Comparison of Vertical and Horizontal Facial Ratio–An Anthropometric Study

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Abstract: *Introduction:* Information on facial ratios of men and women has significant application in science and clinical practice. Facial proportions differ from one individual to another within a gender, group and race. Data on facial anthropometric ratios for men may not generally be appropriate for women of identical ethnicities.

Objectives: The aim was to determine the difference in the facial ratios among Indian American men and women, and compare these results with facial ratios of Indian and Caucasian persons.

Methods: Using a digital caliper, direct facial measurements of 200 Indian American students (100 men and 100 women) were made. These were students of American University of Antigua (AUA), Antigua, ages 18-30 years. Facial ratios amongst this group were then calculated and the differences between sexes compared.

Results: The mandibulo-lower facial height, upper face-face height, mandibulo-facial height, mandibulo-upper face height, eye fissure-nasal width, upper lip-nose height, mandibular and upper lip height-mouth width ratios showed sexual differences, which were extremely statistically significant (p<0.001). Horizontal to horizontal facial ratios did not show statistically significant sexual difference when compared with vertical to vertical and vertical to horizontal facial ratios in between sexes.

Conclusion: Among Indian and Caucasian populations, the vertical to horizontal facial ratios showed significant sexual differences. The present study variance in the facial ratios amid Indian American sexes can be clinically applied by surgeons during procedures involving the face to help in achieving an attractive and symmetrical appearance.

Keywords: Facial ratio comparison, vertical face ratio, horizontal face ratio.

1. INTRODUCTION

A true facial balance and harmony is when the individual facial features are proportional. Each human face is a variation of a mask. Some faces vary slightly and others significantly, while most fall somewhere in between [1]. However, facial ratios vary from one face to another within a group, gender or race [2]. The knowledge of facial ratios in men and women are indispensable for scientific applications in various fields such as prosthodontics, facial surgery, orthodontics, facial attractiveness study, and in the development of facial mask [3]. During development, the face of both sexes begins as feminine–even for genetic males. With testosterone exposure, the face of a genetic male gradually changes into the male configuration [4].

There are anatomical differences in the faces of different genders. Men have a larger and unique cranial shape, greater skeletal muscle mass, unique subcutaneous fat distribution, increased blood vessel density and more extensive facial skin wrinkles when compared to women. Even with gender differences in facial anatomy, few researches have examined the role of gender in cosmetic procedures. Evidently, the approach to male aesthetics should differ from that of females [5]. According to Jefferson [6], any deviation of the human face in terms of facial ratio can result in the development of facial abnormalities. However, a study by Rossetti *et al*., [7] showed that, the ratios between three-dimensional facial distances were not related to attractiveness.

The annual plastic surgery procedural statistics reported 15.9 million surgical and minimally-invasive cosmetic procedures performed in the United States in 2015. This represents a 2% increase from the previous year [8]. According to the American Society of Plastic Surgeons' (ASPS) 2014 procedural statistics, the number male plastic surgery patients continue to increase. Cosmetic surgery has necessarily evolved from simple applying the same techniques used with females for the opposite sex. Men are seeking to regain a more youthful look and improve their self-image to feel better about their appearance [9].

In 2010, 87.2% of Indian-American adults were foreign-born. This represents the largest percent of the six major Asian-American groups [10]. Most of the studies on facial ratios in the USA involved only Caucasians and therefore, may not be applicable to Americans of Indian ancestry. It will be useful for facial

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Table 1: **Anthropometric Land Marks in Indian American Men and Women**

en	Endocanthion	Internal commissura of the eye fissure
ex	Exocanthion	External commissura of the eye fissure
al	Alare	Most lateral point on the alar contour
ch	Cheilion	Labial commissura
n	Nasion	The innermost point between forehead and nose
st	Stomion	Midpoint of the horizontal labial fissure
gn	Gnathion	Lowest median point on the lower border of the mandible
sn	Subnasale	Midpoint at the union of the lower border of the nasal septum and the upper lip
sa	Superaurale	Highest point on the auricle
sb	Subaurale	Lowest point on the free margin of the auricle
go	Gonion	Most lateral point on the mandibular angle
zy	Zygion	Most lateral point of the zygomatic arch

proportions data of Indian American men and women are maintained and used for medical purposes including facial reconstruction surgery.

A few previous studies have been conducted on facial proportions of Indian populations within that country [11-17]. A study performed by Chakravarthy Marx [18], of 100 Indian American female faces also dealt with facial proportions. Sadacharan [19, 20] performed anthropometric studies of horizontal thirds of the face and proportions of lower-face height and orbito-facial assessment in Indian Americans. A similar study performed by Husein *et al*. [21] calibrated 100 Indian American female faces with the use of photographs. These results did not however, atone for facial proportions. Another study performed by Anand *et al*. [13] including 50 Indian female and male faces dealt with facial proportions. Male facial ratio data may not be suitable for women of matching ethnicity. Nonetheless, there are no available reports comparing facial ratios between Indian American men and women.

The aim of the study was to determine the difference in facial ratios between the Indian American man and woman, then compare these results with the Indian and Caucasian facial ratios available in published literature.

2. MATERIAL AND METHODS

The study group consisted of 100 Indian American students (with north Indian origin) of American University of Antigua (AUA), Antigua. The cohort consisted of equal number of males and females, 18-30 years. The study was approved by AUA ethics committee. Subjects with a history of developmental and/or neurological facial defects, facial cosmetic procedures, cranio-facial trauma and surgery, and bi-racial ethnic origins were excluded.

The study was explained and the standard informed forms of consent were collected from each participant. With careful inspection, each individual's facial anthropometric landmarks were identified and marked with black liquid eye liner (Table **1**, Figures **1**, **2**).
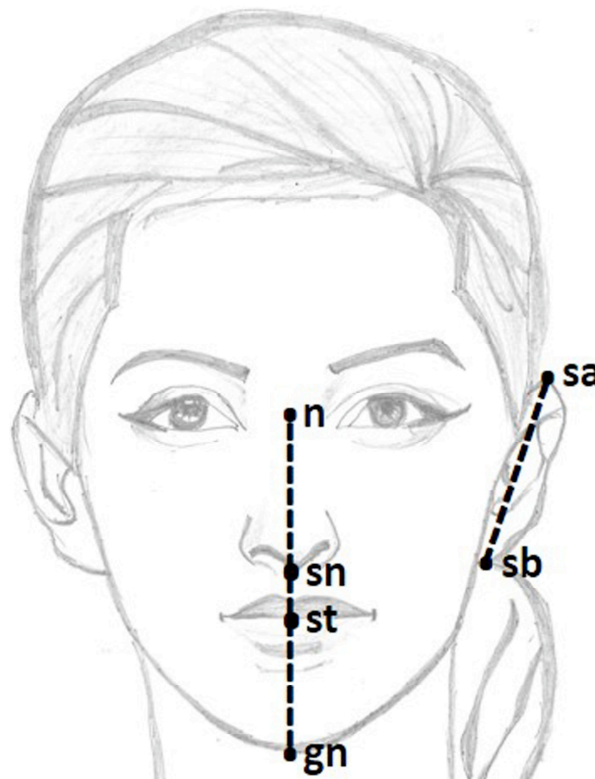

Figure 1: Photograph shows Indian American men facial anthropometric landmarks; en: Endocanthion; ex: Exocanthion; al: Alare; ch: Cheilion; go: Gonion; zy: Zygion.

Subjects were asked to sit in an upright relaxed position with the head and shoulders in a natural and normal erect posture. For the linear measurements of the face, both arms were allowed to hang free alongside the trunk. The following landmarks were identified on both sides of the face and measured (Table **2**, Figures **1**, **2**).

Table 2:   Facial Ratios Undertaken in this Study

| Indices Vertical - Vertical	Ratios
Mandibulo - lower face height	st-gn/sn-gn
Lower face - face height	sn-gn/n-gn
Upper face - face height	n-st/n-gn
Nose - face height index	n-sn/n-gn
Mandibulo - face height	st-gn/n-gn
Ear - lower face height	sa-sb/sn-gn
Ear - nose height	sa-sb/n-sn
Mandibulo - upper face height	st-gn/n-st
Nose - lower face height	n-sn/sn-gn
Upper lip - upper face height	sn-st/n-st
Upper lip - nose height index	sn-st/n-sn
Upper lip - mandible height	sn-st/st-gn
Horizontal - horizontal	
Mandibular - face width index	go-go/zy-zy
Eye fissure - intercanthal width	en-ex/en-en
Mouth - face width	ch-ch/zy-zy
Eye fissure + intercanthal width -	(en-ex+en-en)/ch-ch
Mouth width	
Eye fissure - nasal width	en-ex/al-al
Intercanthal - nasal width	en-en/al-al
Vertical - horizontal	
Upper face height - biocular width index	n-st/ex-ex
Mandibular width - face height index	go-go/n-gn
Facial index	n-gn/zy-zy
Nasal index	al-al/n-sn
Upper face index	n-st/zy-zy
Mandibular index	st-gn/go-go
Upper lip height - mouth width index	sn-st/ch-ch
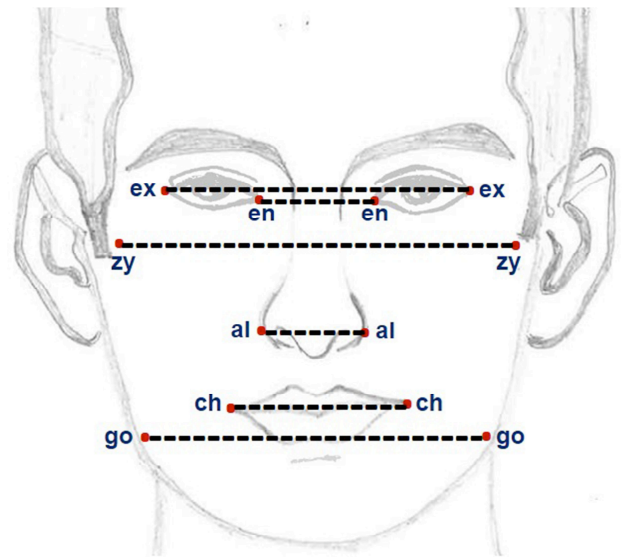
Figure 2: Photograph shows Indian American women facial anthropometric landmarks; n: Nasion; st: Stomion; gn: Gnathion; sn: Subnasale; sa: Superaurale; sb: Subaurale.

With maximum care and comfort to the subjects, the measurements were made up to 0.5 degree and 0.5mm accuracy using a Neiko 01407A stainless steel digital caliper with extra-large LCD (liquid crystal display) screen and instant SAE-metric (Society of Automotive Engineers) conversion, New York, USA. Every measurement was obtained twice by the same observer. A third reading was taken for additional reference. If the initial two measurements showed a large discrepancy, the final the two closer readings were considered (Figure **3**) [14].
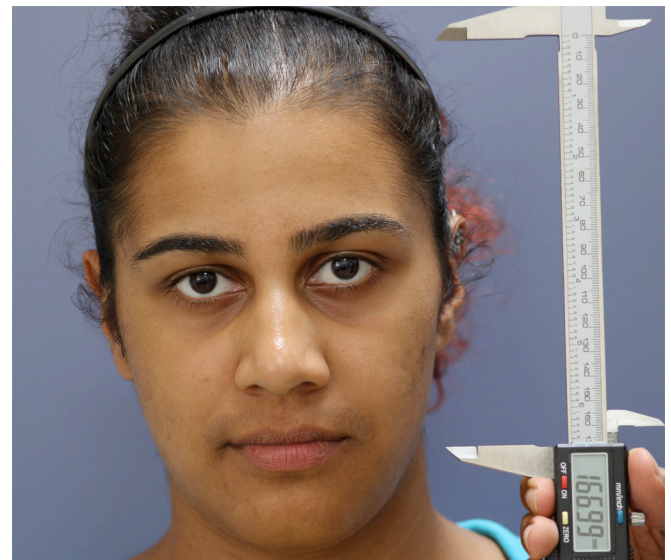

Figure 3: Photograph shows the sample facial linear measurement of Indian American women using digital caliper.

The standard linear distances (in mm) were measured and the facial ratios then calculated. Facial

ratios (vertical-vertical, horizontal-horizontal and vertical-horizontal) were examined in this study and summarized in Table **2**.

2.1. Statistical Analysis

Records were collected and analyzed in accordance with the current law on personal data and privacy. The statistical analysis was performed using "Graph pad instat" (Version 3.06, Graph pad Software Inc.), San Diego, CA. Unpaired t test was used to compare the facial ratios between male and female Indian American students and also to compare the present study results with existing studies (Indian and Caucasian) using mean, standard deviation (SD) and number of samples.

3. RESULTS

The facial anthropometric ratios for 25 indices were calculated in 100 Indian American students (with equal number of sexes) and compared to see if there is any significant difference between the genders using unpaired t test. The results of facial anthropometric ratios mean difference and its significance levels are shown in Table **3**.

Table 3:   The Mean Horizontal and Vertical Ratios and Mean Difference of the Indian American Men and Women

Ratio	Mean	SD	Mean	SD	Mean	p-value	t test
Vertical - Vertical	**Men**		**Women**		**Difference**		
st-gn/sn-gn	0.74	0.06	0.67	0.04	-0.07	0.0001	***
sn-gn/n-gn	0.54	0.03	0.53	0.03	-0.01	0.0194	*
n-st/n-gn	0.6	0.03	0.63	0.05	0.03	0.0001	***
n-sn/n-gn	0.44	0.04	0.45	0.04	0.01	0.0786	NS
st-gn/n-gn	0.39	0.03	0.35	0.03	-0.04	0.0001	***
sa-sb/sn-gn	0.95	0.15	0.97	0.11	0.02	0.2836	NS
sa-sb/n-sn	1.17	0.18	1.13	0.14	-0.04	0.081	NS
st-gn/n-st	0.66	0.08	0.57	0.07	-0.09	0.0001	***
n-sn/sn-gn	0.82	0.12	0.87	0.11	0.05	0.0024	**
sn-st/n-st	0.3	0.48	0.28	0.04	-0.02	0.6784	NS
sn-st/n-sn	0.42	0.09	0.38	0.07	-0.04	0.0006	***
sn-st/st-gn	0.46	0.07	0.49	0.09	0.03	0.0092	**
Horizontal - Horizontal							
go-go/zy-zy	0.96	0.12	0.95	0.09	-0.01	0.5058	NS
en-ex/en-en	1.11	0.14	1.14	0.12	0.03	0.1053	NS
ch-ch/zy-zy	0.42	0.05	0.43	0.04	0.01	0.1199	NS
(en-ex+en-en)							
/ch-ch	1.33	0.14	1.33	0.15	0	0.1	NS
en-ex/al-al	0.93	0.08	0.99	0.11	0.06	0.0001	***
en-en/al-al	0.85	0.11	0.87	0.1	0.02	0.1801	NS
Vertical - Horizontal							
n-st/ex-ex	0.7	0.06	0.68	0.06	-0.02	0.0194	*
go-go/n-gn	1.01	0.11	1.04	0.1	0.03	0.0449	*
n-gn/zy-zy	0.95	0.1	0.92	0.09	-0.03	0.0269	*
al-al/n-sn	0.76	0.09	0.75	0.08	-0.01	0.4073	NS
n-st/zy-zy	0.57	0.07	0.57	0.07	0	1	NS
st-gn/go-go	0.4	0.06	0.34	0.05	-0.06	0.0001	***
sn-st/ch-ch	0.41	0.07	0.37	0.05	-0.04	0.0001	***

SD: Standard Deviation; t: test, Unpaired t Test; ***: Extremely Statistically Significant; **: Very Statistically Significant; *: Statistically Significant; NS: Not Statistically Significant.

In vertical to vertical facial ratios, the mandibulo-lower facial height, upper face-face height, mandibulo-facial height, mandibulo upper face height and upper lip nose height ratios showed extremely statistically significant sexual difference (p<0.001) whereas, the nose lower face height and upper lip mandible ratios showed very statistically significant sexual difference. The nose-facial height, ear lower face height, ear nose height and upper lip upper face height ratios were not statistically significant sexual difference (p>0.05) (Table **3**).

In horizontal to horizontal facial ratios, the eye fissure nasal width ratio showed extremely statistically significant sexual difference (p<0.001) whereas, the mandibular face width, eye fissure intercanthal width, mouth face width, eye fissure intercanthal mouth width and intercanthal-nasal width ratios did not illustrate statistically significant in sexual difference (p>0.05) (Table **3**).

In horizontal to vertical facial ratios, the mandibular and upper lip height mouth width ratios showed extremely statistically significant sexual difference (p<0.001) whereas, the upper face height-biocular width, mandibular width face height and facial ratios showed statistically significant sexual difference. The nasal and upper face ratios did not indicate statistically significant in sexual difference (p>0.05) (Table **3**).

Over all, the horizontal to horizontal facial ratios did not show statistically significant sexual difference when compared with the vertical to vertical and vertical to horizontal facial ratios. The vertical to vertical facial ratios showed statistically significant sexual difference when compared with vertical to horizontal facial ratios.

4. DISCUSSION

Anthropometric parameters are affected by various factors including age, sex, ethnicity, socioeconomic status, environment and region [22]. The facial anthropometric ratios of men differ from that of women even within the same ethnic group. Knowledge of the difference in facial ratio between sexes is important for the application in fields such as prosthodontics, facial surgery, orthodontics, facial attractiveness study, and with the development of face masks. For the desired proportional facial aesthetics, harmonious skeletal relationship and corresponding soft tissue drape is essential [12].

Anthropometric measurements with essential clinical applications were selected in this study. An attempt has been made to correlate the findings with clinical application. The present study mean anthropometric facial ratios were compared with that of Indian and Caucasian population facial ratios and are presented in Tables **4** and **5**. The present study found that there were statistically significant variances between the sexes in the facial ratios when compared to Indian and Caucasian population, using unpaired t test.

In comparison to previous anthropometric facial ratio in Indian men [12] the vertical to vertical ratios of mandibulo-lower face height; upper face - face height and upper lip-nose height ratios were significantly different from our study whereas, horizontal to horizontal ratios of intercanthal-nasal width ratio was also significantly different. In horizontal to vertical ratios, the mandibular width - face height; facial; nasal; upper face and upper lip height - mouth width ratios were significantly different from our study (Table **4**).

In comparison to previous anthropometric facial ratio in Caucasian men [23] the vertical to vertical ratios of mandibulo - lower face height; lower face - face height; upper face-face height and upper lip-mandible height ratios were significantly different from our study whereas, horizontal to horizontal ratios of mandibular-face width, mouth - face width and intercanthal-nasal width ratios were significantly different. In horizontal to vertical ratios, the upper face height-biocular width; mandibular width-face height; facial; nasal and upper face ratios were significantly different from our study (Table **4**).

In comparison to previous anthropometric facial ratio in Hungarian (Caucasian) men [24] the vertical to vertical ratios of mandibulo-lower face height; lower face-face height; upper face-face height; nose-face height; mandibulo-upper face height; upper lip-upper face height and upper lip-nose height ratios were significantly different from our study. The study on Hungarian (Caucasian) men [26] did not have data on horizontal to horizontal and vertical to horizontal ratios for the comparison (Table **4**).

In comparison to previous photographic facial ratio in German (Caucasian) men [25] the vertical to vertical ratios of upper face-face height; nose-face height and nose-lower face height ratios were significantly different from our study whereas, horizontal to vertical ratios of the upper face and upper lip height-mouth width ratios were significantly different. The study on German (Caucasian) men [27] did not have data on horizontal to horizontal ratios for the comparison.

Table 4:   Mean Facial Ratios of Indian American Men in the Present Study Compared with Mean Facial Ratios of Indian and Caucasian Men in other Studies Using Unpaired t Test

Ratio	50 Indians [15] (Manual Study)		50 Caucasians [25] (Manual Study)		25 Caucasians [26] (Manual Study)		30 Caucasians [27] (Photography)	
	Mean diff.	p-value	Mean diff.	p-value	Mean diff.	p-value	Mean diff.	p-value
Vertical - Vertical								
st-gn/sn-gn	0.084	0.0001***	0.048	0.0001***	0.081	0.0001***		
sn-gn/n-gn			-0.052	0.0001***	-0.048	0.0001***		
n-st/n-gn	-0.035	0.0001***	-0.01	0.034*	-0.028	0.0001***	0.031	0.0001***
n-sn/n-gn			0.003	0.628 (NS)	0.019	0.0301*	0.033	0.0001***
st-gn/n-gn			-0.022	0.346 (NS)	0.014	0.654 (NS)		
sa-sb/sn-gn								
sa-sb/n-sn								
st-gn/n-st			0.017	0.176 (NS)	0.056	0.002**		
n-sn/sn-gn							0.119	0.0001***
sn-st/n-st			0.005	0.436 (NS)	-0.028	0.0018**		
sn-st/n-sn	0.019	0.020**	0.009	0.493 (NS)	-0.069	0.0007***	0.033	0.071 (NS)
sn-st/st-gn			0.022	0.042*				
Horizontal - Horizontal								
go-go/zy-zy	-0.021	0.281 (NS)	0.252	0.0001***				
en-ex/en-en								
ch-ch/zy-zy	-0.004	0.578 (NS)	0.031	0.0001***				
(en-ex+en-en)								
/ch-ch								
en-ex/al-al								
en-en/al-al	-0.05	0.004**	-0.098	0.0001***				
Vertical - Horizontal								
n-st/ex-ex			-0.129	0.0001***				
go-go/n-gn	0.042	0.017*	0.207	0.0001***				
n-gn/zy-zy	-0.065	0.0001***	0.065	0.0001***				
al-al/n-sn	0.106	0.0001***	0.105	0.0001***				
n-st/zy-zy	-0.095	0.0001***	0.03	0.0045**			0.044	0.009**
st-gn/go-go								
sn-st/ch-ch	-0.045	0.0013**	0.001	0.925 (NS)			0.037	0.010*

Mean diff: Mean difference; ***: Extremely statistically significant; **: Very statistically significant; *: Statistically significant; NS: Not statistically significant.

Over all, the vertical to horizontal facial ratios in men showed statistically significant difference when compared with Indian and Caucasian men (Table **4**) [12, 23, 25].

In comparison to previous photographic facial ratio in Indian women [15] the vertical to vertical ratios of mandibulo - lower face height; nose-face height; upper lip-upper face height; upper lip-nose height and upper lip-mandible height ratios were significantly different

Table 5: Mean Facial Ratios of Indian American Women in the Present Study Compared with Mean Facial Ratios of Indian and Caucasian Women in other Studies Using Unpaired t Test

	25 Indians [17]		50 Indians [15]		50 Caucasians [25]		26 Caucasians [26]	
	(Photography)		(Manual Study)		(Manual Study)		(Manual study)	
Ratio	Mean diff.	p-value	Mean diff.	p-value	Mean diff.	p-value	Mean diff.	p-value
Vertical - Vertical								
st-gn/sn-gn	-0.02	0.017*			-0.02	0.0007***	0.026	0.0026**
sn-gn/n-gn	0.01	0.117 (NS)	0.04	0.0001***	-0.06	0.0001***	-0.052	0.0001***
n-st/n-gn	-0.02	0.052 (NS)	-0.09	0.0001***	0.02	0.059**	-0.005	0.622 (NS)
n-sn/n-gn	-0.04	0.0001***	-0.04	0.0001***	0.01	0.843 (NS)	0.024	0.0044**
st-gn/n-gn	-0.01	0.103 (NS)			-0.05	0.0001***	-0.025	0.0002***
sa-sb/sn-gn								
sa-sb/n-sn								
st-gn/n-st	0.02	0.172 (NS)			-0.09	0.0001***	-0.022	0.137 (NS)
n-sn/sn-gn								
sn-st/n-st	0.03	0.0006***			-0.01	0.151 (NS)	-0.42	0.0001***
sn-st/n-sn	0.05	0.001**	-0.01	0.225 (NS)	-0.02	0.086 (NS)	-0.12	0.0001***
sn-st/st-gn	0.04	0.0346*			0.06	0.0001***		
Horizontal - Horizontal								
go-go/zy-zy	0.14	0.0001***	-0.07	0.0001***	0.25	0.0001***		
en-ex/en-en								
ch-ch/zy-zy	0.06	0.0001***	-0.01	0.1169 (NS)	0.05	0.0001***		
(en-ex+en-en)								
/ch-ch								
en-ex/al-al								
en-en/al-al	0.01	0.638 (NS)	0.02	0.2525 (NS)	-0.14	0.0001***		
Vertical - Horizontal								
n-st/ex-ex	-0.05	0.0001***			-0.11	0.0001***		
go-go/n-gn	0.05	0.0244**	0.088	0.0001***	0.23	0.0001***		
n-gn/zy-zy	0.08	0.0001***	-0.15	0.0001***	0.06	0.0001***		
al-al/n-sn	0.13	0.0001***	0.097	0.0001***	0.11	0.0001***		
n-st/zy-zy	0.03	0.0386*			0.05	0.0001***		
st-gn/go-go	-0.03	0.0049**			-0.16	0.0001***		
sn-st/ch-ch	0.01	0.392 (NS)	-0.1	0.0001***	-0.02	0.0074***		

Mean diff: Mean difference; ***: Extremely statistically significant; **: Very statistically significant; *: statistically significant; NS: Not statistically significant.

from our study whereas, horizontal to horizontal ratios of the mandibular-face width ratio was also significantly different. In horizontal to vertical ratios, the upper face height-biocular width; mandibular width-face height; facial; nasal; upper face and mandibular ratios were significantly different from our study (Table **5**).

In comparison to previous anthropometric facial ratio in Indian women [12] the vertical to vertical ratios of lower face-face height; upper face-face height and nose-face height ratios were significantly different from our study whereas, horizontal to horizontal ratios of the mandibular face width ratio, was significantly different. In horizontal to vertical ratios, the mandibular width-face height; facial; nasal and upper lip height-mouth width ratios were significantly different from our study (Table **5**).

In comparison to previous anthropometric facial ratio in Caucasian women [23] the vertical to vertical ratios of mandibulo-lower face height; lower face-face height; upper face-face height; ear - lower face height; nose-lower face height and upper lip-mandible height ratios were significantly different from our study whereas, horizontal to horizontal ratios of the mandibular-face width index; mouth-face width and Intercanthal-nasal width ratios were significantly different. In horizontal to vertical ratios, the upper face height-biocular width; mandibular width-face height; facial; nasal; upper face; mandibular and upper lip height-mouth width ratios were significantly different from our study (Table **5**).

In comparison to previous anthropometric facial ratio in Hungarian (Caucasian) women [24] the vertical to vertical ratios of mandibulo-lower face height; lower face-face height; nose-face height; mandibulo-face height; upper lip-upper face height and upper lip-nose height ratios were significantly different from our study. The study on Hungarian (Caucasian) women [24] did not have data on horizontal to horizontal and vertical to horizontal ratios for the comparison. Over all, the vertical to horizontal facial ratios in women showed statistically significant difference when compared with Indian and Caucasian women (Table **5**) [12, 15, 23].

Developmentally, all human faces began as feminine, regardless of sex. The presence of testosterone in the genetic male causes gradual transformation to the male configuration. The human male face differs from that of the female in slight but significant ways and hence of the true "Archetypal Mask" which is essentially female. The male image or mask, which we refer to as "The Male Variant of the Archetypal Mask" is, however, a distinct and identifiable configuration [4].

The significant difference in facial ratios between men and women might be indications to increase or decrease face height during surgical procedures [26]. The current study's facial ratio variations may be due to the effect of climate, diet, and environment in USA. Our study proposes that facial anthropometric ratios of men may not be applicable for women of the same ethnic group.

A number of increasingly sophisticated methods are available to analyze the facial morphometry. They are very expensive and difficult to use in routine clinical practice [25]. However, this study has been done *via* direct measurements, which is more reliable. Working on live material was also found to be superior to photography. No authentic, published data on the Indian American population was available and the available data from the Indian and Caucasian population was significantly different.

In our study, mandibulo-lower facial height, upper face-face height, mandibulo-facial height, mandibulo upper face height, eye fissure nasal width, upper lip nose height facial ratios, mandibular and upper lip height mouth width ratios showed extremely statistically significant sexual difference. When compared with Indian and Caucasian populations, the vertical to horizontal facial ratios showed significant sexual difference. The present study difference in the facial ratios between Indian American men and women can be utilized by surgeons working with Indian American populations for achieving optimum attractive and harmonious facial features. The present study of facial ratios can also be used as a reference value for Indian American men and women.

CONCLUSIONS

The facial morphometry is important in cosmetic face and maxillofacial surgeries such as mandibular reconstruction. The dimensions differ among various races and even between males and females. The dimensions may also have medicolegal importance. Cosmetic surgeries are usually performed in young populations. The present study has provided important morphometric data of the face in Indian Americans. The data was examined for differences between the males and females. The present study has provided parameters such as mandibulo-lower facial height, upper face-face height, mandibulo-facial height, mandibulo-upper face height, eye fissure nasal width, upper lip nose height facial, and mandibular and upper lip height mouth width dimensions.

CONFLICT OF INTERESTS

The authors declare that they have no conflict of interest.

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