

Estimation Of Cephalic Index of Population of Central India.

ABSTRACT:

Cephalic record is otherwise called cranial list or broadness file. It's processed as the length separated by the width of the skull times by 100. An assessment of varieties in cephalic record across guardians, children, and family members can uncover in case hereditary qualities are passed down hereditarily. The exploration included 480 clinical understudies (296 male and 184 female understudies). Hardlika's methodology was utilized to decide the cranial record. Most of the people were Mesocephalic (cephalic record 7579.9). 43.58 percent of guys and 42.93 percent of young ladies had a mesocephalic head. Mens had a normal cephalic record of 81.24 3.66 while ladies had a normal cephalic file of 80.31 4.28.

Somatometric estimations, for example, the face and cephalic records are used in criminological human sciences. These lists utilized a human's sex and racial populace to compute their singular character. The objective of this exploration is to give benchmark data to cephalic record and face file in the Central Indian populace, just as to contrast these outcomes with past research. This material will be helpful to legal specialists, anatomists, and others in related disciplines.

The cephalic record (CI), in some cases called the cranial list, is the proportion of the head's maximal expansiveness to length. The motivation behind the review was to research the anthropometry of cranial qualities.. The review's objective was to check out the anthropometry of cranial qualities utilizing google structures circled in the school gatherings. Experts in scientific science will see as the data offered advantageous, just as in clinical, medico-lawful, anthropological, and excavator settings.

Keywords - Cephalic index, Dolichocephalic, Facial index, Hyper leptoprosopic, Physical anthropology

INTRODUCTION

The noggin is the skeleton's skull, which is comprised of 22 bones that are combined. They complete 29 when one hyoid bone and three sets of ear ossicles are incorporated. As per the

encompassing constructions, the noggin is partitioned into two classifications. The neurocranium is the part that encompasses the mind, though the splanchnocranium is the locale that covers the oral and nasal holes (viscerocranium). The neurocranium, which encompasses the cerebrum, has eight bones while the splanchnocranium, which encompasses the face, has fourteen. These bones are isolated into two classes: level and sporadic. Aside from the mandible bone, every one of the bones are consolidated by immobilize.

Stitches are the names for the joints. The life structures of both the neurocranium and the splanchnocranium is impacted by a portion of the bones that make up the skeleton. The hyoid bone is a piece of the neck. Its beginning is as old as of the head bones.

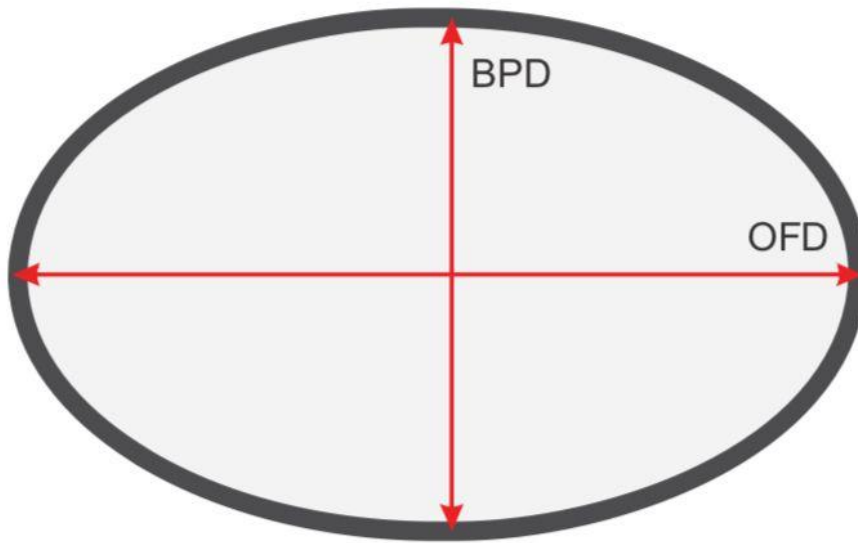
The cephalic file (CI), otherwise called the record of expansiveness or cranial file, is perhaps the main qualities for recognizing human race. The CI was initially utilized in actual human sciences to order bones of antiquated people uncovered in Europe by a Swedish teacher (1796-1860).

Natural, environmental, territorial, sex, ethnic, and age factors all impact the elements of the human body [1]. The CI is determined by increasing the width of the skull by 100 and partitioning it by the length. There are three sorts of CI: dolichocephalic (under 75), mesaticephalic (75 to 80), and brachycephalic (greater than 80). Dolichocephalic skulls are found in Australians and local Southern Africans, Mesaticephalic skulls are seen as in Chinese and Europeans, and brachycephalic skulls are found in Andaman Islanders and Mongolians [2,3].

As of now, CI is regularly used to portray individuals' appearances and to gauge the time of babies for obstetrical and lawful purposes. Accordingly, it very well may be utilized in an assortment of scientific lab examinations. The genetic transmission of acquired qualities might be uncovered by contrasting changes in CI among posterity, guardians, and kin. CI is humanities language for having a simple recognizing module or measurement to isolate the given individual, regardless of whether by sex, race, or even character [4].

The current review was directed to gauge the CI of the grown-up populace, to decide the prevailing head type, and to decide sexual dimorphism in Central Indian grown-ups old enough gathering >18 years. The ebb and flow study's perceptions and discoveries will fill in as an establishment for similar cephalometric research on assorted gatherings, stations, and races in explicit geographic zones.

EU-EU / BPD = Biparietal diameter or, side to side
G-Op / OFD = Occipitofrontal diameter or front to back



CI = Maximum head Breadth (EU-EU) \times 100 Maximum head Length (G-OP) (Martin and Saller).

Fig. 1. Cephalic Index

UNDER PENA

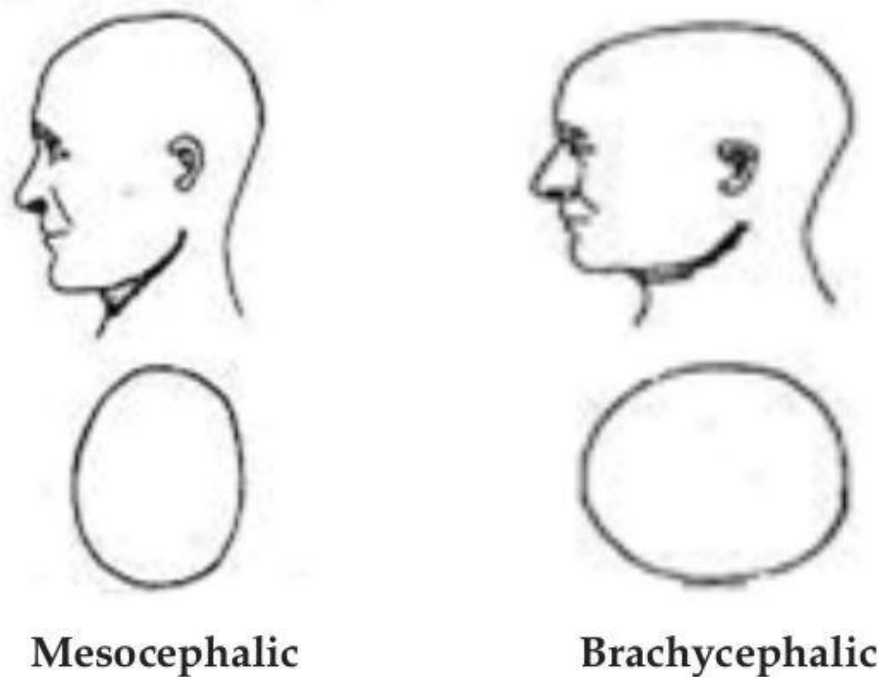


Fig. 2, Mesocephalic and brachycephalic

Distinguishing proof is the most common way of deciding a singular's character. One of the standards used to characterize an individual's recognizable proof is race. Anthropometry is the study of going to methodical lengths of human actual qualities, explicitly dissecting different aspects like size, structure, tallness, and body extents. These anthropometric information will be helpful in recognizing individuals of different ethnic gatherings, financial classes, nourishing state, and sexual orientation. Cephalometric estimations can be utilized to decide race and nationality corresponding to a specific geological appropriation. [5]

Cephalometry is a logical technique for deciding the components of an individual's head. The Cephalic Record (C.I.) or Expansiveness List is one of the main markers in cephalometry. Anders Retzius, a Swedish educator of life systems, was quick to propose for the reception of the Cephalic Record (1796-1860). [6]It's the proportion of the skull's maximal broadness to its most extreme antero-back length duplicated by 100. Since the Cephalic File is race and populace explicit, there is huge racial variety. This file is used in criminological examinations where the distinguish of a perished individual not set in stone.

In circumstances when face attributes are unidentifiable, for example, air crash mishaps, wrecks, bomb impacts, multi-story building breakdowns, railroad mishaps, etc, the utilization of the cephalic file serves a basic job in deciding the recognizable proof of individuals of various races. Anthropometric evaluations and their applications relating to race-based isolation of decayed, ruined, consumed, skeletonized bodies are basic for deciding the primer halfway or absolute personality, which thusly assists with building up corpus delicti to continue with additional examinations in specific tragic circumstances, for example, massacres followed by mass entombments. Incorporating a geography based information base of cephalic record has become exceptionally significant because of overall shrinkage and variety of populaces everywhere. With Cephalic File 70-74.9, 75-79.9, 80-84.9, and 85-89.9, human head shapes might be delegated dolichocephalic, mesocephalic, brachycephalic, and hyperbrachycephalic, separately.

Subsequently, it has become earnest to foster segment and geology based Cephalic Files that might be utilized to gather an exact data set.

Human skulls are typically partitioned into three classes.

1.SKULL FROM EUROPE (CAUCASIAN)

Long just as limited

Barrel shaped eye circles

Three-sided nasal going to open with considerably more unmistakable nasal extension

Less noticeable cheek bones

2.ASIAN SKULL (MONGOLOID SKULL)

Teeth are small and close to enough

Jawline is broadened

Circles elliptic

Nasal opening is stretched out at base

Nasal extension turns out to be less conspicuous

Zygomatic curves are wide, giving particular high cheek bone qualities

3.AFRICAN SKULL (NEGROID)

Skull is more extensive from front to back

Forward incline from brow to jawline

Forward incline makes Prognathism (jaw projection)

Circles are rectangular and put further separated with a more extensive nasal scaffold

Lists of the cranial vault

Three lists are utilized to portray the type of the cranial vault: the noggin, elevation length, and height broadness.

Anders Retzius (1796-1860), a Swedish developmental scientist, was the first to depict the cranial vault. It is the most explored list in the examination, and it portrays ethnic variety. Albeit certain examination [7,8] on African human populaces uncovered the inverse, it is perceived to be more noteworthy in ladies than in men. Study found a more extensive range of cranial records relying upon geological spots, for instance. Thailand and Hong Kong inhabitants are brachycranial and mesocranial, appropriately, Northern Chinese and Siberians are brachycranial or hyperbrachycranial, Malaysian Indians have a brachycephalic skull with an inclination to mesocephalic [9], and Iranians have hyperbrachycephalic heads.

Sri Lankans have brachycephaly [10], Chinese Hakka have mesocephalic skulls, Fijians have brachycephaly [11], India's waterfront Andhra populace has dolichocranial type, and

blended populaces in South India have brachycephalic skulls . The kind of list utilized in the examination expressed above could be something very similar, however the normal file esteems are impressively unique. When differentiated to the long head, Weidenreich [12] accepts that the round head owes its interesting shape to a critical decrease of its length rather than an extension in its expansiveness. Truth be told, the record varies from one individual to another, yet its greatness might be kept inside indicated limits in each specific circumstance.

In for the most part, a brachycephalic structure (cranial record of 80.0-84.99, wide or round headed) is viewed as more great under cool pressure, while a long head, i.e., dolichocephalic, is relied upon to be more helpful during hot climatic conditions. [13-14]. Nonetheless, in chilly environment Upper east Asian examples, these ends are invalidated, with wide and extended crania that don't actually squeeze into assumed cranial shape alterations for cold-environment gatherings . Dolichocranial , mesocranial [15], and ultrabrachycranial (extremely wide head to short skull) are depicted among African ethnic gatherings of Nigeria living in sweltering environments.

Inside every temperature ranges, there are contrasts in cephalic records (around 2 units more noteworthy than Cranial File), for instance, North Indians of Punjab have a Brachycephalic sort , though Haryana and Rajasthan have a dolichocephalic kind. Therefore, unmistakably inherited factors are the essential driver of variety in head shape between beginnings, identities, and geological regions, while the environmental elements assumes a supporting part . There is a grounded connect among cranial polymorphism and geographic confinement [16].

A few morphological anomalies are connected to head shape, for example, beginning blend of the saggital stitch, which makes scapho-cephaly (a 2.5 percent event), untimely conclusion of highest fontanels just as different stitches, which makes formative issues, and untimely conclusion of two-sided coronal stitch, which causes brachiocephaly. Changes in skull shape are likewise brought about by counterfeit cranial deformity and long haul starvation.

Dollicocranial type (around 45%) was found in the gathering researched, trailed by Hyperdollicocranial type (roughly 15%) (around 36%). In the cutting edge populace (5.06 percent), a propensity inclining further toward the Brachycranial skull has been seen, which is the result of expanding cranial expansiveness.

As far as close to home varieties, the Cephalic List (cranial) of Iranians [17], Nepalese , Albanians , and Nigerians , Srilankans , Mumbai Indians , and Uttar Pradesh (Present exploration) all showed significant changeability, in spite of the fact that examination on other Indian people group didn't.

Most of the heads through both segment bunches had a place with the orthocranial type, gone before by the hypsicranial type. Be that as it may, there were 14.15 percent extra hypsicranial sorts skulls in the current populace. This was credited to present day people having higher basion-bregma statures. Just the current populace had significant sexual dimorphism, and just ladies had considerable fleeting varieties. The proper factual worth showed plainly that this change is really observable. As indicated by Gabel, Fijian buyers have a decent cranial vault corresponding to their head length, with a mean list of 68-69, placing them in the Chamaecranial bunch. Jheng et al. found a Hypsi prevalence Hypsicephalic head shape in Chinese Hakka populace.

Cross over vertical record or width tallness file: Acrocranial crania represent considerably over 90% of crania across both segment groupings, gone before by metriocranial crania. In spite of the fact that there were generous sex varieties in the two populaces, classification precision was low. All sexes were without fleeting contrasts. Ointment and Chnadrshkhar [18] found an acrocranial local area in Mumbai, India, with significant contrasts among people. As per Gabel , Fijian head tallness is 83% of the general expansiveness, placing people in the Tapeinocranial type, though most of the Chinese Hakka populace had a Metrioranial (low, wide) type skull. [19]

Just in the current populace has the longitudinal craniofacial file uncovered generous contrasts among male and female. Just current ladies showed an ascent in the fleeting variety. Different populaces all throughout the planet, like current North Indians, South African

Africans , Cretans [20], Australians , and Romanians , showed almost no change in the value of this record. It's additionally important that men' standards aren't really higher.

Vertical craniofacial list: It uncovered significant physically dimorphic in every one of the populaces examined, notwithstanding the shortfall of fleeting contrasts among people. While considering the mean record upsides of the Thai populace [21] South African native populace South African Blacks, Cretans ,Australians ,[22] and Romanians.

OBJECTIVE

1. To break down the Cephalic List of populace of Focal India.

The CI is a scale used to decide the size of an individual's skull. The CI rating is determined by increasing the most extreme head width by 100 and isolating the outcome by the greatest head length. It was planned as a distinctive boundary for distinguishing changes in head development. At the point when the determined file is multiple SD from the mean, it is assessed. The CI review uncovers one more part of the skull's turn of events and development, just as permitting basic assessment of uncommonly small or gigantic skulls. Also, the CI in a roundabout way communicates cranial limit, which is utilized to assess mind volume and anticipate mental fitness [23]

This exhibits a proclivity towards brachycephalization. When past information of the cephalic file are contrasted with current examinations, it shows a pattern leaning toward "brachycephalisation" - sign of proceeding with mind development in the stream way (Shah and Jadhav). Also, the head structure in equatorial jungle areas is more extensive (dolichocephalic), though the head structure in calm zones is more round (mesocephalic or brachycephalic) (Bharati et al., 2001). Since India is similarly in the mild and equatorial jungle areas, the current order uncovers an affinity for dolicocephalic people to become brachycephalic.

The varieties of head shape might be because of innate component or ecological which might go about as optional impact (Golalipour et al., 2007). The sort of diet taken could likewise assume a part in affecting the predominant head shape. Head shapes can likewise change from one age to the next. For example, in the original of Japanese migrants in Hawaii it was seen that they had an expanded head broadness, a diminished head length and a higher cephalic record than their folks (Heravi and Zieae, 2002).

The Cephalic Record is determined utilizing four physical milestones: Glabella (the mid-point between the eyebrows in the mid-sagittal plane, simply over the base of the nose), Ophisthocranium (the back most place of the outer occipital projection along the mid-sagittal plane), and the two sides Euryon (horizontal most mark of the parietal distinction on one or the other side of the head). A spreading caliper with adjusted focuses was bought from a respectable standard organization and used to make the estimations. The most extreme head broadness was estimated by broadening the caliper focuses until they arrived at the best sidelong place of the parietal bone on one or the other side.

The male head had a mean width of 14.15 0.83 inches and a mean length of 18.18 0.63 inches. The female head had a mean width of 13.04 0.56 inches and a mean length of 17.33 0.38 inches. Male people had a cephalic file of 77.93 5.10, while female respondents had a cephalic worth of 75.22 2.92. The review tracked down a genuinely critical distinction in cephalic record among male and female skulls, with a p worth of 0.001, demonstrating that the thing that matters is very huge.

Different types of gear that are utilized as defensive hardware, like protective caps and goggles, or for different purposes, like earphones, should be made in a predetermined size and structure dependent on the cephalic record of the populace being referred to. At the point when somebody's ID is known, it becomes simpler to research their destruction. To explore and validate antiquated and ancient remaining parts, measurable anthropologists, legal pathologists, and criminological odontologists typically work together. Scientific humanities is amazingly important in cataclysmic events like tidal waves, mass debacles, war fatalities with impressive skeletal remaining parts, and mass graves. It's likewise valuable in examinations and managing genuine individuals, like stirring up babies in the clinic nursery, confirming a singular's ID during movement, criminals, thieves, looters, and illegal exploitation, among other things.[24]

The mean distinction in cranial record among male and female skulls was found to be 2.54, which can help with sex ID. A correlation of cephalic list varieties across guardians, posterity, and kin can uncover whenever acquired qualities are passed down hereditarily.

If the head has an ordinary oval transaxial structure and the maternal age is as long as 26 weeks [25]. The estimation of BPD will rise or diminish mistakenly if the developing head is exorbitantly round (brachiocephaly) or excessively extended (dolichocephaly), bringing about erroneous fetal dating. In the second trimester of pregnancy, head measures are inclined toward, especially through BPD, the frequently utilized fetal biometry test, where contrasts in fetal skull shape generously affect BPD readings [26].

A ultrasound check is extremely gainful and helpful for Gynecologists in many regions of the planet where ladies who are pregnant are every now and again incapable to offer an exact date of their last period [27]. For the ultrasound estimations, there are a few fetal ages assessment charts accessible [24]. Some of them were assembled dependent on comparable fetal populaces and are utilized first when they are open [28]. The reception of altered fetal development outlines, which consider components that by and large impact fetal development, decreases the rate of bogus up-sides [29]. In view of social and racial contrasts, it has been viewed as that every local area should use their own normograms.

Craniofacial anthropometry is basic for assessing facial harm, distinguishing hereditary distortions and irregularities, and diagnosing different problems. Since these qualities show the conceivable fluctuated types of craniofacial advancement because of ethnic, racial, and sexual varieties, it is basic to have native information of these limitations [30].

Patency of the metopic and sagittal just as coronal and lambdoid stitches is answerable for the satisfactory development of cranial vault/base in the foremost back and cross over headings, separately, in view of Virchows law of equal and opposite bone extension. Metopic stitch wires somewhere in the range of 3 and 9 months, while the others intertwine somewhere in the range of 22 and 39 months [31]. Untimely combination of the sagittal stitch will build the whole length of the head front back while just the length of the foremost is diminished in early metopic combination. Early combination of two-sided coronal stitches results in expanded biparietal distance across and decreased head length (old style brachycephaly) [32].

This is deteriorated when the lambdoid stitches are impacted. The development of the face is reliant upon the foundation of the skull and it is additionally impacted when these stitches intertwine early [31].

Otitis media is seen less every now and again in Dolichocephalic individuals than in brachycephalic individuals. [33] People with Apert's disorder are additionally supposed to be hyperbrachycephalic. [34]

Kumar M,[35] observed that the two sexual orientations displayed dolichocephalic skull shapes in an Indian populace study. Moreover, laborers in the Nigerian population[35,36] portrayed their skulls as dolichocephalic. Regarding the mean cephalic record of both genders, brachycephalic skull shape has been found in Gujarat population[37-42] Chile population[38], and Iran populace. Oladipo GS19 noticed brachycephalic skull structure in guys and mesocephalic head shape in females among Nigerian Ijaws. Indians have a mesocephalic head shape in men and a brachycephalic head shape in females, as per studies[43-48].

CONCLUSION

As indicated by our discoveries, the upsides of CI contrast little between sexual orientations. Young men had a mean cephalic file of 81.24 3.66 while young ladies had a mean cephalic file of 80.31 4.28. The Cephalic File didn't contrast altogether by sex. Anthropologists and measurable experts can utilize this data for an assortment of anthropological applications. Varieties in cephalic files have been connected to a complicated interchange among heredity and natural factors inside and across populaces.

Measurable anthropologists, human researcher, and anatomists have consistently been keen on anthropometric elements since they give guidelines and help recognize two ethnic gatherings. The current review adds as far as anyone is concerned of the absolute cephalic list and face record in the Focal Indian populace matured 18 to 50 years (focal India.)

Blacks, Asians, and Whites are among the few racial groupings, and their differentiations depend on actual attributes. Then again, different races have huge hereditary differentiations. It is all around recognized that utilizing a norm for craniofacial structures when settling on

treatment and indicative arranging choices for people of different ethnic foundations is ineffectual.

Reference:

1. Martin R, Saller K. Lehrbuch de Anthropologie, Gustav Fischer Verlag, Stuttgart. 1957.
2. Singh IP, Bhasin MK. A laboratory manual on biological anthropology, 2nd edition, Nazia offset press. India. 1989.
3. National Center for Social Research explaining the Frankfurt Plane.<http://www.quickmedical.com/include/php/nocache/pdf/download.php?file=downloads%20frankfort-measurement-guide.pdf>
4. Lobo SW, Chandrasekhar TS, Kumar S. Cephalic index [16] of Gurung community of Nepal. An anthropometric
5. de la Población CM, de Kosovo A. Cephalofacial [17] morphological characteristics of Albanian Kosova population. *International Journal of Morphology*. 2008; 26(4):935–40.2004; 53(1): 25-26.
6. Larsell O. *Annals of Medical History*:Anders A. Retzius. 1924;VI(1):16-24
7. King CA (1997) Osteometric assessment of 20th century skeletons from Thailand and Hong Kong. MA thesis, Florida Atlantic University.
8. Ishida H, Kondo O (1998) Human cranial variations based on different sets of measurement variables. *Anthropological Science*
9. Weidenreich F. The brachycephalization of recent mankind. *Southwestern J Anthropol* 1: 1-54.
10. Bharati S, Som S, Bharati P, Vasulu TS (2001) Climate and head form in India. *Am J Hum Biol* 13: 626-634.
11. Bharati S, Demarchi DA, Mukherji D, Vasulu TS, Bharati P (2005) Spatial patterns of anthropometric variation in India with reference to geographic, climatic, ethnic and linguistic backgrounds. *Ann Human Bio* 32: 407–444.

12. Mielke JH, Konigsberg LW, Relethford JH (2005) Human biological variation. Oxford University Press.
13. Relethford JH (2009) Race and global patterns of phenotypic variation. *Am J Phys Anthropol* 139: 16-22. [\[Crossref\]](#)
14. Vidya CS, Prashantha B, Gangadhar MR (2012) Anthropometric predictors for sexual dimorphism of skulls of South Indian origin. *Int J Scientific Res Pub* 2.
15. Bhargava I, Sharma JC (1959) The nose in relation to head and face-an anthropometric study. *Ind J Otolaryngol Head Neck Surg* 11: 213-218
16. Franciscus RG, Long JC (1991) Variation in human nasal height and breadth. *Am J Phys Anthropol* 85: 419-427. [\[Crossref\]](#)
17. Green H (2007) Cranial variation of contemporary East Asians in a global context. PhD thesis. University of New South Wales, 2007.
18. Moore-Jansen PH. A multivariate craniometric analysis of secular change and variation among recent North American populations, Ph.D. Dissertation. University of Tennessee, Knoxville. 1989.
19. Kumar M, Patnaik VVG (2013) The study of Cephalic Index in Haryanvi population. *Int J Pure App Bio Sci* 1: 1-.6.
20. Dayal MR, Spocter MA, Bidmos MA (2008) An assessment of sex using the skull of black South Africans by discriminant function analysis. *Homo* 59: 209-221. [\[Crossref\]](#)
21. Marinescu M, Panaitescu V, Rosu M, Maru N, Punga A (2014) Sexual dimorphism of crania in a Romanian population, Discriminant function analysis approach for sex estimation. *Rom J Leg Med* 22: 21-26.
22. Dillon (2014) Cranial sexual Dimorphism and the population specificity of anthropological standards. Masters thesis, University of Western Australia.
23. W
24. Khair S, Bhandari D, Wavhal S. Study of cephalic index among the students of Mumbai region.

25. Mohammed YM, Anthony UC, Ali Alhaji M, Mohammed A. Sonographic assessment of fetal cephalic index among the fulanis in Maiduguri, Borno State. IOSR Journal of Nursing and Health Science (IOSR-JNHS). 2018;7(1) Ver. II:55-59.
- Modi's medical jurisprudence and toxicology ,23rd edition page no 269-70.
- 26.
27. Waldenstrom V, Axlesson O, Nilsson S. A comparison of the ability of a sonographic biparietal diameter and the last menstrual period to predict the spontaneous onset of labour. American Journal of Radiology. 1990;76(3):336-38.
28. Giampaolo M. Guideline for fetal intrauterine growth restriction and chronic fetal hypoxemia. Timisoara Medical Journal. 2009;59(2):9-12.
29. . Bernstein I, Mohs G, Rucquoi M. Case for hybrid fetal growth curves: a population-based estimated of normal fetal size across gestational age. Journal of Matern Fetal Medicine. 1996;5(3):124-27.
30. Gardosi J, Chang A, Kalyan B. Customized antenatal growth chart. The Lancet. 1992;339:283-87.
31. Oladipo GS, Fawehinmi HB, Suleiman YA: [The study of nasal parameters \(nasal height, width and nasal index\) among the Yorubas of Nigeria](#). J Biol Anthropol. 2009, 3:1-19.
32. M. M. Cohen Jr. and S. Kreiborg, "Cranial size and configuration in the apert's syndrome," *Journal of Craniofacial Genetics and Developmental Biology*, vol. 14, pp. 95–102, 1994. View at: [Google Scholar](#)
33. Stolovitzky JP, Todd NW. Head shape and abnormal appearance of Tympanic membrane. Otolaryngol Head Neck Surg 1990;102(4):322-5.

34. Cohen MM Jr, Kreiborg S. Cranial size and configuration in the Apert syndrome. *J Craniofac Genet Dev Biol* 1994;14(3):153-62.
35. Kumar M, Gopichand PV. The study of cephalic index in Haryanvi population. *Int J Pure App Biosci*. 2013;1(3):1-6.
36. Eroje MA, Fawehinmi HB, Jaja BN, et al. Cephalic index of Ogbia tribe of Bayesla state. *Int J Morphol*. 2010;28(2):389-392.
37. Shah GV, Jadhav HR. The study of cephalic index in students of Gujarat. *J Anat Soc India*. 2004;53(1):25-26.
38. Del Sol M. Cephalic index in a group of Mapuche individuals in the IX region of Chile. *Int J Morphol*. 2005;23(3):241-246.
39. Anitha MR, Vijayanath V, Raju GM, et al. Cephalic index of North Indian population. *Anatomica Karnataka*. 2011;5(1):40-43.
40. Yagain VK, Pai SR, Kalthur SG, et al. Study of cephalic index in Indian students. *Int J Morphol*. 2012;30(1):125-129.
41. Madaan S, Jaiswal A, Kumar S, Talwar D, Halani D. Premature ovarian failure - A long COVID sequelae. *MEDICAL SCIENCE*. 2021 Jun;25(112):1286-90.
42. Abbafati, Cristiana, Kaja M. Abbas, Mohammad Abbasi, Mitra Abbasifard, Mohsen Abbasi-Kangevari, Hedayat Abbastabar, Foad Abd-Allah, et al. "Five Insights from the Global Burden of Disease Study 2019." *LANCET* 396, no. 10258 (October 17, 2020): 1135-59.

43. Abbafati, Cristiana, Kaja M. Abbas, Mohammad Abbasi, Mitra Abbasifard, Mohsen Abbasi-Kangevari, Hedayat Abbastabar, Foad Abd-Allah, et al. "Global Burden of 369 Diseases and Injuries in 204 Countries and Territories, 1990-2019: A Systematic Analysis for the Global Burden of Disease Study 2019." *LANCET* 396, no. 10258 (October 17, 2020): 1204–22.
44. Franklin, Richard Charles, Amy E. Peden, Erin B. Hamilton, Catherine Bisignano, Chris D. Castle, Zachary Dingels V, Simon Hay I, et al. "The Burden of Unintentional Drowning: Global, Regional and National Estimates of Mortality from the Global Burden of Disease 2017 Study." *INJURY PREVENTION* 26, no. SUPP_1, 1 (October 2020): 83–95. <https://doi.org/10.1136/injuryprev-2019-043484>.
45. James, Spencer L., Chris D. Castle, Zachary Dingels V, Jack T. Fox, Erin B. Hamilton, Zichen Liu, Nicholas L. S. Roberts, et al. "Estimating Global Injuries Morbidity and Mortality: Methods and Data Used in the Global Burden of Disease 2017 Study." *INJURY PREVENTION* 26, no. SUPP_1, 1 (October 2020): 125–53. <https://doi.org/10.1136/injuryprev-2019-043531>.
46. James, Spencer L., Chris D. Castle, Zachary Dingels V, Jack T. Fox, Erin B. Hamilton, Zichen Liu, Nicholas L. S. Roberts, et al. "Global Injury Morbidity and Mortality from 1990 to 2017: Results from the Global Burden of Disease Study 2017." *INJURY PREVENTION* 26, no. SUPP_1, 1 (October 2020): 96–114. <https://doi.org/10.1136/injuryprev-2019-043494>.
47. Lozano, Rafael, Nancy Fullman, John Everett Mumford, Megan Knight, Celine M. Barthelemy, Cristiana Abbafati, Hedayat Abbastabar, et al. "Measuring Universal Health Coverage Based on an Index of Effective Coverage of Health Services in 204 Countries and Territories, 1990-2019: A Systematic Analysis for the Global Burden of Disease Study 2019." *LANCET* 396, no. 10258 (October 17, 2020): 1250–84. [https://doi.org/10.1016/S0140-6736\(20\)30750-9](https://doi.org/10.1016/S0140-6736(20)30750-9).
48. Reitsma MB, Reitsma MB, Kendrick PJ, Ababneh E, Abbafati C, Abbasi-Kangevari M, et al. Spatial, temporal, and demographic patterns in prevalence of smoking tobacco use and attributable disease burden in 204 countries and territories, 1990-2019: a systematic analysis from the Global Burden of Disease Study 2019. *LANCET*. 2021 Jun 19;397(10292):2337–60.