**The Republic of Iraq**

**Ministry of Higher Education**

**& Scientific Research**

**Baghdad University**

**College of Dentistry**

# Clinical Facial Analysis of Iraqi young adults for both genders

***A Graduation project***

***Submitted to the council of the College of Dentistry, University of Baghdad, in partial fulfillment of the requirements for the degree of Bachelor Dental Surgeon***

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**قُلْ لَنْ يُصِيبَنَا إِلَّا مَا كَتَبَ اللَّهُ لَنَا هُوَ مَوْلَانَا ۚ وَعَلَى اللَّهِ فَلْيَتَوَكَّلِ الْمُؤْمِنُونَ**

**صدق الله العظيم**

**(التوبة -٥١)**

# Dedication

To My Heaven on Earth "My Beloved Parents":

Thank you for your unconditional love that encourages ,motivates , helps and pushes me forward to be who I am now.

To My Lovely Sisters and brother :

Thank you for your continuous support.

To those who inspire me and stand by my side:

Thank you for being a wonderful and special part of my life.

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All the love to my wonderfull family for there endless love and there great efforts to support me throughout my life

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# Introduction

# Introduction:

## What is Clinical Facial Analysis?

Clinical facial analysis (CFA) is the method utilized by physicians for evaluating and judging the patient‘s face; to define its proportions, volume, appearance, symmetry, and visible deformities. It is based on direct examination, clinical photographs, and conventional and computerized x-ray imaging. Clinical facial analysis is essential for many specialists, such as plastic surgeons, facial plastic surgeons, maxillofacial surgeons, ophthalmic plastic surgeons, otorhinolaryngologists, head and neck surgeons, cosmetic surgeons, orthodontists, rehabilitative dentists, and dermatologists, and, generally, for any physicians dealing with facial aesthetics and functions.Clinical facial analysis is not a particular phase of clinical practice or a moment during a patient consultation. It is the largest part of a professional life and a never-ending process. Furthermore, CFA is not separable from everyday activities and we should be able to analyze the face of the patient and, at the same time, answer his or her questions, or illustrate a procedure. Clinical facial analysis is not delegable to other colleagues. Our findings, along with patient needs and requests, are the basis for treatment planning and the successive surgical treatment. Dealing with facial aesthetics, we are responsible for the overall process and not just a single aspect of it. Facial surgery, as well as orthodontics and any “aesthetic” treatments, is a matter of rearranging things that already exist. Through CFA we can visualize, evaluate and prioritize what exists.

## Aims of the study

The present study aimed to:

1- To assess the macro-aesthetic appearance of the face for Iraqi adults with class I normal occlusion by using photographs and computer analysis.

2- Detect possible gender differences in macro-aesthetic appearance.

3- Determination of facial types and its percent for both male and female among Iraqi adults.

# Chapter One:

# Review of Literature

# Review of literature:

## 1.1 Review

About 5000 years ago, Egyptian civilization marked the first sign of facial beauty displayed in their art works **(Peck and Peck, 1970).** The most famous painted limestone character of Queen Nefertiti (1350 BC), with her harmonious facial proportions and symmetry, is an example of how the Egyptians immortalized the beauty of their kings and queens by depicting them; the name Nefertiti literally means the "*Perfect One*"(**Naini, 2006).**

Angle who was intensely aware of facial art says *"Every feature is in balance with every other feature and all the lines are wholly incompatible with mutilation or malocclusion"* **(Angle, 1899).**

What is important to us is the evolution of the first "ideal" composition of human facial form conceived in balance and harmony and executed to classic proportions. Scholars and scientists from time immemorial had studied and tried to understand and explain this complex multifaceted concept **(Barker and Barker, 2002).**

## 1.2 Classification of Aesthetic Appearance

Aesthetic appearance could be classified into: **(Sarver, 2011)**

**A-** Macro-aesthetics consideration includes**:**

i. Vertical proportions.

ii. Profile.

iii. Lip fullness.

iv. Chin projections, nasal projections, big ears, etc.

**B-** Mini-aesthetics consideration includes**:**

i. Smile arc.

ii. Smile types.

iii. Buccal corridors.

**C-** Micro-aesthetics consideration includes**:**

i. Tooth proportions.

ii. Tooth shade and color.

iii. Connectors area and embrasures.

iv. Gingival height, shape and contours.


Figure (1): **Classification of Aesthetic Appearance**

Macro, mini and micro-aesthetics in orthodontics are the considerations that carried out during and at the end of orthodontic treatment to enhance the cosmetic appearance of the patient **(Proffit *et al*, 2007).**

In addition to previous classification, another classification identifies five levels of aesthetics which include: *facial, oral-facial, oral, dentogingival and dental* (**Meneghini F, 2005).**

## 1.3 Facial Beauty and Attractiveness

Perceptions of an attractive face are questionable, some debate perceptions of attraction were subjective while some debate perceptions of attraction could be measured, subjective believers stated that the personal feelings, culture or combinations of traits that give pleasure to the senses or mind influence

perceptions (**Naini *et al*., 2006).** Additionally, subjective believers intended that perceptions of attraction reflect individual opinion and could be influenced by society, it has been suggested that minority groups seek to look like majority groups and patients seek to look like fashion models and Hollywood celebrities (**Rhodes G, 2005).**

There is evidence to suggest that perception of attractiveness has a genetic basis, *Rubenstein* found that even at 6 months old infants show a predilection for attractive faces, and because 6 months old is too early in human development for social influences.

$$\text{Facial Morphological Index} = \frac{\text{Facial height}}{\text{Bizygomatic diameter}} \times 100$$

## 1.4 Unattractive features of facial appearance

The flowing features of facial appearance are generally rated as unattractive:

- Severe class 2 or class 3 malocclusions
- Little show of vermilion border
- An upper lip that slopes backwards
- A very high or very low smile line
- Lack of a well defined labiomental fold
- An everted lower lip
- Extreme bilabial protrusion

## 1.5 Facial Harmony and Balance

Knowledge of normal facial balance and symmetry in the adult is essential; while harmony considered as one of the main characteristics of beauty (**Swaddle JP, 1995).** This harmony is primarily determined by the soft tissue integument, along with the underlying skeletal framework **.**The relationship of facial features must be

balanced in order to achieve facial harmony, and the facial index is considered a significant criterion of this harmony. Therefore orthodontic treatment must be designed to the face rather than only to dental or skeletal norms (**Proffit, 2007).**

The facial index is calculated to find the facial morphological types by measuring the relation between facial height and width directly from the face. The length of the anatomical face is measured as a straight line from the nasion to the gnathion. The facial width, the distance between the most laterally projecting points of the zygomatic arch, is measured between the right and left zygions in living persons. The facial height is measured from nasion to gnathion .The facial index is the relation between the height and width of the face. **(sarver 2011).**

## 1.6 Social Importance of Facial Aesthetics

The face is the most noticeable feature and has a unique influence on how we assess attractiveness in others and how we identify one another **(Rhodes G, 2005)**. Facial appearance is the focus of attention in social interaction , we depend on its information to form first impressions of other people and without further interaction is the basis on how we judge others **(Cunningham, 1999)**, for example, attractive children tend to be perceived more positively by their parents **(Langlois *et al.*, 1987)**, while teachers perceive more attractive children as being more intelligent **(Clifford and Walster, 1973)** and in professional life, less attractive adults are perceived as having fewer qualifications and have less potential for employment success . In addition to that, individuals with Class II malocclusions and mandibular retrognathism may be regarded as weak and possibly idle, whereas those with significant Class III malocclusions and mandibular prognathism may be regarded as aggressive personality types **(Naini *et al.*, 2006)**.

Attractiveness is a visual cue that people use to make hypotheses and conclusions about the personality and behavior of others in once-off encounters and it can influence how we treat other, in modern society, physical beauty is considered as a personal characteristic and is valued as such in its own right, independent of other traits **(Paul RK, 2015).**

## 1.7 Classification of Facial Types

**(Moss, 1962)** stated: "The anterioposterior dimensions of the face appeared to reflect the effects of environmental influences to a greater extent than do height dimensions, i.e., environment exerts varying effect on craniofacial form". Later, they mentioned that craniofacial morphogenesis is influenced by both genetic and environmental factors. This was confirmed by **(Meredith , 1997)** who stated "The genetic factors certainly influence craniofacial form". Consequently, various areas of the craniofacial complex may be subject to different degrees of genetic and environmental influence during morphogenesis**.**

(**Ricketts, 1982**) categorized facial types in the transverse plane and described three basic facial patterns as shown in figure (2):

- Mesofacial (normal) which is the most average facial pattern.
- Brachyfacial (wide) which is horizontal growth pattern.
- Bolichofacial (narrow) which is a vertical growth pattern.

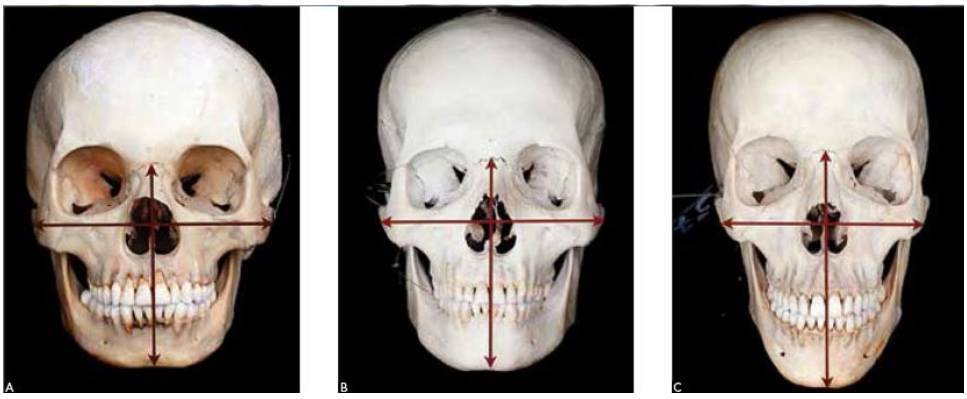
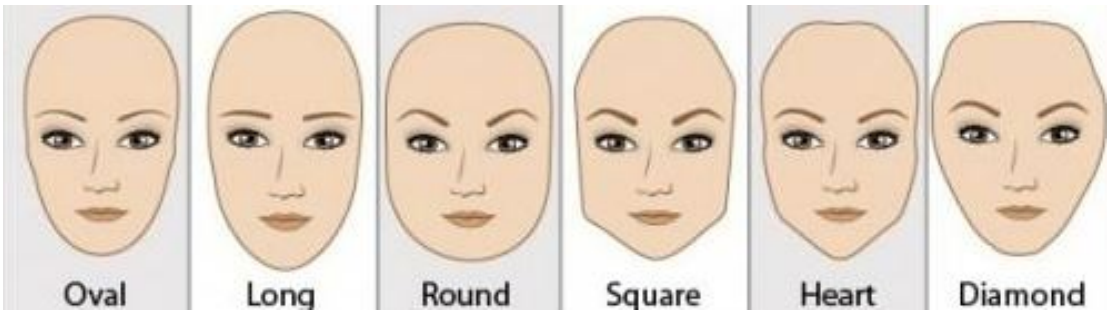



Figure (2 ):

**Powell and Humphreys (1984)** described the face as either round, or oval or square diamond or pear shape type as seen in figure (3)




Figure(3):

**Graber (1988)** described the three facial types: figure (4)

The brachycephalic is likely to have a broad dental arch to go with the broad facial structure; the mesocephalic probably have an average dental arch form and the dolichocephalic is most likely to have a long and narrow dental arch to harmonize with the long and narrow face.


Figure(4):

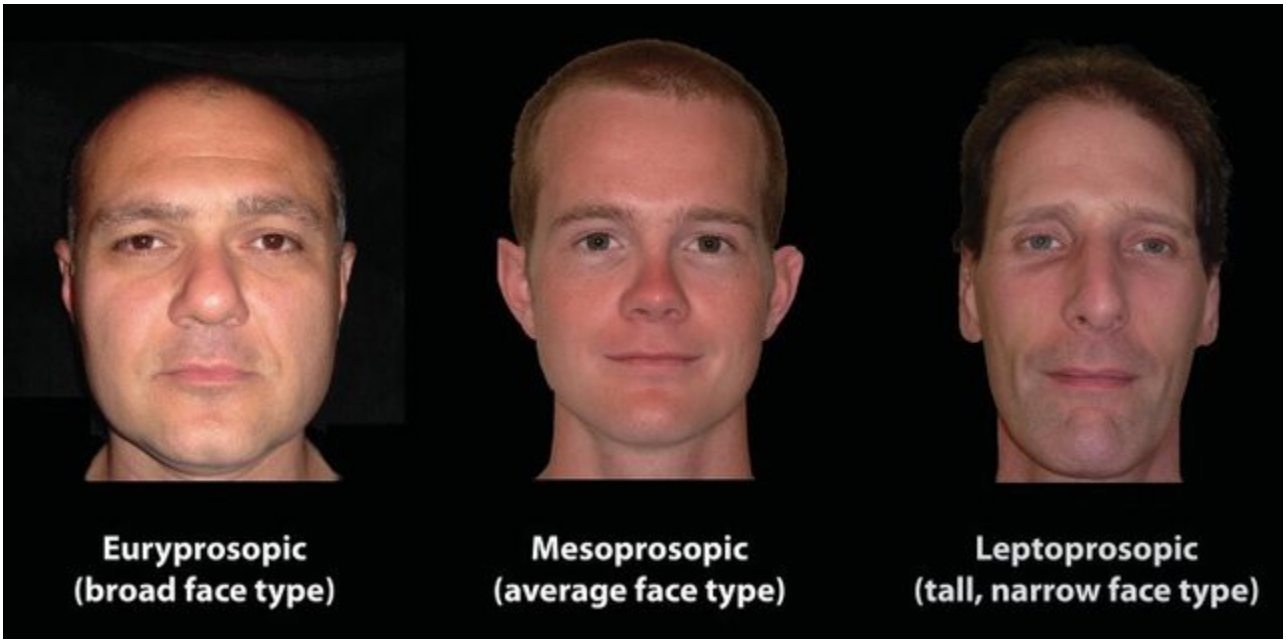
**Proffit (1986)** have determined facial types, by calculating the ratio between interzygomatic distance and anterior facial height, and then the face type for each subject is classified as follows(As figure (5) shown):

**Euryprosopic** facial type is broader and shorter, and frontally appears flat or shallow. It is also characterized by: wide-set eyes; a short, rounded “pug like”

nose, with straight or convex bridge and an upturned nasal tip; an upright bulbous forehead; and prominent cheekbones. This facial type corresponds to the brachycephalic head form.

**Mesoprosopic** facial type is the more neutral and lies between the leptoprosopic and Euryprosopic facial types.

**Leptoprosopic** facial type the face is narrow, long and protrusive. The eyes are closely set, the forehead is sloping, the supraorbital rims are prominent, and the nose is thin, long and protrusive. This facial type corresponds to the dolichocephalic headform.




Figure(5):

(**Arnett and Bergman, 1993)** classified face types into:

*The square faces*: was described as having almost equal distances at the inter parietal, interzygomatic and inter gonial areas.

*The oval face*: was described as having the interzygomatic distance as the widest horizontal dimension of the face (more than inter parietal and inter gonial distances), and *The tapered face*: was described as having the widest dimension of the face in the interparietal area and the face tapered toward the chin.

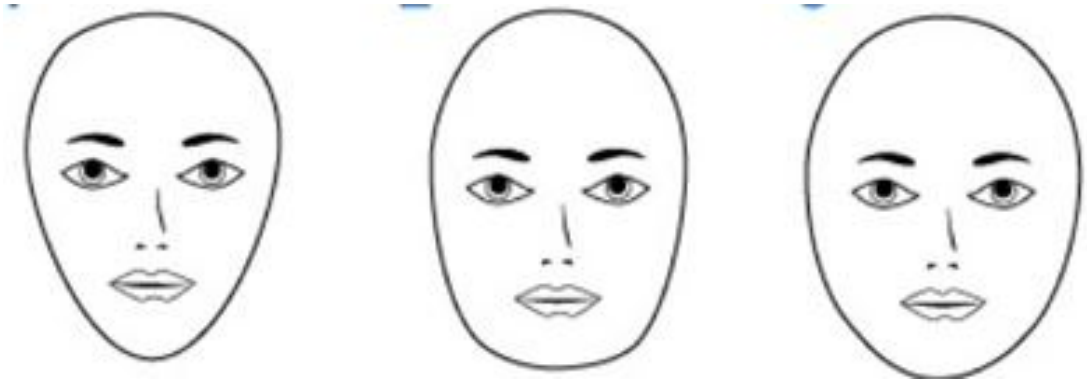
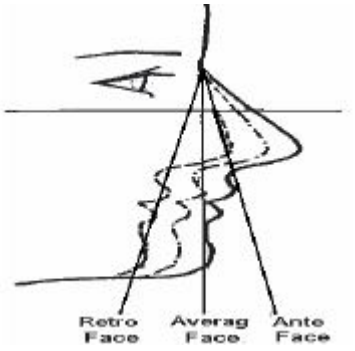


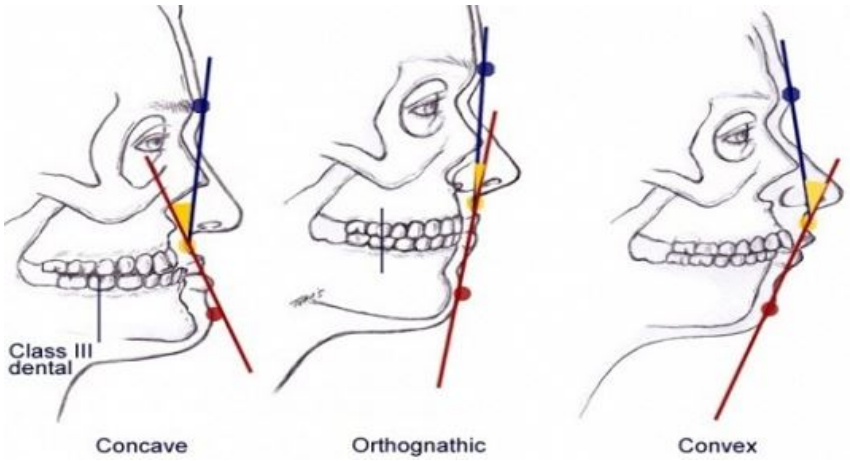
Figure ( 6):

**(Rakosi, 1982)** Has classified the face in profile view as seen in figure (7) depending on the position of the subnasale relative to the Nasion perpendicular, distinction maybe made between the following types: **Retro face** : Subnasale behind on the nasion perpendicular, **average face**: Subnasale lying on the nasion perpendicular and **ante face**: Subnasale in front of the nasion perpendicular.




Figure(7)

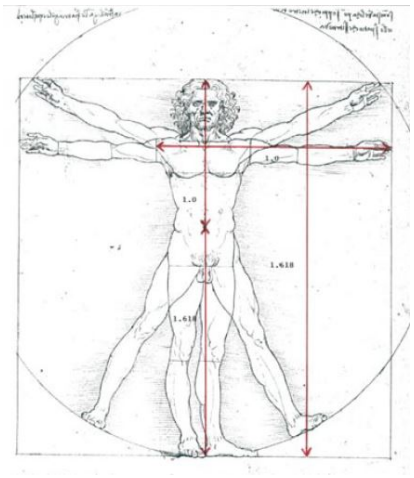
As figure (8) shown Patient with straight profile usually have normal occlusion or class I malocclusion, those having convex profile having an increase in the probability of having a class II malocclusion associated with retrusive mandible or a protrusive maxilla, patient with concave profile having an increase in the probability of having a class III associated with retruded maxilla, a protrusive mandible or both **(Bishara;1884).**




Figure(8)

## 1.8 Ideal Facial Proportions and Measurements

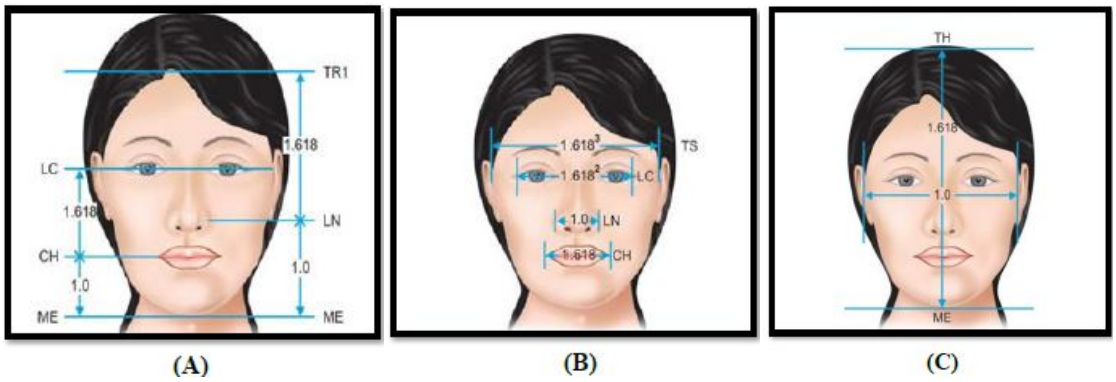
*Leonardo Da Vinci* (1452-1519) excelled as a painter, sculptor, in addition to architecture, engineering, human physiology and anatomy **(Sarwer DB,2003).** Da Vinci reported on the proportions according to which the bodies and the faces should be ideally shaped. According to Da Vinci, in a well-proportioned face; the size of mouth was equal to the distance between the parting of lips and edge of the chin figure (10) B, while the distance from chin to the nostrils, from nostrils to the eyebrows, and from eyebrows to the hairline were all equal , and the height of the ears was equal to the length of the nose figure (10)A. Da Vinci could not deny the variations of the nature; he did his measurements on the live bodies and compared the sizes of the various parts of these live bodies to one another (**Rhodes G, 2005**). There is no greater example of illustrating divine proportion of the human body than Leonardo DaVinci's drawing, Human Figure in a Circle illustrating Proportions,




Figure(9):illustrates the human body in perfect proportion.

If the distance from the top of the head to the umbilicus is 1, then the distance from the umbilicus to the bottom of the foot is 1.618. Also, if the distance from the right shoulder to the tip of the left finger is 1, then the total height of the human body (head to toe) is 1.618. Divinely proportioned individuals, both males and females, are attractive and tend to be strong, physiologically healthy, and fertile. It would be interesting to study the proportions of Olympic athletes compared to the general population.

Dr. Jefferson was intrigued by the thought that an ideally proportioned face would also have an outside dimension that conforms to the divine proportion. He reasoned that if the widest part of the face, LCh (lateral border of the cheek) is 1, then TH (top of the head) to ME (soft tissue menton, bottom of the chin) should be 1.618 as seen in figure (10)C. If it was shorter than 1.618, the face would be short, and if it was longer than 1.618, the face would be long figure (10) C. He was able to test this hypothesis by finding a photograph in a magazine of a female model with a beautifully proportioned face. The face was facing straight on and she was bald so that he was able to measure the top of her head to her soft tissue mention. As predicted, her facial width to her facial height was very close to 1 to 1.618.




Figure(10):

Note that faces that do not to conform to the divine proportion have esthetic and physiologic Long faces tend to have nasal obstruction and breathing problems. Short faces tend to have tempor disorder and headaches. Ideally proportioned face tend to have minimal physiologic problems. Adult human face must conform to the divine proportion in order for it to be beautiful and healthy.

## Divine proportion= facial beauty= TMJ health= physiologic harmony =fertility =Total Health and Wellness= Quality of Life

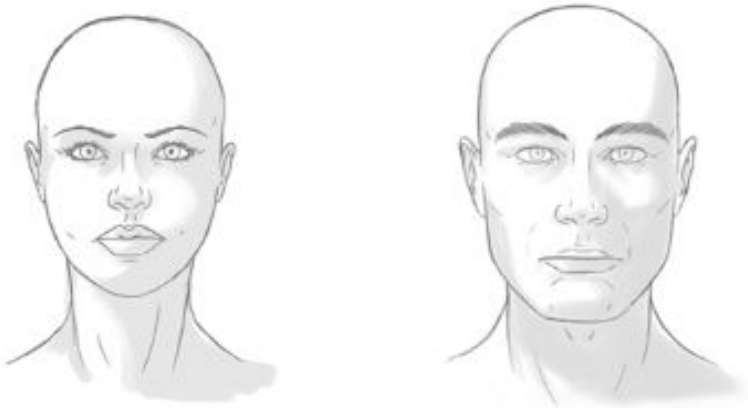
*Ricketts* was the first who claimed that the analysis of a physically beautiful faces should be achieved mathematically, and he claimed to use the golden proportions in that respect, *Ricketts* visualized dozens of photographs of the magazine models to select pairs of distances or measurements that representing a golden proportion in those beautiful faces and he proved that the harmonious faces of the beautiful women were to be built according to the golden proportions *"the ratio that is most attractive to the human eye and mind"* (**Ricketts, 1982**). The Greek letter phi (Ɵ) was used to indicate the number 1.618, The golden divider was a sliding caliper with which any given distance could be divided in accordance to the 1:1.618 ratio.

## 1.9 **Distinguishing Features:**

The most attractive faces appear to have certain *"distinguishing features"* which transfer upon their owners a particularly high degree of attractiveness. **(Langlois *et al*., 1987).**

A number of distinguishing features have been suggested, these varied from facial features such as the forehead, cheeks, lips and eyes to dental aesthetics *(well-shaped, correctly inclined or slightly protruding anterior teeth were regarded to be attractive),* there is also a gender specific characteristics, the female face is considered more attractive if it has full lips, thin eyebrows, large eyes, prominent cheek bones, and a small chin and nose (**Faure *et al*., 2002).**

In addition to these gender specific characteristics, "a particularly attractive female face would have to incorporate an innocently child like appearance which appeals to protective instincts but at the same time mature, showing dominance as well as being expressive" (**Swaddle and Cuthill, 1995**). Men on the other hand were considered to be attractive if they have features such as prominent cheek bones, large jaws, a strong chin, thin lips and thick eyebrows (**Edler, 2001).**



Figure(11): Illustration the distinguishing features in male and femal

### 1.10 Mixed-race people perceived as more attractive:

A study by Rhodes et al, however, appeared to suggest that people of mixed race have an advantage in that they are perceived as more attractive than people whose ancestral background falls more uniformly within a single racial group ( **Rhodes G et al, 2005)** Specifically, their research showed that people of a mixed Asian and European background were rated as more attractive than Asians, Europeans, or even faces generated as morphs between these two groups. This research, however, was based on a small set of individuals. There is a biological phenomenon that would predict that we would expect mixed-race people to be more attractive. This comes from the genetic process known as heterosis (or hybrid vigour). This is an idea, put forward by Darwin, that cross-breeding within species leads to offspring that are genetically fitter than their parents **(Paul RK et al, 2015)**. For heteros is to affect attractiveness, it is necessary that attractiveness be related to genetic fitness. In fact, it is probably the best indicator of genetic fitness, as others, such as intelligence or height, would be affected by the environment to a greater degree than attractiveness. It has certainly been argued that attractiveness is related to genetic fitness and the fact that it is so important in mate selection is also further evidenced **(Hume D K et al, 2001; Gangestand SW, 1993)**. There is even some recent evidence that genetic heterozygosity is predictive of attractiveness **[Lie HC et al, 2008)**.

Figure(12)

## 1.11 Facial Photography

The photographs are an excellent aid in appraising facial balance, type and harmony of the external features. In addition to that it may reveal things that were not seen during clinical examination **.**Photographs must be clear, sharp and large enough to see with the unaided eye. It is suggested to take full or 3/4 sized picture **( Ramadan OZ, 2000)**.

For the purpose of researches, most investigators use both frontal and profile views for photographic facial analysis and comparisons .According to **(Meredith G ,1997)** photographic analysis has several benefits over the radiographic analysis, such as absence of harmful exposure of the patient to radiation, evaluation of craniofacial structures including the contribution of muscles and adipose tissue, stable hardware. Availability of technical assistance, photography can be readily used to assess the posture of the head and the face, and to compare these with the relationships existing among different craniofacial structures and low cost and relatively inexpensive hardware (camera, optics, and lighting). Photographic views, like cephalometric tracing, not only can provide points and landmarks for measurements, but they can also offer an analytic system and complete evaluation

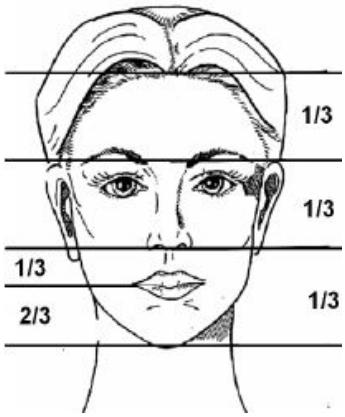
of the unique craniofacial aspect of the person who is being investigated **(Benson and Richmond, 1997)**.

Some surgeons find it helpful to have a negative of the patient's profile enlarged to fit 1:1 to their lateral cephalometric radiograph so that the two are superimposed allowing both soft and bony tissues to be seen. This can then be cut up to help determine the effects of different surgical options upon the patient's profile and can be used to give the patient an idea of his appearance post-surgery **(Chang ZC, 2011)**. Photographs on the other hand are excellent for patient communication but of limited value for lecture purposes. The advent of digital photography provides the clinician with the facility to use the material both for lecturing purposes as well as providing the facility to print a hard copy photograph for the patient to handle and appreciate **.** Photographs can be used to assess the symmetry of the face, profile and facial types, serves as a record of the patient and to assess the progress of a case by comparing the preoperative and postoperative photographs **(Chang ZC, 2011 ).**

**(Meneghini F,2005 )** developed an eight steps approach to facial analysis with the goals of providing a basic conceptual framework that reinforces the established facial proportional relationships

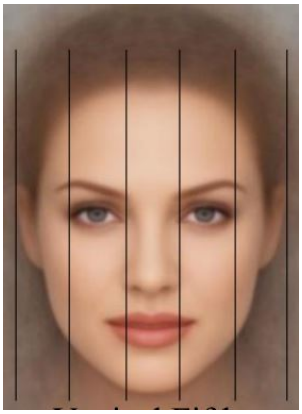
**1.11.1 Frontal view evaluation:**

***Step 1. Vertical height*** - From the time of Michelangelo, observers have noted that the face can be divided into equal thirds. The boundaries of the upper third are the trichion and the glabella, with the mid third extending from the glabella to the subnasale. The lower third extends from the subnasale to the menton. The lower third can be further subdivided into thirds with the stomion marking the inferior boundary of the upper third, and the lower lip and chin forming the lower two-thirds, as seen in figure(13):




Figure(13)

***Step 2. Width*** – "Roll of fifth" is the easiest way to evaluate the relative width of facial structures is to divide the face into vertical fifths with each fifth being equal to one eye width, as figure (14) shown:



Figure(14)

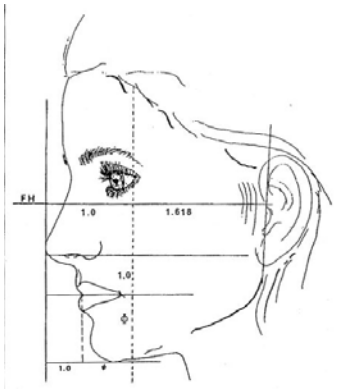
***Step 3. Symmetry*** - A mid sagittal line is drawn and the symmetry of the various subunits (ears, eyes, eyebrows, nose, and mouth) is compared. This is also a good time to assess the overall facial shape.

**1.11.2 Lateral View evaluation:**

Prior to evaluating the patient's profile, it is important to assure appropriate head position. This has traditionally been accomplished by placing the Frankfort horizontal line parallel to the floor. The Frankfort horizontal line is drawn between the superior aspect of the external auditory canal (or through the tragion) and the

infraorbital rim. A second technique to obtain the patient's natural horizontal head position is to have them fix their eyes on a point at eye level.

***Step 4. Vertical height*** facial height is divided into thirds as in step 1, and the equality of the thirds reassessed. The vertical placement of landmarks is also determined in this step. As stated above, the lower third can be further divided into thirds with the stomion separating the upper and mid thirds and the pogonion lying in the center of the lower subdivision, as seen in figure (15)




Figure(15)

***Step 5. Mid face projection*** – To assess the midface position relative to the upper face, a second line is drawn from the nasion to the subnasale. This line should form an angle of 85 to 92 degrees when compared to the Frankfort horizontal line and is termed the zero meridian. If this line is excessively anterior, the midface is described as anteface, and if posteriorly, a retroface profile is present.

***Step 6. Lower face position*** - The position of the lower third of the face compared to the upper third is then established, again with the zero meridian providing the reference. A line is drawn from the subnasale to the pogonion.

***Step 7. Nose-Lips-Chin Position*** - At this point the relationship of the nose, lips and chin to each other is evaluated using Rickett's E (esthetic) line figure (16). This line is drawn from the nasal tip to the pogonion. The lips should lie just posterior to this line with the upper lip approximately twice as far from the line as the lower

lip. If this is the case, no further evaluation of these structures is indicated at this time. If not, one of the three structures is malpositioned.

Figure(16)

***Step 8. Evaluation of individual subunits*** –Forehead, Eyes and eyebrows, Nose, Lips, Chin and neck, Ear and Dental occlusion.

# Chapter two:

# Materials and Methods

## 2.1 Materials

### 2.1.1 Sample:

The sample of this study was achieved from 5th grade undergraduate students at College of Dentistry/University of Baghdad, The sample consisted of 72 students (24 male, 48 Female). After the research purpose was explained to the students and an agreement was obtained from them to participate in this study. All the participants in the project were examined clinically.

### 2.1.2 Criteria for Subject Selection:

All samples are Iraqi with an age ranged between 21-22 years. Skeletal Class I relationship determined clinically by two finger method (Foster, 1985). They have full permanent dentition regardless the third molars. Normal overjet and overbite (2-4 mm). Bilateral Cl.I angle and canine classification (**Angle, 1899).** No spacing or crowding in the anterior teeth.

All data with no History of facial trauma, orthodontic/orthognathic treatment, dentofacial deformities, surgeries or asymmetry, Anterior or posterior crossbite and history of bad habits.

### 2.1.3 Instruments and Equipments:

- Disposable dental mirrors, cotton, gloves, masks, disinfectant (Desident Cavicide, Spofadental)
- Measuring tape to measure the distance between the participants and the camera lens.
- A digital camera (Nikon D5200, 24.1 Megapixels, Thailand) with (18-55) lens.

- Two rulers variable in size, one for the extraoral photograph and the other for intra oral examination.
- white background made of a piece of cloth.
- Stool
- Personal Computer (Sony Vaio CW16FA).
- Analyzing software (AutoCAD, 2007).

## 2.2 Methods

### 2.2.1 History and Clinical Examination:

Each participant was seated on the dental chair and information about his/her name, age, medical and dental history was obtained from him/her, then each participant was examined clinically (extraoral and intraoral) to ensure his/her inclusion in the study according to criteria of sample selection. After that, a written consent form was obtained from the participants to assure their voluntary participation in the study.

#### 2.2.1.1 Skeletal Examination:

a. Anteroposterior Relation: each participant was postured in an upright position with Frankfort plane parallel to the floor, and asked him/her to occlude gently on posterior teeth and look straight forward.

By using the index finger of the right hand to palpate the soft tissue point A (deepest point in the upper lip at midline) and the middle finger to palpate the soft tissue point B (deepest point in the lower lip at midline), the skeletal pattern was assessed (**Roberts-Harry and Sandy, 2003).**

b. Vertical Relation: The vertical relation was measured in terms of facial height, the upper anterior facial height was represented by the distance from the point between the eyebrows “Glabella” to the base of the nose “subnasale”, the lower

anterior facial height was the distance from the soft tissue Menton (base of the chin) to the base of the nose, after marking the points of Glabella (Gl), Subnasale (Sn), Menton (Me) with a marker, the facial heights were measured with a ruler (**Roberts-Harry and Sandy, 2003).**

c. Horizontal Relation: This dimension was assessed by looking at the participant head-on and assess whether there was asymmetry in the facial midline (**Roberts-Harry and Sandy, 2003).**

### 2.2.1.2 Dental Examination

Each participant was examined intraorally to ensure that all permanent teeth were present according to the previously mentioned criteria. Then the relation between the maxillary and mandibular teeth were examined:

a. **Classification of Occlusion**

- *Molar Classification*: In Class I normal occlusion, the tip of the mesio-buccal cusp of the maxillary first permanent molar should occlude with the mesio-buccal groove of the mandibular first permanent molar (**Angle, 1899).**
- *Canine Classification:* The tip of maxillary permanent canine in Class I relation should occlude into the embrasure between the mandibular canine and mandibular first premolar (**Angle, 1899).**
- *Incisor classification*: According to British Standard Institution in Class I relation, the incisal edges of mandibular permanent incisors should occlude on or directly beneath the cingulum plateau of the maxillary permanent incisors.

b**. Measurement of the Overjet and the Overbite**

While the participant was in centric occlusion with his/ her occlusal plane horizontal, the overjet was measured with the use of ruler by placing the tip of ruler on the labial aspect of the mandibular central incisor, holding it against the

incisal edge of the maxillary central incisor horizontally. The overjet was measured to the nearest millimeters (**Draker, 1960).**

c. In addition to the classification of occlusion and measurements of the overjet and overbite, the presence of spacing or crowding, posterior crossbite, signs of gingival or periodontal diseases were assessed clinically according to the criteria of sample selection.

### 2.2.2 Standarization of the Photographs

The camera fixed in position and adjusted in height to be at the level of the participant's eyes according to the participant's body height. The distance from the camera to the background was fixed at a distance of about 100 cm ,The EF-S 18-55mm lens was used, participants were seated on a constant chair in front of a white background which was made from a piece of cloth.

### 2.2.3 Photographic Exposure

72 Frontal facial photographs were taken with the participant in rest. For the facial photographs, each participant was positioned in the cephalostat with the interpupillary plane parallel to the floor (**Chang ZC, 2011**), and instructed to keep their teeth in maximum intercuspation and gently closed lips in rest position (**Al-Sehaibany F,2011**). The camera lens positioned parallel to the participant's face and the participant was asked to look at the center of the camera's lens during taking the photograph with the participant's hair did not cover any part of the face (**Varjão *et al*., 2006**) ,a ruler was placed near the participant's head to correct the magnification.

### 2.2.4 The Digital Camera Set-Up

The digital camera was set on the manual exposure shooting chosen from the model dial that determined the desired function.

### 2.2.5 Photographic Analysis

Each shoot analyzed by AutoCAD 2007 program. The measurements were divided by scale for each picture to overcome the magnification.

### 2.2.6 The Macro-aesthetic Appearance Includes: figure (17)

**a)** Facial Landmarks **(Bishara *et al.*, 1984)**

Glabella (Gl): It is the most prominent point on the midline of the face, between the eyebrows, if the glabella is not clearly visible and the subject has a thin eyebrows, the top border of eyebrows can be used as reference to the position of the glabella and if the glabella is not visible and the subject has thick eyebrows, the middle of eye brows can be used.

- Nasion (n): It is the point in the midline of both the nasal root and the nasofrontal suture, always above the line that connects the two inner canthi, identical to bone nasion.
- Inner canthus of the eye (Ic): It is the medial angle of palpebral fissure.
- Pupil's of the eye (p): It is the hole that located in the center of the iris of the eye that allows light to enter the retina.
- Zygoin (zy): It is most lateral point on each zygomatic arch, widest part of the face below the level of the eyes.
- Alare of the nose (AL): It is located at each lateral rim of the ala of the nose at its widest width.
- Subnasale (Sn): It is the point at which the nasal columella merges with upper mucocutaneous lip in the mid sagittal plane.
- Chilion (Ch): It is a point located at each angle of the mouth and selected to be on the same level with stomion.
- Stomion (Sto): It is the midpoint of the intra-labial fissure.

- The Labrale Superius (LS): The midpoint in the upper margin of the upper membranous lip.
- The Labrale Inferius (LI): The midpoint in the lower margin of the lower membranous lip.

**b)** The Horizontal Facial Measurements **(Farkas, 1987)**

- Zygomatic width (zy-zy): The distance between the two zygion points.
- Inter-canthal distance (ICD): The distance between the median (inner) angles (canthi) of the palpebral fissure.
- Interpupillary width (IPW): It is a horizontal line that connects between the center of right and left pupils.
- Interalar width (IAW): The distance between the outer points of the ala of the nose.

c) The Vertical Facial Measurements **(Bishara *et al*., 1984):**

- Facial height (FH): The distance between the soft tissue nasion and menton.
- Lower face height (LFH): The distance between the subnasale and menton.
- Upper lip vermilion (ULV): The distance between labrale superius and stomion
- Lower lip vermilion (LLV): The distance between labrale inferius and stomion.

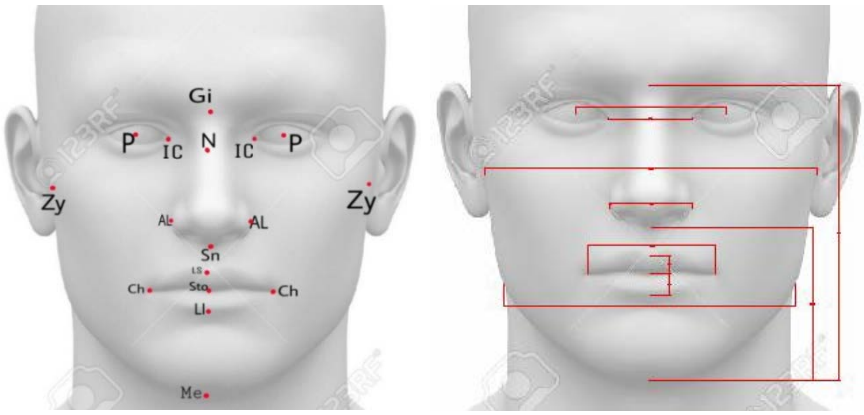



Figure (17 ):

### 2.2.7 Statistical Analysis:

All the data of the sample were subjected to computerized statistical analysis using SPSS (statistical package of social science) software version 19. The statistical analysis included the followings:

**1. Descriptive Statistics**

a) Mean.
b) Standard deviation (SD).
c) Statistical tables and figures.

**2. Inferential Statistics**

Independent samples t-test: for the comparison between both genders.

***In the statistical evaluation, the following levels of significance were used:***

- $P > 0.05$ Non-significant.
- $0.05 \geq P > 0.01$ Significant.
- $P < 0.01$ Highly significant.

***In the statistical evaluation, the following levels determine the strength of the relationship*:**

- $0.7 < |r| < 1.0$ the correlation is strong.
- $0.3 < |r| < 0.7$ the correlation is moderate.
- $|r| < 0.3$ the correlation is weak.

***In the statistical evaluation, the following signs determine the type of the relationship:***

- **(+)** r the correlation is direct.
- **(-)** r the correlation is indirect.

# Chapter Three: Results

## Results:

**3.1 The sample** of this study consisted of 72 5th grade students (24 males and 48 females) from College of Dentistry-University of Baghdad, the age of the participants ranged between 21-22 years.

**3.2 Descriptive statistics for male and female groups**

The mean values of all measured variables in table (3.1) were higher in males than females, the same results for facial indices FH/Zy and FH/Go; the results is clear in figure (18) except for upper lip virmillion.

**3.3 Independent T-test for male and female groups.**

Independent sample t-test in table (3.2) indicated that there was a high significant difference regarding the bizygomatic width, bigonial width, Interpupillary width, Inter-canthal distance, Interalar width, Mouth width, Facial height, Lower face height; while non-significant gender difference in the Upper lip vermilion, Lower lip vermilion, FH/Zy and FH/Go.

**3.4 Descriptive statistics and gender differences in face shape**

In table (3.3) indicated that Hypereuryprosopic (very broad face) is higher in femal 4% as showen in figure (19) and 0% in male as showen in fiqure (20) , while Euryprosopic (broad face) 8% in femal and 2% in male, Mesoprosopic (round face) 17% in female and 33% in male , Leptoprosopic (long face) 42% in femal and 33% in male and Hyperleptoprosopic (very long face) 33% in femal and 48% in male

**Table 3.1: Descriptive statistics for male and female groups**

| Variables | Gender | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Inter-canthal | Male | 31.88 | 42.21 | 35.80 | 2.50 |
| | Female | 27.00 | 40.44 | 33.22 | 2.93 |
| Interpupillary | Male | 61.66 | 76.59 | 69.73 | 3.85 |
| | Female | 56.23 | 73.95 | 64.97 | 3.59 |
| Interalar | Male | 42.64 | 52.87 | 46.11 | 3.35 |
| | Female | 33.83 | 46.55 | 39.74 | 3.03 |
| Mouth width | Male | 53.34 | 66.77 | 60.50 | 4.57 |
| | Female | 43.46 | 64.97 | 53.85 | 4.63 |
| Upper vermilion | Male | 2.53 | 8.48 | 5.82 | 1.80 |
| | Female | 2.49 | 10.66 | 6.34 | 1.68 |
| Lower vermilion | Male | 6.37 | 14.82 | 11.62 | 2.37 |
| | Female | 8.06 | 15.15 | 11.29 | 1.69 |
| ZY-ZY | Male | 129.75 | 159.77 | 146.79 | 8.16 |
| | Female | 119.43 | 153.10 | 132.93 | 6.70 |
| Go-Go | Male | 97.71 | 140.10 | 113.56 | 13.20 |
| | Female | 87.58 | 119.44 | 100.09 | 7.33 |
| FH | Male | 120.52 | 146.79 | 136.16 | 8.90 |
| | Female | 111.71 | 144.88 | 125.55 | 7.68 |
| LFH | Male | 61.52 | 80.10 | 72.01 | 5.86 |
| | Female | 52.62 | 76.83 | 63.90 | 6.48 |
| FH/ZY | Male | 82.28 | 101.75 | 92.85 | 5.30 |
| | Female | 77.63 | 110.60 | 94.60 | 6.34 |
| FH/Go | Male | 103.08 | 144.22 | 121.01 | 12.75 |
| | Female | 97.46 | 145.91 | 125.86 | 9.15 |

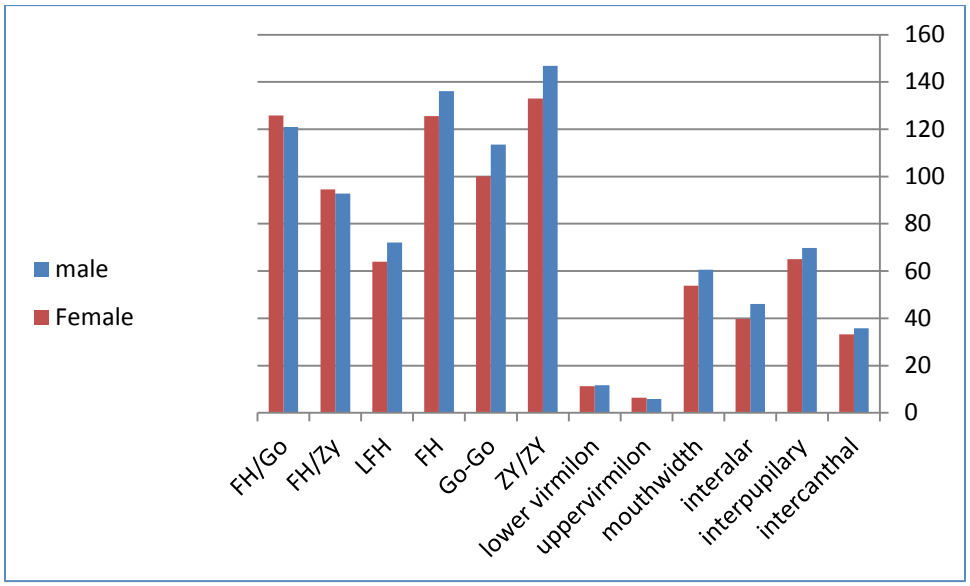



**Figure 18: Descriptive statistics for male and female groups.**

**Table 3.2: Independent T-test for male and female groups.**

| | Group | Mean | Std. Deviation | T-test | Mean Difference | P-Vaue |
|---|---|---|---|---|---|---|
| **Zy-Zy** | **Male** | 146.79 | 8.16 | 7.68 | 13.86 | .000 |
| | **Female** | 132.93 | 6.70 | 7.19 | | HS |
| **Go-Go** | **Male** | 113.56 | 13.20 | 5.58 | 13.47 | .000 |
| | **Female** | 100.09 | 7.33 | 4.65 | | HS |
| **Inter-canthal** | **Male** | 35.80 | 2.50 | 3.70 | 2.58 | .000 |
| | **Female** | 33.22 | 2.93 | 3.90 | | HS |
| **Interpupillary** | **Male** | 69.73 | 3.85 | 5.18 | 4.76 | .000 |
| | **Female** | 64.97 | 3.59 | 5.06 | | HS |
| **Interalar** | **Male** | 46.11 | 3.35 | 8.11 | 6.37 | .000 |
| | **Female** | 39.74 | 3.03 | 7.85 | | HS |
| **Mouth width** | **Male** | 60.50 | 4.57 | 5.77 | 6.65 | .000 |
| | **Female** | 53.85 | 4.63 | 5.80 | | HS |
| **FH** | **Male** | 136.16 | 8.90 | 5.24 | 10.61 | .000 |
| | **Female** | 125.54 | 7.68 | 4.98 | | HS |
| **LFH** | **Male** | 72.01 | 5.86 | 5.16 | 8.11 | .000 |
| | **Female** | 63.90 | 6.48 | 5.34 | | HS |
| **Upper vermilion** | **Male** | 5.82 | 1.80 | -1.21- | -.52- | NS |
| | **Female** | 6.37 | 1.68 | -1.18- | | |
| **Lower vermilion** | **Male** | 11.62 | 2.37 | .69 | .34 | NS |
| | **Female** | 11.29 | 1.68 | .62 | | |
| **FH/Zy** | **Male** | 92.84 | 5.30 | -1.17- | -1.76- | NS |
| | **Female** | 94.60 | 6.34 | -1.24- | - | |
| **FH/Go** | **Male** | 121.00 | 12.75 | -1.85- | -4.86- | NS |
| | **Female** | 125.86 | 9.15 | -1.67- | | |

**Table 3.3: Descriptive statistics and gender differences in face shape**

| Face Shape | Range of Prosopic Index | Male | Female |
|---|---|---|---|
| (1) Hypereuryprosopic (very broad face) | <79. | 0 | 2 |
| (2) Euryprosopic (broad face) | 80–84.9 | 2 | 1 |
| (3)Mesoprosopic (round face) | 85–89.9 | 4 | 6 |
| (4) Leptoprosopic (long face) | 90–94.9 | 10 | 16 |
| (5) Hyperleptoprosopic (very long face) | >95 | 8 | 23 |

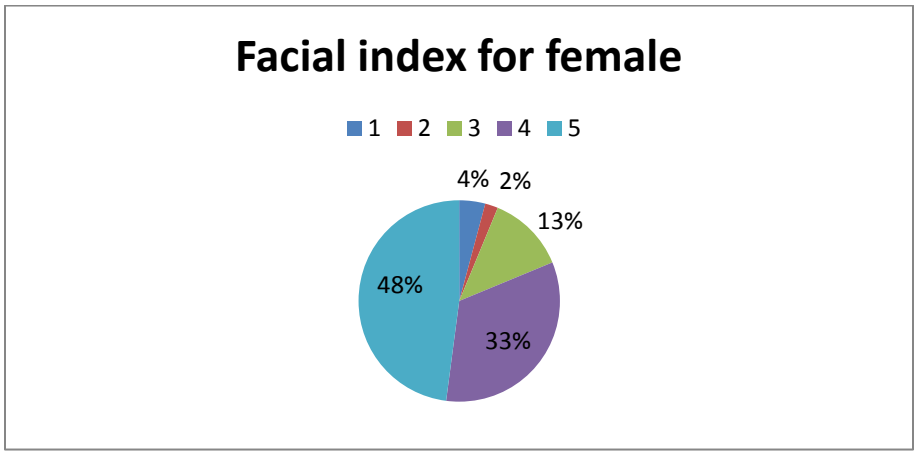



**Figure ( 19)**

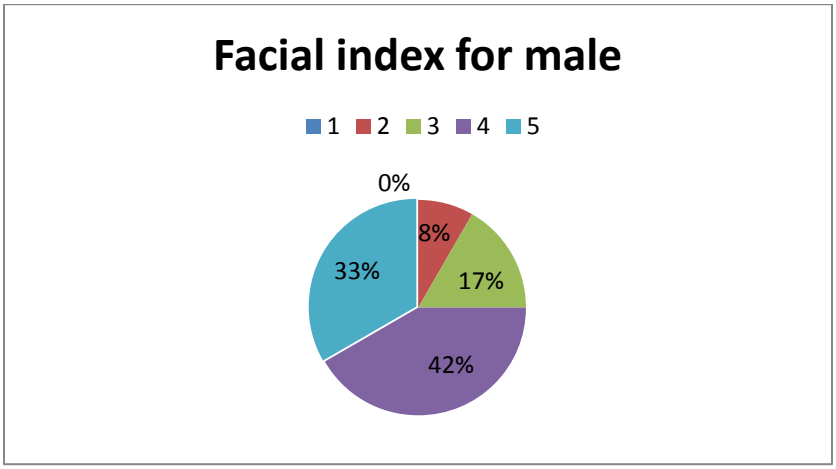



**Figure (20 )**

# Chapter Four:

# Discussion

## Discussion:

**4.1 The sample** in this study was selected at age between (21-22) to insure that the individuals maintain the same facial pattern and to minimize the effect of any remaining skeletal growth **(Bishara, 1984).**

**4.2 The differences in facial appearance between the males and females** were illustrated in table (3.2). The mean values for most of facial parameters were higher in males than females, this came in agree with **Ibrahimagić- Šeper *et al*. (2006) .**since the lower mean values in facial parameters in females have been positively associated with improved facial beauty in females compared to males (**Raymond *et al*., 2006).**

One exception was found in the mean value of upper lip vermilion, it was higher in females than males, it could be attributed to that the aesthetically attractive female face demonstrated larger lips, and this result linked to the youthfulness and suggests a strong evolutionary effect on female attractiveness **(Peck and Peck, 1970**) .But the result is not so much higher to be significant difference from male as shown in independent T-test; this result for both upper and lower lip virmillion and that agreed with that of **Ahmed *et al*. (2013).**

While for facile indices FH/Zy and FH/ Go, if we take each parameter separately we found no significant difference between male and female but when we use formula of index and multiply the result with number100; the difference will increases to an extent to be significant difference between both genders.

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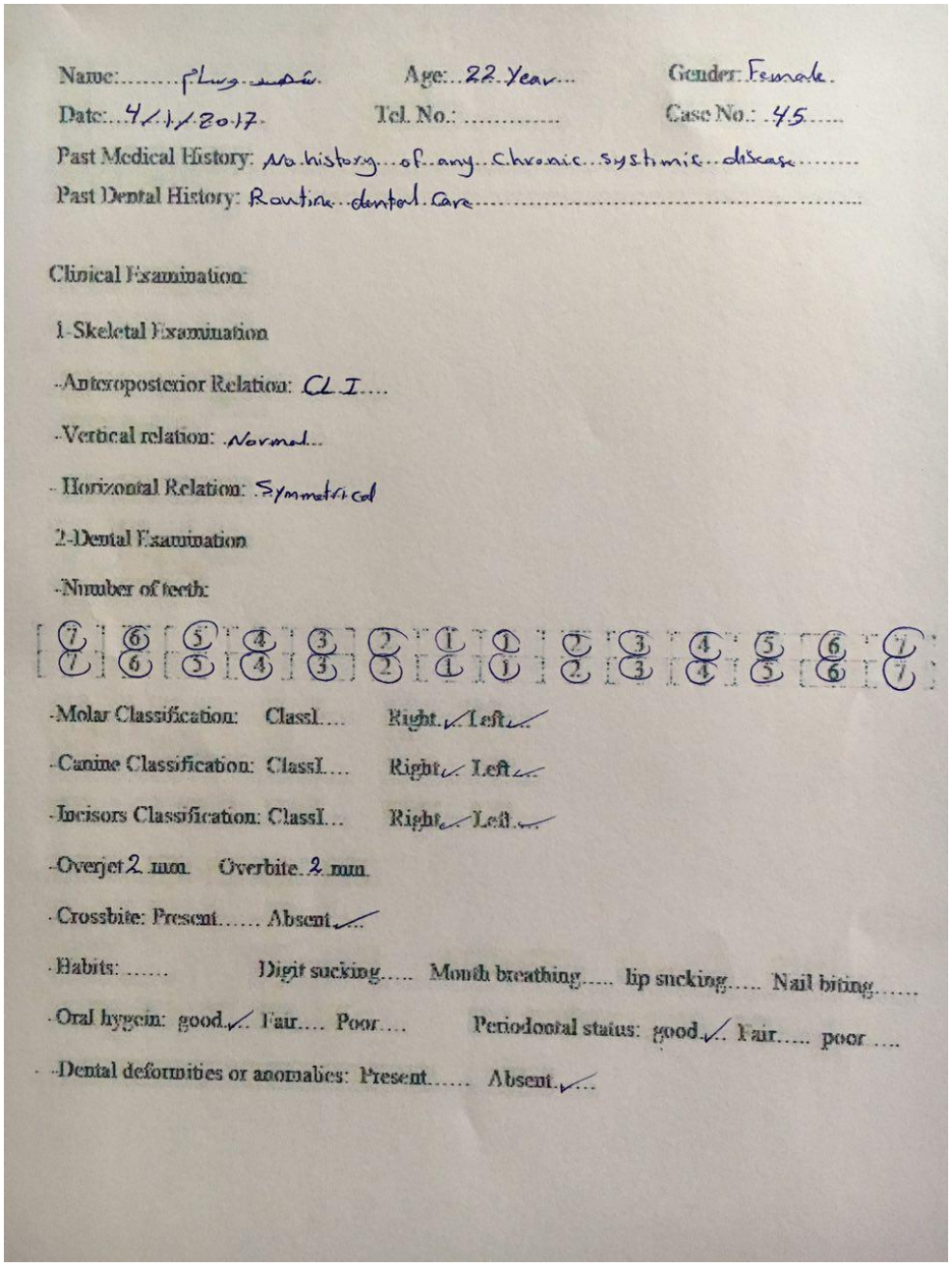
## Appendix

Sample of The case sheet that used in the study:



Name:.....Ghufran..... Age:...22.Year... Gender: Female.

Date:...4/1/2017. Tel. No.: ..... Case No.: .45.....

Past Medical History: No history of any chronic systimic disease.....

Past Dental History: Routine dental care.....

Clinical Examination:

1-Skeletal Examination

-Anteroposterior Relation: CL I....

-Vertical relation: .Normal...

- Horizontal Relation: Symmetrical

2-Dental Examination

-Number of teeth:

-Molar Classification: ClassI.... Right.✓ Left✓

-Canine Classification: ClassI.... Right✓ Left✓

-Incisors Classification: ClassI... Right✓ Left✓

-Overjet 2 mm. Overbite. 2 mm.

-Crossbite: Present..... Absent✓...

-Habits: ..... Digit sucking..... Mouth breathing..... lip sucking..... Nail biting.....

-Oral hygein: good✓.. Fair.... Poor.... Periodontal status: good✓.. Fair..... poor ....

-Dental deformities or anomalies: Present..... Absent✓...