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A CROSS SECTIONAL STUDY ON HEIGHT ESTIMATION WITH RESPECT TO RELIGION FROM FACIAL PARAMETERS IN INDORE POPULATION, INDIA.

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Abstract:

Introduction: The term "human identification" refers to the process of recognizing a specific person based on their distinctive physical traits. One of the most useful anthropometric parameters for identifying people is their height. In order to help with the detection of crimes like rape, murder, and child trafficking, forensic anthropologists' analyses and identify human remains like dry bones and skull using metric techniques. Determining a person's height and gender is crucial in forensic science when establishing their identification. Forensic anthropology, healthcare, and multidisciplinary research may all benefit from researchers broadening the study's focus to include the Indore population and improving its influence on height estimate using face features across various religions.

Methodology: A cross sectional study was done in adults belonging to Indore. Both the institute's ethical approval and the patients' informed permission were obtained. The participants' demographic information, Measurements of face characteristics were taken, along with height. The cephalon-facial measurements used were maximum head length (MHL), maximum head breadth (MHB), horizontal head circumference (HC), Bigonial diameter (BD), physiognomic facial length (PFL), ear length (EL), ear breadth (EB), and cephalic index (CI) and analysed with respect to various religion. All face parameter data was transformed from millimeters to centimeters. Data was analysed on Windows XP Professional using SPSS (Statistical Package for the Social Sciences). The collected data

were analysed using regression analysis, standard error of estimate, mean, standard deviation, and Karl Pearson's correlation coefficient. The estimation of height was done using regression models. Using them on a different sample of 25 males and 25 females from Indore allowed us to assess their dependability as well.

Results: There were 494 women and 506 men, with an age distribution of within the 18–50 age bracket. Muslims tend to be taller and have larger faces than non-Muslims, according to the data. The TFH has the greatest r‖ value in men who are Hindu and Christian. Compared to Hindu men, Christian guys had a higher TFH r‖ value of 0.543. For Muslim males, the greatest ―r‖ rating is for BOW (0.461). To sum up, When it comes to finding out what percentage of male Indore inhabitants identify as Hindu or Christian, TFH is considered the gold standard, whereas BOW is considered the best standard for finding out what percentage of male Indore residents identify as Muslim.

Conclusion: TFH is considered the gold standard, whereas BOW is considered the best standard for finding out what percentage of male Indore residents identify as Muslim.TFH is the gold standard for identifying Christian and Hindu women, but for Muslim women, there is no robust face characteristic that correlates with height.

Keywords: Height prediction, Indore, Facial parameters, male, female, Hindu, muslim, Christian.

INTRODUCTION

For practical, ethical, and legal reasons, human identification is a crucial process The primary goal of anthropometry in forensic science is to assist law enforcement in positively identifying unidentified human remains. The measuring of facial and head morphological traits is known as cephalometry, a subfield of anthropometry. 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. To predict height from measurements of body parts, bone fragments, or whole bones, regression equations are utilized nowadays. Even in cases when favoured predictors, such as the pelvis and long bones, are damaged or missing, accurate measurement of the person's height may be accomplished by meticulous examination of facial components.

In cases involving crimes like murder, rape, abduction, drug trafficking, harassment, etc., personal identification is becoming an increasingly prevalent issue nowadays. The field of forensic anthropology has a subfield known as forensic anthropometry. To better understand and investigate crimes and their investigations, as well as to resolve medicolegal cases, forensic anthropology focuses on the identification and analysis of skeletal remains, such as dry bones and skulls, using metric techniques to extract pertinent personal information about identifying characteristics of the dead, including gender, height, ethnicity, and unique skeletal characteristics.

As, research on estimating height from facial features alone is limited. Because of racial, cultural, nutritional, and climate differences, it is well-established that different races need different methods for height assessment. That is why it is not possible to generalize study findings from one demographic to another. Consequently, research from this area has to be more methodical. This is why we set out to determine maxillo-facial anthropometry as a means of height estimation in this work.

Individuals from diverse backgrounds and ethnic backgrounds, as well as their progeny, exhibit intriguing variations in their physical composition and dimensions. Similar to other phenotypic qualities, height is influenced by a mix of environmental, genetic, and demographic variables. It has been underlined that variations in diet and physical activity levels cause connections between various physiological markers to differ across populations.

For the population's stature to be predicted more accurately, population-based regression and multiplication formulas (M.F.) must be updated at least once every ten years. There is a dearth of literature from this region of the globe on regression equations. Hence this study was done to understand how people's height is correlated with their facial characteristics and how it varies according to genetic, cultural, and environmental variables.

AIMS & OBJECTIVES OF THE STUDY

- To learn how certain anthropometric measures of the face relate to one's height.
- To learn if there are any variations in height and facial features across various religions

METHODOLOGY

A cross sectional study was done in 1000 adults belonging to Indore, India during May 2021 to November 2023 after obtaining institutional ethical committee clearance. The study's purpose was explained to subjects in both English and vernacular, and signed consent was obtained from them.

Inclusion criteria:

Individuals aged 18-60 years lived in Indore for at least five years.

Exclusion criteria

People who suffer from facial abnormalities, have had facial surgery in the past, or have any other ailment that impacts the structure of their face.

The following measures were taken:

1. Height (or stature)
2. TFH (Total Facial Height)
3. Upper facial height (UFH)
4. Lower facial height LFH
5. Nasal Height (NH)
6. Nasal Width (NW)
7. Bizygomatic width (BZW)
8. Bigonial width (BGW)
9. Biorbital width (BOW)
10. IOW, or inter-orbital width

3.3 VARIOUS ANTHROPOMETRIC LANDMARKS:

1. The zygomatic arch's most anterior side is called the zygion.

2. Gonion (go): at the angle of the mandible's most lateral aspect

3. Nasion (n): the nasofrontal suture meets the nasal root.

4. Subnasale (sn): about where the upper lip's philtrum meets the columella.

5. Gnathion (gn): midway along the protuberance of the mandible.

6. Prosthion: Located on the upper alveolar arch, halfway between the upper incisors and median incisors.

ANTHROPOMETRIC MEASUREMENTS

1. Height: The subjects were asked to stand up and have their height measured using a standard flexible steel tape measuring in centimeters from the heel to the top of their skull.

Participants were instructed to sit up straight and relax while staring at a faraway object in order to take their faces measurements. The following facial characteristics were measured using the digital vernier calliper:

2. Total facial height: Measure the distance between Nasion and Gnathion in millimetres to get the total face height.

3. Upper facial height- The height of the upper face may vary from nasion to prosthion on a mathematical scale.

4. Lower facial height — ranging from prosthion to gnathion, measured in metres.

5. Nasal aperture height- Measured in millimeters, it extends from the nose to the tip of the nose.

6. Nasal aperture width- The greatest transverse distance in millimeters between the nasal aperture's right and left edges.

7. Bizygomatic width- It is the measurement of the whole breadth of the face, sometimes called bizygomatic width. It is the distance between the two zygomatic arches.

8. Bigonial width- Measured in millimeter's, it is the widest possible space between the right and left mandibular angles.

9. Bi-orbital width- It is the measurement in millimeters that separates the periphery of the left and right orbits.

10. Inter-orbital width- It is the measurement in millimeters that divides the space between the inside of the two orbits.

Figure 1: The height of the nose From the Nose to the Base of the Nasum

Figure 2: Nasal width

The width of the nasal passages, measured from the right side of the nose to the left side,

RESULTS

Table 1: Distribution of study population by age and gender.

Age Group	Male	Female	Total
18-30	434	419	853
31-40	57	55	112
41-50	15	20	35
Total	506	494	1000

There are 419 girls and 434 men, with an age distribution of within the 18–50 age bracket. (table 1). As per religion hindu males were 278 and females were 264, muslim males were 131 and females were 126 where as christian males were 97 and females were 104.

Table 2: Descriptive data of height and face attributes across various religion

FP	Sex	Hindu (Male=278, female =264)		Muslim (Male=131, female =126)		Christian (Male=97, female =104)	
		Mean	SD	Mean	SD	Mean	SD
TFH	Male	11.01	0.71	11.12	0.73	11.1	0.64
	Female	10.1	0.64	10.07	0.72	9.81	0.78
	P value	<0.001		<0.001		<0.001	
UFH	Male	5.62	0.42	5.87	0.44	5.74	0.44
	Female	5.21	0.43	5.36	0.45	5.09	0.51

	P value	<0.001		<0.001		<0.001	
LFH	Male	5.38	0.58	5.27	0.59	5.39	0.59
	Female	4.89	0.49	4.67	0.84	4.67	0.45
	P value	<0.001		<0.001		<0.001	
NH	Male	4.76	0.43	4.8	0.37	4.72	0.38
	Female	4.49	0.41	4.62	0.46	4.34	0.54
	P value	<0.001		<0.001		<0.001	
NW	Male	3.65	0.31	3.54	0.35	3.73	0.37
	Female	3.33	0.37	3.31	0.31	3.32	0.43
	P value	<0.001		<0.001		<0.001	
BOW	Male	10.15	0.49	9.93	0.63	10.27	0.49
	Female	9.79	0.53	9.64	0.49	9.65	0.55
	P value	<0.001		<0.001		<0.001	
IOW	Male	3.44	0.33	3.3	0.38	3.39	0.37
	Female	3.28	0.33	3.23	0.35	3.12	0.38
	P value	<0.001		<0.001			
BZW	Male	11.84	0.61	11.98	0.59	12.01	0.8
	Female	11.55	0.66	11.43	0.58	11.41	0.82
	P value	<0.001		<0.001		<0.001	
BGW	Male	10.74	0.75	10.79	0.71	11.12	0.85

	Female	10.52	0.76	10.43	0.79	10.39	0.92
	P value	<0.001		<0.001		<0.001	
Height	Male	167.68	7.79	165.91	7.1	166.44	7.18
	Female	152.99	6.69	153.6	6.2	153.51	6.2
	P value	<0.001		<0.001		<0.001	

It reveals that Hindu men are taller than Hindu females and that all face characteristics are larger in Hindu men.All of the metrics show a statistically significant difference whenthe height and other face characteristics of male and female Indore Muslims compare to one another. Muslims tend to be taller and have larger faces than non-Muslims, according to the data.Compared to Christian girls, Christian men are taller and have larger faces in every facial measure.All of the metrics show a statistically significant difference. (table 2)

Table 3: Analysis of linear regression and correlation coefficients between height and face attributes in a 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 + 4.7 TFH	5.99	<0.001
UFH	M	0.237	Y = 146.34+3.8 UFH	6.61	<0.001
	F	0.251	Y = 132.46+3.9 UFH	6.48	<0.001
LFH	M	0.412	Y = 141.88+4.8LFH	5.33	<0.001
	F	0.324	Y = 131.49+ 4.4 LFH	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	0.087	Y = 161.03+1.8NW	6.78	0.14

	F	0.136	Y = 144.42+2.6NW	6.63	0.02
BOW	M	0271	Y = 137.17+3.0BOW	6.64	<0.001
	F	0.283	Y = 112. 76+4.1BOW	6.32	<0.001
IOW	M	0.192	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

In Hindu men from the study population, 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 3. Compared to the other facial characteristics, Total Facial Height (TFH) had a better correlation with height A stronger correlation between height (—r‖ value of 0.47 and SEE -6.01) and Lower Facial Height (LFH) was observed (—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 Males and ladies who practice Hinduism. That being said, TFH may be considered the most accurate face measure to predict height in the Hindu community of Indore.

Table 4: Analysis of linear regression and correlation coefficients between height and face attributes in a Muslim population

			Regression equation		
FP	Sex	R value	Y = a+bx	SEE	P value

TFH	M	0.421	Y = 123.31+4TFH	6.31	<0.001
	F	0.401	Y = 115.72 + 1.8 TFH	5.89	0.01
UFH	M	0.215	Y = 150.72+2.9 UFH	6.84	0.03
	F	0.204	Y = 138.06+2.7 UFH	5.91	0.02
LFH	M	0.367	Y = 145.5+4.3LFH	6.47	<0.001
	F	0.340	Y = 151.49+ 0.2LFH	6.03	0.7
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	0.216	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+5BOW	6.18	<0.001
	F	0.409	Y = 139.18+4.4BOW	5.99	0.22
IOW	M	0.187	Y = 156.07+3.6IOW	6.84	0.03
	F	0.132	Y = 152.52+3.5IOW	6.01	0.44
BZW	M	0.295	Y = 129.92+3.6BZW	6.93	0.31
	F	0.269	Y = 124.71+2.8BZWx	6.02	0.06
BGW	M	0.078	Y = 168.03+0.02BGW	6.97	0.97
	F	0.144	Y = 148.64+0.4BGW	6.02	0.56

In the Muslim males according to Table 4, the only variables that showed a highly significant positive correlation with height ($P < 0.000$) were TFH, LFH, and BOW. Out of all the facial characteristics, the ones that demonstrated the best association with height were Both Bi-Orbital Width (BOW) and Total Facial Height (TFH) with lower SEE values of 6.31 and 5.99 and a higher R-value of 0.461 and 0.421, respectively. 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)

Table 5: Analysis of linear regression and correlation coefficients between height and face attributes in a Christian population

FP	Sex	R value	Regression equation Y = a+bx	SEE	P value

TFH	M	0.462	Y = 117.43+4.5TFH	6.11	<0.001
	F	0.411	Y = 115.72 + 3.7 TFH	5.87	<0.001
UFH	M	0.224	Y = 147.78+3.8 UFH	6.73	<0.001
	F	0.267	Y = 133.69+3.7 UFH	6.19	<0.001
LFH	M	0.381	Y = 143.29+4.5LFH	6.36	<0.001
	F	0.228	Y = 142.13+ 2.3 LFH	6.27	<0.001
NH	M	0.224	Y = 149.71+3.7NH	6.73	<0.001
	F	0.239	Y = 138.58+3.2NH	6.25	<0.001
NW	M	0.087	Y = 161.67+1.6NW	6.88	0.07
	F	0.136	Y = 145.30+2.3NW	6.36	0.003
BOW	M	0271	Y = 132.27+3.4BOW	6.64	<0.001
	F	0.283	Y = 119.18+3.4BOW	6.15	<0.001
IOW	M	0.192	Y = 155.07+3.6IOW	6.77	<0.001
	F	0.132	Y = 152.52+3.5IOW	6.65	<0.001
BZW	M	0.295	Y = 129.92+3.6BZW	6.53	<0.001
	F	0.269	Y = 124.71+2.8BZWx	6.45	<0.001
BGW	M	0.078	Y = 161.03+0.8BGW	7.52	<0.001
	F	0.144	Y = 142.64+1.2BGW	6.62	<0.001

In the Christian population of Indore, there is a link between height and face attributes (Table 5). Among Christian men in Indore, height was positively correlated with all facial markers the exception of NW. Among the major facial features, the one that best correlates with height for Christian men of Indore is Total Facial Height (TFH), which has an R-value of 0.462 and a SEE of 6.11.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 (0.462) than the males (0.411). Accordingly, we draw the conclusion that TFH is the most appropriate metric to link with height among Indore's Christian community. (table 5)

Table 6: The correlation coefficient (r) among Christian, Muslim, and Hindu men and women.

FP		Male			Female	
	Hindu	**Muslim**	**Christian**	**Hindu**	**Muslim**	**Christian**
TFH	**0.470**	**0.421**	**0.543**	**0.448**	0.211	**0.588**
UFH	0.237	0.185	0.268	0.251	0.204	**0.432**
LFH	**0.412**	0.367	0.366	0.324	0.034	0.370
NH	0.278	0.167	0.081	0.243	0.124	**0.379**
NW	0.084	0.016	0.225	0.142	0.218	0.039
BOW	0.216	**0.461**	0.229	**0.329**	0.109	0.378
IOW	0.217	0.187	0.138	0.132	0.068	0.258
BZW	0.295	0.089	0.261	0.269	0.060	0.121
BGW	0.078	0.002	0.169	0.144	0.052	0.056

Table 6 shows the results of how the correlation coefficients (r) differ among the male and female members of the Indore population who identify as Hindu, Muslim, or Christian. The TFH has the greatest r‖ value in men who are Hindu and Christian. Compared to Hindu men, Christian guys had a higher TFH r‖ value of 0.543. For Muslim males, the greatest ―r‖ rating is for BOW (0.461). To sum up, when it comes to finding out what percentage of male inhabitants identify as Hindu or Christian, TFH is considered the gold standard, whereas BOW is considered the best standard for finding out what percentage of male Indore residents identify as Muslim.

The TFH has the greatest r‖ value in Christian and Hindu girls. The TFH value of Christian ladies is 0.588, which is higher than that of Hindu females, who have a value of 0.448. The maximum ―r‖ value for Muslim females in NW is 0.218. So, TFH is the gold standard for identifying Christian and Hindu women, but for Muslim women, there is no robust face characteristic that correlates with height.

DISCUSSION

From May 2021 to November 2023, the research was carried out at the Anatomy department. One thousand adult Participants in the study ranged in age from eighteen to fifty years old.

In this study majority of the population belonged to the ages of 18 and 30. The average age of the males was 23.66 ±7.16 years and the females were 23.72 ±7.12 years. There were 51% males and 49% females.

Males of Hindu and Muslim Indonesian descent are shorter than those of the Nagpur, South Indian, and Haryanvi populations, but taller than those of the Jat, Kattunaykan, and Gujarati populations, according to research conducted in India.[1,2]

Compared to the Northwest, Sri Lankan, Jat, Kattunaykan, and Gujarati populations, the Christian male population has a higher mean height value (166.44 cm). Compared to the following populations: Indo-Mauritian, South Indian, Haryanvi, and Nagpur.[1,2,3]

Compared to the Nepali population, Indo-Mauritius population, and the Christian population of Indore, the average height of the ladies in this research is 153.01 cm, which is lower. This is more than the following populations: in Nagpur, in the Northwest, in Haryana, in South India, and in Gujarat. It is lower than the following populations: in Sri Lanka, in Kattunay, and in Gujarat. The average height of Sri Lankan women is consistent with that of Muslim women and the Jat population. Variations in environment, genetics, ethnicity, or geography could be to blame for the discrepancy. [1]

Overall face height were comparable in studies conducted by Sinchal Datta on men from Mumbai and Swami et al. on men from Haryana. (11.01 cm), Muslim males (11.12 cm), and Christian males (11.10 cm) in the Indore population. Compared to men from other nations, the values are lower, although they are higher than those from Gujarati and Tamil Nadu.[4,5]

Christian women had a higher mean total face height (9.81 cm) than the populations of Tamil Nadu (129 cm) and Gujarat (130 cm), but lower than those of Nigeria (125 cm), the Ijaw ethnic group (122), Central Serbia (118 cm), Haryana (126 cm), Mumbai (124 cm), and Nepal (125 cm). Variations in environment, genetics, ethnicity, or geography could be to blame for the discrepancy.[6]

UPPER FACIAL HEIGHT

This research lends credence to the idea that Indore residents had lower mean values for Upper Facial Height (men 5.70 cm, women 5.22 cm) in comparison to their Northern and Southern Indian equivalents. Compared to the research conducted by Baral P et al., these

values are higher. The same holds true for the male and female members of Indore's Hindu, Muslim, and Christian populations.[1]

LOWER FACIAL HIGHT

Males in Indore had a lower mean face height (5.35 cm), which is lower than the Nigerian population but similar to research conducted by Baral P and Hatwal et al. The men of Indore's Hindu, Muslim, and Christian communities are no exception.[1]

Among comparison to research conducted by Baral P, Hatwal, and O Ebeye, the average value of shorter face height among Indorewoman (4.79 cm) was lower. The same is true for the women of Indore's Hindu, Muslim, and Christian communities.[1]

BI-ORBITAL WIDTH

In this research, men had a wider bi-orbital breadth than women did on average. The current study's male and female participants had wider bi-orbital bones than the populations of M.P, Pune, and Kenya. Both the Christian and Hindu populations' mean bi-orbital width values are the same. Muslim males had a larger mean bi-orbital width than their counterparts in M.P. and Pune, but a smaller one than the Kenyan population. Muslim women had a wider average bi-orbital than women in M.P. and Pune, and it is consistent with the values seen in Kenya. [5,6]

INTER-ORBITAL WIDTH

The current research found that men had a greater mean inter-orbital width than women. In this research, the male and female participants from the Indore, Hindu, Muslim, and Christian populations had similar mean inter-orbital width values to those from the Pune community. Christian ladies in this research had the same mean value (3.12 cm) as Buddhist females from Bangladesh.[7,8]

BIGONIAL WIDTH

Bigonial breadth was greater in men than in women in this research. The Christian male population of Indore has the widest bigotry when compared to the Muslim and Hindu male populations, and it is on par with the Haryanvi male population. [1] The Bigonial breadth of the male Hindu and Muslim residents of Indore is similar to that of the residents of Pune and

the residents of Gujarat. When compared to Muslim and Christian ladies, the Hindu females in Indore population have the widest bigotry. The percentage of women with bigotry in the Indore population is higher than in the Pune and Gujarati populations, and it is on par with that of Haryanvi females.[1] The Indore population's stature and other face traits' correlation coefficients (r). Furthermore, we calculated the regression equation for every single parameter individually. There was a correlation between stature and overall face height (r=0.46, SEE=6.11) among Indore men. In women, there was a larger relationship between stature and total face height (r=0.41, SEE=5.87).[8]

FACIAL HEIGHT OF PREVIOUS STUDIES

reviewing the literature on the relationship between stature and total face height and finding the correlation coefficient (r). Among the Indore population's men and girls, as well as its Hindu, Muslim, and Christian subsets, total facial height proved to be an accurate height predictor in this research. Christians' total face height (r' = 0.543 for men and 0.588 for females) when it comes to predicting one's future success.[9,10]

The results for Hindu men and females in this research are similar to those found by Sinchal Dutta in their investigations on the M.P. population, where they found a positive association between the two variables, with a correlation coefficient of 0.250 for men and 0.249 for women.[4]

A positive association with a greater R-value and statistical significance was observed between nasal height and stature in the current study's male and female participants from the Indore community, as well as among Hindu and Christian females.

Nasal height was positively correlated (in research by Wankhede KP et al., Kharyal et al., Agnihotri et al., and Jaiswal A et al., with a maximum r value of 0.22 for females and 0.36 for men). It was shown by Christian ladies a stronger relationship between tall and nasal height in this research.[3,11,12,13,14]

The current investigation found no association between bigotry and height among the whole Indore population. Nonetheless, prior research by K Krishan and Jibon Kumar shown a favourable association between height Bigonial Width in Imphal men and guys from North India. [15]

CONCLUSION

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.The TFH has the greatest r‖ value in men who are Hindu and Christian. Compared to Hindu men, Christian guys had a higher TFH r‖ value of 0.543. For Muslim males, the greatest ―r‖ rating is for BOW (0.461). To sum up, When it comes to finding out what percentage of male Indore inhabitants identify as Hindu or Christian, TFH is considered the gold standard, whereas BOW is considered the best standard for finding out what percentage of male Indore residents identify as Muslim.Muslim men in Indore may be best measured by BOW, a face characteristic that correlates well with height. Among Muslim women in Indore, there was no correlation between any one face characteristic and height.TFH was shown to be the most reliable indicator for predicting height in Indore's Christian men. In Christian girls, TFH had the strongest association with height.Men and women of Indore's Hindu, Muslim, and Christian populations all have mean assessed height values that are quite close to their actual stature.

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