standards, but these differences should be viewed with caution, as they are clinically unimportant.

Keywords: Cephalometry, facial profile, reference standards.

INTRODUCTION

The adoption of standard measurement values for facial profile soft tissues constitutes a powerful diagnostic tool which helps one to achieve an orthodontic treatment of excellence.

Assessing the relationship between the parts that make up facial profile soft tissues, especially in the lower third, is paramount for diagnosing and planning orthodontic treatment[4,10,13] given that orthodontic treatment has the ability to alter the relationship between the basal bones and tooth positions, ultimately affecting the aesthetics of the face[27].

Variables such as gender and ethnic origin have different characteristics of skeletal, dental and soft tissue normality, which require knowledge of what is considered normal or standard in each ethnic group[1,27]. In addition, patients expect results to be in accordance with social and cultural standards of beauty prevalent in their reference group, the Zeitgeist, as well as in society in general[16].

For the purposes of orthodontic planning one must consider above all the position of the lips in their aesthetic contour since this is the area most affected by the orthodontic treatment[10]. Besides considering the phenomenon of biological growth, changes can be expected to occur in the contour of the facial profile before the individual reaches adulthood. This is due to (1) a higher growth increment of the

mandible[18] and (2) changes in the soft tissues that make up the profile such as nose, lips[29] and chin[22].

Studies show dentofacial and aesthetic characteristics that are specific to each ethnic group, leading professionals to take these differences into account when diagnosing and planning the orthodontic treatment[12,24]. One should therefore plan the treatments to accommodate the outcome of these changes and what might be expected of the facial profile in adulthood.

The standards for hard and soft tissues should be considered in establishing a balanced facial aesthetics and an ideal functional occlusion. However, the most widely accepted normative values are based on studies of untreated subjects of European[26,28], or North American stock[23].

Thus, white Brazilian adults with excellent occlusion might display the position of the lips in the contour of the facial profile in a different relationship from those advocated by various authors for a population of North American or European origin, which would necessarily entail different decisions when planning the orthodontic treatment.

Therefore, the aim of this study was to investigate whether or not there is agreement between the measurement values obtained for white Brazilian adults and the values recommended by Burstone[3] (1967), Holdaway[13] (1983), Merrifield[20] (1966), Ricketts[23] (1968) and Steiner[26] (1953) for an analysis of facial profile soft tissues.

MATERIAL AND METHODS

This study was approved by the Research in Ethics Committee of Universidade Federal Fluminense (UFF) under submission number 868.924.

Cephalometric measurements of facial profile soft tissues were obtained from 30 cephalometric radiographs from the archives of the Department of Orthodontics, Universidade Federal Fluminense (UFF), composed of white Brazilian adults aged 18 to 31 years old with all teeth, in normal or excellent occlusion. The sample comprised 15 women (mean age = 22.67 ± 3.48), and 15 men (mean age = 23.93 ± 3.47).

Inclusion criteria were: subjects with all teeth in normal or excellent occlusion. Controversial occlusion cases were examined by three orthodontists and removed from the sample, as were patients with a history of trauma and previous orthodontic treatment.

The cephalograms were traced manually by a single calibrated operator. The anatomical details, points, lines and planes that make up the analysis of soft tissue described by Burstone[3] (1967), Holdaway[13] (1983), Merrifield[20] (1966), Ricketts[23] (1968) and Steiner[26] (1953) were marked (Figure 1).

Descriptions of these measures are shown in Table 1. Negative values were assigned to the points located below (posterior) the lines and planes, and positive values assigned to the points located at the front (anterior) of the recommended lines and planes.
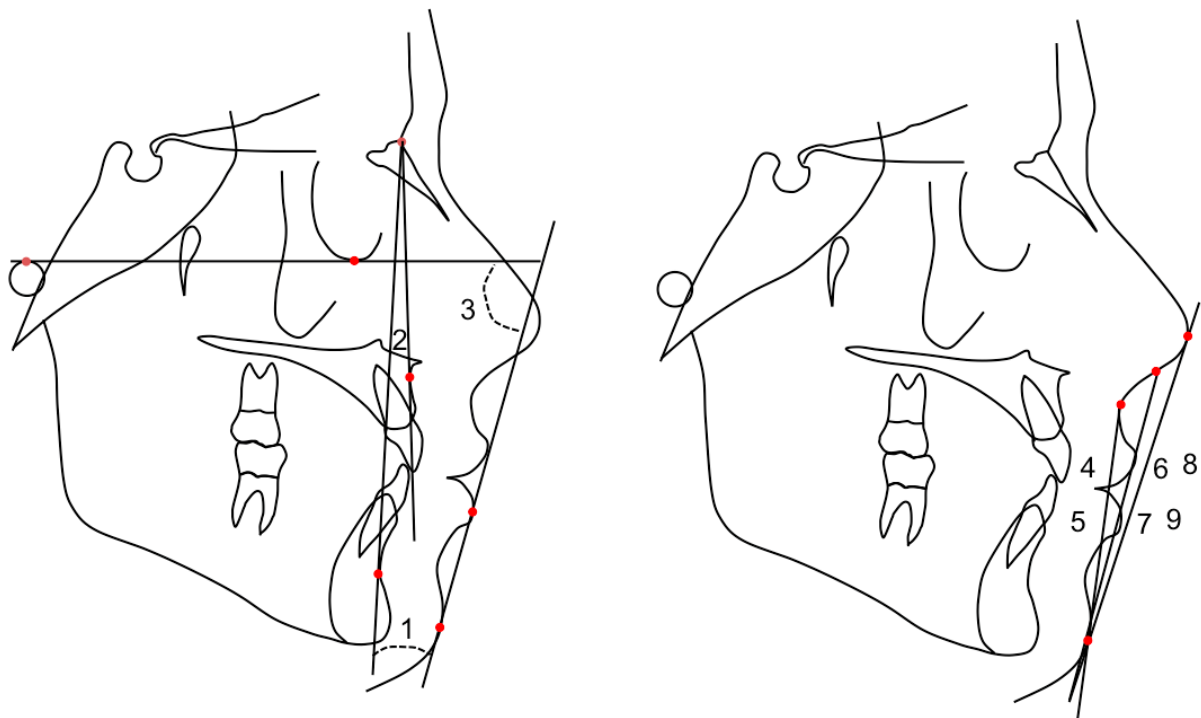

Figure 1 - Measures used (1) H-Angle[13]; (2) ANB angle[26]; (3) Z-Angle[20]; (4) Linear measurement from the most anterior point of the upper lip to the line joining the subnasal and Pogonion points[3]; (5) Linear measurement from the most anterior point of the lower lip to the line joining the subnasal and Pogonion points[3]; (6) Linear measurement from the most anterior point of the upper lip to the line joining the midpoints of the base of the nose to the Pogonion[26]; (7) Linear measurement from the most anterior point of the lower lip to the line joining the midpoints of the base of the nose to the Pogonion[26]; (8) Linear measurement from the most anterior point of the upper lip to the line connecting the tip of the nose and Pogonion points[23]; (9) Linear measurement from the most anterior point of the lower lip to the line joining the tip of the nose and Pogonion points[23]

Table 1 - Description of the measures used

	Measures		Description
Holdaway	1	Â.H	H-Angle: Formed by the line connecting point S to point N, and joining the lines from the soft Pogonion points to the upper lip
	2	ANB	Angle formed by joining the line connecting point N to point A, and the line connecting point N to point B
Merrifield	3	ÂZ	Z-Angle: Formed by joining the Frankfort horizontal plane, and the line joining the soft Pogonion point and a more prominent lip
Burstone	4	LB-LS	Linear measurement from the upper lip to the line formed by joining the subnasal and soft Pogonion points
	5	LB-LI	Linear measurement from the upper lip to the line formed by joining the subnasal and soft Pogonion points
Steiner	6	S- LS	Linear measurement from the upper lip to the line joining the midpoints of the nose base (middle of the "S") to the soft Pogonion
	7	S-LI	Linear measurement from the lower lip to the line joining the midpoints of the nose base (middle of the "S") to the soft Pogonion
Ricketts	8	E-LS	Linear measurement from the upper lip to the line joining the tip-of-the-nose point to the soft Pogonion
	9	E-LI	Linear measurement from the lower lip to the line joining the tip-of-the-nose point to the soft Pogonion

In order to assess intraexaminer method error measurements from 10 radiographs were evaluated in two stages, with a minimum interval of one week. After the initial evaluation, new tracings were carried out, determining the new points, lines and planes that make up the analysis of the soft tissues proposed for the study. Moreover, Intraclass Correlation Coefficient (ICC) was applied.

The resulting measurements were organized in tables, the means and variations around the means were obtained and comparisons with the measurement values advanced by the aforementioned authors were made[3,13,20,23,26].

Sample calculation was performed to calculate test power. Variables S-LI and SL-S were employed as they are the most frequently used measures for evaluating the position of the lips.

Biostat 5.3 (Belém, Pará, Brazil) software was employed, and the means, standard deviations, minimum and maximum values were calculated.

The differences between genders and between ages were compared, and the Shapiro-Wilk test was used to analyze data normality. Student's t-test was applied to those variables whose data distribution was normal in order to compare the means for gender characteristics. The purpose was to determine whether or not sexual dimorphism was present. Furthermore, the Mann-Whitney test was applied to those variables whose data distribution was abnormal.

The mean measurement values found in this study were compared to the values proposed by the authors[3,13,20,23,26] using t-test. The correlation between ANB and Â-H measurement values as described by Holdaway[13] (1983) was tested using Pearson's correlation coefficient.

A significance level of 5% was adopted for all tests (p < .05).

RESULTS

Sample size calculation showed a high test power. For the S-Li variable, test power was 93% with alpha level of 0.05, and 96% power for the S-LS variable, with an alpha level of 0.001 after assessing 30 individuals.

In evaluating ICC, excellent reproducibility was found in most measures (Â.H, ANB, Â-Z LB-LS and LB-LI), as well as an average to good reproducibility in 4 other measures (S-LS, S-LI, E-LS and E-LI).

Age in the total sample ranged from 18 to 31 years, with a mean value of 23.30 (SD ± 3.48). In males, the mean value was 23.93 (SD ± 3.47), and in females, 22.67 (SD ± 3.48), with no statistically significant difference between the groups as a result of the Mann-Whitney test (P = .2998).

Each of the nine measures was evaluated to elicit differences between genders. Distribution was tested by the Shapiro-Wilk test. The five measurements showed abnormal distribution (A-H, LB, LS, LI S-E-E-LS, LI). The Mann-Whitney test was applied to these measurements and independent t test was used for other measurements with normal distribution.

Given that no significant differences were found between the genders, the subgroups were gathered in a single sample group (n = 30) and statistical analysis was performed with independent t test.

The means, standard deviations, minimum and maximum values, and assessment of the differences found in comparison to the values proposed by the authors[3,13,20,23,26] are described in Table 2.

Table 2 - Mean, standard deviation, minimum and maximum values, and means suggested by the authors to evaluate soft tissues, as well as the results from the independent t-test for a given sample

	Measure	Mean	Standard Deviation	Minimum	Maximum	Author's mean	P
1	Â.H (^{0})	8.11	2.42	1.50	13.9	8.0	0.7939 [n.s.]
2	ANB (^{0})	1.68	1.17	-1.0	5.0	2.0	0.1491 [n.s.]
3	ÂZ (^{0})	77.93	4.85	66	89	80.0	0.0267*
4	LB-LS mm	3.41	1.75	-2.5	6	3.50	0.7963 [n.s.]
5	LB-LI mm	2.28	1.59	-1	5	2.20	0.7761 [n.s.]
6	S-LS mm	-1.48	1.60	-5	2	0	<0.0001*
7	S-LI mm	-1.01	1.60	-4	1.5	0	0.0016*
8	E-LS mm	-4.85	2.58	-9	5	_	_
9	E-LI mm	-2.78	2.71	-6	5	-4	0.0203*

* Statistically significant (p<0.05); ns: Not significant.

No statistically significant differences were found between the means of the ANB and Â.H measurement values using the parameters provided by Holdaway[13] (1983). The same proved true for the LB-LS and LB-LI mean values using the parameters provided by Burstone[3] (1967).

Holdaway[13] (1983) described a correlation between ANB and Â-H. Thus, this correlation was tested in this sample using the Pearson correlation coefficient, and a positive (r = .4419) and significant (P = .0144) correlation was found. Due to the

dependence among these measures a simple linear regression was performed and found the equation: y = 6.5766 x + .9149 x, where y = A.H and x = ANB.

A statistically significant difference was found between mean Â.Z values in the sample and those provided by Merrifield[20] (1966). Differences were also found between the means of the S-LS and S-LI measurement values compared to the standards provided by Steiner[26] (1953) and between the mean values for E-LI relative to the norms provided by Ricketts[23] (1968).

Only a descriptive analysis of the E-LS was performed since Ricketts[23] (1968) failed to provide a reference value for this measure.

DISCUSSION

This study aimed to evaluate white adults with normal occlusion and well balanced faces to determine whether or not the measurement values found for these subjects were similar to those of North Americans and Europeans. However, it should be considered that Brazilians, even those considered white, experience a high degree of miscegenation, which makes them one of the most heterogeneous populations in the world.

The ANB measure, although skeletal, was included since Holdaway[13] (1983) proposes a value dependence relationship between ANB and the H-Angle.

Among the measures evaluated, 4 showed statistically significant differences: Â.Z, S-LS, S-LI and E-LI. The E-LS measure cannot be compared because the author[23] failed to set a mean value. No statistically significant differences were found for variables Â.H, ANB, LB-LS and LB-LI.

Regarding Holdaway's[13] (1983) analysis, given that statistically significant differences were not observed among the measures of this sample and the above measures, one can consider that the standards and correlations of this analysis can be applied to white Brazilian adults.

For the Z-Angle a mean of 77.93 degrees was found, 2.07 degrees less than the value recommended by Merrifield[20] (1966), suggesting a slightly larger convexity in the profile of white Brazilian adults. Although it is a small difference it proved statistically significant. But clinically, this difference cannot be considered relevant. Leichsenring et al[19](2004) found a mean of 71.75 degrees and Yu et al [30] (2016) found a mean of 68.33 degrees for the Z-Angle in a study conducted with Chinese patients

with normal occlusion and balanced profiles, values lower than the 77.93 degrees found in this study. This is probably due to age differences between the samples and can be attributed to the early maturation of girls[2]. It is to be expected that due to mandibular growth there should be an increase in this angle.

In measuring the Subnasal-Pogonion line in the soft tissues relative to the lips[3] the values for LB-LS = 3.41 mm and LB-LI = 2.28 mm, appeared very close to the standards. However, this applied only to adolescents with normal occlusion (LB-LS = 3.50 mm and LB-LI = 2.20 mm). One can therefore consider that the measurement values for American teenagers resemble those of Brazilian adults.

The S-LS (-1,48 mm) and S-LI (-1.01 mm) measures in this study showed slightly more retruded upper and lower lips compared to the standard established by Steiner[26] (1953). These differences were significant. Moreover, the lower lip protruded more than the upper lip. The differences found in this study can be attributed to the growth of the nose and chin regions, causing the lips to take on a more retruded position relative to this line[6].

These differences may be explained by ethnic differences in each group. Erbay, Caniklioğlu, Erbay[8] (2002) evaluated 96 Turkish adults aged between 21.63 and 22.45 years, with normal occlusion, and also found lips that were more retruded than the values recommended by Steiner[26] (1953) (women: S-LS = 2.7 mm and S-LI = -2.0 mm, and men S-LS = -3.3 mm and S-LI = -2.7 mm). Isiekwe, Olatokunbo and Chukwudi[15] (2012), in evaluating 100 adult Nigerian individuals (ages 18 to 25 years) with normal occlusion found the values of S-LS= 5.89 mm and S-LI= 8.19 mm, indicating lips that were much more protruded than the values established by Steiner[26](1953), Sharma[25] (2011) also found upper and lower lips that were more protruded than Steiner's standards[26] in assessing 121 Nepalis with normal occlusion and well balanced faces (S-LS= 2.1 mm and S-LI= 2.2 mm).

Regarding the measurement values found for Ricketts' aesthetic plane[23], the E-LS averaged -4.85 mm and could not be compared quantitatively owing to the lack of a reference value. The difference was attributed to the early maturation of girls and their increased nose growth compared to boys. Freitas et al[11] (2010) also found different results in white Brazilians with normal occlusion (E-LS = -4.23 mm), and although a sample of adolescents was used, the results were similar to those found in this study.

In measuring E-LI, the mean was -2.78 mm, with the lower lip positioned 1.22 mm more anteriorly in relation to the standards established by Ricketts[23] (1968)

suggesting that the lower lip in white Brazilian adults is more protruded than advocated by the author, and with a significant difference. Nobuyasu et al[21] (2007) in evaluating Brazilian individuals aged between 12 and 15 years with normal occlusion also found more protruded lower lips (-.95 mm ± 2,37 mm). Freitas et al[11] (2010) found -1.96 mm for E-LI in white Brazilian adolescents with normal occlusion. However, the nose and chin positions were not evaluated separately, and those with a more developed nose and chin can provide a good aesthetic appearance due to their greater labial protrusion[7]. Lahlou et al[17] (2010) also found more retruded upper and lower lips (E-LS = -1.23 mm and E-LI = -.05 mm) after evaluating 102 Moroccan adults with normal occlusion and mean age of 21 years and 6 months.

Neglecting soft tissue analysis and evaluating dental and skeletal relationships separately can produce misleading results since the soft tissues of the face vary in thickness, length and postural tonus in different individuals[26].

It is important to consider the specific variations in different populations and establish standards for each group, which should be treated according to their own characteristics[14].

Furthermore, caution should be exercised in growing patients, and the changes in nose, chin and lip growth should be considered. Nose growth is greater in boys than in girls, and the convexity of the profile soft tissue increases with age, influenced by the position of the nose.

Van der Heijden et al[29] (2008) reported in a systematic review that nose growth reaches its maturity at 15.8 years for females and 16.9 years for males. Nevertheless, Fortes et al[10] (2014) contend that the size of the nose is not as important as its relationship with other facial structures, and recommend weighing all these issues.

Holdaway's[13] (1983) was the best analysis for relating the position of the lips with the other structures of the facial profile. Besides, it yielded similar results to this sample. Burstone's[3] (1967) analysis uses an area of stable growth, i.e., the subnasal point, and also showed results that were similar to this sample.

Although this study was concerned with establishing standards for white Brazilian adults, one should take into account the fact that Brazil is a huge country with an interbred population, making it difficult to establish a single diagnosis and planning standard. One must also take into account each individual's ascendency[9,11], as there are differences in dentofacial relationship depending on the ethnic variability of each racial group[11].

Even though some of the measurement values presented statistically significant differences compared to the standards or means recommended by different authors one can consider, from a clinical point of view, that the differences were of approximately 1 to 1.5 mm, and that these values are therefore very close to the standards.

It should also be emphasized that there is a wide variety of facial and ethnic types among individuals seeking treatment to improve the aesthetic appearance of their facial profile, thereby rendering these small differences of little clinical significance.

CONCLUSIONS

In Brazilian adults:

No statistically significant differences were found between the mean values obtained in this sample and the mean values recommended by Holdaway and Burstone.

The measurement values advocated by Merrifield, Steiner and Ricketts showed statistical differences. Nevertheless, regarding the Z-angle, Brazilians feature a more convex profile, which was slightly more concave compared to Steiner's, and showed an increased protrusion of the lower lip compared to the E-Plane (Ricketts).

It could be asserted that adult Brazilians have a slightly more convex facial profile than US standards, but these differences should be viewed with caution, as they are clinically unimportant.

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4- CONCLUSÕES

Em adultos brasileiros:

Não foram verificadas diferenças estatisticamente significativas entre as médias obtidas nesta amostra e as preconizadas por Holdaway e Burstone.

As medidas preconizadas por Merrifield, Steiner e Ricketts apresentaram diferenças estatísticas, sendo que para o ângulo "Z", os brasileiros apresentam um perfil mais convexo, para Steiner ligeiramente mais côncavo e para o Plano E (Ricketts), maior protrusão do lábio inferior.

Pode-se considerar que os indivíduos brasileiros adultos apresentam o perfil facial ligeiramente mais convexos dos que as normas americanas, mas estas diferenças devem ser vistas com cautela, pois clinicamente são pequenas.

FACULDADE DE MEDICINA DA UNIVERSIDADE FEDERAL FLUMINENSE/ FM/ UFF/ HU	Plataforma Brasil

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Normas estéticas do perfil facial em brasileiros adultos jovens
Pesquisador: Mariana Martins e Martins
Área Temática:
Versão: 1
CAAE: 37655914.0.0000.5243
Instituição Proponente: Faculdade de odontologia
Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 868.924
Data da Relatoria: 06/11/2014

Apresentação do Projeto:

Tendo em vista certas variações em relação a diferentes grupos populacionais, pretende-se determinar normas para servirem de parâmetros no procedimentos de diagnóstico e planejamento do tratamento ortodôntico, em relação ao perfil facial de indivíduos adultos brasileiros.

Tem como objetivo determinar as medidas médias e as variações das medidas encontradas em linhas utilizadas para a avaliação do contorno do perfil facial, em brasileiros brancos adultos, com oclusão excelente. Serão obtidas medidas e médias de trinta traçados cefalométricos de indivíduos brasileiros adultos brancos, 15 homens e 15 mulheres, com idades entre 18 e 30 anos, todos portadores de oclusão excelente. Cinco cefalogramas serão reavaliados com intervalo mínimo de uma semana para avaliar a concordância intra operador através do índice de correlação intraclasse. Após a calibragem do operador, serão obtidas médias e variações em torno da média da análise dos tecidos moles que compõem o perfil facial dos participantes da amostra e será realizada a comparação com os parâmetros das análises para os tecidos moles, preconizadas por Holdaway, Merrifield, Burstone, Steiner e Ricketts através de análise estatística de regressão.

Objetivo da Pesquisa:

Objetivo Primário:

O Objetivo deste trabalho será o de determinar as medidas médias e as variações das medidas encontradas em linhas utilizadas para a avaliação do contorno do perfil facial, em brasileiros

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brancos adultos, com oclusão excelente.

Objetivo Secundário:

Comparar as medidas médias com os padrões das análises para perfil propostas por Holdaway, Steiner, Ricketts, Merrifield e Burstone e determinar normas para serem utilizadas no diagnóstico e planejamento do tratamento ortodôntico em brasileiros leucodermas.

Avaliação dos Riscos e Benefícios:

Segundo o pesquisador, "não existem riscos envolvidos na pesquisa, uma vez que serão utilizados apenas os cefalogramas dos prontuários", sem envolvimento direto dos participantes. Identifica como benefícios aqueles relacionados "à orientação aos clínicos referente a um planejamento mais preciso no que diz respeito a estética do perfil facial no tratamento ortodôntico de adultos brasileiros."

Comentários e Considerações sobre a Pesquisa:

Pesquisa que trata de tema importante para a especialidade em tela e que apresenta metodologia adequada para o objeto de investigado. Solicita dispensa de TCLE, o que foi atendido por entender a dificuldade na localização dos sujeitos, dado o tempo em que o registro foi efetuado.

Destaca-se o necessário cuidado na generalização dos resultados, pois a amostra provavelmente seja insuficiente para representar o perfil facial de brasileiros, brancos, adultos e com oclusão excelente.

Considerações sobre os Termos de apresentação obrigatória:

Atende aos requisitos.

Recomendações:

Conclusões ou Pendências e Lista de Inadequações:

Projeto que atende aos Termos de apresentação obrigatória e não oferece risco aos participantes do estudo.

Situação do Parecer:

Aprovado

Necessita Apreciação da CONEP:

Não

Considerações Finais a critério do CEP:

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FACULDADE DE MEDICINA DA UNIVERSIDADE FEDERAL FLUMINENSE/ FM/ UFF/ HU

Continuação do Parecer: 868.924

NITEROI, 12 de Novembro de 2014

Assinado por:
ROSANGELA ARRABAL THOMAZ
(Coordenador)