# Estimation Of Height / Stature From Facial Parameters In Indore Population

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**ABSTRACT**
All face parameter data was transformed from millimeters to centimeters. Data was analysed using SPSS (Statistical Package for the Social Sciences) on Windows XP Professional. Various statistical tests were performed on the obtained data, including mean, standard deviation, regression analysis, standard error of estimate, and Karl Pearson's correlation coefficient. We ran statistical analysis on the data to find a correlation between various face attributes and height, and we compared the findings for men and women. The Indore population's gender difference marking points were determined using the formula Mean ± 3SD. These points will be valuable xiii for future usage in medicolegal instances for determining the sex of an unknown sample. The examination of stature was done using regression models. Using them on a different sample of 25 boys and 25 females from Indore allowed us to assess their dependability as well. Results for the Indore, Hindu, Muslim, and Christian populations may be found in the regression equations supplied by this research, which assesses stature from face parameters. When forensic examinations include solely face remains, these methods have been shown accurate and reliable.

**KEYWORDS:** orbital width, facial height, Nasal aperture width, anthropology

## INTRODUCTION

The primary goal of anthropometry in forensic science is to assist law enforcement in positively identifying unidentified human remains. It becomes difficult to identify the deceased when their remains are severely decayed and damaged, rendering regular measures ineffective. Estimating height, along with other variables like age, sex, and race (the "Big four" of forensic anthropology), becomes crucial in these kinds of cases. Forensic examination relies heavily on the proportionate biological connection of height with every part of the human body, including the head, face, trunk, limbs, etc., in order to determine stature from severed or otherwise deformed body parts. Many scientists have succeeded, with varied degrees of success, in reconstructing human height from individual bones. The length of a person's foot and shoe prints are also subject to 2 examinations.

The practice of amputating the head from the trunk of a mutilated corpse is prevalent, and forensic and archaeological investigations often fail to recover all of the individual's bones. As a result of their anatomical landmarks being standard, well-defined, and easy to locate, craniofacial structures are relatively resistant to decay. Careful study of these structures can enable reliable determination of the person's stature, even when preferred predictors like the pelvis and long bones are destroyed or fragmented. Presenting severely decayed or dismembered corpses or partial remains for medico-legal investigation is not unheard of. On occasion, the only artefacts brought in for analysis are the skull or face bones. It is very uncommon for dead people in our area to be attacked by wild animals in the woodlands, making identification a challenge. Verifying the identity of the dead becomes paramount in these types of situations. Status is a key factor in determining who someone is. In biology, there is a direct relationship between a person's height and features like their legs, arms, trunk, and spine. The calculation of height using percutaneous measurements of different body parts, including arms, legs, feet, fingers, etc., has been the subject of several research.

A positive identification of person is necessary for the resolution of all these issues. Determining the unique identity of a person, whether they be a living, dead, partly decomposed, or skeletonized corpse, is known as personal recognition. Both partial and perfect identification are possible. Absolute fixation of individuality refers to a person's full identity, which involves determining the specific location the person occupies in the society. Conversely, when some details about a person's identity are known 4 but others are still a mystery, this is known as partial or incomplete identification. In cases involving crimes like murder, rape, abduction, drug trafficking, harassment, etc., personal identification is becoming an increasingly prevalent issue nowadays.

## LITERATURE REVIEW

### THE ENLIGHTENMENT PERIOD:

Brysbaert, Marc. (2015). A phrase used to describe societal and intellectual shifts in the 18th century is the Enlightenment. The driving factor was a shift away from the mediaeval emphasis on religion and tradition and towards a more scientific method of information acquisition. Intellectuals started to consider the scientific method as a means to organise society

as science grew more successful. The Enlightenment brought about a shift in clinical psychology towards seeing people with mental disorder as sick patients in need of specialised facilities for treatment. Üniversitesi,
Uludağ et.al (2019). A comprehensive description of the Enlightenment is rather elusive. The Enlightenment's pervasive influence on every facet of human existence is the root cause of this problem. Almost everyone would agree that the Enlightenment was primarily an intellectual endeavour. This line of thought originated in the West. Many distinct schools of thought emerged throughout Europe as a result of this Western intellectual revolution. A more "empiricist" British character and a more "rationalistic" French one formed the Enlightenment. Distinction between social systems emerged at the same time as the French and British Enlightenments. Here, a "peaceful revolution" was the outcome of British empiricism while a "bloody revolution" was the product of French rationalisation. My goal in writing this piece is to discuss the contrasts between empiricism in the United Kingdom and rationalisation in France and to show how these differences impacted societal progress.
Torpey, John. (2018). The connection between the Enlightenment and contemporary social science is the subject of this article's abstract. Various 29 national "enlightenment" traditions are outlined, along with their effects on the development of the social sciences. The book delves at the social sciences' attempts at a "Enlightenment project" and the criticisms levelled against such efforts.
Sukandi, Syayid. (2015). As we returned to the material from History of Rhetoric I, I saw that new authors like John Locke, David Hume, and Mary Astell were contributing to the field of rhetoric with their unique perspectives. These three writings by Bizzell are strong in their own right when it comes to arguing about rhetoric, but reading them has also given me a lot of concerns regarding the meaning and context of rhetoric in their respective eras. John Locke and Corbett's piece stands out to me as one that makes a lot of sense.
Gaziyev, Masud. (2016). Doing so weakens the various set of connections that occurred among them throughout the scientific revolution, making it impossible to simply define it as a war between reason and religion. Both reason and religion were areas of concern to almost all scientific revolution theorists; there was no clear delineation between the two. This article contends that religious dogmatism and rational thought were not the only competing forces during the scientific revolution. Rather, it was a time of profound change, characterised by a web of interdependent relationships between religion and reason that extended beyond mere fellowship. It is hard to draw any firm conclusions about the relationship between reason and religion from it because of how complicated it is. In addition, the paper examines the Enlightenment and contends that, despite the period's association with increasing scepticism towards organised religion and reliance on reason, it was not merely "the period of conflict between reason and faith"; rather, it encompassed far broader topics, including the nature of authority, the prospect of advancement, the incorporation of natural laws 30 into societal organisation, and the critique of absolutism. It would be a simplification to characterise the whole Enlightenment as a struggle between reason and faith; criticism of organised religion was just one of many things that occurred during that time.

**HEIGHT/STATURE FROM FACIAL PARAMETERS**

Agnihotri (2011) Determination of stature from fragmented human remains is vital part of forensic investigation for the purpose of identification. The present study was aimed to modelling the stature both for male and female separately on the basis of craniofacial dimensions. The study was conducted on 150 young and healthy students (75 males and 75 females) in the age group ranging from 20 to 28 years. The stature and fourteen cephalo-facial dimensions were measured on each subject by using standard anthropometric instruments. It is remarked that the stature and craniofacial measurements of males were significantly higher than that of females, except for nasal height where no significant difference was observed ($p > 0.05$). The correlation coefficients (r) of all cephalo-facial dimensions were less than 0.5. It means the estimation of stature is not reliable with the help of cephalo-facial dimensions.
Yadav (2019) Background: Stature or body height is one of the most important and useful anthropometric parameters which determines the physical identity of an individual. As craniofacial structures have the advantage of being composed largely of hard tissue which is relatively indestructible, the careful study of these can enable reliable determination 43 of stature of the person in life. Studies pertaining to stature estimation from facial measurements are limited in an Indian population. The present investigation attempts to estimate stature from anthropometric dimensions of face. Materials and methods: The material for the present study comprises 361 Indian students (151 males and 210 females) in the age range of 21-45 years. Stature and six facial measurements were taken on each participant following standard methods and techniques. Karl Pearson's correlation coefficient and linear regression were done to estimate stature.
Results: The results indicate that facial measurements are strongly and positively correlated ($P < 0.001$) with stature. The accuracy of the computed equations was further tested on 50 randomly selected study participants of each group, which shows close approximation of actual and estimated stature. Conclusion: Within the limits of this study, we conclude that facial dimensions can be used as a supplementary approach for the estimation of stature but with caution, as these are population-specific approach. Kedia (2024) Background Stature or body height is one of the most important and useful anthropometric parameters which determines the physical identity of an individual. Cranium encompasses hard tissue components with approximately immortal behavior, reason being cranial measurements were selected for the present study for estimation of stature. Objective This investigation aimed to assess the stature of unknown using cephalometric parameters by creating equations through regression analysis. Materials and Methods We selected 361 dental students for the present research; among them, 210 were females and 151 were males in the age range of 21–32 years. Stature and cephalic parameters, i.e., frontooccipital circumference, head length, and head breadth were measured for 44 each contributor following standard methods and techniques. Cephalic Index was calculated by using the formula: Cephalic

Index (CI) = (Head width/Head length) ×100. Karl Pearson's correlation coefficient of stature with cephalic parameters was calculated, and regression analysis was done to generate the formulae for stature estimation. Results Results indicated that all cephalic measurements have strong correlation with stature, and among them, circumference of head was found to be the most reliable predictor. Conclusion Stature of unknown or deceased can be identified using cephalic parameters as an auxiliary practice.

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## OPERATIONAL DEFINITION

### Height

If you want to know how "tall" something is or how "high" a point is, you may use the vertical distance measurement known as height. Let's say "The height of that building is 50 m" as well as "The height of an aeroplane inflight is about 10,000 m". Let's say "Shaq O'Neal is 7 foot 1 inches in vertical height."

Altitude is the more common word to express a vertical position (of, say, an aeroplane) relative to sea level when height is not explicitly mentioned. The term "elevation" is used to describe the height above sea level when the place in question is connected to the Earth, such as a mountain summit. in the vertical axis (y) between two points in two-dimensional Cartesian space that do not have the same y-value is used to measure height. Their 17 relative height is 0 if the y-values of the two locations are identical. As a distance from (or "above") the x-y plane, the vertical z-axis is used to measure height in three-dimensional space.

### Facial Parameters

The MPEG-4 Face and Body Animation (FBA) International Standard (ISO/IEC 14496-1 & -2) was created by the Moving Pictures Experts Group and includes a Face Animation Parameter (FAP). It lays forth a protocol for the virtual representation of people and humanoids that can convey animation parameters with little bit rate compression while still achieving visual speech intelligibility and the speaker's mood and gesture. Animated visemes, emotions, and head and eye movement are all controlled by FAPs, which are critical feature points on a face model mesh. The MPEG-4 standard also defines the Face Definition Parameters (FDPs), which include these feature points. The neutral face position is described as follows: lips closed, eyelids tangent to the iris, gaze and head orientation straight ahead, teeth contacting, and tongue touching teeth. FAPs reflect 66 displacements and rotations of the feature points from this centre. The mechanics of these FAPs were modelled by those of the human face. Aside from animation, FAPs find utility in biometrics and automated voice recognition.

### Population

The usual way to describe the amount of people living in a certain place is as a population. The purpose of a census is to provide a numerical representation of the people living in a certain area for statistical purposes. In addition to non-human animals, microbes, and plants, the phrase has particular applications in genetics and ecology.

## RESULT

**Table 1: Correlation Coefficient(r) and linear Regression Analysis of height with facial parameters in Hindu population**

| FP | Sex | r value | Regression equation y=a+bx | SEE | P value |
|---|---|---|---|---|---|
| **TFH** | M | **0.470** | **Y=118.16 + 4.5TFH** | **6.01** | **<0.001** |
| | F | **0.448** | **Y=105.39 + 4.7TFH** | **5.99** | **<0.001** |
| **UFH** | M | **0.237** | **Y=146.34 + 3.8UFH** | **6.61** | **<0.001** |
| | F | **0.251** | **Y=132.46 + 3.9UFH** | **6.48** | **<0.001** |
| **LFH** | M | **0.412** | **Y=141.88 + 4.8LFH** | **5.33** | **<0.001** |
| | F | **0.324** | **Y=131.49 + 4.4LFH** | **6.34** | **<0.001** |
| **NH** | M | **0.278** | **Y=146.85 + 4.4NH** | **6.53** | **<0.001** |
| | F | **0.243** | **Y=135.16 + 4.0NH** | **6.50** | **<0.001** |
| **NW** | M | 0.084 | Y=161.03 + 1.8NW | 6.78 | 0.14 |

| | | | | | |
|---|---|---|---|---|---|
| | F | 0.142 | Y=144.42 + 2.6NW | 6.63 | 0.02 |
| **BOW** | M | **0.216** | **Y=137.17 + 3.0BOW** | **6.64** | **<0.001** |
| | F | **0.329** | **Y=112.76 + 4.1BOW** | **6.32** | **<0.001** |
| **IOW** | M | **0.217** | **Y=152.52 + 4.4IOW** | **6.65** | **<0.001** |
| | F | 0.132 | Y=145.46 + 2.2IOW | 6.65 | 0.04 |
| **BZW** | M | **0.295** | **Y=128.82 + 3.2BZW** | **6.51** | **<0.001** |
| | F | **0.269** | **Y=121.71 + 2.7BZW** | **6.45** | **<0.001** |
| **BGW** | M | 0.078 | Y=160.03 + 0.7BGW | 7.51 | 0.17 |
| | F | 0.144 | Y=139.65 + 1.2BGW | 6.63 | 0.02 |

**(*P<0.05; statistically significant by linear regression)**

In Hindu men from the Indore community, there was a substantial positive connection (P < 0.001) between height and all face measures, with the exception of NW and BGW, as shown in Table 5.7. Compared to the other facial characteristics, Total Facial Height (TFH) had a better correlation with height (—r‖ value of 0.470 and SEE −6.01) and Lower Facial Height (LFH) had a better connection with height (—r‖ value of 0.412 and SEE -5.33). Among Hindu men in Indore, TFH is the most reliable face measure for height correlation.

The height of Hindu girls in the Indore community was shown to be substantially correlated with all face features, with the exception of NW, IOW, and BGW (p < 0.001). As far as facial parameters go, Total Facial Height (TFH) has the highest correlation with height for females, with an R-value of 0.448 and the lowest SEE of 5.99.

It is observed that the r‖ value of TFH is greater in men (0.470) than in females (0.448) when comparing Hindu males and females. Therefore, it may be concluded that TFH is the most accurate face measure to predict height in the Hindu community of Indore.

**Table 2 Correlation Coefficient(r) and linear Regression Analysis of height with facial parameters in Muslim population**

| FP | Sex | r value | Regression equation y=a+bx | SEE | P value |
|---|---|---|---|---|---|
| **TFH** | M | **0.421** | **Y=123.31 + 4.0TFH** | **6.31** | **<0.001** |
| | F | 0.211 | Y=135.01 + 1.8TFH | 5.89 | 0.01 |
| **UFH** | M | 0.185 | Y=150.72 + 2.9UFH | 6.84 | 0.03 |
| | F | 0.204 | Y=138.06 + 2.7UFH | 5.91 | 0.02 |
| **LFH** | M | **0.367** | **Y=145.50 + 4.3LFH** | **6.47** | **<0.001** |
| | F | 0.034 | Y=151.49 + 0.2LFH | 6.03 | 0.70 |
| **NH** | M | 0.167 | Y=153.09 + 3.1NH | 6.86 | 0.05 |
| | F | 0.124 | Y=145.07 + 1.6NH | 5.98 | 0.17 |
| **NW** | M | 0.016 | Y=166.72 + 0.3NW | 6.96 | 0.84 |
| | F | 0.218 | Y=138.75 + 4.2NW | 5.88 | 0.21 |
| **BOW** | M | **0.461** | **Y=117.77 + 5.0BOW** | **6.18** | **<0.001** |
| | F | 0.109 | Y=139.73 + 1.3BOW | 5.99 | 0.22 |
| **IOW** | M | 0.187 | Y=156.59 + 3.4IOW | 6.84 | 0.03 |
| | F | 0.068 | Y=156.55 – 1.2IOW | 6.01 | 0.44 |
| **BZW** | M | 0.089 | Y=159.89 + 0.7BZW | 6.93 | 0.31 |
| | F | 0.060 | Y=146.84 + 0.5BZW | 6.02 | 0.06 |
| **BGW** | M | 0.002 | Y=168.11 - 0.02BGW | 6.97 | 0.97 |
| | F | 0.052 | Y=148.99 + 0.4BGW | 6.02 | 0.56 |

**(*P<0.05; statistically significant by linear regression)**

In the Muslim male population of Indore, only TFH, LFH, and BOW demonstrated a significant positive connection with height (P < 0.000), as shown in Table 3 Out of all the facial characteristics, the ones that demonstrated the best association with height were Bi-Orbital Width (BOW) with an R-value of 0.461 and a SEE of 6.18, and Total Facial Height (TFH) with a greater R-value of 0.421 and a lower SEE of 6.31. If you want to know how tall Muslim men in Indore are, BOW is the finest facial metric to use.

Both TFH and UFH were positively correlated with height for Muslim females in the Indore community. Muslim women in Indore did not show any correlation between height and any one face characteristic.

**Table 4: Correlation Coefficient(r) and linear Regression Analysis of height with facial parameters in Christian population**

| FP | SEX | r value | Regression equation y=a+bx | SEE | P value |
|---|---|---|---|---|---|
| **TFH** | **M** | **0.543** | **Y=98.79 + 6.1TFH** | **6.06** | **<0.001** |
| | F | **0.588** | **Y=107.74 + 4.6TFH** | **5.04** | **<0.001** |
| **UFH** | M | 0.268 | Y=141.51 + 4.3UFH | 6.96 | 0.01 |
| | F | **0.432** | **Y=127.29 + 5.1UFH** | **5.62** | **<0.001** |
| **LFH** | M | **0.366** | **Y=142.47 + 4.4LFH** | **6.71** | **<0.001** |
| | F | **0.370** | **Y=129.99 + 5.0LFH** | **5.78** | **<0.001** |
| **NH** | M | 0.081 | Y=159.45 + 1.4NH | 7.20 | 0.47 |
| | F | **0.379** | **Y=134.67 + 4.3NH** | **5.76** | **<0.001** |
| **NW** | M | 0.225 | Y=150.01 + 4.4NW | 7.04 | 0.04 |
| | F | 0.039 | Y=151.62 + 0.5NW | 6.22 | 0.69 |
| **BOW** | M | 0.229 | Y=132.25 + 3.33BOW | 7.03 | 0.03 |
| | F | **0.378** | **Y=112.30 + 4.2BOW** | **5.77** | **<0.001** |
| **IOW** | M | 0.138 | Y=157.46 + 2.6IOW | 7.15 | 0.21 |
| | F | 0.258 | Y=140.55 + 4.1IOW | 6.02 | 0.001 |
| **BZW** | M | 0.261 | Y=138.44 + 2.3BZW | 6.97 | 0.01 |
| | F | 0.121 | Y=143.11 + 0.9BZW | 6.18 | 0.22 |
| **BGW** | M | 0.169 | Y=182.18 – 1.4BGW | 7.12 | 0.13 |
| | F | 0.056 | Y=149.59 + 0.3BGW | 6.22 | 0.57 |

**(*P<0.05; statistically significant by linear regression)**

In the Christian population of Indore, there is a link between height and face attributes (Table 4). Among Christian men in Indore, there was a strong positive connection between height and all face indicators with the exception of NH, IOW, and BGW. Among the major facial features, the one that best correlates with height for Christian men of Indore is Total Facial Height (TFH), with an R-value of 0.543 and a SEE of 6.06.

Among Indore's Christian women, there was a positive link between height and TFH, UFH, LFH, NH, BOW, and IOW. Total Facial Height (TFH) had the strongest connection with height among these notable facial measures, with an R-value of 0.588 and SEE - 5.04.

When we look at the r‖ value of TFH in Christian men and women, we find that the ladies have a higher value (0.588) than the males (0.543). Accordingly, we draw the conclusion that TFH is the most appropriate metric to link with height among Indore's Christian community.

**Table 5: Comparison of actual height and estimated height from facial measurements in Indore population using regression analysis**

| FP | SEX | Minimum estimated height | Maximum estimated height | Mean estimated height |
|---|---|---|---|---|
| **TFH** | M | 157.70 | 175.75 | 167.15 |
| | F | 144.09 | 164.3 | 152.83 |
| **UFH** | M | 161.92 | 171.98 | 167.16 |
| | F | 147.12 | 158.59 | 153 |
| **LFH** | M | 158.9 | 176.45 | 167.36 |
| | F | 147.19 | 160.46 | 153.14 |
| **NH** | M | 155.55 | 171.05 | 167.32 |
| | F | 143.54 | 154.45 | 152.94 |
| **NW** | M | 165.47 | 168.93 | 167.47 |
| | F | 148.35 | 156.7 | 152.93 |
| **BOW** | M | 158.45 | 172.15 | 166.64 |
| | F | 114.76 | 157.73 | 152.22 |
| **IOW** | M | 163.67 | 172.63 | 167.31 |
| | F | 150.71 | 155.55 | 153 |
| **BZW** | M | 162.53 | 170.72 | 166.8 |
| | F | 148.94 | 156.43 | 152.59 |
| **BGW** | M | 168.16 | 168.57 | 168.26 |
| | F | 151.51 | 155.17 | 153.19 |
| | M | 146 | 185 | 167.16 |
| **Actual stature** | F | 136 | 166 | 153.01 |

Table 5 shows the results of a regression analysis comparing the actual and estimated stature of the Indore population based on face measurements. Measurements' minimum, maximum, and mean values were substituted into their respective regression models to determine assessed stature. It has been observed that for every face parameter, the least assessed height exceeds the real minimum stature, the highest assessed stature falls short of the real maximum tall, and Regression equations are assessed using measurements of central location or tendency, therefore the mean estimated stature values are virtually comparable to the actual height in both boys and girls of Indore.

**Table 6: Comparison of actual height and estimated height from facial measurements in Hindu population using regression analysis**

| FP | Sex | Minimum estimated height | Maximum estimated height | Mean estimated estimated height |
|---|---|---|---|---|
| **TFH** | M | 160.01 | 176.51 | 167.69 |
| | F | 145.47 | 161.63 | 152.85 |
| **UFH** | M | 162.15 | 172.31 | 167.70 |
| | F | 147.70 | 158.48 | 152.77 |
| **LFH** | M | 159.65 | 177.25 | 167.69 |
| | F | 147.91 | 164.90 | 153.02 |
| **NH** | M | 153.82 | 172.23 | 167.78 |
| | F | 141.34 | 159.42 | 153.13 |
| **NW** | M | 165.31 | 168.82 | 167.60 |
| | F | 147.88 | 157.33 | 153.06 |
| **BOW** | M | 162.53 | 172.38 | 167.61 |
| | F | 142.41 | 159.23 | 152.89 |
| **IOW** | M | 163.35 | 173.99 | 167.64 |
| | F | 150.02 | 155.91 | 152.69 |
| **BZW** | M | 160.26 | 173.28 | 166.69 |
| | F | 148.36 | 158.64 | 152.88 |
| **BGW** | M | 166.59 | 169.44 | 167.55 |
| | F | 149.87 | 155.12 | 152.28 |
| **stature Actual** | M | 144 | 185 | 167.67 |
| | F | 133 | 173 | 152.98 |

The Hindu population of Indore used regression analysis to compare their real height to their estimated tall based on face measurements (Table 6). Measurements' minimum, maximum, and mean values were substituted into their respective regression models to determine assessed stature. It has been observed that for every face parameter, the least assessed height exceeds the real minimum stature, the highest assessed stature falls short of the real maximum tall, and Evaluation of regression equations using measurements of central location or tendency results in mean assessed height values that are substantially identical to the actual stature in both Hindu boys and females of Indore. If

**Table 7: Comparison of actual height and estimated height from facial measurements in Muslim population using regression analysis**

| FP | Sex | Minimum estimated height | Maximum estimated height | Mean estimated height |
|---|---|---|---|---|
| **TFH** | M | 159.13 | 174.30 | 167.80 |
| | F | 150.11 | 158.65 | 153.14 |
| **UFH** | M | 164.04 | 171.37 | 167.73 |
| | F | 149.79 | 156.24 | 152.52 |
| **LFH** | M | 160.46 | 174.91 | 168.14 |
| | F | 151.93 | 153.04 | 152.43 |
| **NH** | M | 163.94 | 170.21 | 167.96 |
| | F | 150.17 | 153.96 | 152.46 |
| **NW** | M | 167.47 | 168.01 | 167.78 |
| | F | 149.09 | 156.81 | 152.64 |
| **BOW** | M | 156.27 | 176.45 | 167.44 |
| | F | 150.71 | 153.73 | 152.27 |
| **IOW** | M | 164.87 | 173.18 | 167.81 |
| | F | 151.73 | 154.12 | 152.61 |
| **BZW** | M | 166.61 | 169.54 | 168.10 |
| | F | 151.72 | 153.73 | 152.56 |
| **BGW** | M | 167.84 | 167.92 | 167.89 |

| | | | | |
|---|---|---|---|---|
| | F | 152.32 | 154.01 | 153.08 |
| | M | 146 | 185 | 167.90 |
| **stature Actual** | F | 136 | 166 | 152.64 |

In the Muslim community of Indore, Table 7 shows the contrast of estimated height from face measurements with actual stature, as determined by regression analysis. Measurements' minimum, maximum, and mean values were substituted into their respective regression models to determine assessed stature. It has been observed that for every face parameter, the least assessed height exceeds the real minimum stature, the highest assessed stature falls short of the real maximum tall, and The reason why the estimated height values of Muslim boys and girls of Indore are so close to the real stature is because regression equations are evaluated using measures of central location or tendency.

**Table 8: comparison of actual height and estimated height from facial measurements in Christian population using regression analysis.**

| FP | Sex | Minimum estimated height | Maximum estimated height | Mean estimated height |
|---|---|---|---|---|
| **TFH** | M | 158.92 | 177.13 | 166.54 |
| | F | 143.01 | 164.01 | 152.85 |
| **UFH** | M | 162.57 | 170.35 | 166.20 |
| | F | 145.82 | 159.38 | 153.27 |
| **LFH** | M | 159.63 | 173.20 | 166.17 |
| | F | 147.02 | 159.40 | 153.34 |
| **NH** | M | 165.03 | 167.41 | 166.07 |
| | F | 146.13 | 157.49 | 153.35 |
| **NW** | M | 162.88 | 169.96 | 166.43 |
| | F | 152.52 | 153.67 | 153.27 |
| **BOW** | M | 162.20 | 170.98 | 166.12 |
| | F | 147.06 | 157.61 | 152.87 |
| **IOW** | M | 163.67 | 170.14 | 166.28 |
| | F | 148.35 | 156.46 | 153.36 |
| **BZW** | M | 161.46 | 169.84 | 166.07 |
| | F | 151.40 | 155.42 | 153.38 |
| **BGW** | M | 164.19 | 169 | 166.61 |
| | F | 152.11 | 153.34 | 152.71 |
| **Actual stature** | M | 144 | 179 | 166.44 |
| | F | 135 | 172 | 153.51 |

In the Christian population of Indore, Table 8 shows the contrast of estimated height from face measurements with actual stature, as determined by regression analysis. Measurements' minimum, maximum, and mean values were substituted into their respective regression models to determine assessed stature. It has been observed that for every face parameter, the least assessed height exceeds the real minimum stature, the highest assessed stature falls short of the real maximum tall, and Because regression equations are assessed using measurements of central location or tendency, the mean evaluated height values of Christian boys and females of Indore are virtually comparable to the actual stature.

## CONCLUSION

The results of this research show that face factors might be helpful when trying to gauge height. The current study's data for height and face attributes may be used as benchmarks for the people of Indore. Anthropology, genetics, and forensic medicine may all benefit from using them as regional benchmarks for diagnostic and anthropometric assessments. In cases when facial features are the only ones that can be examined, they will also lend credence to other forms of personal identity data, such as height, sex, race, etc. Results for the Indore, Hindu, Muslim, and Christian populations may be found in the regression equations supplied by this research, which assesses stature from face parameters. When forensic examinations include solely face remains, these methods have been shown accurate and reliable. For both sexes in the Indore population, Total face Height (TFH) was the most strongly correlated face characteristic with height.

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