THE POSSIBLE ROLE OF HUMAN EAR DIMENSIONS AND NASAL INDEX IN ESTIMATION OF STATURE AMONG AN ADULT EGYPTIAN POPULATION SAMPLE

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ABSTRACT

Background: Ear biometrics is gaining significant interest and has become the method of identification due to its biological and physiological characteristics. **Aim of the work:** to study the dimensions of human external ear as well as nasal index among an Egyptian population sample and use these parameters for stature and sex estimation. **Materials and methods:** The study was conducted on 200 participants of both sexes aged 18 to 60 years, four measurements of each ear (ear height, ear width, lobular height and lobular width), nasal height, nasal width were measured by Vernier caliper; nasal index was then calculated and stature was measured by Stadiometer. **Results:** There was a higher male value regarding the right ear height and the right ear width, and right lobular width with statistical significance but there was a higher female value regarding the right lobular height with highly statistically significant difference. Males had higher values regarding the nasal height, width and index. We constructed regression equations to estimate the stature from right ear height, left ear height, left lobular width, nasal height and nasal width. **Conclusion:** From this study we concluded that stature can be estimated from external ear and nasal measurements. Novel regressions equations were constructed in the current study to estimate stature from ear and nasal measurements as well as differentiation between males and females with significant difference.

Keywords: Anthropology, Identification, Stature determination, Ear parameters, Nasal dimensions

INTRODUCTION

Human features are very specific and help in personal identification. Anthropometry refers to the field where measurements of the living body are made for understanding differences. Genetic and environmental influences affect the facial anthropometry for each population which is specific due to the genetic and environmental influences (**El Ella et al., 2022)**

The human ear is very unique to each person, as fingerprints, the ear retains certain individualistic characteristics which are totally different from one person to another **(Krishan et al., 2019)**

One of the distinguishing features of the face is the ear, and the structure of the ear can reveal sex and age. The external, middle, and interior portions make up the human ear. The external ear is formed of the pinna and the external acoustic meatus **(Laxman 2019)**

Ear biometrics nowadays is gaining a lot of interest and has become a unique method of identification because of its high stability **(Attalla et al., 2020).**

Nasal anthropometry refers to the measures of a human nasal size, proportion, and shape. The nasal index, which is the percentage ratio of the nasal breadth to its height, is currently a key instrument in forensic sciences and is used to distinguish between different sexes and races **(Dhulqarnain et al., 2020).**

In forensic sciences, establishing a person's identity is dependent on establishing their age, sex, race, and stature. The association between stature and many bodily parts, such as the cranial and facial bones, long bones, trunk, and foot bones, has been proven **(Dinakaran et al., 2021).**

The objective of the current study was to examine the nasal index and external ear dimensions in a sample of the Egyptian population in order to estimate stature and sex.

MATERIALS AND METHODS

- **Population of study:**

200 people between the ages of 18 and 60, of both sexes, who were recruited at Kasr Alainy Hospital-Cairo University made up the study sample. After outlining the study's objectives and gaining the Research Ethics Committee's approval at Cairo University's Kasr Al-Ainy Faculty of Medicine, along with the committee's approval number (**N- 13- 2022**), and the participants provided their informed consent before the study.

- **Inclusion criteria:** 18-60 years old and both sexes.
- **Exclusion criteria:** developmental anomalies in ear and nose**,** any physical anomalies, injuries, nasal or face surgery, kyphosis scoliosis, and any deformities of the skull or face.

Methodology in details:

All participants sat on chairs with their heads in the horizontal Frankfurt plane. Female participants were requested to take any measures without their earrings on. Before beginning the data collection, the participants were requested to sign an informed consent form. All measurements were taken twice using a Vernier caliper as shown in figure (1), and the two were calculated and their arithmetic mean was noted. The results were documented in cm.

Ear dimensions

Each participant's right and left external ear got four measurements as illustrated in Figures (2 & 3) (**Faakuu et al., 2020; Shireen and Karadkhelkar 2015):**

- Ear height: The term "ear height" refers to the distance between the highest point on the auricle and the lowest point on the earlobe (supra-to sub-aurale).
- Ear width: Pre-aurale to post-aurale, the distance between the most anterior and posterior points of the auricle, was used to measure ear width.
- Lobular height: The intertragic incisure to the caudal section of the lobe (inter-tragic notch to sub-auricle) was used to estimate lobular height.
- Lobular width: The distance between the lobule's most anterior and posterior points was chosen as the standard for measuring lobular width.

Figure (1): Digital Vernier caliper

Figure (2): Ear dimensions Red arrow: Ear height, Blue arrow: Ear width.

Figure (3): Ear dimensions. Green arrow: lobular height, yellow arrow: lobular width

Nasal index

Using a Vernier caliper, nasal widths and heights were measured. Figure (4) illustrates how nasal width and height were calculated. Nasal width was calculated as a straight line from the right ala to the left ala, and nasal height as the distance from the nasion to the sub-nasale. This is how the nasal index was determined: Nasal index is equal to nasal width/nasal height times 100 **(Dhulqarnain et al., 2020).**

Stature

Using a Stadiometer, the person's stature was calculated as the vertical distance from the vertex to the heel contacting the ground while they were standing upright and with their heads in the Frankfort plane (**Barwa and Singh 2020).**

Figure (4): Nasal measurements. Black arrow: Nasal height, Red arrow: Nasal width

Sample size: The sample size was calculated as follows:

The smallest sample size required to determine the effect of human ear measurements and nasal index in estimate of stature among an adult Egyptian population sample was determined using a clinical sample size calculator for observation study with 0.05 alpha error and 0.80 power of the investigation.

According to literature, both stature and nasal height have male mean values that are significantly greater than female mean values: stature (males, 172.3 6.4; females, 158.9 5.6); and nasal height (males, 5.0.37; females, 4.6.30). Nasal height is significantly (p 0.05) and positively linked with stature in both the overall sample of participants and male participants individually (**Barwa and Singh 2020).**

The mean ear height was 6.42, SD 0.61 in males and 6.34, SD 0.34. Mean ear width was 2.94, SD 0.28, 2.79, SD 0.25 in males and females respectively (**Shireen and Karadkhelkar 2015).**

The total sample size calculated is 120 healthy individual (60 males and 60 females).

Sampling technique:

Up until the estimated total sample size is reached, a practical sample of people will be chosen for the study while taking the inclusion and exclusion criteria into account.

STATISTICAL METHODS:

The data has been coded and entered via SPSS, the statistical software for the social sciences (SPSS), version 28 (IBM Corp., Armonk, NY, USA). For quantitative variables, the mean, standard deviation, minimum and maximum, and frequencies (number of occurrences), and relative frequencies (percentages), were used to summarize the data. To compare males and females, the unpaired t-test was applied. (**Chan YH 2003a).** The correlations between the quantitative variables were calculated using the Pearson correlation coefficient (**Chan YH 2003b).** Linear regression analysis predicted stature using significant measurement (**Chan YH 2004).** The test for mean equality between males and females was the first step in the discriminant analysis. The significant predictors required to establish the discriminate function were identified using stepwise statistics. Next, group centroids (group means) were variables were calculated using the Pearson correlation coefficient (**Chan YH 2003b).** Linear regression analysis predicted stature using significant measurement (**Chan YH (2004).** The test for mean equality between males and females was the first step in the discriminant analysis. The significant predictors required to establish the discriminate function were identified using stepwise statistics. Next, group centroids (group means) were determined, representing the decisive points for discriminating between males and females. According to the discriminate function, the percentage of correctly classified cases was categorized (**Chan YH 2005).** Statistics were considered significant for P-values under 0.05.

RESULTS

This is a descriptive, cross-sectional study on a 200 participants of both sexes comprising 106 (53%) females and 94 (47%) males in the age group between 18 and 60 years.

Regarding the stature of the studied participants, the stature ranged from 141 cm to 187 cm with mean value 164.52 cm as shown in table (1).

Ear dimensions

The mean value of the height, width of the right ear, right lobular height and width were 62.79, 36.39, 18.69 and 21.01 cm respectively while that of the height, and width of the left ear, left lobular height, and width were 62.67, 36.18, 18.45, and 21.03 cm respectively as shown in table (2)

Table 1: Minimum and maximum of the measured stature

	Mean	Standard Deviation	Minimum	Maximum
Stature	164.52	8.64	141.00	187.00

Table 2: Mean and standard deviation of ear dimensions

Ear dimensions	Mean	Standard Deviation	Minimum	Maximum
Right ear height	62.79	4.94	49.08	77.05
Right ear width	36.39	4.17	24.65	45.06
Right lobular height	18.69	3.05	11.00	26.90
Right lobular width	21.01	3.04	12.41	29.58
Left ear height	62.67	4.73	52.97	75.75
Left ear width	36.18	4.53	24.05	70.21
Left lobular height	18.45	3.02	11.21	26.26
Left lobular width	21.03	3.05	12.63	30.36

Nasal dimensions

The mean value of nasal height, and nasal width was 54.28 and 33.56 cm respectively. According to table (3), the nasal index ranged from 42.66 to 88.59 with a mean value of 62.51.

Table 3: Mean and standard deviation of nasal measurements

	Mean	**SD**	**Minim.**	**Max.**
Nasal height	54.28	5.04	40.80	68.66
Nasal width	33.56	3.39	22.37	42.42
Nasal index	62.51	8.90	42.66	88.59

Comparison between males and females

The right ear's height and width were statistically significantly higher in male than in female, as indicated in table (4), with p values of 0.001 and 0.003, respectively. but there was a statistically significant higher female value regarding the right lobular height with (p value 0.018). Concerning the right lobular width there was a higher male value than female with no statistically significant difference.

Table (5) demonstrates that the male value for the left ear's height and width was significantly higher, with p values of 0.001 and 0.026, respectively However, the left lobular height had a larger female value despite there being no statistically significant difference. Concerning the left lobular width there was a higher male value than female with no statistically significant difference.

As can be seen in table (6), there was a statistically significant difference in the mean nasal height of males and females, which was 55.55 cm for men and 53.16 cm for women (p = 0.001).). In terms of mean nasal breadth, there was a statistically significant difference between males and females, measuring 34.76 cm and 32.50 cm, respectively (p value 0.001). Regarding the nasal index, the mean male value was higher than that of the female representing 63.29 and 61.81 respectively with no statistically significant difference.

Correlation with stature in whole population

The height of the right and left ears, the breadth of the left lobule, and the height and width of the nose were all significantly positively correlated with stature. However, as shown in figure (5-9) and table (7), there was no statistically significant association between stature and (right ear width, right lobular height and width, left ear width, left lobular height, and nasal index).

Table 4: The difference between males and females value regarding right ear dimensions

	Female				Male				P value
	Mean	**SD**	**Minimum**	**Maximum**	**Mean**	**SD**	**Minimum**	**Maximum**	
Right ear height	61.40	4.77	49.08	77.05	64.36	4.67	52.17	75.04	<0.001
Right ear width	35.58	4.02	24.65	44.26	37.31	4.16	27.32	45.06	0.003
Right lobular height	19.17	2.90	12.18	26.90	18.15	3.15	11.00	26.22	0.018
Right lobular width	20.89	2.78	15.51	28.45	21.14	3.33	12.41	29.58	0.557

P ≤ 0.001 is significant

Table 5: The difference between males and females value regarding left ear dimensions

	Female				Male				P value
	Mean	**SD**	**Minimum**	**Maximum**	**Mean**	**SD**	**Minimum**	**Maximum**	
Left ear height	61.55	4.72	52.97	75.75	63.92	4.43	53.59	74.86	< 0.001
Left ear width	35.51	5.10	24.05	70.21	36.94	3.68	27.37	47.10	0.026
Left lobular height	18.71	2.99	11.21	26.26	18.15	3.04	11.64	25.37	0.190
Left lobular width	20.76	2.88	15.80	30.36	21.33	3.21	12.63	29.24	0.189

P ≤ 0.001 is significant

Table 6: The difference between males and females value regarding nasal dimensions

	Female				Male				P value
	Mean	**SD**	**Minimum**	**Maximum**	**Mean**	**SD**	**Minimum**	**Maximum**	
Nasal height	53.16	5.05	40.80	68.66	55.55	4.74	44.28	68.28	0.001
Nasal width	32.50	3.36	22.37	40.39	34.76	3.03	28.44	42.42	< 0.001
Nasal index	61.81	9.56	42.66	88.59	63.29	8.07	48.06	81.47	0.241

P ≤ 0.001 is significant

Table 7: Correlation between the stature with ear and nose measurements

	Stature		
	R	**P value**	**N**
Right ear height	0.268	< 0.001	200
Right ear width	0.095	0.180	200
Right lobular height	-0.137-	0.053	200
Right lobular width	0.132	0.062	200
Left ear height	0.230	0.001	200
Left ear width	0.055	0.437	200
Left lobular height	-0.066-	0.356	200
Left lobular width	0.232	0.001	200
Nasal height	0.254	< 0.001	200
Nasal width	0.325	< 0.001	200
Nasal index	0.071	0.316	200

P ≤ 0.001 is significant

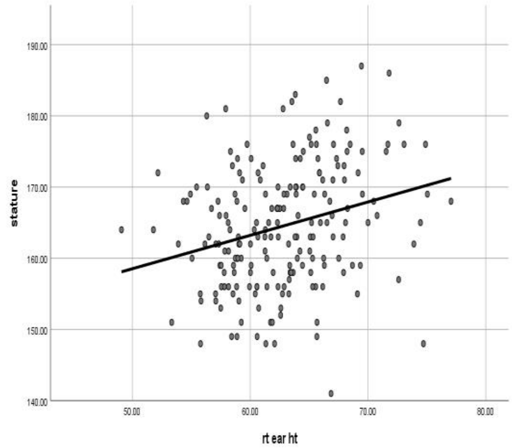

Figure (5): Correlation between stature and right ear height

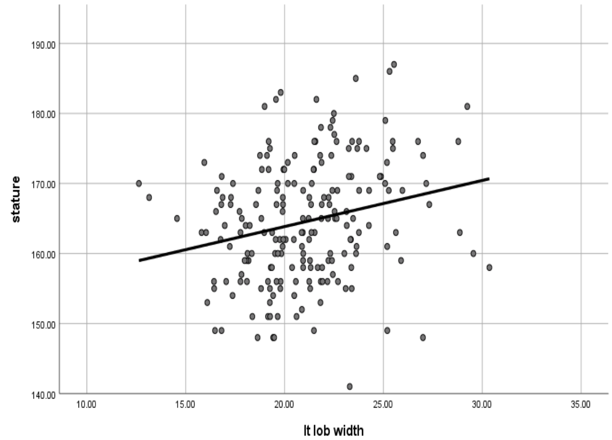

Figure (7): Correlation between stature and left ear lobule width

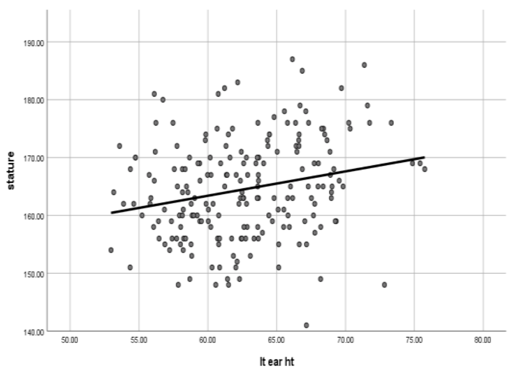

Figure (6): Correlation between stature and left ear height

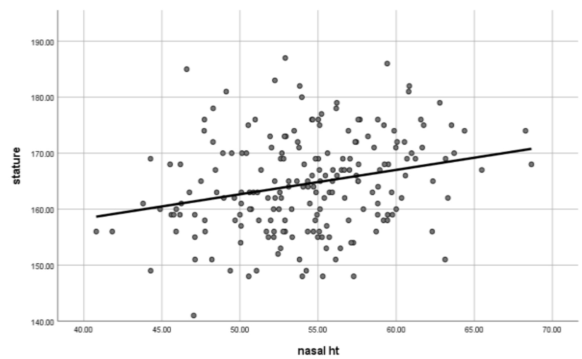

Figure (8): Correlation between stature and nasal height

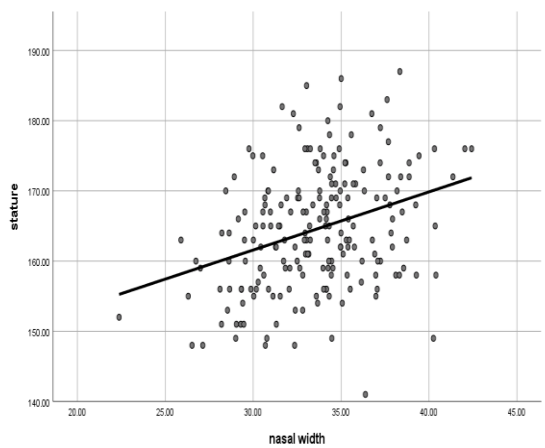

Figure (9): Correlation between stature and nasal width

As shown in table (8-13), discriminant function analysis was used to obtain unstandardized coefficients. Univariate and multivariate linear regression methods were used to predict stature. Six equations were constructed using these values to determine the stature of a person which were:

Stature=135.086+0.469* Right ear height

Stature=138.119+0.421* Left ear height

Stature=150.669+0.659* Left lobular width

Stature=140.908+0.435* Nasal height

Stature=136.729+0.828* Nasal width

Stature=103.582+0.736* Nasal Width +0.481* Nasal Height +0.481* Left Lobular Width

Correlation with stature in females only

As shown in table (14). there were no significant correlations between statures and female's ear and nasal measurements.

Correlation with stature in males only

As shown in table (15) and figures (10 and 11), there was no significant correlation between stature and (male right ear height and width, right lobular height, left ear height and width, left lobular height, nasal height and width, and nasal index). However, there was a significant positive correlation between stature and male right and left lobular width.

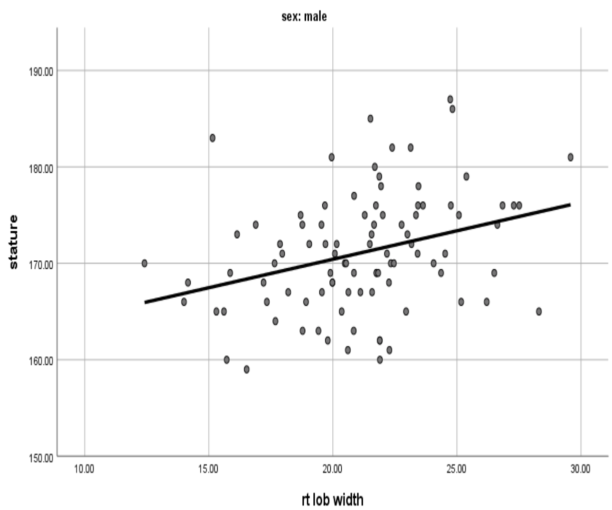

Figure (10): Correlation between stature and right lobular width in males

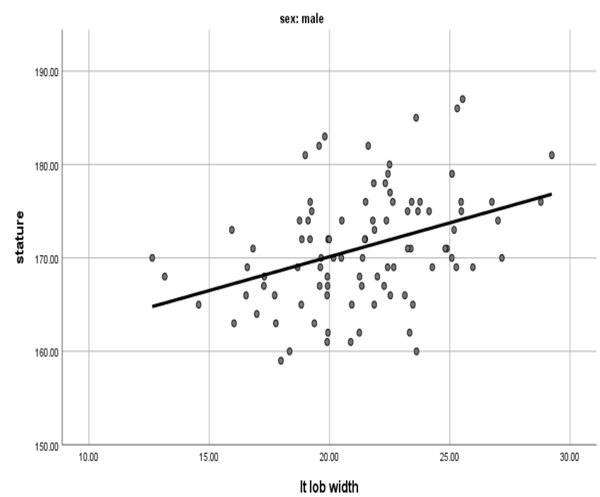

Figure (11): Correlation between stature and left lobular width in males

Table 8: Unstandardized, standardized coefficient for right ear height

Model		Unstandardized Coefficients		Standardized Coefficients	T	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature	(Constant)	135.086	7.549		17.895	<0.001	120.200	149.973
	Right ear height	0.469	0.120	0.268	3.912	<0.001	0.232	0.705

Stature=135.086+0.469* right ear height

Table 9: Unstandardized, standardized coefficient for left ear height

Model		Unstandardized Coefficients		Standardized Coefficients	T	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature	(Constant)	138.119	7.949		17.375	<0.001	122.443	153.795
	Left ear height	0.421	0.126	0.230	3.331	0.001	0.172	0.671

Stature=138.119+0.421* left ear height

Table 10: Unstandardized, standardized coefficient for left lobular width

Model		Unstandardized Coefficients		Standardized Coefficients	T	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature	(Constant)	150.669	4.169		36.143	<0.001	142.449	158.890
	Left lobular width	0.659	0.196	0.232	3.358	0.001	0.272	1.046

Stature=150.669+0.659* left lobular width

Table 11: Unstandardized, standardized coefficient for nasal height

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature	(Constant)	140.908	6.431		21.910	<0.001	128.225	153.590
	Nasal height	0.435	0.118	0.254	3.688	<0.001	0.202	0.668

Stature=140.908+0.435* nasal height

Table 12: Unstandardized, standardized coefficient for nasal width

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature	(Constant)	136.729	5.774		23.680	<0.001	125.342	148.115
	Nasal width	0.828	0.171	0.325	4.838	<0.001	0.491	1.166

Stature=136.729+0.828* nasal width

Table 13: Unstandardized, standardized coefficient for nasal width, nasal height and left lobular width

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature	**(Constant)**	103.582	8.711		11.892	<0.001	86.403	120.760
	Nasal width	0.736	0.170	0.289	4.341	<0.001	0.402	1.071
	Nasal height	0.481	0.110	0.280	4.384	<0.001	0.265	0.697
	Left lobular width	0.481	0.189	0.170	2.542	0.012	0.108	0.855

Stature=103.582+0.736* nasal width +0.481* nasal height +0.481* left lobular width

Table 14: Correlation between stature and all ear and nose measurements in females

Female	**Stature**		
	R	**P value**	**N**
Right ear height	-0.006-	0.948	106
Right ear width	-0.164-	0.093	106
Right lobular Height	-0.136-	0.166	106
Right lobular width	-0.042-	0.672	106
Left ear height	0.017	0.866	106
Left ear width	-0.176-	0.071	106
Left lobular height	-0.104-	0.288	106
Left lobular width	0.094	0.337	106
Nasal height	0.128	0.190	106
Nasal width	0.146	0.137	106
Nasal index	0.019	0.847	106

P ≤ 0.001 is significant

Table 15: Correlation between stature and all ear and nose measurement in males

Male	**Stature**		
	R	**P value**	**N**
Right ear height	0.176	0.089	94
Right ear width	0.011	0.912	94
Right lobular Height	0.087	0.405	94
Right lobular width	0.320	0.002	94
Left ear height	0.143	0.170	94
Left ear width	0.051	0.622	94
Left lobular height	0.115	0.268	94
Left lobular width	0.380	< 0.001	94
Nasal height	0.119	0.255	94
Nasal width	0.114	0.276	94
Nasal index	0.013	0.898	94

P ≤ 0.001 is significant

Univariate linear regression to predict stature in males

As shown in table (16 & 17), discriminant function analysis was used to obtain unstandardized coefficients. Two equations were constructed using male values to determine the stature in males using univariate linear regression method which were:

Stature=158.613+0.590* Right Lobular Width

Stature=155.646+0.724* Left Lobular Width

Discriminant functional analysis for sex determination

As shown in table (18, 19& 20), discriminant score=-15.877+0.237* right ear height-0.367* right lobular height+0.061* nasal height+0.135* nasal width

This score can discriminate between males and females with centroid of female (-0.718) and centroid of male group (0.809).

With accuracy to predict females=79.2%, accuracy to predict males=85.1%, accuracy in all=82%.

Table 16: Unstandardized, standardized coefficient for right lobular width in males

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature in males	(Constant)	158.613	3.896		40.711	<0.001	150.875	166.350
	Right lobular width	0.590	0.182	0.320	3.243	0.002	0.229	0.952

Stature=158.613+0.590* right lobular width

Table 17: Unstandardized, standardized coefficient for left lobular width in males

Model		Unstandardized Coefficients		Standardized Coefficients	t	P value	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Stature in males	(Constant)	155.646	3.967		39.232	<0.001	147.766	163.525
	Left lobular width	0.724	0.184	0.380	3.938	<0.001	0.359	1.090

Stature=155.646+0.724* left lobular width

Table (18): Canonical Discriminant Function Coefficients

	Function
Right ear height	0.237
Right lobular height	-0.367-
Nasal height	0.061
Nasal width	0.135
(Constant)	-15.877-

Unstandardized coefficients

Table (19): Functions at Group Centroids

Sex	Function
Female	-0.718-
Male	0.809

Unstandardized canonical discriminant functions evaluated at group means

Table (20): Accuracy of the model

		Sex	Predicted Group Membership		Total
			female	**Male**	
Original	**Count**	**Female**	84	22	106
		Male	14	80	94
	%	**Female**	79.2	20.8	100.0
		Male	14.9	85.1	100.0

DISCUSSION

The current study aims to find the morphological difference in measurements of the external ear and nose between males and females as well as correlation between these measurements and the stature in Egyptians.

In the present study, the results showed higher male value regarding the ear height and the ear width and lobular width while higher female values regarding the lobular height with high statistically significant differences in ear height, width and lobular height. This went in the same line with **(Shireen and Karadkhelkar 2015; Ahmed and Omer 2015; Asadujjaman et al., 2019; Singh et al. 2022; Kumari et al., 2022; Prasad et al., 2022 and Bob-Manuel et al., 2023)** who stated that higher male values in all ear dimensions. However, **Doepa et al. (2013)** revealed in their study that there was no significant sexual difference in all studied measurements of both ears, but **Sunday et al. (2020)** in their study about the relation between stature and right ear measurements found that females had higher values for ear measurements **(Scendoni et al., 2023).**

Discriminant functional analysis for sex determination was done with these measurements and resulted in accuracy to predict females=79.2%, accuracy to predict males=85.1%, accuracy in all=82%.

Regarding the nasal height and width, we found a statistically significant sexual difference with higher male values while the nasal index showed no significant difference with higher male values which went with a study done by **Scandino et al. (2023)** where they studied the nasal height and nasal width by CT and found sexual significant difference between measurements of males and females, a statistically significant difference with higher male values was discovered by **Barwa and Singh (2020)** who examined the difference in nose height between males and females. Their findings corroborated the results of this study. Also, with the study of (**Hegazy 2014 and Zolbin et al. 2015)** except that their results showed significant difference in the nasal index after the age of 20 years which was not the same as in the current study**.**

Right ear height, left ear height, and left lobular breadth all showed a strong positive connection with stature. However, there was no significant association between stature and left lobular height, left lobular width, right lobular height, or left lobular width. This was consistent with **Sunday et al. (2020),** who discovered a statistically significant positive connection between stature and right ear characteristics in both males and females. The study conducted by **Durgawale and Jadhav (2018)** revealed a significant positive correlation between ear length and stature from a population in western **Durgawale and Jadhav (2018)** and **Laxman (2019)** found a similar correlation. The ear height was proved by simple linear regression analysis that it's the most accurate predictable variable of stature from both ears in males **(Laxman 2019).**

Ear measurements can be used to assess female stature, according to **Babu (2022)** findings, there was a statistically significant association between stature and ear measurements in females (**Babu 2022)**

Except for ear width, which has a strong association with stature in males (p0.05), ear length and width are not significantly correlated with stature (p>0.05) in either gender **(Rathee et al., 2021).**

The current study discovered a relationship between nasal height, nasal width, and stature in both men and women. This finding was consistent with research by **Kamadar and Babu (2016)** that discovered a relationship between nasal height, width, and stature, as well as research by **(Shrestha et al. 2016; Barwa and Singh 2020 and Dinakaran et al. 2021)** that discovered a relationship between stature and nasal height.

CONCLUSION

The measures of the male and female ear and nose were significantly different, which can be used in forensic identification. Right ear height, left ear height, left lobular width, nasal height, and nasal width all correlated with stature. We developed a regression equation for estimating stature that may be useful in forensic identification.

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- **Funding:** the authors did not receive support from any organization for the submitted work

- **Ethical approval:** The study was performed after the approval of Cairo University's Faculty of Medicine's ethical committee. The ethical approval number is **N-13- 2022**
- **Informed consent for participation and publishing :**informed consent was obtained from all individual participants included in the study for participation and for publishing their image if required.
- **Data Availability Statements:** the datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.
- **Disclosure of potential conflicts of interest:** The authors have no relevant financial or non-financial interests to disclose.
- **Authors' contributions:** All authors search about the point of research and write down a preliminary protocol, all the authors together with the corresponding author put the final protocol. All authors helped in the practical process. All authors shared in writing the manuscript and the formatting. The corresponding authors is responsible for the publishing process.

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الملخص العربي

الدور المحتمل لأبعاد الأذن البشرية ومؤشر الأنف في تقدير القامة لدى عينة من السكان المصريين البالغين

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أصبحت قياسات الأذن تشكل اهتمامًا كبيرًا وتعتبر وسيلة لتحديد الهوية نظرًا لخصائصها البيولوجية والفسيولوجية. **الهدف من العمل:** دراسة أبعاد الأذن الخارجية للإنسان وكذلك مؤشر الأنف لدى عينة من السكان المصريين واستخدام هذه االقياسات في تقدير الطول والجنس. **طريقة الدراسة**: أجريت الدراسة على 200 مشارك من الجنسين تتراوح أعمارهم بين 18 إلى 60 عام , وتم قياس أربعة قياسات لكل أذن (ارتفاع الأذن، عرض الأذن، الارتفاع الفصيصي، العرض الفصيصي)، ارتفاع الأنف، عرض الأنف ؛ ثم تم حساب مؤشر الأنف وقياس القامة. **النتائج**: كانت هناك قيمة أعلى للذكور فيما يتعلق بارتفاع الأذن اليمنى وعرض الأذن اليمنى وعرض الفصيص الأيمن مع دلالة إحصائية ولكن كانت هناك قيمة أعلى للإناث فيما يتعلق بارتفاع الأذن اليمنى مع اختلاف ذو دلالة إحصائية عالية. كان لدى الذكور قيم أعلى فيما يتعلق بارتفاع الأنف وعرضه ومؤشره. قمنا ببناء معادلات الانحدار لتقدير القامة من ارتفاع الأذن اليمنى وارتفاع الأذن اليسرى وعرض الفصوص اليسرى وارتفاع الأنف وعرض الأنف. **الخلاصة:** من هذه الدراسة خلصنا إلى أنه يمكن تقدير القامة من قياسات الأذن والأنف الخارجية. تم بناء معادلات انحدارات جديدة في الدراسة الحالية لتقدير القامة من قياسات الأذن والأنف وكذلك التمييز بين الذكور والإناث مع وجود اختلافات كبيرة.

الكلمات الأفتتاحية: الأنثروبولوجيا، تحديد الهوية، تحديد القامة، معلمات الأذن، أبعاد الأنف