



**Ministry of Higher Education
And Scientific Research
University of Babylon College
of Dentistry**



Orthodontic Treatment challenges

***A research submitted to the department of Orthodontics, in
the College of Dentistry, Babylon University as a partial
requirement of degree of bachelors (B.D.S.)***

Supervised by:

**Lecturer Dr. Lamis Khidher Mohammed Al- Maawi
B.D.S., M.Sc.(orthod)**

And

**Lecturer Dr. Issam M. Abdullah
B.D.S., M.Sc.(Ortho.)**

Done by:

Abdul Aziz Hassan

And

Haider Mohammed

2022 A.D

1443 H.D

Contents

Abstract.....	3
Introduction.....	4
Aim Of The Study.....	5
Chapter One: Review of Literature.....	7
1- what is the orthodontics.....	7
2- the important of orthodontics.....	7
3- who seeking orthodontic therapy.....	7
4- Advantages and dis advantages.....	10
5- Complication of orthodontics.....	11
Chapter two : Material and methods.....	14
1- study group.....	14
2- survey form.....	14
3- data collection.....	16
Chapter Three : Results.....	17
Chapter Four : Discussion	21
Chapter five : Conclusions.....	27
Chapter six : References.....	29

Abstract

Objective of the study To find out the main Reasons of the rejection and the reluctance of some persons with maligned teeth for the orthodontic therapy and find the solution to them.

Material and method: we do a survey that was created by Google Form in Arabic language and then published on social media, targeting all segments of society, and both gender.

Results: data was collected from 208 persons and statistically analyzed and the result was most patients refuse to undergo orthodontics due to the high cost of the orthodontic device by 29% out of the total , as well as the long time taken for treatment by about 24%.

Conclusion: from the result of the study we concluded that the cost and the time are the most common causes of the rejection of most patients for orthodontic therapy .

Introduction

The orthodontics according to **Noyes in 1911** is the study of the relation of the teeth to the development of the face and the correction of arrested and perverted development, while the **British Society of Orthodontics in 1922** defined orthodontics as the study of growth and development of the jaws and face particularly, and the body generally, as influencing the position of the teeth: the study of action and reaction of internal and external influences on the development, and the prevention and correction of arrested and perverted development.

Many patients seeking orthodontic therapy for aesthetic reasons , according to **Laura Mitchell in 2007** the most important objectives of orthodontic treatment are the aesthetics , dental health, function ,and stability.

For every orthodontist there are many challenges he will face them in each received case of malocclusion , for example ; the severity of malocclusion: as minor tooth spacing and crowding can be corrected in a year or less, while more severe conditions such as a malocclusion class II or class III can take longer to correct, and the age and the cooperation of the patient: as the patient age determines how long braces should be placed on a tooth. Anyone of any age can benefit from orthodontics, but children and teens get better and faster results with orthodontic treatment. Orthodontics in adolescence is treated faster, easier and more comprehensively. Orthodontics in adults takes place longer due to stunted growth. Of course, this does not mean that orthodontics for all adults lasts for two years or more, but due to the goal of treatment, most adults can achieve the desired smile in a year or less, this should be clarified to all patient to understand the treatment proses, in addition to that the Cooperating with an orthodontist helps the patient get better results in less time.

There are many reasons for the patients to reject the orthodontic treatment for their malaligned teeth and to discover these reasons we do this study research.

Aim Of The Study

The aim of the study are :

To find out the main Reasons of the rejection and the reluctance of some persons with maligned teeth for the orthodontic therapy and find the solution to them .

Chapter One

Review of Literature

Chapter One

Review of Literature

1.1 What is the orthodontics

The orthodontics can be defined as 'a branch of science and art of dentistry which deals with the developmental and positional anomalies of the teeth and the jaws as they affect oral health and the physical, esthetic and mental well being of the person (Salzmann, 1943)

1.2 The important of orthodontics

According to(Gill , 2008) Orthodontic treatment is commonly undertaken for the management of malocclusion. Malocclusion is any deviation from normal or ideal occlusion. It should not be considered as a disease but a variation of normal. When such a deviation impacts on an individual's psychological or dental health one should consider orthodontic treatment. Besides the management of malocclusion, orthodontics is increasingly being undertaken to enhance the results of other forms of dental and surgical treatment (multidisciplinary care,. For example, orthodontics can be used to facilitate: restorative treatment , the management of severe skeletal discrepancies in combination with orthognathic surgery; and management of cleft lip and palate , management of severe craniofacial deformity , management of obstructive sleep apnoea.

1.3 Who seeking orthodontic therapy:

According to **Sridhar Premkumar, 2020** the following problems and mal functions represented the most common reasons for persons to seek orthodontic therapy :-

1.3.1. Psychological and social problems

- Irregular and protruding teeth have a negative impact in a patient's psychology.
- Children with malocclusion become introvert.
- Their social behaviour is immature.

1.3.2. Poor appearance

Poor appearance due to malocclusion affects a child's performance in school as well as in play.

- Treatment should be initiated to improve the self-confidence of the patient. Preventive or interceptive measures should be attempted.

1.3.3. Interference with growth and development

Abnormal finger-sucking habit, a perverted perioral muscle activity, could cause morphological and functional changes to the dentition.

- Common effect of abnormal perioral muscle activity is posterior crossbite.
- Many a time functional aberrations will lead to unilateral crossbite which, in turn, will cause facial asymmetry.
- Abnormal tongue posture breathing will cause supraeruption of the posterior teeth, thereby increasing the facial height.

1.3.4. Abnormal muscle function

- Abnormal muscle activity could contribute to malocclusion or sometimes a resultant of malocclusion.
- In the case of lip trap., cushioning of lower lip behind the proclined upper incisor will aggravate the proclination. Correction of proclination will correct or eliminate lip trap.

1.3.5. Improper deglutition

- In abnormal swallowing, muscles of facial expression are involved and can cause or aggravate the malocclusion.

1.3.6. Mouth breathing

In many cases, reduction of increased overjet activates upper lip, makes lip closure possible to establish anterior oral seal and stimulates nasal breathing.

1.3.7. Improper mastication

Malaligned teeth initiate different pattern of chewing. Different patterns of chewing can lead to temporomandibular joint (TMJ) and periodontal problems.

1.3.8. Speech defects

Malocclusion affects the speech pattern of individuals.

- Effects of cleft lip: Speech problem in cleft patients are due to velopharyngeal incompetence, naso-oral communication, abnormal tongue posture and function and lip tissue inadequacy.

1.3.9. Increased susceptibility to caries and periodontal diseases

- Irregular teeth make self-cleansing of oral cavity less effective.
- This leads to increased susceptibility to caries and periodontal diseases. Loss of tight contacts and abnormal axial inclinations could lead to uneven distribution of functional stresses. This also leads to periodontal problems.

1.3.10. Predilection to periodontal disease

- The systematic review on the effects of a malocclusion on periodontal health suggests that subjects with a malocclusion have worse periodontal health than subjects without a malocclusion.

1.3.11. Temporomandibular joint disorders

- Malocclusion causes TMJ problems like clicking, pain and crepitus.

1.3.12. Malocclusion and trauma

- One of the most common problems seen in class II division 1 malocclusion is trauma to maxillary anterior teeth.

1.3.13. Impacted and unerupted tooth

- Interferes with eruption of the successor OR neighbouring tooth.
- Causes resorption of the roots of the adjacent tooth.
- Creates possibility of development of cysts due to impacted/unerupted tooth.

1.3.14. Prosthetic rehabilitation problems

- Supraeruption of the tooth into opposing edentulous area and tipping of teeth into adjacent edentulous area cause space problems for prosthetic rehabilitation.
- Stress distribution in a tipped tooth when taken as an abutment is not even.

1.4 Advantages and disadvantages of orthodontic treatment

According to (Laura Mitchell in 2013)

1.4.1 Advantages of orthodontic treatment

Improved function . and Improved aesthetics and Psychological benefits

1.4.2 Disadvantages of orthodontic treatment: 1- Root resorption: It is now accepted that some root resorption is inevitable as a consequence of tooth movement. On average, during the course of a conventional 2year fixed-appliance treatment around 1 mm of root length will be lost

2- Loss of periodontal support :As a result of reduced access for cleansing, an increase in gingival inflammation is commonly seen following the placement of fixed appliance

3- Decalcification: Caries or decalcification occurs when a cariogenic plaque occurs in association with a high-sugar diet. The presence of a fixed appliance predisposes to plaque accumulation n as tooth cleaning around the components of the appliance is more difficult

4- Soft tissue damage :Traumatic ulceration can occur during treatment with both fixed and removable appliances. although it is more commonly seen in association with the former as a removable appliance which is uncomfortable is usually removed.

1.5 Complication of orthodontic treatment

According to **Sridhar Premkumar, 2015** the most common complications of any orthodontic treatment can be summarized by the followings effects :-

1.5.1 Intraoral effects: these effects included:-

1.5.1.1 Periodontal inflammation: Gingivitis, periodontitis and burns due to etchant or during thermal bonding can happen.

- Alveolar bone loss: Minimal crestal bone loss of about 0.5-1 mm occurs. Long-term effect also is minimal.
- Mucosal trauma: Ulcerations from distal ends or long spans of arch wire. Initial ulcerations from brackets, acid burn following etching and injury due to displacement of face-bows have been reported.

1.5.1.2 Damage to crown: Decalcification occurs due to attack by acidic byproducts of plaque metabolism.

1.5.1.3 Trauma to enamel: Due to burs used, most common during debonding procedure.

1.5.1.4 Root resorption

1.5.1.5 Pulp damage: Pulpitis is common but rarely leads to loss of vitality. Previous history of trauma to be assessed.

- Allergy: Nickel hypersensitivity reactions have been reported, but they are rare. If established by patch testing, remove the sensitizing agent.

1.5.2 Extra oral Effects : these are may be included :-

- TMJ: Temporomandibular joint problems are seen in adult patients. Evidence to support that orthodontic treatment causes (TMJ) symptoms is weak. Soft diet, muscle exercise and analgesics to be advised as necessary. Class II elastics and headgear therapy to be discontinued.
- Eye: Ocular injuries due to face-bow accidents have been reported.
- Skin: Bruising associated with neck straps; injuries due to displacement of headgear; pressure alopecia in scalp following headgear therapy.
- Allergy: Contact dermatitis due to nickel. Type IV sensitivity reactions have been reported. Patch test to be done to establish cause.
- Alopecia: Hair loss following headgear therapy has been reported.

1.5.3 Systemic Effects : these are may be included :-

- Bacteremia following banding and placement of separation.
- Cross-infection due to improper sterilization.: Rarely radiation hazard, if the patient is exposed for too many radiographs.

1.5.4 Psychological Effects : these are may be included :-

- Patients may not be satisfied with the treatment due to high expectations.
- Teasing by peers also is a problem.
- Failed treatment

Chapter two

Material and methods

Chapter Two

Materials and Methods

2.1 Study group

This study was conducted for a total of ٢٠8 persons from both gender with aged range of (١٥-٣٠) years old . Through a survey that was created by Google Form in Arabic language as in figure (2.1) and then published on social media, targeting all segments of society, including university students, middle school students, employees and the unemployed in the Provinces : Baghdad, Mosul, and Babylon\ Iraq.

2.2 Survey form

There are a lot of people with maligned teeth or poor jaws relationship and till now refused the orthodontic treatment for many reasons from their point of views. Accordingly, this study survey was created on 05/1/2022 and the data was collected from 20/1/2022 to 6/4 / 2022 to find out these reasons, So the title of this survey was:

What are the reasons for not doing orthodontic treatment for your maligned teeth yet?(Select one or more)

- 1- Unable to bear the cost of treatment
- 2- The shape of the orthodontic is embarrassing and not beautiful
- 3- Fear of infection as a result of the COVID-19
- 4- Orthodontic treatment requires a long time
- 5- I do not have enough information about orthodontics
- 6- I refused treatment because I heard bad experiences for some patients
- 7- Because of the difficulties that accompany the orthodontic from pain and difficulty in eating
- 8- I don't know if I need orthodontic treatment or not
- 9- Because I think that at my age it is not possible to perform orthodontic treatment for my teeth

ما هي أسباب عدم إجراء علاج تقويم الأسنان لأسنانك حتى الآن؟ اختر واحد أو أكثر .. *

☐ غير قادر على تحمل تكلفه العلاج

☐ شكل التقويم محرج وغير جميل

☐ التخوف من العدوى جراء جائحه كوفيد 19

☐ علاج التقويم يتطلب وقتا طويلا

☐ لا املك معلومات كافية عن التقويم

☐ رفضت العلاج لان سمعت تجارب سيئة لبعض المرضى

☐ بسبب الصعوبات التي ترافق التقويم من الام وصعوبه في الاكل

☐ لا اعلم اذا كنت بحاجة الى تقويم لاسناني ام لا

☐ لاني اعتقد ان بعمرى هذا لا يمكن اجراء علاج التقويم لاسناني

Fig.(2.1): Google form of study survey.

2.3 Data collection

After we collected data information from survey for ٢٠8 people we found that :

- 1- 101 person chose this answer (Unable to bear the cost of treatment)
- 2- 82 person chose this answer (Orthodontic treatment requires a long time)
- 3- 35 person chose this answer (The shape of the orthodontic is embarrassing and not beautiful)
- 4- 27 person chose this answer (Fear of infection as a result of the COVID-19)
- 5- 23 person chose this answer (I do not have enough information about orthodontics)
- 6- 17 person chose this answer (I refused treatment because I heard bad experiences for some patients)
- 7- 23 person chose this answer (Because of the difficulties that accompany the orthodontic from pain and difficulty in eating)
- 8- 25 person chose this answer (I don't know if I need orthodontic treatment or not)
- 9- 13 person chose this answer (Because I think that at my age it is not possible to perform orthodontic treatment for my teeth)

2.4 Statistical analysis

The data after its collection was analysis by Microsoft Excel 2010 statistic and the percentage of each reason out of 100% was depend as a result .

Chapter Three

The Results

Chapter Three

The Results

After creating the survey, data was collected from 208 persons and statistically analyzed and the results were as shown in the **table 1**.

Table.1 : Percentage of each reason in the google form of survey .

Reasons	No	Percentage %
Total number of persons that answer the survey	208	
Total number of responses for all reasons	346	
Cost	101	29%
Time	82	24%
Esthetic	35	10%
Infection (Covid-19)	27	8%
I don't know if I need orthodontic treatment or not	25	7%
Education	23	7%
Pain	23	7%
Bad experiences	17	5%
Age	13	4%
Total	346	100%

Total number of persons that answered the google form of survey was 208 persons and Total number of responses for all reasons questions was (346), and the number of selection of each reason and the percentage that came out according to the survey was as follow:-

(Cost)Unable to bear the cost of treatment:- 101 select answers that represented (29%)

(Time)Orthodontic treatment requires a long time:-82 select answers that represented (24%).

(Esthetic)The shape of the orthodontic is embarrassing and not beautiful :- 35 select answers that represented (10%).

(Infection (Covid-19) Fear of infection as a result of the COVID-19:- 27 select answers that represented (8%).

I don't know if I need orthodontic treatment or not :- 25 select answers that represented (7%)

(Education) I do not have enough information about orthodontics :- 23 select answers that represented (7%)

(Pain) Because of the difficulties that accompany the orthodontic from pain and difficulty in eating :- 23 select answers that represented 7%) .

(Bad experiences) I refused treatment because I heard bad experiences for some patients:- 17 select answers that represented 5%).

(Age) Because I think that at my age it is not possible to perform orthodontic treatment for my teeth:- 13 select answers that represented (4%), as shown in figure (3.1)

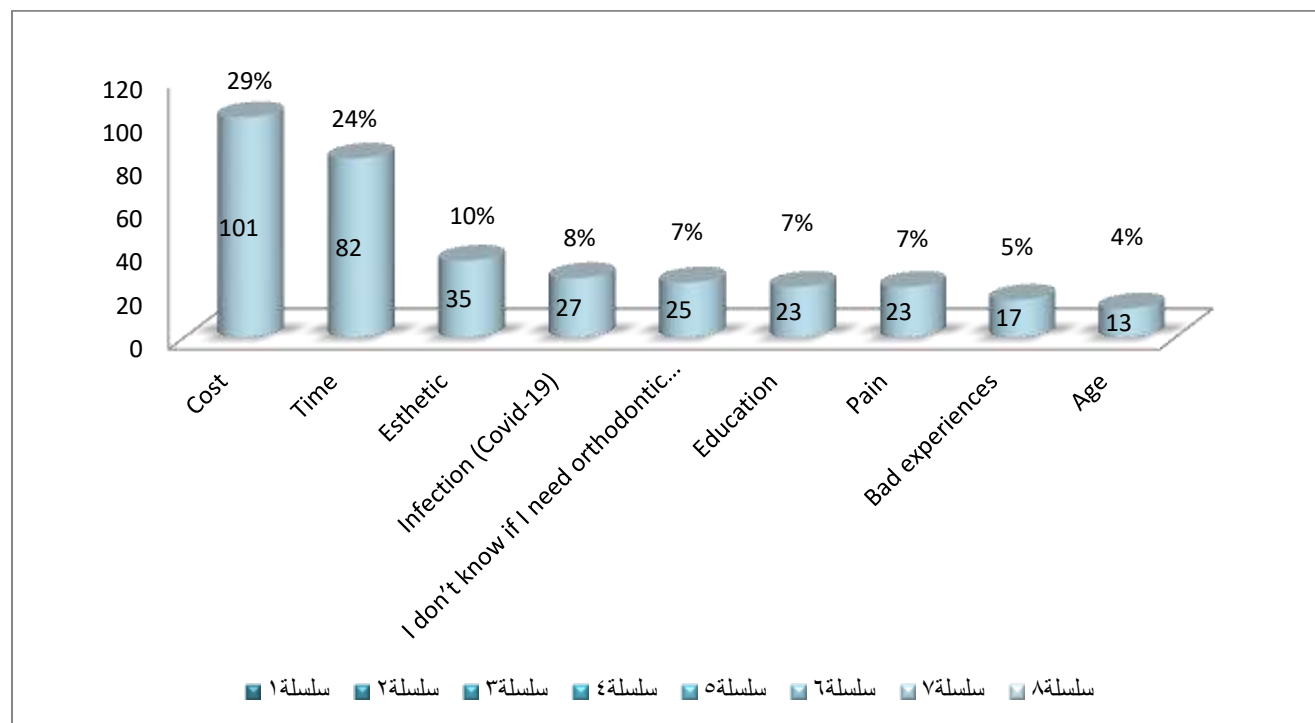


Fig.(3.1): Bar chart of the percentage of each reason put in the google form of survey

Chapter Four

The Discussion

Chapter Four

The Discussion

4.1. We note that a larger percentage of persons are selected ,the unable to bear the cost of treatment, which amounted to 101(29%) out of 346 selected answers, there are many factors that affect the cost of orthodontic treatment which may be are according to the type of deformation, method of treatment, duration of treatment, age of the patient, the severity of the deformation, dental or skeletal and the type of device used, whether the orthodontic appliance is removal or fixed, orthodontic device inside or outside the mouth, orthodontics with the same color of the teeth, or invisible braces or, lingual braces, orthodontic treatment with surgery (orthognathic surgery), use of a miniscrew or use of a Mini plate or other factors. That means If the patient tends to use clear braces (ceramic or composite), the total cost of treatment increases due to the high cost of these braces, that mean when ever the type of appliance , age ,severity of case increase the cost of orthodontic treatment increase too, in addition to that the persons economical living level represent a major factor of patient rejection of orthodontic treatment. To **solve** this reason, the patient can attend the specialized government dental centers or the clinics that work in the installment system, which makes a facilitations for the process of paying the cost of treatment by dividing it into parts.

4.2.The second biggest reason - Orthodontic treatment requires a long time which amounted to 82 (24%) out of 346 selected answers , An orthodontic procedure takes 6 to 24 months whether you use traditional braces or invisible (clear) braces. If the severity of dental problems is less, the treatment will take place in a shorter period and for more complex problems, the treatment period will be longer. An orthodontist usually suggests the fastest and safest way to straighten the teeth, and as he move the teeth together with the gums and jaws toward their original position, so speeding up the process can lead to problems such as bone loss and gum resorption. Generally there are many Factors Affecting Duration of Orthodontics work differently for each patient because

each person's mouth is unique. Although it is not possible to determine the exact duration of orthodontics, it is possible to point out the most common factors that play an important role in determining this duration which should be clarified for patient to make him understand his case of malocclusion and accept the time that need to complete the orthodontic treatment for him:-

The Age is the first factor that determines how long braces should be placed on a tooth. Anyone of any age can benefit from orthodontic treatment , but children and teens get better and faster results with orthodontic treatment. Orthodontics in adolescence is treated faster, easier and more comprehensively. Orthodontics in adults takes place longer due to stunted growth. Of course, this does not mean that orthodontics for all adults lasts for two years or more, but due to the goal of treatment, most adults can achieve the desired smile in a year or less this.

The Severity of dental problems represented another key point in this discussion as minor tooth spacing and crowding can be corrected in a year or less, while more severe conditions such as a malocclusion class II or class III can take longer to correct.

The cooperation and commitment of patient : Patient adherence to orthodontic treatment plays a very important role in the duration and outcome of orthodontic treatment. The patient's lack of cooperation can prolong orthodontic treatment and reduce the quality of the end result. Cooperating with an orthodontist helps the patient get better results in less time. Collaboration includes orthodontic dental hygiene, regular attendance at orthodontic appointments, and use of orthodontic braces as instructed.

4.3 (Esthetic) The shape of the orthodontic is embarrassing and not beautiful .which amounted 35 (10%) persons out of 208 .

The first thing that comes to mind when mentioning orthodontics is the usual metal braces, which some hate its shape, color, appearance or smile with. This is because some people avoid laughing, smiling, and talking a lot in public and in front of strangers because they hate their appearance and are embarrassed by their appearance. With age, the feeling of embarrassment increases from appearing in public places, social events, and sometimes the workplace itself,

with dark braces on your teeth, and it may bring back memories of that dark period of your childhood. For this reason, cosmetic dentistry is keen to provide alternative solutions that serve the same purpose and result, but with fewer defects and greater self-confidence. Transparent orthodontics came as a prominent solution that was able to combine the cosmetic need to adjust and straighten teeth, and overcome the disadvantages of the embarrassing appearance of regular braces so that it is almost invisible at all.

What is transparent orthodontics?

Clear orthodontic braces are invisible braces that are more flexible than dark metal braces and clear wires in order to treat dental problems such as straightening crooked, malaligned and spaced teeth, returning them to a natural-looking single row and not losing

self-confidence during a smile.

4.4 Fear of infection as a result of the COVID-19 which amounted 27 (8%) out of 346 selected answers , Also, Covid-19 played an important role in not seeking of some persons to orthodontic treatment because fear of spreading an epidemic that transmitted through the mouth . We note, according to this study, that Covid-19 is transmitted through the mouth and is also related to some oral diseases such as gingivitis, dry mouth, etc. , and this affect on seeking willings of people for orthodontic treatment and so represented a challenge to the dentist who dealt with this epidemic, this result come in agree with result of **Morosan,Hariclea , 2021** who found that the Covid-19 pandemic had severe effects on orthodontic treatments; as many orthodontists noticed a delay for about one-third of their patients. However, from the patient's point of view, half believe that their treatment was negatively affected by the Covid-19 pandemic in different degrees. Almost all orthodontic patients found a safe place when coming to the orthodontist's office every month, meaning they trust their doctor and believe that the new regulations are effective.

4.5 I don't know if I need orthodontic treatment or not:- this reason which amounted 25 (7%) out of 346 selected answers , generally there are many common signs and symptoms refer to indicate that an adult or child needs orthodontic treatment according to **Sridhar Premkumar, 2020** ,the causes of why most people do not know these signs and symptoms are related to the lack of community awareness about the orthodontic field and this can be avoided or reduced by spreading the dental health awareness and everything related to orthodontic through television dental health programs and social media.

4.6 According to the result there are (7 %) of persons not orthodontics their teeth Because of the difficulties that accompany the orthodontic from pain and difficulty in eating, Experiencing mild pain and discomfort, common in orthodontic treatment. Pain is a mental response to stimuli during orthodontic treatment and is one of the main reasons patients abandon orthodontic treatment. This cause also related to the lack of community awareness about the orthodontic field as mentioned previously and this can be avoided and reduced by spreading the dental health awareness and everything related to orthodontic through television dental health programs and social media in it should be clarified for all the people that any orthodontic treatments such as placing braces and wires on the teeth and placing fixed and removal devices, cause mild pain to the patient, and fortunately, this pain does not accompany the patient throughout all the treatment period, and it is not as bad as the person imagines, but in fact, the patient feels pain in the gums and teeth at first when orthodontic installation, and each time the orthodontist activation the orthodontic wires, generally, the feeling of pain and discomfort disappears within a few days, and to reduce this feeling we should be explained for persons that they will follow some instructions which will relieve the feeling of pain. but also it is really important that the person make conscious choices for his food during this time; as hard or sticky foods can damage the orthodontic brackets and may cause pain in the days following alignment, so we advised patient to avoid hard foods and eat soft foods.

4.7 I do not have enough information about orthodontics :this reason which amounted 23 (7%) out of 346 selected answers, as we mention previously this come as a result of the lack of community awareness about the orthodontic field , so we encourage the community to read everything about the topics and reviews the orthodontist to know its goals, benefits, , cases of treatment and its cost until to get enough information about orthodontics, so researching a topic will help them to get enough information on the orthodontic treatment.

4.8 I refused treatment because I heard bad experiences for some patients. which amounted 17 (5%) out of 346 selected answers .Some patients report bad experiences about orthodontics, such as pain, gum disease, pigmentation on the surface of the tooth and decay, etc. Some patients refrain from undergoing orthodontic treatment because of the bad experiences they heard from others. Therefore, the patient should consult an orthodontist to clarify everything about the treatment and not depend on experiences of other patients, so the orthodontist can for example explain to the patient that the irregular teeth can be the cause of many problems, especially cosmetic problems as there will be difficulty to clean them, which means an increase the risk of caries and gum disease.

4.9 Because I think that at my age it is not possible to perform orthodontic treatment for my teeth . which amounted 13 (4%) out of 346 selected answers, There are many misconceptions about orthodontics among the people in our community as we mentioned previously ,including they believe that orthodontic treatment is limited to a certain age, as most people believe that orthodontics should begin after the completion of all teeth eruption at the age of 12 years, which is a misconception as it applies to approximately 75% of cases only, while the remaining 25% require early treatment starting from the age of 7 years, according to type of problem. The American Orthodontic Association recommends making the first visit to the orthodontist at the age of 7 years, and the calendar at this age is often for problems of the jaws and to treat bad oral habits. So the education about the orthodontics is required for all age group in our community clarifying that any orthodontic case can be treated at any age if there is a healthy bone, healthy gums and good oral care.

Chapter Five

Conclusions and Suggestions

Chapter Five Conclusions and Suggestions

Conclusions

We concluded from this study that most patients and people refuse the orthodontics therapy even though they need it due to the high cost of the orthodontic treatment as well as the long time of treatment period.

Suggestions

As a solution for these causes and orthodontic challenges we suggested the following :-

- 1- The government should be help to provide financial support for health centers to reduce costs for citizens
- 2- Opening of private orthodontic centers that provide installments system
- 3- Increasing awareness of dentistry and orthodontics by publishing television programs and social media programs
- 4- Spreading dental culture among children and their families through educational institutions.

Chapter six

The References

References

1. British Orthodontic Society. Guidelines for referrals for orthodontic treatment. (accessed 9 January 2015).
2. Czeisler MÉ, Tynan MA, Howard ME, et al. Public attitudes, behaviors, and beliefs related to COVID-19, stay-at-home orders, nonessential business closures, and public
3. Daljit S. Gill. Orthodontics at a Glance . 2008
4. Enrico G, Elisabetta P, Giulia T, Paolo C. Dentistry and Covid-19 pandemic: operative indications post-lockdown. *New Microbiol.*
5. Gurkeerat Singh . Textbook of orthodontics . second Edition 2007
6. Laura Mitchell , Simon J. Littlewood , Zararna L. Nelson-Moon .introduction of orthodontics . 2007
7. Laura Mitchell. an introduction to orthodontics. fourth Edition 2013.
8. Proffit, W.R., Fields, H.W., Larson, B. and Sarver, D.M., 2007. Contemporary orthodontics-e-book. Elsevier Health Sciences.
9. Qiu J, Shen B, Zhao M, et al. A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations. *General Psychiatry*. 2020;33:e100213. doi: 10.1136/gpsych-2020-100213
10. Roberts-Harry D, Sandy J . Orthodontics. Part 1: Who needs orthodontics? *Br Dent J* 2003; **195**: 433–437.
11. sridhar premkumar . essential of orthodontics . 2015
12. sridhar premkumar . Textbook of orthodontics . 2020
13. Suri S, Vandersluis YR, Kochhar AS, Bhasin R, Abdallah MN. Clinical orthodontic management during the COVID-19 pandemic. *Angle Orthod.* 2020;
14. World Health Organization Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected - Interim guidance. 2020 Available Accessed April 5, 2020.