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Anthropometry of the Upper Central Incisor: A Review of the Literature

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Abstract

The esthetic dimensions and proportions of the upper central incisors (UCI) are fundamental in dental and facial esthetics due to their prominence in the smile. This literature review aimed to establish the ideal width/length ratios of the UCIs. Nineteen relevant studies were identified after a search of 3 databases: PubMed, Scopus, and Springer. Results: Mean width/length ratios ranged from 80-85% in various populations. It has been corroborated that UCI dimensions present a significant difference between genders, with men showing larger dimensions in both width and height than women. The overall mean for males was 8.63 mm in width and 10.17 mm in length, while for females it was 8.32 mm and 9.36 mm, respectively. Conclusions: It is crucial to adapt dental treatments to individual patient characteristics to achieve functional and esthetic results. Factors such as gender, ethnicity and dental wear influence the dimensions and proportions, underlining the importance of individualizing dental treatments to optimize esthetic and functional results.

Keywords

Dental proportions; Width; Anthropometric measures; Upper central incisor; Length.

Introduction

Anthropometry is the science that studies the dimensions of the human body, the knowledge and techniques for carrying out measurements, as well as their statistical treatment. Meanwhile, dental appearance is one of the most important aspects of facial attractiveness and includes the color, position, shape, size of the teeth as well as aspects related to gingival morphology and the height of the upper lip during resting position and smile. One of the most important aspects of dental and facial esthetics is the visualization of the anterior teeth [1-3].

The upper central incisors (UCI), being the most prominent, are fundamental to the esthetic appearance of the anterior teeth, as well as to the overall facial esthetics, which is the basis for the origin of the term, dominance of the central teeth, as a fundamental parameter of the smile. The width-to-length ratio of the crown is considered the most stable and essential parameter for achieving harmony between dental esthetics and facial contours. For esthetic reasons, the anterior teeth of the upper jaw should be in proportion to the facial morphology [4].

UCI is the most important reference tooth than the rest of the anterior teeth in terms of visible coronal tooth structure [5]. The relationship between the width and length of the central incisor, as well as its possible association with anthropometric characteristics such as subject height, are topics of interest for improving esthetic and functional outcomes in dentistry [6,7]. The main factors influencing the UCI dimension may be left and right-side symmetry, gender, measurement method and ethnicity.

Gender is considered an important factor within the UCI dimension between men and women; men usually have larger faces than women, therefore, their teeth are usually larger; some studies mention a significant difference between these 2 genders, which dentists should consider elaborating a gender-differentiated treatment plan [8-11]. Therefore, the aim of this review was to establish the dimensions and the proportional width/length ratio of the upper central incisors in different populations according to the published scientific evidence.

Methodology

A narrative literature review was conducted, with a descriptive scope and a deductive approach. The research was carried out in a cross-sectional manner by collecting and analyzing articles published in international databases without date restrictions.

Outcome

The UCIs usually have a range of measurements that can vary. The average dimensions considered were expressed in millimeters (mm). However, the variability in measurements may be due to factors such as the population studied, the measurement methodology employed and the age of the individuals.

Search strategy

An appropriate search strategy was developed for each of the following electronic databases: PubMed, Scopus and Springer (Table 1), limited to articles written in English and Spanish, with no date restrictions.

References cited in the included articles were checked to detect any additional studies that could be included in the analysis. Using reference management software (Zotero), duplicate studies were collected, identified, and excluded.

PUBMED

(((((((Upper central incisor measurements) OR ("Width and length of the central incisor upper"[Todos los campos]) OR ("Dimension of the upper central incisor"[Todos los campos]) OR ("Proportions"[Todos los campos]) OR ("Anthropometric measurements"[Todos los campos]))

Scopus

TÍTULO-ABS-CLAVE ("Measurements" OR "Width and length" OR "Dimension" OR "Proportions" OR "Anthropometric measurements" Y TÍTULO-ABS-CLAVE ("Upper central incisor") Y TÍTULO -ABS-KEY ("Dental aesthetics").

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("Upper central incisor measurements") AND ("Width and length" OR "Dimension" OR "Proportions" OR "Anthropometric measurements") AND NOT ("golden proportions" OR "facial analysis" OR "Color")

Table 1: Search strategy.

Information organization

To organize the information collected, a database was created. (Excel, Microsoft, USA). Subsequently, each scientific article was analyzed according to the established inclusion criteria, ensuring its compatibility with the study topic. In this way, those that were not relevant to the research were discarded (Figure 1).
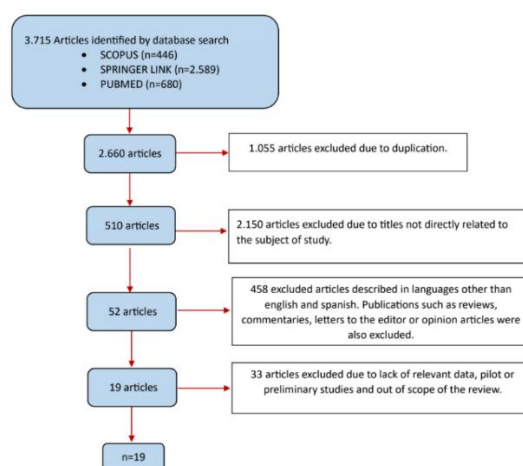

Figure 1: Flowchart.

Results

Selection of articles

After searching the aforementioned databases, as shown in Figure 1,3,715 articles were initially identified. Using a bibliographic reference manager (Zotero), 1,055 duplicate documents were eliminated, reducing the number to 2,660 articles for the title review. Subsequently, articles that were not directly related this the topic of study or did not have the full text were excluded, leaving 510 articles. Of these, 458 were eliminated because they were written in languages other than English or Spanish, or because they were reviews, commentaries, letters to the editor or opinions, leaving a total of 52 articles. Finally, 33 additional studies were discarded because they were not relevant, were pilot or preliminary studies, or were outside

the scope of the review. Finally, 19 articles that met the inclusion criteria and specifically addressed the anthropometry of the upper central incisors were selected and considered for the final analysis (Table 2).

S. No	Year	Author	Title	Study Type	Objective	Methodology	Results
1	Published: August 10, 202	Dervarič T., et al. (12).	The Relationship between the Length/Width of the Face and the Length/Width of the Crown of the Permanent Upper Central Incisors	Observational	This study had two main objectives: first, to establish baseline measurements for the length and width of the face, as well as the length and width of the clinical crown of the upper central incisors in this demographic group; second, to analyze the relationship between the facial index and the dental index. By identifying patterns and correlations, more personalized and effective restorative dental, orthodontic and prosthetic treatment planning would be obtained.	One hundred subjects (43 males and 57 females) with a mean age of 17.5 ± 3.4 years before orthodontic treatment were included. Facial length and width were measured using cephalometry by the same orthodontist and clinical crown lengths and widths of the upper central incisors were measured using a sliding caliper by the same dental student. Data were analyzed using SPSS version 29.0, presenting descriptive statistics for age, upper central incisor crown and facial dimensions, and indices. Pearson's correlation coefficient assessed the relationship between facial features and upper central incisor crown. The significance level was $p \leq 0.05$.	Men: 10.2 mm (left), 10.1 mm (right); Women: 9.9 mm (left), 9.8 mm (right). Men's width: 9.0 mm.

2	Published: September 2, 2013	Alhammadi A. et al. (13)	Incisors' proportions in smile esthetics	Experimental	The specific objectives of this study were to determine: (1) whether altering the crown width of the maxillary lateral incisor (its ratio to the central incisor) would affect the perceived aesthetics of the smile, (2) whether altering the relationship between the width and crown length of the maxillary central incisor would affect the perceived aesthetics of the smile, (3) the most aesthetic relationship between the width of the maxillary lateral incisor and the central incisor and (4) the	Photographic manipulation was performed to produce two sets of photographs and with a sub-set of four photographs showing the modified lateral incisor width and central incisor length. The eight photographs produced were evaluated by non-experts, dentists and orthodontists. For the upper central incisor, the crown length was shortened in increments by reducing the crown from the incisal edge. Four photographs were developed as follows: average crown length to width ratio of 0.8:1 for an average long incisor (10.4-11.2 mm) (A1), crown length reduced 1.0 mm (B1), crown length reduced 1.5 mm (C1) and crown length reduced 2.0 mm (D1).	Average length: 10.4-11.2 mm; Ratio width/length: 0.8:1

						perception of laypersons, dentists and orthodontists on the altered relationships.		
3	Published: February 07, 2022	Ahmed N., et al. (4)	An Analysis of Maxillary Anterior Teeth Crown Width-Height Ratios: A Photographic, Three-Dimensional, and Standardized Plaster Model's Study.	Analytical	To analyze the width and height proportions of maxillary anterior teeth at different crown levels through photographs, 3D dental models and casts in a subset of the Pakistani population.	This study was conducted at the Institute of Dental Medicine, Altamash, Pakistan. A total of 230 subjects participated in this study. Maxillary impression, standardized photographs and models were constructed for width and height analysis. The age range of the participants was 18 to 30 years. SPSS version 25 was used for statistical analysis. Considering the width to height ratio of 85.55% for the central incisor, the estimated sample size with a margin of error of 5% with a confidence interval of 95%. A paired t-test analysis was performed to compare the dependent variables (tooth size, width and height ratios) with the independent variables (applied techniques, lateral disparity). A p value of ≤ 0.05 was considered	Right upper central incisor: 8.397 ± 0.540 mm; left upper central incisor: 8.788 ± 0.426 mm.

					statistically significant.	
4	Published: August 10, 2014	Vadavadagi S. et al. (14).	Variation in Size and Form between Left and Right Maxillary Central Incisor Teeth.	Comparative	To compare the size variation of left and right maxillary central incisors in male and female patients (using 0.01 mm precision digital calipers). To find out the difference between male and female maxillary central incisors.	Dental students from the Faculty and Hospital of Dentistry of PMNM were selected who met some criteria in their natural dentition, such as both upper central incisors were present and with a reasonably acceptable alignment. Both incisors were free of abrasion, restoration, caries or obvious deformities. No inflammation or gingival hypertrophy was present that would prevent accurate measurement of crown length and cervical width of the central incisors. From 70 dental students, 40 males and 30 females were selected. Perforated metal tray impressions were taken for all subjects using irreversible hydrocolloid. The mesiodistal crown width and cervical width were measured	Men: Length rigth: 10,17 mm; lefth: 10,32 mm; Women: length rigth: 9,14 mm; lefth: 9,26 mm
5	Published: March, 2	Miguel Cabello M. (15)	Width/length ratios of clinical crowns of maxillary anterior teeth in a Latin-American cohort	Observational Transversal	To analyze the dimensions of the clinical crowns of the maxillary anterior teeth with respect to width, length and width/len	This was a cross-sectional observational study, a sample of 94 male and female students between 17 and 28 years of age was selected. The width, length and width/length ratio of the central incisor (CI), lateral incisor (LI) and upper right canine	Men: Length: 10.36 mm; Width: 8.44 mm. Women: Length: 9.45 mm; Width: 8.16 mm.

					gth ratio; and to determine if there is a correlation between these parameters, as well as with facial height in a Latin American population.	(RA) were evaluated on plaster models, as well as the facial height was clinically determined using a digital measuring device.	
6	Published: June 18, 1998	Sterrett J.,et al. (16)	Width/length ratios of normal, clinical crowns of the maxillary anterior dentition in man	Descriptive	To analyze the clinical crown of the three tooth groups of the maxillary anterior sextant of the permanent dentition of normal subjects with respect to (i) width, length and width/length ratios and (ii) to determine if there is a correlation between tooth dimensions or tooth group ratios and the height of the subject.	Subjects (>20 years) were recruited for this study if (i) the free gingival margin on the facial surface of the teeth in the maxillary sextant was positioned apical to the cervical bulge, (ii) there was no evidence of attachment loss; as determined by the lack of a detectable cervical attachment and (iii) the marginal tissue was knife-edge shaped, firm in consistency and coral pink in color. Teeth were excluded if (i) there was evidence of gingival disruption, i.e., gingival overgrowth/hyperplasia, inflammation, altered passive eruption, attachment loss, gingival recession, or history of periodontal surgery, or (ii) there was evidence or history of incisal edge/proximal tooth disruption with restorative	Men: Length: 10.19 mm; Width: 8.59 mm. Women: Length: 9.39 mm; Width: 8.06 mm.

						intervention, traumatic injury, or occlusal wear on dentin. At least 1 suitable tooth from each tooth group of the maxillary anterior dentition had to be present. A maxillary impression was taken and poured in yellow plaster. The widest mesial-distal and the longest apical-coronal portion of the test teeth were measured. The gender, ethnicity, and subject height (SH) of each participant were registered.	
7	Published: May 2003	Magne P. et al. (17)	Anatomic crown width/length ratios of unworn and worn maxillary teeth in white subjects.	Experimental	The purpose of this study was to analyze the anatomical crowns of 4 groups of teeth (central incisors, lateral incisors, canines and first premolars) of the maxillary dentition with respect to width, length and width/length ratios and to determine how these parameters are influenced by incisal	Standardized digital images of 146 human maxillary anterior teeth extracted from white subjects (44 central incisors, 41 lateral incisors, 38 canines, 23 first premolars) were used to measure the widest mesiodistal portion "W" (in millimeters) and the longest inciso-cervical/occlusal-cervical distance "L" (in millimeters). The width/length ratio "R" (%) was calculated for each tooth. A one-way analysis of variance was used to compare the mean values of W, L and R for the different groups ("unused" and "used" subgroups, except for premolars). Multiple least	Length: Unworn: 11.69 mm; worn: 10.67 mm Width: 9.10 mm (unworn).

					edge wear.	significant difference rank tests (95% confidence level) were then applied to determine which means differed statistically from others.	
8	Published: June 04, 2021	Jennes M., et al. (18)	Gender- and age- related differences in the width of attached gingiva and clinical crown length in anterior teeth	Observational	This cross-sectional observational study was designed to evaluate gender- and age-related differences in attached gingival width (AGW), clinical crown length (CCL) and their interrelationship in anterior teeth to determine the relationship between esthetics.	This cross-sectional observational study was approved by the Ethics Committee of the Charité Universitätsmedizin Berlin, Germany, and was conducted in accordance with the Declaration of Helsinki. Informed consent was obtained from each participant. Eighty fully dentate individuals (54 women, 26 men) aged 20 to 25 years and 36 subjects (23 women, 13 men) aged 45 to 55 years were included in the study. All were selected from the Caucasian population. CCL and WAG analyses were performed on the following teeth: maxillary and mandibular central incisors. Since this was a cross-sectional observational study, tehre was no pretermined sample size.	Men: Length: 10.27 mm; Width: 3.9 mm. Women: Length: 9.58 mm; Width: 3.77 mm.

9	Published: November 24, 2017	Shetty T.,et al.(19)	Upper anterior tooth dimensions in a young-adult Indian population in the UK: implications for aesthetic dentistry.	Descriptive	To analyze the dimensions and relationships of the upper anterior teeth in young adults of Indian origin, living in an urban area of the United Kingdom, and to compare the data obtained with data belonging to other ethnic groups.	A descriptive, cross-sectional, non-experimental, qualitative study was carried out with the approval of an ethics committee. The dependent variables were tooth dimensions and ratios. The study included 100 participants (50 males and 50 females) aged 18 to 35 years, all with both parents of Indian descent. No other ethnic groups were directly analyzed in this investigation. However, the results obtained were compared with existing data from other populations, such as Caucasians, Portuguese, Brazilians, Irish, Zimbabweans, and South Africans, to assess ethnic differences in dental dimensions. Upper and lower full-arch impressions were obtained from each of the 100 participants. Plaster casts were obtained from these impressions. The width and length of each upper anterior tooth included in the casts were measured using precision calipers. The length of the anterior arch was determined using a flexible tape measure. All	Width: UCI Right: 8.79 mm; UCI Left: 8.87 mm. Length: UCI Right: 9.55 mm; UCI Left: 9.63 mm.

						measurements were repeated at least three times to obtain consistent values. Method error was determined by repeated measurements. The data obtained were analyzed and compared with existing data on tooth dimensions and used to investigate the presence of golden ratio relationships.	
10	Published: June 2016	Radia S. et al. (20).	Relationship between maxillary central incisor proportions and facial proportions	Prospective	The primary objective of this study was to determine the relationship between Maxillary Central Incisor (MCI) height and width and facial height and width in adults and, therefore, to investigate whether the use of facial measurements as guides for anterior tooth selection is.	The width and height of the right and left ICM were measured, and horizontal and vertical facial measurements were taken. Participants were dental students at King's College London. The hypothesis stated was that of the 170 participants (90 females:80 males) willing to participate in the study, there would be no relationship between tooth size and facial size, with no differences between sexes. In addition, no differences would be found between right.	Average UCI height: 10.28 mm; Average width UCI: 8.65 mm (right) and 8.66 mm (left). UCI Width/height ratio: 85%.

						and left ICM proportions. Tooth measurements are often calculated with digital calipers, either intraorally or on diagnostic plaster models. The sample consisted of white British dental students aged 18 to 30 years with a mean age of 25 years and 4 months, to reduce the likelihood of incisal edge, incisal wear disturbance, and to reduce the likelihood of extensive periodontal disease and extensive gingival recession.	8.66 mm (left). UCI Width/height ratio: 85%.
			proportions		appropriate. Secondary objectives were to evaluate possible intersex differences and measurement differences between the right and left MCI.	
11	Published: January 2015	OrozcoA., et al. (21).	Biometric analysis of the clinical crown and the width/length ratio in the maxillary anterior region	Comparative	To analyze the clinical crown width and length and the width/length ratio of maxillary central incisors, lateral incisors and canines in an adult population. The study also aimed to determine whether there is a correlation between the natural dimensions of the teeth and the suggested	Plaster models from irreversible hydrocolloid impressions of 412 healthy adult participants were used. These models were used to measure the maximum mesiodistal width and maximum crown/root length of the upper central incisors, lateral incisors and canines with a digital precision caliper (0.01 mm). The width/length ratio was calculated for each tooth and 40 models were selected to test the reliability of the measurement method.	ICU length: 10.23 mm; ICU width: 8.71 mm. Average width/length ratio: 85%.

						optimal tooth dimension guidelines for planning esthetic restorations.	
12	Published: January 11, 2021	Alqahtani A., et al. (22)	Maxillary anterior teeth dimension and relative width proportion in a Saudi subpopulation	Observational	To analyze the dimensions of maxillary anterior teeth and their apparent width proportions in the Saudi adult population. The information obtained from the results of the study would help local dentists to design and establish the optimal anterior tooth dimensions for their patients.	One hundred and eighty patients (112 men and 68 women) with intact maxillary anterior teeth (age range = 20-30 years) participated in this investigation. Maxillary impressions were made in polyvinylsiloxane. A digital caliper was used to record the length and width of the maxillary anterior teeth in millimeters (mm) from the dental models, and the models were digitally photographed to calculate the relative width proportions.	Men: Length: 10.04 mm; Width: 8.89 mm. Women: Length: 9.64 mm; Width: 8.60 mm.

| 13 | Published: March 3, 1980 | Mavroskoufis F., et al. (23). | Variation in size and form between left and right maxillary central incisor teeth | Comparative | To examine variations in the size and shape of left and right maxillary central incisors and differences between male and female teeth. | lThe sample consisted of 70 dental students (41 males and 29 females). All subjects had irreversible hydrocolloid impressions taken with a modified perforated tray. A small amount of mixed material was applied to the labial surfaces of the anterior and interdental teeth before the bulk of the tray material was introduced into the mouth. The impressions were immediately poured into plaster using a vibrator, then stored in a humidifier until fully set. Ratios, temperatures and times were used for both impression material and casting material. Measurements were made on the molds using modified dividers that could be fixed in position with a screw thread and with finely pointed ends that fit interdentally. The recorded distance was measured to an accuracy of 0.1 mm. | Males: Length: 10.63 mm (left), 10.57 mm (right). Women: Length: 10.27 mm (left), 10.07 mm (right). |
| 14 | Published: June 6, 2022. | Saleem B., et al. (24). | Analysis of Width, Height and Width/Height Ratio of | Descriptive Transversal | To determine the clinically normal crown width and height and the width/height ratio | A total of 101 volunteer subjects with six upper anterior teeth present in the mouth were included in the study. An impression of the maxillary arch was taken. The | Right central incisor Width: 5,95 ± 1,03 Length: 7,69 ± 1,37 Left central incisor |

						maximum mesiodistal width perpendicular to the longitudinal axis of the tooth and the maximum cervicoincisal length (CI) parallel to the longitudinal axis of the upper central incisors, lateral incisors and canines were recorded, and the width/height ratio was calculated. The final measurements were recorded on a form.	Width: 5,97 ± 1,07 Length: 7,70 ± 1,38
					of the six maxillary anterior teeth. This study would help determine the ideal standard tooth dimension of the six maxillary anterior teeth to restore esthetics.		
15	Published:December, 2005	Hasanreisoglu U., etal. (25).	An analysis of maxillary anterior teeth: Facial and dental proportions	Observational	To analyze the clinical dimensions of the crown of maxillary anterior teeth with respect to their width, height and width-to-height ratio and to determine whether a golden ratio existed between these factors in a Turkish population.	Full-face and anterior tooth images of 100 Turkish dental students were recorded with digital photography under standardized conditions. Plaster casts of the subjects' maxillary arches were also made. The dimensions of the anterior teeth, the occurrence of the golden ratio, the difference between the actual and perceived sizes and the relationship.	Width: Males: 8.72 mm Females: 8.55 mm Height: Males: 9.83 mm Females: 9.37 mm
						between the anterior teeth and various facial measurements by gender were analyzed using the information obtained from both the computer images and the casts.	

16	Published:December, 2014	Kumar S. et al. (26)	Maxillary anterior teeth dimensions and proportions in a central mainland Chinese population.	Observational	To analyze the clinical dimensions of the crown of maxillary anterior teeth with respect to their width, height and width-to-height ratio and to determine whether a golden ratio existed between these factors in a Turkish population.	Tooth dimensions and proportions of six maxillary anterior teeth were recorded on plaster casts obtained from 147 subjects (82 females and 65 males). Of these, 115 casts were digitally photographed in a standardized manner and the apparent width values of six maxillary anterior teeth were recorded for golden ratio analysis.	Males: Width: 8.21 mm Height: 9.50 mm Females: Width: 8.11 mm Height: 9.31 mm
17	Published: September, 2011.	Marcushamer E., et al.(27).	Anatomical Crown Width/Length Ratios of Worn and Unworn Maxillary Teeth in Asian Subjects	Observational	To analyze the anatomical crown dimensions of maxillary anterior tooth groups with respect to width, length and width/length ratios among an Asian population.	Two hundred and sixty-four human maxillary teeth extracted from Asian subjects (91 central incisors, 76 lateral incisors, 54 canines, and 43 first premolars) were collected from the Faculty of Dentistry, Kyushu University, Fukuoka, Japan. Teeth with restorations, caries lesions, and undetectable amelocemental attachment were excluded. Teeth were classified by tooth group (central incisors, lateral incisors, canines, premolars) according to their anatomical characteristics and divided into worn and unworn	Central incisors: Average width: 8.63 mm Average length: 11.93 mm

						subgroups after undergoing scaling and ultrasonic cleaning. The widest mesiodistal portion and the longest apicocoronal distance were measured. A special calibration tool incorporated in Image J software was used to convert all distances to millimeters.	
18	Published:August, 2014	Calçada D., et al. (28).	Anthropometric analysis of anterior maxillary teeth with digital photography – a study in a Portuguese sample	Observational	To study the proportions of the maxillary anterior teeth of a Portuguese population sample and to see if any of the existing anthropometric proportions can be applied to the oral rehabilitation of this population.	Standardized frontal and lateral images were captured from 50 patients who met the inclusion criteria. Maxillary anterior tooth widths and heights were measured using image processing software and the data were statistically analyzed using a parametric test.	Males: Average width: 8.89 mm. Average height: 10.52 mm. Females: Average width: 8.37 mm. Average height: 9.93 mm.
19	Published: March 31, 2021	RodríguezS., et al. (29)	Analysis of dental esthetic proportions in a Spanish population sample	Observational	To analyze in a sample of a Spanish population the measurement of maxillary anterior teeth and compare them with the esthetic dental	Photographs of the smiles of 78 individuals were calibrated and digitally analyzed considering the following proportions: golden proportion (GP), recurring esthetic dental (RED), golden percentage (GPG), Preston's proportion and modified golden	Males: Average width (right): 8.71 mm. Average width (left): 8.55 mm. Women: Average width (right): 8.44 mm. Average width

					proportions described in the literature.	percentage (MGPG).	(left): 8.19 mm.

Discussion

UCI represents a key component in dental and facial esthetics, due to their prominence in the smile and their influence on the perception of attractiveness. Therefore, this work aimed to review the dimensions and proportions of the upper central incisors collected in the literature. The width-to-length ratio of the upper central incisors remained within a relatively constant range of 80 to 85% in both genders. This indicates that, although the absolute size of teeth may vary between individuals, the ratio between their width and length tends to be conserved, making it a useful and predictable parameter in dental esthetic evaluation. This underscores the need to prioritize proportions over absolute measurements when planning customized treatments, as proportions play a crucial role in the esthetic perception of the smile. However, significant variations in millimeter measurements were also identified according to gender and the measurement techniques employed.

Measurement according to gender

The results of the present analysis corroborate that the dimensions of the UCI presented a significant difference between genders, with males showing larger dimensions than females in both width and height. The overall mean for males was 8.63 mm in width and 10.17 mm in length, while for females it was 8.32 mm and 9.36 mm, respectively. These differences, although subtle, are consistent with previous studies suggesting sexual dimorphism in dental dimensions. In addition, the symmetry observed between the right and left sides reinforces the importance of considering both sides in the design of esthetic restorations and treatments. Similarly, Jennes et al. [18] highlighted how gender influences UCI dimensions, with males presenting longer crowns compared to females, while age had minimal impact on these dimensions. Of course, within the age range, one must consider factors inherent to the loss of dental tissue according to various etiologies.

Measurement techniques used

At this point, there are also relevant variations in the values obtained. The techniques used to measure dental dimensions (photography, 3D models, planning software, direct measurements) can generate discrepancies in the results. Measurements taken on plaster models tend to yield slightly larger dimensions, probably due to factors such as material expansion or possible human error, with an average reported width of 8.7 mm. On the other hand, digital techniques, such as intraoral scanning or the use of CAD/CAM technology, offer more accurate and repeatable measurements, recording an average width of 8.5 mm. Finally, direct measurement in the mouth can be affected by limitations such as patient position or restricted visibility, yielding lower average values, around 8.3 mm in width. These technical differences

can generate variations of up to 0.4 mm in width for the same population, which underlines the importance of considering the measurement method when comparing results between studies.

Dimensions by origin and ethnic group

The work of Cabello Chávez [15] highlights that, although men presented larger absolute dimensions in terms of width and length of the UCIs (10.36 mm and 8.44 mm, respectively), the average width/length ratio is similar between men and women. This underscores the importance of focusing on proportions rather than absolute measurements when designing personalized treatments. Consistently, Orozco-Varo et al. [21] reported an average ratio of 85% in a white European population, suggesting stability of this parameter within western populations. However, studies such as that of Shetty et al. [19] in a population of Indian origin in the United Kingdom highlighted significantly higher proportions (91%), exceeding the typical range reported in other populations. This finding highlights how ethnic and genetic factors can influence the perception of dental esthetics and ideal UCI dimensions. This is especially relevant for dental professionals when dealing with diverse populations, as esthetic perception may vary according to the cultural and genetic characteristics of each demographic group. In addition to ethnic differences, Mavroskoufis and Ritchie [23] found notable asymmetries between left and right UCI in more than 60% of the cases studied. This variability reinforces the need to carefully evaluate each case individually before restorative procedures are performed to avoid compromising the esthetic and functional outcome of the treatments. The influence of tooth wear on the dimensions of UCIs should also be emphasized. Magne et al. [17] showed that worn crowns have different width/length ratios, suggesting that the degree of wear should be considered when planning dental restorations.

Facial and dental proportions

In addition to dental proportions, the relationship between UCI dimensions and facial proportions has also been the subject of research interest. Radia et al. [20] investigated the correlation between dental and facial measurements, finding that dental dimensions do not necessarily correlate with facial proportions. This finding highlights the importance of considering multiple aesthetic and functional factors when designing smiles, rather than relying solely on generic proportional guidelines. In terms of clinical applicability, the findings found in the scientific evidence highlight the relevance of assessing dental proportions according to gender to optimize esthetic outcomes.

Dentists should keep in mind that, although proportions are similar, differences in absolute dimensions may require specific adjustments in the design of restorations or prostheses to ensure facial harmony. In this regard, the visagism approach becomes relevant, as it proposes a smile design that harmonizes with the patient's facial features, personality and emotions. The inclusion of this approach would make it possible to adapt treatments not only to objective esthetic parameters, but also to the subjective and expressive expectations of each individual, favoring more comprehensive and personalized results [30].

Finally, the findings of this literature review highlight that the ideal proportions of the upper central incisors are not absolute, but relative to the characteristics of the individual, including gender, to achieve a functional and esthetically balanced smile. The integration of anthropometric measurements of the UCI is crucial, therefore, the clinical crown length, width and width/length ratio should be analyzed. It is also

important to evaluate the gingival contour, where the gingival margins should follow a harmonious alignment: UCIs usually have a slightly higher level in relation to the lateral incisors and canines, creating a gingival curve that respects the esthetics of the smile [17].

Conclusion

The UCI measurements collected in this review confirm that males have larger dental dimensions compared to females, but the width/height proportions remain consistent between the two genders. This suggests that dental proportions are a key indicator for guiding successful esthetic treatment, regardless of absolute tooth size.

Symmetry between the right and left sides of the UCI reinforces their consideration in restorative design, ensuring harmonious and esthetically pleasing results. The width/length ratio of the upper central incisors is an essential and relatively constant parameter for esthetic smile design. It is suggested to investigate the accuracy and reproducibility of different measurement methods to standardize practices in the field of dentistry. Furthermore, since esthetic perception may vary according to cultural characteristics, future studies should include evaluations of esthetic perception in different cultural contexts.

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