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Comparison of Nasal Anthropometric Measurements of Turks Living in Different Geographical Regions

Farklı Coğrafi Bölgelerde Yaşayan Türklerin Nazal Antropometrik Ölçümlerinin Karşılaştırılması

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ABSTRACT

Aim: Determining the anthropometric characteristics of the nose, which is located in the center of the face, plays an important role not only in surgical procedures but also in identifying ethnic differences. This study aimed to examine the nasal similarities and differences between Kazakhs and Turks who have lived in different regions for more than a thousand years.
Material and Methods: The study included 200 Turkish students and 200 Kazakh students. For each student, sixteen distance measurements and five angle measurements of the nose were taken. The photographs were taken using a digital camera mounted on a tripod, with a distance of 1.50 meters between the photographer and the student participating in the study. Digital photographs of the front, left side, and base of the nose were taken in the Frankfurt Horizontal Plan, which is the standard head position. The photographs were transferred to the DIGIMIZER software, where measurements were made using anthropometric points previously determined.
Results: The findings reveal that among both societies, nasal measurements tend to be greater for males compared to females. Conversely, females exhibit higher nasofrontal (p=0.001) and nasolabial (p=0.001) angles compared to males. Moreover, Turks generally exhibit greater nasal length (p=0.001), width (p=0.001), and height (p=0.037) than Kazakhs, whereas tend to have lower nasofrontal (p=0.001) and nasolabial (p=0.001) angles than Kazakhs.
Conclusion: Nasal anthropometric measurements for males were generally higher than for females. In addition, all measurements differed between Turks and Kazakhs. The results of this study will be useful for future anthropometric studies.
Keywords: Anthropometry; nose; Kazakh; Turk.

ÖZ

Amaç: Yüzün merkezinde yer alan burnun antropometrik özelliklerinin belirlenmesi, sadece cerrahi işlemlerde değil, aynı zamanda etnik farklılıkların belirlenmesinde de önemli bir rol oynamaktadır. Bu çalışmanın amacı, bin yıldan fazla bir süredir farklı bölgelerde yaşayan Kazaklar ve Türkler arasındaki burun benzerliklerinin ve farklılıklarının incelenmesidir.
Gereç ve Yöntemler: Çalışmaya 200 Türk öğrenci ve 200 Kazak öğrenci dahil edildi. Her bir öğrenci için burnun on altı adet mesafe ve beş adet açı ölçümü alındı. Fotoğraflar, fotoğrafçı ile çalışmaya katılan öğrenci arasında 1,50 m mesafe olacak şekilde, tripod üzerine yerleştirilmiş dijital fotoğraf makinesi kullanılarak çekildi. Burnun ön, sol taraf ve tabanının dijital fotoğrafları, başın standart pozisyonu olan Frankfurt Yatay Planında çekildi. Fotoğraflar DIGIMIZER yazılımına aktarıldı ve daha önce belirlenen antropometrik noktalar kullanılarak ölçümler yapıldı.
Bulgular: Elde edilen bulgular, her iki toplumda da burun ölçümlerinin erkeklerde kadınlara göre daha büyük olma eğiliminde olduğunu ortaya koydu. Tersine, kadınlar erkeklere kıyasla daha yüksek nazofrontal (p=0,001) ve nazolabial (p=0,001) açılar göstermekteydi. Ayrıca, Türkler genel olarak Kazaklardan daha büyük burun uzunluğu (p=0,001), genişliği (p=0,001) ve yüksekliği (p=0,037) sergilerken, Kazaklara göre daha düşük nazofrontal açı (p=0,001) ve nazolabial (p=0,001) açılara sahip olma eğilimindeydi.
Sonuç: Erkekler için nazal antropometrik ölçümler genellikle kadınlara göre daha yüksekti. Ayrıca, tüm ölçümler Türkler ve Kazaklar arasında farklılık gösteriyordu. Bu çalışmanın sonuçları gelecekteki antropometrik çalışmalar için yararlı olacaktır.
Anahtar kelimeler: Antropometri; burun; Kazak; Türk.

INTRODUCTION

Anthropometry is a universally applicable method that can reveal the proportions and dimensions of the human body (1). Anthropometric measurements, utilized to define human morphology, gender, ethnic origin, or age, also serve as benchmarks in clinical diagnosis and for pre-, and post-operative patients (2). This approach has been employed to determine anthropometric measurements of populations, and numerous studies have been conducted to examine various parts of the human body anthropometrically. The results of such studies in different populations and at different periods considerably determine the standards for those populations (1,3). The aesthetic appeal of facial features has significantly improved in recent years. Numerous researchers have dedicated their efforts to this subject, conducting studies aimed at objectively measuring facial beauty (4-7). In this context, it is crucial to reveal the anthropometric characteristics of the nose, as it plays a pivotal role in the natural and harmonious appearance of the human face, contributing significantly to facial aesthetics (8). In addition to ethnicity, gender, and genetic factors, the structure of the nose varies as the skeletal system evolves throughout life for various reasons. Future studies will use these factors to establish standards that will play an important role in surgical procedures and in determining societal norms (3,9). According to studies conducted among people living in different geographies, nasal anthropometric measurements vary (10,11).

This study aimed to investigate how the anthropometric measurements of noses differ between individuals of Kazakh Turks and Turkey Turks, despite originating from the same lineage. As far as we know, there is no study in the literature comparing the nasal anthropometric measurements of Turks and Kazakhs. We hypothesized that these differences have emerged due to varied cultural interactions in distinct geographical regions throughout history.

MATERIAL AND METHODS

The required sample size was calculated as 350 with the G*Power v.3.1.9.6 (effect size, d=0.6; power, 1-ß=0.85). The study included 400 healthy individuals selected by random sampling method, comprising 200 Turkish students (100 females and 100 males) aged between 18 and 30 years from Ahi Evran University, and 200 Kazakh students (100 females and 100 males) aged between 18 and 30 years from Ahmet Yesevi University.

All participants had no history of nasal trauma or surgical procedures, and their body mass index (BMI) fell within specified limits (18.5-24.5 kg/m^2). Photographs of Turkish students were taken at Ahi Evran University, and Kazakh students at Ahmet Yesevi University. The photographs were taken using a digital camera mounted on a tripod, with a distance of 1.50 m between the photographer and the student participating in the study. Digital photographs of the anterior, lateral, and basal views of the nose were taken in the "Frankfurt Horizontal Plane" with each participant seated in a chair, head upright, eyes forward, and pupils fixed at the midway point (12). Prior to the study, informed consent was obtained from the individuals participating in this study. The study was approved by the Erciyes University Clinical Research Ethics Committee before commencement (Decision no: 2017/311).

The photographs were transferred to the DIGIMIZER software. The transferred photographs were utilized to identify anthropometric points including nasion (n), subnasale (sn), pronasale (prn), alare (al), soft nasal tip point (al'), and columella top point (c') for measuring the width of the columella. Additionally, wing margin point (ac), wing thickness point (alI), subalare (sbal), gnathion (gn), and labiale superior (ls) were determined. For each individual's nose, 13 distances and five angles between these anthropometric points were measured. Anthropometric points and abbreviations used in nasal measurements are shown in Table 1. Soft tissue landmarks in the anterior, lateral, and basal views are described in Table 2. To ensure

Table 1. Anthropometric points and abbreviations used in nasal measurements

Measurements	Anthropometric Point	Abbreviation	Figure
Nose length	Nasion-Pronasale	n-prn	1A,B
Nose tip protrusion length	Subnasale-Pronasale	sn-prn	1B,C
Columella length	Subnasale-Columella	sn-c	1C
Nasal root width	Maxillofrontale-Maxillofrontale	mf-mf	1A
Nose fold width	Alare'-Alare'	al'-al'	1A,C
Nose width	Alare-Alare	al-al	1A,C
Anatomical nose width	Alarcurvatur-Alarcurvatur	ac-ac	1A,C
Columella width	Columella'-Columella'	c'-c'	1C
Nostril floor width	Subalare-Subalare	sbal-sbal	1C
Nose height	Nasion-Subnasale	n-sn	1B
Distance between alar curvature and pronasal	Alar curvatur-Pronasale	ac-prn	1C
Distance between subalar and pronasal	Subalare-Pronasale	sbal-prn	1C
Right nose wing thickness	AlareI-AlareI	alI-alI	1C
Nasofrontal angle	Glabella-Nasion-Pronasale	g-n-prn	1D
Nasofacial angle	Pronasal-Nasion-Gnathion	prn-n-gn	1D
Nasal tip angle	Nasion-Pronasale-Subnasale	n-prn-sn	1D
Nasolabial angle	Pronasale-Subnasale-Labiale Superior	prn-sn-ls	1D
Wing inclination angle	Alare-Pronasale-Alare	al-prn-al	1C

Table 2. Soft tissue landmarks on the anterior, lateral, and basal views

Measurement points	Description	Figure
Glabella (g)	The midpoint between the eyebrows	1A,B
Nasion (n)	The point where the sutura internasalis and sutura frontonasalis meet	1A,B
Pronasale (prn)	The midpoint of the apex nasi	1A-C
Subnasale (sn)	The midpoint where the base of the columella (the lower edge of the septum nasi between the two nostrils) joins the upper lip	1A-C
Labiale superior (ls)	The midpoint of the upper vermillion line	1B
Gnathion (gn)	The midline point of the lower edge of the mandible	1A,B
Top of Columella (c)	It is the point at the junction of the nasal wings, soft nasal tip, and columella (the lower edge of the septum nasi between the two nostrils)	1C
Maxillofrontale (mf)	The point where the nasofrontal and maxillofrontal canal intersect	1A
Alare (al)	It is the point where the nose protrudes the most laterally on both sides when viewed from the opposite side of the face	1A-C
Soft Nasal Tip (al')	It is the point showing the two domes formed by Cartilago alaris major at the tip of the nose	1A-C
Wing Thickness Point (alI)	These are the points where the middle part of the nose wings are taken as a level and used to measure their thickness	1C
Wing Edge Point (ac)	It is the most lateral point of the wing groove where each wing meets the base	1A-C
Subalare (sbal)	Landmark on the skin of the upper lip where the bases of the nasal wings disappear from view	1C
Columella Width Point (c')	It is the point where the columella tapers and curves at a level higher than the base of the columella	1C
Nasofrontal Angle (g-n-prn)	It is the angle formed between the nose and forehead as it continues from the dorsum nasi to the forehead	1D
Nasofacial angle (prn-n-gn)	It is the angle formed between the plane passing through the glabella-gnathion points perpendicular to the ground and the nasal dorsum	1D
Nasal Tip Angle (n-prn-sn)	It is the angle formed by combining the nasion, pronasal, and subnasal points	1D
Wing inclination angle (al-prn-al)	It is the angle formed between the right and left alar points and the pronasal point	1D
Nasolabial Angle (prn-sn-ls)	It is the angle formed between the upper lip and the base of the columella	1D

measurement reliability, the measurements were repeated twice by one investigator and then averaged. The anthropometric points utilized for the measurements, as determined on the photographs, are illustrated in Figure 1.

Statistical Analysis

The data normality was evaluated using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The Q-Q graphs and histograms were analyzed. An independent t-test was used for group comparisons. Statistical analysis was performed using the SPSS v.16.0 software package. A significance level of $p<0.05$ was utilized for all statistical analyses.

RESULTS

The mean age of the individuals was 24.07±1.05 years. Linear and angular measurements in Turks and Kazakhs were shown in Table 3. Most of the linear and angular measurements at the nose measured in this study were higher in Turks than in Kazakhs, except for sn-c (p=0.003), nasal tip angle (p=0.001), nasofrontal (p=0.001) angle, and nasolabial angle (p=0.001). These measurements were found higher in Kazakhs.

It was observed that there were sex-related differences in the measured parameters. The measured values of males were generally higher than those of females. However, females demonstrated higher values than males in the nasofrontal and nasolabial angles (Table 4).

While there were no statistically significant differences between the genders among the Turkish students, in terms of the values of the measurements alI-alI left (p=0.134), and alI-alI right (p=0.119), sn-c (p=0.457), wing inclination angle (p=0.083), and nasal tip angle (p=0.452), significant differences were found in the rest of the parameters.

On the other hand, statistically significant differences were found between Kazakh males and Kazakh females in terms

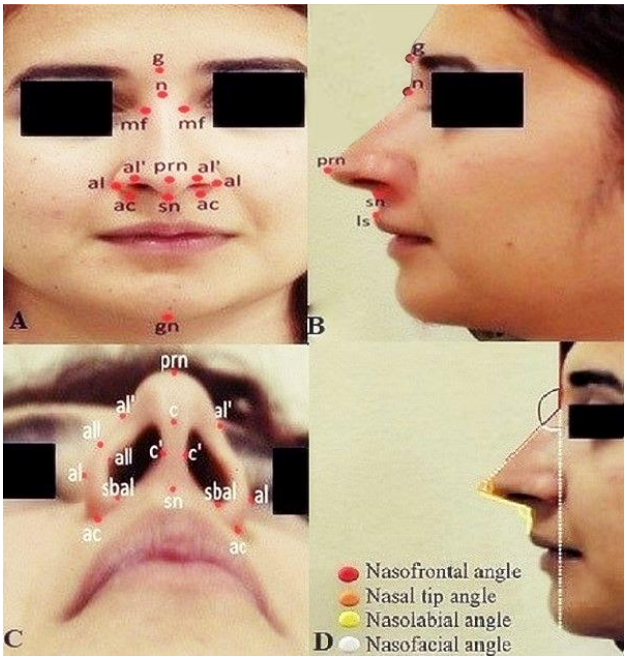

Figure 1. A) Anterior, **B)** lateral, and **C)** basal views of the anthropometric points used, and **D)** the nasal angles from the lateral view of the nose

Table 3. Linear and angular measurements at the nose in Turk and Kazakh students

Measurement	Turk (n=200)	Kazakh (n=200)	p
ac-ac	33.17±3.62	25.87±2.93	**<0.001**
ac-prn (L)	31.53±3.08	26.83±3.33	**<0.001**
ac-prn (R)	31.52±3.04	27.10±3.43	**<0.001**
al'-al'	26.43±2.93	20.61±2.66	**<0.001**
al-al	36.39±3.53	28.85±3.39	**<0.001**
alI-alI (L)	4.62±0.85	3.80±0.85	**<0.001**
alI-alI (R)	4.70±0.80	3.96±0.76	**<0.001**
c'-c'	6.81±0.91	5.40±0.81	**<0.001**
mf-mf	17.60±1.75	17.06±2.28	**0.009**
n-prn	50.66±4.52	47.28±6.12	**<0.001**
n-sn	55.81±5.15	54.67±5.66	**0.037**
sbal-prn (L)	25.62±2.77	22.28±2.98	**<0.001**
sbal-prn (R)	25.45±2.72	22.61±3.01	**<0.001**
sbal-sbal	24.64±3.65	17.56±2.36	**<0.001**
sn-c	11.13±1.59	11.66±1.91	**0.003**
sn-prn	21.20±2.55	19.29±2.54	**<0.001**
Wing inclination angle	81.73±8.39	68.15±6.78	**<0.001**
Nasal tip angle	77.51±5.85	91.95±4.84	**<0.001**
Nasofacial angle	35.38±6.00	28.62±5.12	**<0.001**
Nasofrontal angle	141.14±12.27	148.87±7.81	**<0.001**
Nasolabial angle	104.25±14.58	110.11±10.72	**<0.001**

L: left, r: right, linear measurements are reported in mm, and angles are in degrees

of the measurements of ac-ac (p=0.021), c'-c' (p=0.008), mf-mf (p<0.001), n-prn (p<0.000), n-sn (p<0.001), wing inclination angle (p<0.001) nasofacial angle (p=0.046), and nasofrontal angle (p<0.001), while there was no significant difference between genders in other measured parameters.

When the linear and angular distances measured by the marked reference points in Turk and Kazakh males were compared, sn-c (p=0.044), nasal tip angle (p<0.001), nasofrontal angle (p<0.001), and nasolabial angle (p<0.001) were found to be higher in Kazakh males, while the other parameters were statistically significantly higher in Turk males (p<0.001 for all parameters).

While sn-c (p=0.027) and mf-mf (p<0.001) values were higher in Kazakh females, other linear measurements were found to be higher in Turk females. Kazakh females exhibited higher values in nasal tip angle (p<0.001) and nasofrontal angle (p<0.001), whereas Turk females showed higher values in nasofacial angle (p<0.001) and wing inclination angle (p<0.001). Despite the nasolabial angle being measured higher in Kazakh females than in Turk females, statistical analysis did not reveal any significant difference (p=0.460).

DISCUSSION

Identifying the anthropometric features of the nose, pivotal for the natural and harmonious appearance of the human face, and their contribution to aesthetic appeal, underscores the importance of conducting comparative studies across diverse societies. Such endeavors are crucial

Table 4. Linear and angular measurements of the nose in Turk and Kazakh students by gender

Measurement	Gender		Turk (n=200)	Kazakh (n=200)	p
	Male (n=100)		34.90±3.22	25.39±2.88	**<0.001**
ac-ac	**Female (n=100)**		31.43±3.14	26.35±2.91	**<0.001**
		p	**<0.001**	**0.021**	
	Male (n=100)		32.55±3.04	26.92±3.61	**<0.001**
ac-prn (L)	**Female (n=100)**		30.51±2.78	26.75±3.04	**<0.001**
		p	**<0.001**	0.103	
	Male (n=100)		32.51±3.01	27.32±3.74	**<0.001**
ac-prn (R)	**Female (n=100)**		30.53±2.75	26.89±3.08	**<0.001**
		p	**<0.001**	0.377	
	Male (n=100)		27.63±2.74	20.25±2.78	**<0.001**
al'-al'	**Female (n=100)**		25.24±2.62	20.97±2.49	**<0.001**
		p	**<0.001**	0.053	
	Male (n=100)		38.23±3.14	28.69±3.49	**<0.001**
al-al	**Female (n=100)**		34.56±2.89	29.01±3.29	**<0.001**
		p	**<0.001**	0.478	
	Male (n=100)		4.71±0.88	3.86±0.88	**<0.001**
alI-alI (L)	**Female (n=100)**		4.53±0.81	3.74±0.81	**<0.001**
		p	0.134	0.319	
	Male (n=100)		4.79±0.80	3.92±0.82	**<0.001**
alI-alI (R)	**Female (n=100)**		4.61±0.80	3.99±0.69	**<0.001**
		p	0.119	0.574	

L: left, r: right, linear measurements are reported in mm, and angles are in degrees

Table 4. Linear and angular measurements at the nose in Turk and Kazakh students by gender (continued)

Measurement	Gender		Turk (n=200)	Kazakh (n=200)	p
	Male (n=100)		7.16±0.89	5.25±0.78	**<0.001**
c'-c'	**Female (n=100)**		6.46±0.79	5.55±0.81	**0.009**
		p	**<0.001**	**0.008**	
	Male (n=100)		18.21±1.72	15.91±1.76	**<0.001**
mf-mf	**Female (n=100)**		16.98±1.56	18.22±2.16	**<0.001**
		p	**<0.001**	**<0.001**	
	Male (n=100)		52.87±3.73	50.25±5.91	**<0.001**
n-prn	**Female (n=100)**		48.46±4.17	44.30±4.75	**<0.001**
		p	**<0.001**	**<0.001**	
	Male (n=100)		58.40±4.53	56.32±5.91	**<0.001**
n-sn	**Female (n=100)**		53.22±4.39	53.03±4.90	**<0.001**
		p	**<0.001**	**<0.001**	
	Male (n=100)		26.37±2.93	22.63±3.18	**<0.001**
sbal-prn (L)	**Female (n=100)**		24.86±2.40	21.94±2.74	**<0.001**
		p	**<0.001**	0.103	
	Male (n=100)		25.97±2.93	22.97±3.26	**<0.001**
sbal-prn (R)	**Female (n=100)**		24.93±2.40	22.25±2.71	**<0.001**
		p	**<0.001**	0.091	
	Male (n=100)		26.12±3.65	17.63±2.33	**<0.001**
sbal-sbal	**Female (n=100)**		23.15±3.00	17.48±2.39	**<0.001**
		p	**<0.001**	0.650	
	Male (n=100)		11.21±1.62	11.72±1.90	**0.044**
sn-c	**Female (n=100)**		11.04±1.57	11.60±1.94	**0.027**
		p	0.457	0.666	
	Male (n=100)		21.89±2.61	19.17±2.78	**<0.001**
sn-prn	**Female (n=100)**		20.50±2.95	19.42±2.29	**0.001**
		p	**<0.001**	0.487	
	Male (n=100)		82.76±9.20	64.92±5.74	**<0.001**
Wing inclination angle	**Female (n=100)**		80.70±7.39	71.37±6.21	**<0.001**
		p	0.083	**<0.001**	
	Male (n=100)		77.20±5.86	91.36±4.70	**<0.001**
Nasal tip angle	**Female (n=100)**		77.83±5.86	92.55±4.92	**<0.001**
		p	0.452	0.082	
	Male (n=100)		36.33±6.46	29.35±5.11	**<0.001**
Nasofacial angle	**Female (n=100)**		34.42±5.37	27.90±5.06	**<0.001**
		p	**0.024**	**0.046**	
	Male (n=100)		133.58±11.37	145.04±8.15	**<0.001**
Nasofrontal angle	**Female (n=100)**		148.71±7.60	152.70±5.17	**<0.001**
		p	**<0.001**	**<0.001**	
	Male (n=100)		99.35±12.60	109.71±10.85	**<0.001**
Nasolabial angle	**Female (n=100)**		109.16±14.83	110.51±10.63	0.460
		p	**<0.001**	0.598	

L: left, r: right, linear measurements are reported in mm, and angles are in degrees

for establishing standards tailored to the specific characteristics of examined communities. In the current study, anthropometric measurements of the noses of Kazakh Turks and Turkish Turks were conducted to reveal the similarities and differences.

In the present study, the nasal height (n-sn) measured in Turkish males (58.40 mm) was observed to be lower than values reported by Farkas et al. (13) in their study of various ethnic groups, including Iranian (62.6 mm), Bulgarian (61.6 mm), and Portuguese (59.5 mm) males. Additionally, it was found to be higher than ethnic groups, Japanese (56.9 mm), Italian (56.9 mm), Greek (55.5 mm), and Slovenian (56.2 mm) males. In the present study, the nasal height (n-sn) measurement in (56.32 mm) Kazakh males was found to be lower than males from other ethnic groups except Greek and Slovenian males (13).

In the study, the nasal height (n-sn) of a Turkish female was measured as 53.22 mm, while that of a Kazakh female was 53.03 mm. These measurements are similar to both Japanese (53.3 mm) and Han Chinese (53.87 mm) females reported in Farkas et al. (13).

In the present study, the nose length (n-prn) in Turkish males (52.87 mm) which was found to be higher than that of Kazakhs (50.25 mm), was also found higher than Italians with 51.00 mm (3), Chinese with 48.84 mm (8), Han Chinese with 48.43 mm (14), Saudi Arabians with 50.6 mm (15), Nigerians with 47.8 mm (10), and North Americans with 50 mm (16). The nose length (n-prn) in Turkish females (48.46 mm) which was higher than Kazakhs (44.30 mm), was also higher than Italians with 46.46 mm (3), Chinese with 46.68 mm (8), Saudi Arabians with 43.3 mm (15), and North Americans with 44.7 mm (16). However, it exhibited similarity with the Han Chinese at 48.34 mm (14) and Egyptian females at 48.46 mm (17).

Farkas et al. (13) compared nose width (al-al) among different ethnic groups. According to their findings, the highest measurement in males was observed in individuals of Indian descent (42.6 mm), while the lowest measurement was found in Italians (32.1 mm). As for Turkish males in the present study, their nose width (al-al) measurement (38.23 mm) surpassed the measurements of individuals from Azerbaijan (35.7 mm), Greece (35.7 mm), Italy (32.1 mm), Iran (35.3 mm), and Egypt (32.4 mm). However, it was lower than the measurements of individuals from Bulgaria (42.6 mm) and India (43.4 mm). Kazakh males in the present study had the lowest nose width (al-al) measurement (28.69 mm) compared to all these ethnic groups. Among females, the highest measurement belonged to individuals from Singapore (37.2 mm), whereas the lowest was in Egyptian females (29.3 mm). The nose width (al-al) of Turkish females (34.56 mm) in the present study, was higher than the measurements of North Americans (31.4 mm), Italians (29.5 mm), and Egyptians (29.3 mm). However, it was lower than the Singaporean (37.2 mm) and Japanese (37.1 mm) females. Additionally, the nose width (al-al) value of Kazakh females (29.01 mm) was found to be similar to the measurements of Italian (29.5 mm), Slovakian (30.6 mm), and Egyptian (29.3 mm) females (13).

The angle values related to the nose are examined in Table 5, it is generally observed that nasofrontal, nasal tip, and nasolabial angles are higher in females in most ethnic groups, while the nasofacial angle is higher in males. Among males, the nasofacial angle is highest in Saudi Arabians (15) and lowest in Kazakhs. In females, this value is highest in Egyptians (17) and lowest in Kazakhs. The wing inclination angle is higher in Kazakh females compared to Kazakh males in the present study, while it is similar between males and females in Turks and other ethnic groups. In both genders, the wing inclination angle is lower in Kazakhs compared to other ethnic groups.

In males, the lowest value of nasofrontal angle was found in Iranian males (18) and the highest value was found in Chinese (8) males. In females, the highest value was found in Kazakhs, and the lowest value was found in Kenyan females (19). However, this angle was similar between North American (16) and Iranian (18) males. The highest nasolabial angle among males belonged to Kazakh males, while the lowest belonged to Kenyan males (19).

The nasofacial angle values were similar among Turkish in this study, Indian (20), and Iranian (18) males. In females, this value was found to be highest in Kazakhs in the present study, and lowest among Kenyans (19). In males, the nasal tip angle had the lowest value in Turks in the present study, and the highest value in Chinese (8). In females, the lowest value of the nasal tip angle was detected in Turkish females in the present study, and the highest value was detected in Saudi Arabian females (15).

The determination of the anthropometric characteristics of the nose located at the center of the face plays an important

Table 5. Comparison of nasal angle measurements in different ethnic groups

Study	Ethnicity	Nasofrontal angle		Nasofacial angle		Nasal tip angle		Nasolabial angle		Wing inclination angle	
		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Present Study	Turkey	133.58	148.71	36.33	34.42	77.20	77.83	99.35	109.16	82.76	80.70
	Kazakhstan	145.04	152.70	29.35	27.90	91.36	92.55	109.71	110.51	64.92	71.37
Sforza et al., 2011 (3)	Italy					93.84	94.99				
Dong et al., 2010 (8)	China	138.19	144.04			94.16	96.19	104.3	103.42		
Li et al., 2014 (14)	China (Han)	132.6	138.7			87.94	90.85	100.9	98.97		
Al-Qattan et al., 2012 (15)	Saudi Arabia	135.9	145.9	41.4	33.3	90.5	97.3	100.4	102.3	92.3	89.3
Choe et al., 2006 (16)	North America		134.3		29.9				104.2		
Mohammed Ali, 2014 (17)	Eygpt	134.97	139.5	39.94	38.79			100.61	102.06	75.43	74.45
Fariaby et al., 2006 (18)	Iran	126	134	36	36			97	98		
Virdi et al., 2019, (19)	Kenya	127.3	127.9					85.5	85.2		
Mehta et al., 2017 (20)	India	135.91	141.18	36.85	35.08			102.53	106.18		

role not only in defining surgical operations and the aesthetic standards of societies but also in the classification of human populations and the identification of ethnic differences. Anthropometric measurements of the nose in different ethnic groups are crucial for nasal surgery because the goal of the surgery is to achieve good long-term functional and aesthetic outcomes. Therefore, clinical data should be supported by quantitative data obtained from anthropometric results (21,22).

CONCLUSION

When nose measurements among ethnic groups are compared, similarities and differences are observed among specific groups. In the parameters measured in the present study, values for males were generally higher than for females based on gender. However, females had higher values in the nasofrontal and nasolabial angles. While the nasolabial angle and n-sn value exhibited similarities in Turkish and Kazakh females, other measurements showed differences between Turkish and Kazakh populations.

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