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Original Research Article

Variations in the Facial Dimensions and Face Types among the Medical Students of Rupandehi District, Nepal

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ABSTRACT

Background: Facial dimensions and the face types are the most variable factors in human community. It has been the area of interest since a long time for the anthropologist, forensic experts, anatomists and surgeons.
Objective: The present study is aimed to determine the facial dimensions and face types among the medical students.
Materials and Methods: A cross-sectional descriptive study was conducted in Devdaha Medical College and Research Institute from January 14-March 15, 2017 among 130 medical students including 47 male and 83 female students. Vernier caliper was employed to measure the facial height and width. Facial index was determined and the face type was categorized by using Banister's classification. The collected data was entered in MS Excel 2007 and further analysed for the descriptive statistics as well as students t-test was performed by using SPSS 16.0.
Results: The mean facial height among the total population was 10.75 ± 0.78 cm and facial width was 12.39 ± 0.73 cm with the mean facial index of 86.83 ± 5.03. The most prevalent face type in the study was the mesoprosopic face (41.54%) followed by euryprosopic (26.92%) whereas the least prevalent was the hyperleptoprosopic face (5.38%) in males and absent in females.
Conclusion: In the present study males had the higher values of facial height, width and facial index as compared to the females. The finding of the present study is helpful for the anthropologists, anatomists, forensic medicine as well as plastic surgeons for the facial reconstruction.

Keywords: Facial height, facial index, facial width, medical students.

INTRODUCTION

Facial index has been an area of interest since a long time. Every individual are unique in their facial characters which varies during the life time and also with different ethnic groups, body form and proportions. [(1,2)] This study is aimed to determine the variations in facial morphometry amongst the medical students.

Anthropometric analysis is a non-invasive quantitative method employed to determine the measurements of the different body parts in either alive or dead human body for scientific purpose. [(3-5)] It has been used for the sex determination, estimation of height and other medico-legal purposes by anthropologists and forensic experts. A study has reported that at birth the development of face is completed by 40% followed by 65% growth within 7 years and growth in the bizygomatic width is by 15% within 10 years. [(6)] It is also found that shape of face depends on many factors like gender, ethnicity, climate, socio-economic,

nutritional and genetic factors. [7-9] Study conducted in Serbia has revealed that facial parameters are useful for the evaluation of facial injuries and other congenital malformations. [10-12] Facial index has been categorized as Hypereuryprosopic, Euryprosopic, Mesoprosopic, Leptoprosopic and Hyperleptoprosopic on the basis of percentage values of facial breadths and lengths. [13] A study conducted in Nepal has reported the mesoprosopic face as the dominant face type in both the male and female population.

Research vacuum is sought in the context of Nepal in different areas to determine the facial type in different ethnic groups and areas. So the determination of facial index is helpful for the anthropologists, anatomists, plastic surgeons for the reconstructive surgery and identification purpose in forensic medicine.

MATERIALS AND METHODS

A cross-sectional descriptive study was conducted in 130 medical students including 47 male and 83 female students of Devdaha Medical College and Research Institute from January 14-March 15, 2017. Ethical consideration was taken from the Institutional review board of Devdaha Medical College and Research Institute. Verbal consent was taken from the study participants prior to the study.

Anthropometric measurements were taken from the study participants by using Vernier caliper. The participants were informed about the study protocols and personal identifiers were removed before the data collection. The variables included in the observation were age, sex, facial height and facial width. The study participants were asked to sit in a relaxed state looking forward straightly.

The facial height was measured in cm by using the vernier caliper from the nasion which is the point in the nose crossed by the midsagittal plane and nasofrontal sutures to the gnathion which is defined as the lowest point of mandible where the midsagittal plane intersects the lower margin of lower jaw. Facial width was measured in cm between the right and left zygion which is the lateral most point on the zygomatic arch.

Facial index was calculated by using the formula, Prosopic index (PI) = (Facial height/Facial width) x 100. It was again categorized into five different face shapes by using the Banister's classification. Study participants were categorized after the estimation of Prosopic index with PI(<80) as Hypereuryprosopic (very broad face), PI(80-85) as Euryprosopic (broad face), PI(85-90) as Mesoprosopic (round face), PI(90-95) as Leptoprosopic (long face), PI(90>) as Hyperleptoprosopic (very long face).

The collected data was entered in MS Excel 2007 and was analyzed by using SPSS 16.0. The descriptive analysis was performed for frequency, mean and SD. Students t-test was employed to compare the means between the facial height and facial width within the study participants.

RESULTS

In the study, a total of 130 medical students were involved including 47 male and 83 female. The mean value of facial height was slightly higher in female participants whereas the value of facial width was higher in male. Both the facial height and facial width had the larger values in the range as shown in table 1.

Table 1. Mean and SD of facial height and facial width among medical students.(n= 130)

Sex	Total (n)	Facial height (cm) Mean± SD	Range of facial height (cm)	Facial width (cm) Mean± SD	Range of facial width (cm)
Male	47	10.13±0.58	10.10-13.00	12.83±0.74	11.2-15.1
Female	83	10.41±0.68	9.30-12.60	12.14±0.60	11.1-13.7
Total	130	10.75±0.78	9.30-13.00	12.39±0.73	11.1-15.1

As demonstrated in table 2, the range of facial index was larger in male with the mean value of facial index as 88.64 in male and 85.80 in female. The facial index values were significantly different between male and female. ($p < 0.01$)

Table 2. Mean and SD of facial index among medical students. (n= 130)

Sex	Facial index range	Facial index Mean ± SD	P-value
Male	75.18-100.00	88.64±6.09	0.002
Female	77.69-92.68	85.80±4.00	
Combined	75.18-100.00	86.83±5.03	

The facial index values were categorized under five different face types as hypereuryprosopic, euryprosopic, mesoprosopic, leptoprosopic and hyperleptoprosopic, as shown in table 3. In males, mesoprosopic faces were prevalent (16) which is also similar with the females (38) and also the prevalent face type was mesoprosopic in study population which is nearly half (41.5%) of the total population. The mesoprosopic face type was followed by euryprosopic in both males and females. Hypereuryprosopic face type was the least prevalent face in males (10.63%) whereas hyperleptoprosopic face type was absent in females and was the least prevalent face among the studied population (5.4%).

Table 3. Distribution of face type among medical students. (n=130)

	Male		Female		Total	
Face types	Number (N)	Percentage (%)	Number (N)	Percentage (%)	Number (N)	Percentage (%)
Hypereuryprosopic	5	10.63	6	7.22	11	8.46
Euryprosopic	6	12.76	29	34.93	35	26.92
Mesoprosopic	16	34.04	38	45.78	54	41.54
Leptoprosopic	13	27.65	10	12.04	23	17.70
Hyperleptoprosopic	7	14.89	0	0	7	5.38
Total	47	36.15	83	63.85	130	100

DISCUSSION

Studies have reported the variations in the facial dimensions and facial index among different ethnic groups and gender. [1,14-20] The mean values of facial height and facial width of the present study were 10.75 ± 0.78 cm and 12.39 ± 0.73 cm. In the study the mean values of facial height and width in male were 10.13 ± 0.58 cm and 12.83 ± 0.74 cm. In a study conducted in Malaysia reported the similar findings in the study. [1,21] A study conducted in Srilanka reported the mean facial height in male as 12.56 ± 0.93 cm and in female as 12.00 ± 0.64 cm which is higher than the present study. [22] Similarly, study conducted in Maharashtra and North India reported higher values than the present study. One of the study conducted in Nigeria reported higher mean value among males whereas facial width was in agreement with the present study. [23-25]

In females the mean facial height and width were 10.41 ± 0.68 cm and 12.14 ± 0.60 cm which is consistent with the findings of the present study. [1,22-25] All the observed values were higher in the male population compared to the female population which is in agreement with the findings of the present study. [26] In the present study the mean facial index values in male and female were 88.64 ± 0.69 and 85.80 ± 4.00. The present study showed lower values of facial index among both male and female than the study conducted in Haryana, Gujarat and Malaysia. [1,21,22,26-28] In contrast, study conducted in North India showed lower values than the present study. [24] In the present study among male population, the mesoprosopic face type was 34.04% more prevalent among the studied population which is inconsistent with the findings of study performed in central Serbia where leptoprosopic face (76.67%) was dominant followed by mesoprosopic (17.78%) and hyperleptoprosopic (5.56%) was the least prevalent face type in male. [26] In female population, mesoprosopic face type (45.78%) was the most prevalent followed by euryprosopic (34.93%) with the absence of hyperleptoprosopic which is similar to the findings in Indian population

[24] whereas leptoprosopic face was most common in Serbian population as well as in Srilanka. [22,26]

Among the combined population, the most prevalent face type was mesoprosopic (41.54%) followed by euryprosopic (26.92%) which is consistent with the study conducted in North Indian population [24] leptoprosopic (17.70%), hypereuryprosopic (8.46%) and the least prevalent face type was hyperleptoprosopic (5.38%). Hyperleptoprosopic face type was the least prevalent face among the male and female population which is similar with the study conducted in Malaysia and Gujarat, India. [1,21,29] Studies conducted in central Serbia and Srilanka reported the hypereuryprosopic face as the least dominant face type which is in contrast with the findings of the present study.

Although the study has met its aim, further studies are sought in different ethnic and age groups in different regions of the country to generalize the findings as the national statistics of the facial dimensions and face type.

CONCLUSION

The mean facial height and width among males were higher than that of the female population in the present study. There was significant difference among the facial height and width in both males and females. The most prevalent face type was the mesoprosopic face (41.54%) whereas hyperleptoprosopic face was the least common among the studied population.

Conflict of Interest

The authors declared none of the conflicts of interest.

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REFERENCES

1. Shetti VR, Pai SR, Sneha G, Gupta C, Chethan P. Study of Prosopic (Facial) Index of Indian and Malaysian Students. International journal of Morphology. 2011;29(3):1018-21.
2. Ngeow W, Aljunid S. Craniofacial anthropometric norms of Malays. Singapore medical journal. 2009;50 (5):525.
3. Farkas LG, Deutsch CK. Anthropometric determination of craniofacial morphology. American Journal of Medical Genetics Part A. 1996;65(1):1-4.
4. Hrdlička A. Practical anthropometry. 4th ed. Stewart T, editor. Philadelphia: Wistar Institute of anatomy and biology; 1952.
5. Montagu M. An Introduction to Physical Anthropology. 2nd ed. Thomas CC, editor: Springfield; 1951.
6. Scott J. The growth of the human face.Proc R Soc Med 1953,47:91-100.
7. Franciscus RG, Long JC. Variation in human nasal height and breadth. American Journal of Physical Anthropology. 1991;85(4):419-27.
8. Porter JP, Olson KL. Analysis of the African American female nose. Plastic and reconstructive surgery. 2003; 111(2):620-6.
9. Xuetong Z, Sankui W, Wei Z, Xianfeng W. Measurement and study of the nose and face and their correlations in the young adult of Han nationality. Plastic and reconstructive surgery. 1990;85(4):532-6.
10. Oladipo G, Didia B, Okoh P, Hart J. Sexual dimorphism in facial, nasal, maxillary, mandibular and oro-facial heights of adult Ijaws. Journal of experimental and Clinical Anatomy. 2008;7:10-8.
11. Oladipo G, Fawehinmi H, Okoh P. Canthal indices of Urhobo and Itsekiri ethnic groups. Australian Journal of Basic and Applied Sciences. 2009;3(4): 3093-6.
12. Oladipo GS, Olotu E, Guinireama IU. Anthropometric comparison of canthal indices between the Ijaw and Igbo tribes. Scientia Africana. 2008;7(1):141-4.

13. Williams PL, Bannister LH, Berry MM et al. Grays Anatomy: Skeletal System. 38th ed: Churchill Livingstone Philadephia; 1995: 607-12.
14. Coon CS. The Races of Europe. New York, The McMillan Company. 1972.
15. Farahani R, Emami M, editors. Estimation of cranial and facial indices in males 19-20 years old. First National Congress of Anatomy, Kerman, Iran; 1993.
16. Jahanshahi M, Golalipour M, Heidari K. The effect of ethnicity on facial anthropometry in Northern Iran. Singapore medical journal. 2008;49 (11):940-3.
17. Ngeow W, Aljunid S. Craniofacial anthropometric norms of Malaysian Indians. Indian journal of dental research. 2009;20(3):313.
18. Mugahii SN, Heidari Z, Sagheb H. Cephalic and prosopic indices: Comparison in 1-day newborn boys in Zahedan. European Journal of Neurology Supplement. 2003;10:180.
19. Pandey AK. Cephalo-facial variation among Onges. Anthropologist. 2006;8 (4):245-9.
20. Raji J, Garba S, Numan A, Waziri M, Maina M. Morphological evaluation of head and face shapes in a North-Eastern Nigerian population. Aust J Basic Appl Sci. 2010;4:3338-41.
21. Yesmin T, Thwin SS, Afrin Urmi S, Wai MM, Zaini PF, Azwan K. A study of facial index among Malay population. Journal of Anthropology. 2014;1-5.
22. Chandimal K, Yasawardene S, Adikari G. Assessment of Prosopic Phenotypes in Purana (old) Inhabitants at Sigiriya Suburbs, Sri Lanka.International Journal of Advances in Science and technology. 2015;3:93-96.
23. Datta S, gopal Sawant V. Correlation of Stature with facial measurements of Maharashtrian adults. Indian Journal of Basic and Applied Medical Research; March 2017:6(2), P. 305-311
24. Kataria DS, Ranjan RK, Perwaiz S. Study of Variation in Total Facial Index of North Indian Population. International Journal of Health Sciences and Research (IJHSR). 2015;5(4):122-7.
25. Osunwoke E, Amah-Tariah F, Obia O, Ekere I, Ede O. Sexual Dimorphism in Facial Dimensions of the Bini. Asian Journal of Medical Sciences. 2011;3(2): 71-3.
26. Jeremić D, Kocić S, Vulović M, Sazdanović M, Sazdanović P, Jovanović B, et al. Anthropometric study of the facial index in the population of central Serbia. Archives of biological sciences. 2013;65(3):1163-8.
27. Kumar M, Muzzafar Lone M. The study of facial index among Haryanvi adults. Int J Sci Res. 2013;2(9):51-3.
28. Shah S, Pandya P, Vadgama J, Rathod S, Patel S. The study of total facial index in living subjects in Gujarat region. NJIRM 2012; 3(4): 95-97.
29. Kanan U, Gandotra A, Desai A, Andani R. Variation in facial index of Gujarati males-a photometric study. International Journal of Medical and Health Sciences. 2012;1(4):27-31.

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