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Anxiety levels in adult patients in the dental office of the universities' master degree programs: Advanced orthodontics versus advanced oral surgery and implantology. An observational study

Presented by: Georgia Victoria Schmitt-Gomez

Tutor: Mónica Isabel Perdomo Lovera

Campus de Valencia
Paseo de la Alameda, 7
46010 Valencia
universidadeuropea.com

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1. ABSTRACT

Introduction: Dental anxiety is categorized by fear triggered by the thought and action of visiting the dentist, or over dental procedures. Dental anxiety affects the patient with fight or flight, exhaustion, fears, as well as avoidance related to eating, hygiene, and social interactions. If not diagnosed, understood or prevented it can complicate, delay or completely prevent the realization of the needed treatments.

Objectives: To determine if the masters degrees (advanced orthodontics, advanced oral surgery and implantology), as well as gender, age, education, nature of necessity of treatment, as well as previous treatment, influence anxiety levels in patients.

Materials and Methods: A total of 71 patients surveys were collected between January and April 2024, of which 31 were from the implantology masters program, and 40 from the orthodontics masters program. The survey used in this study was the Dental Anxiety Scale in a QR format, including questions to inquire about their gender, age, education level, nature of treatment coming in for, and first time visit. A sample of patients who met inclusion and exclusion criteria were selected. A confidence level of 95% was established, chi-square test and Mann-Whitney test were done, and results with p-value of <0.05 were considered statistically significant.

Results: For all objectives stated, results showed that there was no statistical significance ($p>0.05$) on either of the groups (masters degree, age, gender, education, treatment necessity, first visit) on the level of anxiety the patients experienced.

Conclusion: The most prevalent anxiety level in both masters programs have concluded to be “mild anxiety”. The masters program, gender, age group, education level, necessity of treatment, first time visit didn’t have an influence on the level of anxiety of patients.

Keywords: dental anxiety, DAS, orthodontics, implantology, dental university clinic

2. RESUMEN

Introducción: La ansiedad dental se categoriza como el miedo desencadenado por el pensamiento y la acción de visitar al dentista, o sobre los procedimientos dentales. La ansiedad dental afecta al paciente con lucha o huida, agotamiento, miedos, así como evitación relacionada con la alimentación, la higiene y las interacciones sociales. Si no se diagnostica, comprende o previene puede complicar, retrasar o impedir completamente la realización de los tratamientos necesarios.

Objetivos: Determinar si las titulaciones de máster (ortodoncia avanzada, cirugía oral avanzada e implantología), así como el género, la edad, la educación, la naturaleza de la necesidad del tratamiento, así como los tratamientos previos, influyen en los niveles de ansiedad de los pacientes.

Materiales y métodos: Se recogieron un total de 71 encuestas a pacientes entre enero y abril de 2024, de las cuales 31 eran del máster de implantología, y 40 del máster de ortodoncia. La encuesta utilizada en este estudio fue la Escala de Ansiedad Dental en formato QR, que incluía preguntas para indagar sobre su sexo, edad, nivel de estudios, naturaleza del tratamiento por el que acudían y primera visita. Se seleccionó una muestra de pacientes que cumplían los criterios de inclusión y exclusión. Se estableció un nivel de confianza del 95%, se realizaron pruebas de chi-cuadrado y de Mann-Whitney, y los resultados con un valor p <0,05 se consideraron estadísticamente significativos.

Resultados: Para todos los objetivos planteados, los resultados mostraron que no existía significación estadística (p>0,05) en ninguno de los grupos (máster, edad, sexo, educación, necesidad de tratamiento, primera visita) sobre el nivel de ansiedad que experimentaban los pacientes.

Conclusiones: Se ha concluido que el nivel de ansiedad más prevalente en ambos másteres es «ansiedad leve». El programa de máster, el sexo, el grupo de edad, el nivel educativo, la necesidad de tratamiento y la primera visita no influyeron en el nivel de ansiedad de los pacientes.

Palabras clave: ansiedad dental, DAS, ortodoncia, implantología, clínica dental universitaria

3. KEY WORDS

I. Dental anxiety
II. Dental anxiety scale
III. Orthodontics
IV. Implantology
V. Dental university clinic

4. INTRODUCTION

4.1 General Anxiety

One of the most common mental disorders in the world is generalised anxiety disorder with its prevalence being highest in high income countries. Characteristically we find excessive fear, anxiety or even impairing avoidance to perceived threats to certain situations, objects, or thoughts (1). Very often symptoms of a generalised anxiety disorder can overlap with other common mental disorders, and its symptoms aren't necessarily connected to specific events, although it can be worsened by some situations. Generalised anxiety disorder has received its label in 1980 and has been classified before that as anxiety neurosis by Freud in 1894 (2).

Generalised anxiety produces several symptoms, which can be derived from several roots such as finance, family health, or future and have symptoms and outcomes on different levels of severity, possibly deriving from stress, other comorbidities, genetic predisposition, environmental factors, or substance use. Other factors that are commonly found in close association with are females, stressors, lower education level, marital status, and poorer health (3).

It's also important to understand the difference between fear and anxiety before diving deeper into the details of anxiety, its' classifications and its' specifications.
Fear is directly related to the presence of a stimulus triggering the response, whilst anxiety is moreover the state and responses to an expectation of the occurrence of an event, situation or state. Studies in rodents have even shown that the brain mediates different parts for fear and anxiety (4).

Fear is triggered by a perceived threat or danger, and anxiety is the personal evaluation, and expectation of either present, perceived, real or imagined danger. They are both part of the bodies' normal response to threat, but require attention if the response is considered unreasonable or exaggerated and interrupts or affects a persons everyday activities (1).

Studies have shown that if parents are suffering from a panic disorder, generalised anxiety disorder or a specific phobia, the risk of their offspring developing the same or a similar disorder is three to five times as high. Other factors such as

classical and operant conditioning, or a persons personal development and personality traits such as neuroticism play a role in the acquisition, evolution or development of these disorders (5 ,6, 7).

4.1.1 Epidemiology

Approximately 38.2% of the population of the European Union suffers from a mental disorder each year, which is 10,8% higher compared to the results in 2005. This is due to several factors, including new disorders and different population age involvement. The most common disorder being anxiety disorders at 14.0% (8).

Anxiety disorders are the most common mental disorder in the European Union, and by the World Health Organisation it is ranked on place six of all mental disorders worldwide. It is more commonly seen in people aged between 14-65 and more often documented in women. Typically we find anxiety disorders beginning in early childhood, most commonly specific and social phobias, where in 2-3% of children separation anxiety can persist into school age years where treatment might be indicated if it disturbs execution of everyday activities (5, 9, 10).

4.1.2 Physiopathology

Although not entirely yet understood, it is believed that anxiety disorders derive from a disruption in modulation within the nervous system, which produce physical and psychological manifestations. Most commonly we find involvement of the serotonergic and noradrenergic neurotransmitter systems, meaning there is a hypo function of the first, and a hyper function of the latter (11, 7).

It is also believed that the interruption of the gamma-aminobutyric acid system is also involved in the pathophysiological role of anxiety and panic symptoms due to the successful regulation of the bodily response with benzodiazepines (7).

4.1.3 Prevalence

There is a difference in the occurrence and prevalence of anxiety depending on the country, all over the world. But it can be said that there are certain anxiety disorders that are seen more commonly, which by the world mental health survey would be specific phobias, whereas agoraphobia is less commonly diagnosed. It has also been determined that anxiety disorders can be seen at a much earlier age than other psychological mood disorders. Anxiety disorders are more commonly seen in women

and typically are comorbid and seen with other psychological mood disorders together. Separation anxiety is also being paid more attention to in the recent years, due to the fact that it is not only seen, and has been studied in, in children, but has been less focused on with adults (10, 12).

World-wide general anxiety disorder is to be estimated between 2.8-6.6% in adults worldwide, with the highest age group being in the 45-55 year age category, and women being affected twice as much compared to men. Another study has confirmed that in the age group above 55, general anxiety disorder is said to be the most common anxiety disorder, being 10.2% (13).

4.1.4 Classification

Generalised Anxiety Disorder:

During everyday situations, problems and occasions; anxious worry, tension, and fears about daily activities, situations, occasions, problems and events are being experienced (5).

Panic Disorder:

Individual experiences panic attacks or anxiety attacks on a reoccurring and unexpected level with clinical and mental symptoms and manifestations such as palpitations, nausea, burning/prickling or numbing sensation, sweating, shortness of breath, fear of losing control, and mortal fear (5, 14).

Agoraphobia:

Individual experiences fears involving situations such as leaving home, going into stores, entering crowds or other public areas, and also traveling alone in public transportation like buses, trains or planes (5, 14).

Social phobia:

Individual experiences a certain fear of inspection by a group of persons which leads to avoidance of social situations. More pronounced versions of social phobia can present themselves with a lower self-esteem, fear of criticism, blushing, nausea, and tremor (5, 15)

Specific phobia:

Individual experiences fear and avoids specifc/certain situations, and/or objects for example: animals, environmental/nature events, injections, blood/injury or other fear inducing/triggering events, situations and objects (5).

Selective mutism:

Individual experiences partial or total absence of their ability to speak in certain settings under certain circumstances but are able to speak normally in other situations, such as their home (5, 16).

Separation anxiety:

Individual experiences exaggerated, unrealistic and persisting worry and fear about injury towards or losing significant people in their lives, or experiences excessive fear about being away from their significant people or home (5, 17).

4.1.5 Clinical manifestations

The diagnostic and statistical manual of mental disorders, fifth edition (DSM-5) is the taxonomic and diagnostic tool published by the American psychiatric association, which includes the following diagnostic criteria for generalised anxiety disorder:

Anxiety and worry being categorised as excessive and difficult to control, about a number of events or activities, with a duration of most days for at least 6 months. These would come with at least 3 of the 6 specified symptoms which are: 1. Restlessness, 2. Easily fatigued, 3. Difficulty concentrating, 4. Irritability, 5. Muscle tension, 6. Sleep disturbance (18, 2, 19).

Along with the previous mentioned list of diagnostic signs, we also find the typical self-reporting symptoms of anxiety, being: negative thoughts, feelings of dread, apprehension and dwelling, as well as measurable factors such as: an increased heart rate, and increased sweat activity. We also detect visible/physiological factors, such as dry mouth, fainting, hyperventilation, sweat, flushed face, muscle tension and stomach ache (20, 14).

4.1.6 Treatment

For general anxiety disorder it is usually decided whether the patient received medication, psychological therapy or a combination of the two. It is said that general anxiety disorder is a chronic and relapsing disorder, meaning that when undergoing medication therapy it should be done for a course of one year.

When undergoing psychological treatment, cognitive behavioural treatment is the one typically of choice, usually in combination with benzodiazepine (diazepam) treatment due to a better treatment outcome than taking the medication alone (13).

According to the world federation of societies of biological psychiatry, serotonin reuptake inhibitors, selective norepinephrine reuptake inhibitors, and pregabalin were first line options in treating generalized anxiety disorders. And Benzodiazepines were useful and used in treatment resistant cases with no history of substance abuse (21).

4.1.7 Comorbidities

It is common to find comorbidities of medical and psychiatric sorts in patients suffering from generalised anxiety disorders, and equally important to treat all underlying causes or illnesses. As previously listed, common symptoms seen in patients with generalised anxiety disorders are acid reflux, nausea, abdominal pain, constipation, diarrhoea, shortness of breath, chest pain or pressure, palpitations, tachycardia and dizziness (20, 21).

Studies have found that patients suffering from migraines had higher incidences of simultaneously suffering from mood disorders. The results being at 10.2% of those patients suffering from migraines, also having a generalized anxiety disorders, in comparison to 1.9% of patients with no history of migraine incidences (22). It has been reported that patients in the age range of 25-74 years suffering from chronic pain such as arthritis and back pain had much higher rates of also suffering from generalized anxiety disorder than those who didn't report chronic pain (23).

Patients suffering from anxiety were also more than four times more likely to suffer from peptic ulcer disease as well as irritable bowel syndrome (24). Patients suffering from general anxiety disorder and specific symptoms such as worry, tension, restlessness, have an increased risk of suffering any cardiovascular diseases such as angina pectoris, hypertension, myocardial infarction, etc. Twenty percent of the male population suffering from any cardiovascular disease also had a generalized anxiety disorder (21).

4.2 Generalities Dental Anxiety

When the trigger of anxiety is the thought and action of visiting the dentist, or over the dental procedures in itself, it is specified as dental anxiety; which is categorised as the fifth most common cause of anxiety (25).

The majority of studies focusing on anxiety in the dental field investigate and write about dental anxiety rather than dental phobia. Dental anxiety is defined by an increased fear towards field related procedures, that may or may not be categorised as dental phobia. There's also not a definite way of differentiating between the two, because anxiety is subjective, and all diagnosing procedures are self reporting measures (26). This study will utilise the term dental anxiety as inclusion to all, and to encompass dental fear, anxiety and phobia in writing.

Dental phobia is a by the WHO classified disease, and it is estimated to affect approximately 15-20% of the population (26). Dental phobia manifests itself similarly to anxiety but with different triggers. Dental phobia is in close relations with the dentist himself, hence it is important for him to properly detect, diagnose, identify and handle the situation. Patients suffering from dental phobia often react in postponing their treatments, hanging onto painkillers or antibiotics, essentially worsening the treatment outcome. Their triggers very often include stimuli such as syringes, ultrasonic scaler, and the instruments itself (27).

Dental anxiety also affects the patient, not only with momentary symptoms such as fight or flight response, exhaustion, fears and negative thoughts, but also avoidance related to eating, hygiene, crying, aggression, sleep health and social interactions (25). Dental anxiety has a high prevalence worldwide, and that with dental pain is one of the main causes of dental emergencies in the clinic, hence their diagnosis and prevention is of importance to ensure patient safety, and care (28).

Its' aetiology is difficult to define and track back, it could be derivative of lack of control and uncertainty in a clinical setting, but also conditioning, or indirect and direct previous experiences and learning, could play a role in its aetiology (20).

4.2.1 Prevalence

Looking at the results of several studies on the prevalence of dental anxiety, only a small number of patients report that they experience no anxiety related to dental visits and treatments (29). A dutch study done in the Netherlands has disclosed that 14% of their population doesn't experience anxiety when visiting or receiving dental treatments, whilst around 40% has reported to experience above average anxiety levels, and 22% reported high anxiety levels (30).

A recent study in Australia confirmed high levels of anxiety in 16.1% of their population, whilst another Australian study from 1996 reported 14.9% of high levels of dental anxiety in their population (29). A study carried out in New Zealand reported the prevalence of dental anxiety being at an average of 13.3%, whilst DAS (Dental anxiety scale) scores were 14% higher in females, 10% higher in the european/other ethnic group, 10% higher in patients from poor neighbourhoods, and the highest scores coming from the age group 35-54 years (31). When looking globally, international studies have disclosed a number of approximately 5-20% of patients experiencing anxiety levels where 6-15% avoid dental treatments (29)

4.2.2 Identification

According to the Diagnostic and Statistical Manual of Mental Disorders by the American Psychiatric Association the criteria for diagnosis of a phobia are 1) persistent, excessive and unreasonable fear, 2) exposure to stimuli provokes an immediate anxiety response, 3) person themselves recognises their fear as excessive and unreasonable, 4) the situation is avoided or endured with intense anxiety. There are several scales that are accepted to be used in the diagnosis of dental fear and anxiety, including; CFSS-DS, Dental Fear Scale (DFS), Modified Dental Anxiety Scale (MDAS), Dental Anxiety Scale (DAS), and Venham Picture Test (VPT) (32).

The multi item questionnaire that will be used in this study is the Corah Dental Anxiety Scale (DAS), which was the very first dental anxiety scale ever developed in 1969, by Corah. The DAS being the origin of dental anxiety scales is considered a reference point for dental anxiety scales and also acts as the best and most appropriate reference for future developed scales (33). The DAS was tested for consistency and stability over time, and has proven itself to be have a high reliability and validity for a four-item test (34, 35, 36, 37). The questionnaire is made up of 4 questions which makes it easy to understand and simple to use. Each question can be scored between 1-5, that allows the patient to respond accordingly to their perception. The score is then added together to a sum indicating their level of anxiety, being at a level of high anxiety when a score lies between 15-20 (34).

4.2.3 Management

Dental anxiety has several causes, and its management shouldn't solely focus on finding the right pharmaceutical therapeutic option but also considering and

incorporating other pathways such as the assessment of the patients anxiety and the right diagnosis, proper communication, providing sufficient explanations and information, good aesthetic placement to avoid pain, and sedative drugs where needed (28).

It is important to be aware of the patients cause of dental anxiety to be able to manage the problem in a more appropriate way. While it is believed that negative dental experiences are the main cause of dental anxiety, it is also known to be related to factors such as the patients perception of their dental environment, social phobia, panic disorders, agoraphobia, depression or other comorbidities causing the avoidance of dental care (38).

There are several effective management options for patients suffering from dental anxiety, depending on their situation, cause and needs (25). Psychotherapeutic strategies can be more conservative options including muscle relaxation, guided imagery, hypnosis, acupuncture, and desensitisation with distraction. Pharmaceutical management options could include using nitrous oxide, or intravenous or oral sedation, which would be more invasive and have more side effects than the first option (39). Other options also include general anaesthesia, although limited to hospital settings and limited in usage to patients who can’t co-operate at all. Overall, injections, extractions and cavity preparations, play a large role in anxiety inducing procedures, hence considering alternative options in these patients might be of importance (20).

5. JUSTIFICATION AND HYPOTHESIS

Justification

Anxiety, in itself, is a simple response to danger regulated by the brain, which is already visible and developed in early infancy and childhood, that can present itself on a parameter of milder symptoms, up to developing more severe cases of anxiety disorders, including specific phobias, generalized anxiety, panic disorder, and more. Anxiety becomes an issue when it interferes with a person's ability and functionality in day to day life, in that it results, for example, in an avoidant behavior (40).

Dental fear is associated with a negative emotional reaction to certain stimuli that are caused by dental treatment, while dental anxiety is more of a constant negative emotional state, fearing that something dreadful could occur (41).

Dental fear or anxiety, if not diagnosed, understood, or seen and prevented or supported early enough can complicate, delay or completely prevent the realization of the needed treatments. This results in the patient interrupting or postponing their treatments which leads to an increase in both technical and economic cost and hence cause more issues for the patient (42).

Therefore it's very important to understand what can cause, or trigger these states and symptoms in patients, not only better but earlier, and more specifically to be able to prevent these unpleasant outcomes and difficulties for the patient.

There is little information on anxiety levels in patients comparing them with dental postgraduate courses, specifically comparing patients of orthodontics and surgery. Nor indicating that specific master programs induce more anxiety than others, in patients.

By comparing not only the age, gender and level of education of the patients, but also the anxiety induced by the nature of necessity of the treatment and a history of previously done treatments; this study offers a wide range of new insight for both reader and practitioner. This allows a broad spectrum of information to be utilised in future application, for understanding behavioural actions and differences in patients, and counteracting these, to support and help the respective persons seeking treatment, that are confronted with anxieties that disable them to do so.

This observational study can allow professionals to become more aware of the levels of anxieties of patients in their field and different treatments, and consequently assess the specific needs of care and attention toward said patient.

In regards to the Sustainable Development Goals (SDG) of the United Nations, my thesis relates to the third goal; Good health and well-being.
As my observational study can support the spreading of awareness of mental health by comparing the levels of anxiety in patients (of the two different dental specializations and its treatments), it can relate to one of the targets of the third goal; being promotion of mental health.

The comparison of the levels of anxiety in patients between the different specializations, offer insight on the fact that one or the other field, might need different type of attention from the dentist, towards the patient. For example, a more invasive treatment might need more explaining and attention than others, in order to increase encouragement and safety in the patient, and hence decrease the intensity of anxiety.

Hypothesis

Null hypothesis:
Patients attending the masters‘ degree in oral surgery and implantology will have similar levels of anxiety as patients attending the master's degree in orthodontics.

Alternative hypothesis:
Patients attending the oral surgery and implantology masters‘ degree will have higher levels of anxiety than patients attending the orthodontic master's degree.

6. OBJECTIVES

General Objective

1. Determine and compare anxiety levels in patients that receive treatments in the masters programs of advanced orthodontics and advanced oral surgery and implantology at the Universidad European de Valencia, using the DAS (dental anxiety scale) questionnaire.

Specific Objectives

1. Establish which gender has higher levels and prevalence of anxiety in each of the respective master programs
2. Determine which age range has the highest levels and prevalence of anxiety in each of the respective master programs.
3. Determine if the level of education influences the anxiety levels of the patient, in each of the respective master programs
4. Determine if the nature of necessity (medically necessary treatment or treatment by choice; aesthetic reasons) has an impact on the levels of anxiety of the patient, in each of the respective master programs
5. Determine if a previous treatment in each of the respective master programs influences the anxiety levels of the patient

7. MATERIALS AND METHODS

7.1 Materials

7.1.1 Design of the study

A cross-sectional, transversal, non experimental, descriptive, prospective study was carried out, based on questionnaires of patients that received treatments from the respective master programs (Advanced oral Implantology and Advanced Orthodontia) of the dental clinic of Universidad Europea de Valencia (Calle Palleter, 19-21, bajo, 46008). The study protocol was approved by the commission of investigation affiliated to the Universidad Europea de Valencia on the 10th of November 2023 in Villaviciosa de Odón, Madrid with the code CI 2023-357. (Annex 1).

The study with the questionnaires was carried out in the time span from January 2024 to March 2024, with the data being collected in a weekly manner from Monday until Friday, using the Dental Anxiety Scale questionnaire (before or after the patients treatment) via QR code format (Annex 2) (34). The structure of the work was done considering the criteria of the STROBE guideline.

The question of investigation that this study followed is as follows: In adult patients in the dental office of the masters programs of the UEV, do patients treated in the advanced oral surgery and implantology masters degree present differences in anxiety levels to patients treated in the advanced orthodontics masters degree?

PICO Question

P: adult patients in the dental office of the masters programs of UEV
I: patients in the university master's degree in advanced oral surgery and implantology.
C: patients in the university master's degree in advanced orthodontics
O: anxiety levels in the respective masters and differences between them, usinsg the dental anxiety scale.

7.1.2 Sample selection

Inclusion Criteria:

- Patients that are over 18 years of age

- Patients of any nationality
- Patients that attend the dental clinic of the Universidad Europea de Valencia
- Patients that visit the clinic to be treated by the advanced orthodontia master program
- Patients that visit the clinic to be treated by the advanced oral surgery and implantology master program
- Patients that visit the clinic in the respective master programs and undergo both invasive or non invasive treatments
- Patients that enter the clinic between January and March of 2024
- Patients that voluntarily signed and accepted the informed consent given to them to participate in the survey

Exclusion Critera:

- Patients that refuse to complete the questionnaire
- Patients that are not undergoing any treatment in the respective master programs (Advanced oral surgery and implantology and advanced Orthodontics)
- Patients that are under medications to control or treat their anxieties or incapacities
- Patients that suffer from functional disabilities or impairment that hinders them from answering and completing the questionnaire
- Patients that suffer from psychological impairments that hinders them from answering and completing the questionnaire
- Patients that are unable to complete the questionnaire due to the fact that its delivered via QR format

7.1.3 Sample size

Due to the nature of this observational study, comparing the anxiety levels in patients of two of the UEV's master's programs (patients of advanced oral surgery and implantology/advanced orthodontics) two separate calculations of the sample size needed to be carried out.

1. For the calculation of the minimum sample of subjects (Advanced oral surgery and implantology master's program), the patient was chosen as the experimental statistical unit and the number of patients that visited the dental clinic of the UEV for advanced oral surgery and implantology treatment in 3 months on average (n=531) was used to determine the number of surveys to be applied in the study, accepting an alpha risk of 0.05 and a confidence interval of 95%. The obtained estimate amounted to 224.

2. For the calculation of the minimum sample of subjects (Advanced orthodontics master's program), the patient was chosen as the experimental statistical unit and the number of patients that visited the dental clinic of the UEV for advanced orthodontics treatment in 3 months on average (n=950) was used to determine the number of surveys to be applied in the study, accepting an alpha risk of 0.05 and a confidence interval of 95%. The obtained estimate amounted to 274.

The average of patients visiting the dental clinic of the UEV in the time interval of 3 months was calculated with the total number of patients visiting each respective master program in the 2023 period (accounting for both locations of the master's program's place of residence in the 2023 period):

- Total number of patients in 2023 (Advanced oral surgery and implantology): 2125
- Total number of patients in 2023 (Advanced orthodontics): 3800

The 3-month average of patients of each respective master's program was used as "n" in both calculations of the sample size, due to the surveys being carried out in a 3-month time interval of January 2024 to March 2024.

7.1.4 Material used

The data has been collected using a questionnaire that consisted of two sections of questions (Annex 2): one part of the questions collecting personal and general information about the patient, and the other part of the questionnaire being the collection and grading of dental anxiety through the Dental Anxiety Scale (34).

The Dental anxiety scale is made up of four questions, that make is simple and easy to understand and use. It is used to determine the level of dental anxiety that the

patient experiences in corresponding situations. Each question can be scored between 1-5; 1 meaning not anxious, to 5 meaning (highly anxious), allowing the patient to answer accordingly to their perception. The score is added together to a total score that indicates their level of anxiety, ranging from 4-20 points (highly anxious being 15-20) (34).

Both the general and personal inquiry of the questionnaire as well as the DAS questions included in the questionnaire were translated to Spanish for their use in the clinic of the Universidad Europea de Valencia, and can be seen in detail in Annex 2.

Anxiety assessment: (this isn't visible to the patients filling out the questionnaire)

- Less than 9 = mild anxiety
- 9 to 12 = moderate anxiety but have specific stressors
- 13 to 14 = high anxiety
- 15 to 20 = severe anxiety (or phobia)

7.2 Methods

7.2.1. Procedure description

Permission to carry out the study was requested by the ethics committee of the European university in Villaviciosa de Odon by sending all necessary documentation. The approval received is attached. (Anexo 1) After the approval has been received, the collection of data began via the questionnaires (from January until March 2024)

In the description of the questionnaires via google forms, the aims and purpose of the study have been explained, as well as the fact that the data collected would be treated in a completely anonymous matter, solely for this study and not for any other purpose outside of this research project. The description explained that the questionnaire is done on a completely voluntary basis and that by continuing and answering the questions, they would be agreeing to the informed consent and the voluntary basis of this survey.

The consent form and the questionnaire was given to the patients either before or after their corresponding treatments in form of a QR code.(Annex 2)

The data from correctly and completed filled out questionnaires were analysed

7.2.2 Data collection (attach data collection protocol)

The collection of the data has been done in a completely anonymous manner and on voluntary basis through Google forms. Through the collection of data via google forms, one is able to retrieve information at an individual level for each patient and generate graphs (pie charts) that made the consequent steps of making graphs and understanding the following data.

After the data has been collected, filtered out and organized, the results have been statistically analysed and presented in the results section of this study and discussed consecutively.

See Annex 2 for the collection of data protocol.

7.2.3 Statistical analysis

The statistical analysis entails a comprehensive descriptive analysis utilizing measures such as mean, standard deviation, minimum, maximum, median, and 25th and 75th percentiles (IQR, interquartile range).

The inferential analysis incorporated statistical tests to compare frequencies across various groups.

The Chi-squared test was employed to assess disparities between the orthodontics and implantology groups concerning categorical survey questions. Additionally, the potential impact of gender and age can be explored.

The Mann-Whitney test was utilized to examine differences between the orthodontics and implantology groups regarding categorical survey questions with ordinal nature.

The reference level of significance was set up to 5% ($\alpha=0.05$)

7.2.4 Variables

The main (dependent) variable of this observational study collected was the anxiety level in patients that came to the clinic to be treated in either of the master programs of the university (Advanced oral surgery and implantology or advanced orthodontics).

The other independent secondary variables collected in the study are the ones mentioned both in the specific objectives as well as in the questionnaire of answers to be collected, being: gender, age, level of education obtained, nature of necessity of treatment, and either first time visit/previously received treatment at said clinic.

- Anxiety level: This quantitative variable was evaluated using the DAS (dental anxiety scale) questionnaire grading the responses on a scale of 4-20, and each question having a description of 5 responses lying on that scale.
    - Less than 9 = mild anxiety
    - 9 to 12 = moderate anxiety
    - 13 to 14 = high anxiety
    - 15 to 20 = severe anxiety (or phobia)

- Age: This quantitative variable was collected in completed years the patient has reached, and classified in different age range as intervals.
    - 18-26
    - 27-35
    - 36-44
    - 45-53
    - 54-62
    - 63-71
    - 72-80
    - >80

- Gender: This qualitative variable was collected in the classification of the biological characterics that define the sex of the person.
    - Female
    - Male
    - Other

- Level of education: This qualitative variable was collected by listing options and inquiring for the highest level of education the person has acquired.
    - None
    - Primary
    - Secondary
    - Baccalaureate
    - Bachelor’s degree
    - Postgraduate

- Previous treatment: This qualitative variable has been collected to determine if the patient has previously received treatment at given clinic, or if it's the first time they're coming in for a treatment.
    - First time
    - Has received treatment before

- Nature of necessity: This qualitative variable has been collected to determine the reason of reaching out for a dental treatment.
    - Medically necessary
    - Treatment by choice of aesthetic reasons
    - Doesn't know, no answer

8. RESULTS

8.1 Study Population

8.1.1 Advanced Implantology

A total number of 31 patients who have been visiting the dental clinic of the European University of Valencia, for the implantology masters program, have been collected between January and March 2024. The questionnaire used was the Dental Anxiety Scale (DAS) (Annex 2) (34).

After having applied the inclusion and exclusion criteria described previously, 1 survey has been discarded, and the final sample of the advanced implantology study then consisted of 30 patients.

8.1.2 Advanced Orthodontics

A total number of 40 patients who have been visiting the dental clinic of the European University of Valencia, for the orthodontics masters program, have been collected between January and March 2024. The questionnaire used was the Dental Anxiety Scale (DAS) (Annex 2) (34).

After having applied the inclusion and exclusion criteria described previously, 3 surveys have been discarded, and the final sample of the advanced orthodontics study then consisted of 37 patients.

8.2 Descriptive Analysis

8.2.1 Sample Group Characteristics

For advanced orthodontics, the most common gender with the highest prevalence, that has participated and answered the survey in the study, was found to be Female, with a result of 64.9%, whereas the Male category was found to be the least prevalent to participate in the survey with a total result of 35.1%.

For advanced implantology, the most common gender with the highest prevalence, was also found to be Female, with a result of 66.7%. Whereas the Male category was also found to be the least prevalent, with a total result of 33.3%.

In both master's programs the question that inquired about the patients' gender included the option "Others", that in neither questionnaire has been selected, and hence excluded from the table, for further details *Table 1* can be consulted.

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
Female	44	65.7	24	64.9	20	66.7
Male	23	34.3	13	35.1	10	33.3

Table 1. Group by Gender

For advanced orthodontics, the most prevalent age range that participated in the survey was between 18-26, with a total result of 51.4%. The age ranges with the least prevalence of participating were between 45-53 and 54-62, both having a total result of 10.8%.

For advanced implantology, the most prevalent age range that participated in the survey was between 54-62, with a total result of 36.7%. The age range with the least prevalence of participating was 18-26, with a total result of 6.7%. Further details of the results can be consulted in *Table 2.*

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
18-26	21	31.3	19	51.4	2	6.7
27-35	9	13.4	6	16.2	3	10.0
36-44	7	10.4	4	10.8	3	10.0
45-53	11	16.4	4	10.8	7	23.3
54-62	15	22.4	4	10.8	11	36.7
63-71	4	6.0	0	.0	4	13.3

Table 2. Group by Age

For both groups, the most prevalent education level of the patients that conducted the survey was that of Spanish baccalaureate, with a result of 51.4% in advanced orthodontics, and 33.3% in advanced implantology. Further details of the results can be consulted in *Table 3.*

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
None	1	1.5	0	.0	1	3.3
Primary	4	6.0	1	2.7	3	10.0
Secondary	7	10.4	5	13.5	2	6.7
Spanish Baccalaureate	29	43.3	19	51.4	10	33.3
Bachelor´s Degree	17	25.4	9	24.3	8	26.7
Master´s Degree	9	13.4	3	8.1	6	20.0

Table 3. Group by Education Level

For advanced orthodontics, the most prevalent reason for visiting the master's program was found to be elective reasons (aesthetic motives) with a result of 75.5%, while 18.9% stated medically necessary as their reasoning.

For advanced implantology, the most prevalent reason for visiting the master's program was found to be medically necessary with a result of 56.7%, while 30.0% was found to be elective reasons (aesthetic motives). Further details of the results can be consulted in *Table 4.*

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
Medically necessary	24	35.8	7	18.9	17	56.7
Elective	37	55.2	28	75.7	9	30.0
Unknown	6	9.0	2	5.4	4	13.3

Table 4. Group by Treatment Necessity

For both advanced orthodontics and advanced implantology, the majority of the patients that were coming in, have previously received treatment in this clinic, with a result of 86.5% and 63.3% respectively. Further details of the results can be consulted in *Table 5.*

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
No, first visit	16	23.9	5	13.5	11	36.7
Yes	51	76.1	32	86.5	19	63.3

Table 5. Group by Previous Treatment

An evaluation of the homogeneity of the treatment groups concerning gender, age group and other profile variables was carried out, due to their potential confounding effects. Results of homogeneity analysis are shown in Table 6.

Table 6. Homogeneity of the treatment groups concerning secondary variables: Results of Chi-squared test

	p-value
Gender	0,877
Age group	**<0,001*** **
Education level	0,263
Previous treatment	**0,027***
Reason for treatment	**0,001****

*p<0.05; **p<0.01; ***p<0.001

The age group, previous treatments and the reason for treatment are different across both groups (p<0.05). Therefore, it is relevant to study its potential confounding effects due to the influence these variables could have over the results.

8.2.2 Descriptive analysis of DAS Questionnaire

When looking at the singular responses of the questionnaire by group, we can see a clear prevalence in the most common responses of each question. The questionnaire is made up of 4 questions, each question can be scored between 1-5, that has allowed the patient to respond accordingly to their perception (34). It is interesting to note that only one patient, for one question (DAS Qs. 3) has chosen the last (and therefore highest anxiety) response, being “So anxious that I sometimes break out in a swear or almost feel physically sick”. The detailed phrasing of each question can be read in the complete DAS questionnaire included in Annex 2.

For the rest of the questions the highest response percentages are as follows:

For DAS 1, the most prevalently picked answer for both groups has been the second response: “I wouldn’t care one way or the other”, being at a total of 56.8% in the orthodontics group, and 46.7% in the implantology group.

For DAS 2, the most prevalently picked answer for both groups has been the first response: “Relaxed”, at 64.9% and 63.3% respectively.

For DAS 3, the most prevalently picked answer for both groups has been: “Relaxed”, at 45.9%, and 56.7%, respectively.

And lastly, for DAS 4, the most prevalently picked answer for both groups has been: “Relaxed”, at 45.9% and 43.3%, respectively. All answers collected and further details can be consulted in *Table 7.*

		GROUP					
		Total		Orthodontics		Implantology	
		N	%	N	%	N	%
DAS 1	Total	67	100.0	37	100.0	30	100.0
	I would look forward to it as a reasonably enjoyable experience	15	22.4	8	21.6	7	23.3
	I wouldn´t care one way or the other	35	52.2	21	56.8	14	46.7
	I would be a little uneasy about it	11	16.4	5	13.5	6	20.0
	I would be afraid that it would be unpleasant and painful	6	9.0	3	8.1	3	10.0
DAS 2	Total	67	100.0	37	100.0	30	100.0
	Relaxed	43	64.2	24	64.9	19	63.3
	A little uneasy	14	20.9	6	16.2	8	26.7
	Tense	4	6.0	2	5.4	2	6.7
	Anxious	6	9.0	5	13.5	1	3.3
DAS 3	Total	67	100.0	37	100.0	30	100.0
	Relaxed	34	50.7	17	45.9	17	56.7
	A little uneasy	16	23.9	10	27.0	6	20.0
	Tense	13	19.4	9	24.3	4	13.3
	Anxious	3	4.5	1	2.7	2	6.7
	So anxious that I sometimes break out in a sweat or almost feel physically sick	1	1.5	0	.0	1	3.3
DAS 4	Total	67	100.0	37	100.0	30	100.0
	Relaxed	30	44.8	17	45.9	13	43.3
	A little uneasy	21	31.3	11	29.7	10	33.3
	Tense	13	19.4	8	21.6	5	16.7
	Anxious	3	4.5	1	2.7	2	6.7

Table 7. DAS Question by Group

8.3 Analytic analysis

8.3.1 Anxiety levels (DAS) according to masters program

The scoring of the individual questionnaires, according to the guidelines indicated in the DAS assessment, revealed “mild anxiety” as the most prevalent anxiety level in both masters programs, with 67.6% of the patients having mild anxiety in advanced orthodontics, and 66.7% in advanced implantology.

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
Mild	45	67.2	25	67.6	20	66.7
Moderate	17	25.4	10	27.0	7	23.3
High	3	4.5	1	2.7	2	6.7
Severe	2	3.0	1	2.7	1	3.3

Table 8. Anxiety level by Group

To evaluate the possible effect the group might have on the patients’ anxiety level, Mann Whitney test was carried out. The effect is not significant (p>0.05). The anxiety level can be considered as similar between both groups analyzed in all the questions (see Table 9).

Table 9. Effect of the group over DAS: Results of Mann Whitney test and Mann Whitney test for ordinal variables

	p-value
Anxiety level	0,854

*p<0.05; **p<0.01; ***p<0.001

8.3.2. Anxiety levels (DAS) according to gender

The results of the prevalence of anxiety levels according to gender and group are represented in Table 10.

	GROUP																	
	Total						Orthodontics						Implantology					
	GENDER						GENDER						GENDER					
	Total		Female		Male		Total		Female		Male		Total		Female		Male	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	67	100.0	44	100.0	23	100.0	37	100.0	24	100.0	13	100.0	30	100.0	20	100.0	10	100.0
Mild	45	67.2	28	63.6	17	73.9	25	67.6	16	66.7	9	69.2	20	66.7	12	60.0	8	80.0
Moderate	17	25.4	13	29.5	4	17.4	10	27.0	7	29.2	3	23.1	7	23.3	6	30.0	1	10.0
High	3	4.5	2	4.5	1	4.3	1	2.7	0	.0	1	7.7	2	6.7	2	10.0	0	.0
Severe	2	3.0	1	2.3	1	4.3	1	2.7	1	4.2	0	.0	1	3.3	0	.0	1	10.0

Table 10. Anxiety level (DAS) by group and gender

To evaluate the possible effect of the gender on the patients' anxiety level, Mann Whitney test was carried out (see Table 11). Mann Whitney test concluded no significative effect of the gender on the patients' anxiety levels ($p>0.05$) in either of the masters programs. Therefore, no gender presents a significantly higher anxiety than the other in each of the respective masters programs.

Table 11. Effect of the gender over DAS: Results of Mann Whitney test and Mann Whitney test for ordinal variables

	p-value
Anxiety level	0,481

*p<0.05; **p<0.01; ***p<0.001

8.3.3. Anxiety levels (DAS) according to age

The results of the prevalence of anxiety levels according to age range and group are represented in Table 12.

	GROUP																							
	Total								Orthodontics								Implantology							
	AGE GROUP								AGE GROUP								AGE GROUP							
	Total		18-26		27-53		>=54		Total		18-26		27-53		>=54		Total		18-26		27-53		>=54	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	67	100	21	100	27	100	19	100	37	100	19	100	14	100	4	100	30	100	2	100	13	100	15	100
Mild	45	67.2	17	81.0	15	55.6	13	68.4	25	67.6	16	84.2	6	42.9	3	75.0	20	66.7	1	50.0	9	69.2	10	66.7
Moderate	17	25.4	4	19.0	9	33.3	4	21.1	10	27.0	3	15.8	6	42.9	1	25.0	7	23.3	1	50.0	3	23.1	3	20.0
High	3	4.5	0	.0	2	7.4	1	5.3	1	2.7	0	.0	1	7.1	0	.0	2	6.7	0	.0	1	7.7	1	6.7
Severe	2	3.0	0	.0	1	3.7	1	5.3	1	2.7	0	.0	1	7.1	0	.0	1	3.3	0	.0	0	.0	1	6.7

Table 12. Anxiety level (DAS) by group and age group

To evaluate the possible effect of the age on the patients' anxiety levels, Chi squared test was carried out (see Table 13). The results of Chi squared test indicate no significative effect of the age group on the patients' anxiety levels (p>0.05).

Table 13. Effect of the age group over DAS: Results of Chi-squared test

	p-value
Anxiety level	0,361

*p<0.05; **p<0.01; ***p<0.001

8.3.3. Anxiety levels (DAS) according to educational level

The results of the prevalence of anxiety levels according to level of education and group are represented in Table 14.

	GROUP																					
	Total								Orthodontics								Implantology					
	EDUCATION LEVEL								EDUCATION LEVEL								EDUCATION LEVEL					
	Total		Not higher than Secondary		Spanish Baccalaureate		Bachelor/ Master´s Degree		Total		Not higher than Secondary		Spanish Baccalaureate		Bachelor/ Master´s Degree		Total		Not higher than Secondary		Spanish Baccalaureate		Bachelor/ Master´s Degree	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	67	100	12	100	29	100	26	100	37	100	6	100	19	100	12	100	30	100	6	100	10	100	14	100
Mild	45	67.2	8	66.7	20	69.0	17	65.4	25	67.6	3	50.0	13	68.4	9	75.0	20	66.7	5	83.3	7	70.0	8	57.1
Moderate	17	25.4	3	25.0	8	27.6	6	23.1	10	27.0	3	50.0	5	26.3	2	16.7	7	23.3	0	.0	3	30.0	4	28.6
High	3	4.5	1	8.3	0	.0	2	7.7	1	2.7	0	.0	0	.0	1	8.3	2	6.7	1	16.7	0	.0	1	7.1
Severe	2	3.0	0	.0	1	3.4	1	3.8	1	2.7	0	.0	1	5.3	0	.0	1	3.3	0	.0	0	.0	1	7.1

Table 14. Anxiety level (DAS) by group and level of education

To evaluate the possible effect of the level of education on the patients' anxiety levels, Chi squared test was carried out (see Table 15). The results of Chi squared test indicate no significative effect of the educational level on the patients' anxiety levels (p>0.05).

Table 15. Effect of the educational level over DAS: Results of Chi-squared test

	p-value
Anxiety level	0,908

*p<0.05; **p<0.01; ***p<0.001

8.3.3. Anxiety levels (DAS) according to treatment necessity

The results of the prevalence of anxiety levels according to treatment necessity and group are represented in Table 16.

	GROUP																							
	Total								Orthodontics								Implantology							
	TREATMENT NECESSITY								TREATMENT NECESSITY								TREATMENT NECESSITY							
	Total		Medically necessary		Elective		Unknown		Total		Medically necessary		Elective		Unknown		Total		Medically necessary		Elective		Unknown	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	67	100	24	100	37	100	6	100	37	100	7	100	28	100	2	100	30	100	17	100	9	100	4	100
Mild	45	67.2	14	58.3	26	70.3	5	83.3	25	67.6	5	71.4	19	67.9	1	50.0	20	66.7	9	52.9	7	77.8	4	100
Moderate	17	25.4	8	33.3	8	21.6	1	16.7	10	27.0	2	28.6	7	25.0	1	50.0	7	23.3	6	35.3	1	11.1	0	.0
High	3	4.5	2	8.3	1	2.7	0	.0	1	2.7	0	.0	1	3.6	0	.0	2	6.7	2	11.8	0	.0	0	.0
Severe	2	3.0	0	.0	2	5.4	0	.0	1	2.7	0	.0	1	3.6	0	.0	1	3.3	0	.0	1	11.1	0	.0

Table 16. Anxiety level (DAS) by group and treatment necessity

To evaluate the possible effect of the treatment necessity on the patients' anxiety levels, Mann Whitney test was carried out (see Table 17). The results of Mann Whitney test indicate no significative effect of the treatment necessity on the patients' anxiety levels (p>0.05).

Table 17. Effect of reason for treatment over DAS: Results of Mann Whitney test and Mann Whitney test for ordinal variables

	p-value
Anxiety level	0,610

*p<0.05; **p<0.01; ***p<0.001

8.3.3. Anxiety levels (DAS) according to previous treatment

The results of the prevalence of anxiety levels, according to whether the patient received previous treatment in the universities' masters clinic or is attending for a first visit and group, are represented in Table 18.

	GROUP																	
	Total						Orthodontics						Implantology					
	PREVIOUS TREATMENT						PREVIOUS TREATMENT						PREVIOUS TREATMENT					
	Total		No, first visit		Yes		Total		No, first visit		Yes		Total		No, first visit		Yes	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Total	67	100	16	100	51	100	37	100	5	100	32	100	30	100	11	100	19	100
Mild	45	67.2	11	68.8	34	66.7	25	67.6	4	80.0	21	65.6	20	66.7	7	63.6	13	68.4
Moderate	17	25.4	5	31.3	12	23.5	10	27.0	1	20.0	9	28.1	7	23.3	4	36.4	3	15.8
High	3	4.5	0	.0	3	5.9	1	2.7	0	.0	1	3.1	2	6.7	0	.0	2	10.5
Severe	2	3.0	0	.0	2	3.9	1	2.7	0	.0	1	3.1	1	3.3	0	.0	1	5.3

Table 18. Anxiety level (DAS) by group and previous treatment

To evaluate the possible effect of previous treatment on the patients' anxiety levels, Mann Whitney test was carried out (see Table 19). The results of Mann Whitney test indicate no significative effect of the previous treatment on the patients' anxiety levels ($p>0.05$).

Table 19. Effect of previous treatment over DAS: Results of Mann Whitney test and Mann Whitney test for ordinal variables

	p-value
Anxiety level	0,715

*p<0.05; **p<0.01; ***p<0.001

Considering the homogeneity of the secondary variables, discussed previously in the descriptive analysis under the section of sample group characteristics (Table 6), individual models were constructed to examine whether there is a significant influence of these variables on the anxiety levels:

Table 20. Anxiety level concerning profile variables: Result of simple binary logistic regression model, unadjusted odds ratio, and 95% confidence interval

	OR	IC 95%	p-valor
GROUP			
Orthodontics	1		
Implantology	1.04	0.37 - 2.91	0.938
GENDER			
Female	1		

Male	0.62	0.19 - 1.83	0.397
AGE			0.245
18-26	1		
27-35	2.13	0.34 - 12.71	0.402
36-44	1.70	0.19 - 11.87	0.597
45-53	7.44	1.54 - 43.31	**0.017***
54-62	1.55	0.31 - 7.84	0.589
63-71	4.25	0.41 - 46.02	0.206
TREATMENT NECESSITY			0.437
Medically necessary	1		
Elective	0.59	0.20 - 1.74	0.340
Unknown	0.28	0.01 - 2.1	0.277
PREVIOUS TREATMENT			
No, first visit	1		
Yes	1.1	0.34 - 3.95	0.877
AGE RE			0.189
18-26	1		
27-53	3.40	0.95 - 14.29	0.071
>=54	1.96	0.46 - 9.08	0.365
EDUCATION RE			
Not higher than Secondary	1		
Spanish Baccalaureate	0.90	0.22 - 4.08	0.886

*p<0,05; **p<0,01; ***p<0,001

No statistically significant results were found (p > 0.05). With the aim of assessing the impact of significant variables that could act as confounders (those variables that presented heterogeneity), a model was constructed incorporating them along with the group variable to analyze whether the influence of these variables could alter the outcome:

Table 21. Anxiety level concerning profile variables: Result of multiple binary logistic regression model, adjusted odds ratio, and 95% confidence interval

	OR	IC 95%	p-valor
GROUP			
Orthodontics	—	—	
Implantology	0.41	0.08, 1.84	0.259
AGE GROUP			0.177
18-26	—	—	
27-35	2.41	0.36, 15.4	0.344
36-44	2.03	0.21, 16.9	0.512
45-53	11.0	1.85, 83.2	**0.012***
54-62	2.44	0.39, 15.9	0.336
63-71	6.64	0.40, 124	0.185
TREATMENT NECESSITY			0.525

Medically necessary	—	—	
Elective	0.53	0.13, 2.15	0.368
Unknown	0.33	0.01, 2.99	0.381
PREVIOUS TREATMENT			
No, first visit	—	—	
Yes	1.09	0.23, 5.79	0.916

*p<0,05; **p<0,01; ***p<0,001

The multiple model yields non-significant results ($p > 0.05$), indicating that there is no discernible influence of the group on anxiety levels, even when potential confounding variables are included.

9. DISCUSSION

9.1 Key Results

With respect to the general objective of this study, we can conclude that the most prevalent anxiety level in both masters programs, according to the DAS assessment, revealed to be “mild anxiety”, and can be considered as similar between both groups. Tests, that have been carried out by the statistician to determine the significance of the results regarding the ‘general objective’, also confirm that whether the patients visited the orthodontics or implantology master program, didn’t affect their anxiety level. Herewith the null hypothesis that was formulated at the beginning of the study can be confirmed, stating patients attending the masters degrees in oral surgery and implantology will have similar levels of anxiety as patients attending the masters degree in orthodontics.

Regarding the specific objectives, the results of this study were able to conclude that there is no significative effect of the gender on the patients anxiety levels, in either of the masters programs. Hence no gender presented a significantly higher anxiety than the other in each of the masters programs.

It is worthwhile to note that in a study done by Yavan et al. (43), evaluating orthodontics patients anxiety levels, similar results have been obtained. In their study it has been deducted, that after a 1 year follow up, both genders showed no difference in anxiety scores. A study carried out by Łazarz-Półkoszek et al. (44), measuring the anxiety levels of patients in dental appointments, is also in concordance to the results collected in this study, stating that there was no statistically significant difference between gender and anxiety levels. On another note, a systematic review of cross sectional studies by Tarrosh et al. (45) on levels of dental anxiety between genders and demographic groups demonstrated in their results that women showed a higher prevalence of dental anxiety. A cross sectional analysis of gender discrepancies in anxiety among orthognathic surgery patients, by Avramut et al. (46) also came to the conclusion that females exhibited higher anxiety levels when facing dental surgical treatment. A study previously mentioned by Sukumaran et al. (31) of prevalence on dental anxiety in New Zealand, has also reported results of finding that females had 14% higher anxiety. A study by Dadalti et al. (47) on anxiety about dental treatment, also demonstrated that women had a higher prevalence on dental anxiety. When

looking at and comparing these different results and studies with each other, as well as the results collected in this study, one can conclude that gender poses an inconclusive effect on anxiety levels.

The second specific objective of this study considered age and anxiety level amongst patients, and from the results of this study it can be concluded that the age group has no significative effect on the patients anxiety level.

Another study previously mentioned by Cianetti et al. (41) reviewed different scientific literature to view the prevalence of dental anxiety in children and adolescents and concluded that dental fear and anxiety showed a decrease with increasing age. A study looking at the prevalence of dental anxiety and its relation to age by Mohammed et al. (48) found a significant relation between age groups and anxiety, stating that younger age groups 25-35, demonstrated high anxiety, whereas older age groups, 55-65, noted lower anxiety. A meta-analysis of prevalence on dental anxiety in China by Hong et al. (49) demonstrated that higher dental anxiety was most likely to occur in younger adults aged between 16-39. A prevalence study of dental anxiety among dental patients in Saudi Arabia by Fayad et al. (50) also demonstrated that younger patients demonstrated an increased modified dental anxiety scale score. Another study by Appukuttan et al. (51) on the prevalence of dental anxiety among patients attending a dental educational institution demonstrated a significant difference between age groups related to their total anxiety score, having a decrease of anxiety with increasing age. Here it is also interesting to note that unlike the previous studies mentioned in this section, a study mentioned above by Łazarz-Półkoszek et al. (44) has also demonstrated in their results that there were also no statistically significant differences related to age and level of anxiety of patients, as seen in the results collected in this study. Two more studies by Saatchi et al. (52) on the prevalence of dental anxiety in Iran, and Berberoğlu et al. (53) on dental anxiety among dental emergency patients, also demonstrated in their results that dental anxiety wasn’t affected by age, which is again in concordance to the results collected in this study. The study previously mentioned by Yavan et al. (43) on the other hand has demonstrated that the anxiety scores of adults were higher than when looking at those of adolescents. When looking at and comparing these different results and studies with each other, as well as the results collected in this study, one can conclude that age poses an inconclusive effect on anxiety levels.

Regarding the third specific objective of this study considering the influence of the education level on the anxiety levels of the patients, it has been deducted that there is no significative effect of the educational level on the patients' anxiety levels.

The study mentioned above by Saatchi et al. (52) also demonstrated that the anxiety level of the patient wasn't affected by the level of education. Three studies by Łazarz-Półkoszek et al. (44), Berberoğlu et al. (53), and El Hajj et al. (54), have also concluded that the level of education didn't have an influence on the anxiety levels of the patients included in their studies. A study by Egbor et al. (55) using DAS-R on the evaluation of sociodemographic determinants of dental anxiety for extractions, demonstrated that the educational level attained was significantly related to the dental anxiety level, showing that patients with a secondary school education had the highest DAS score. A study by Muneer et al. (56) on dental anxiety and influencing factors in adults demonstrated that patients with higher education level were more dentally anxious. A study by Svensson et al. (57) on dental anxiety, concomitant factors and change in prevalence over 50 years, demonstrated in their results that a significance was present in relation to education level and anxiety level. These have concluded that severe dental anxiety was related to a low education level in the patient. When looking at and comparing these different results and studies with each other, as well as the results collected in this study, one can conclude that education level poses an inconclusive effect on anxiety levels.

Regarding the fourth specific objective of this study considering the influence of the nature of treatment necessity on the patients anxiety level, it has been concluded that there is no significative effect, of whether the patient came in for medically necessary reasons or aesthetic motives, on the level of anxiety on the patient.

Regarding the fifth and last specific objective of this study, considering whether coming in for the first time, or having had received previous treatment, had an influence on the anxiety level of the patient, also concluded to be insignificant.

A study by Yu et al. (58) on the prevalence of dental anxiety associated with pain among Chinese adult patients, concluded that there was a significant difference found in regard to the frequency of visits to the dentist, and length of time since the most recent dental visit. These results might be comparable to this study, in relation

to the first visit at the masters clinic versus having previously come here; predicting that according to their results, and applying them to this study, it might be concluded that patients who have attended before (regularly visited), manifest less anxiety than first time visitors. A study by Erten et al. (59) found that patients who never visited the dentist had the highest anxiety scores. When considering his study and comparing it to this studies objective, one might say that a patients first time visit at the clinic would manifest more anxiety in the person than the one having come in before.

9.2 Limitations

With respect to the results concluded in this present observational study, the lack of questions, regarding specific anxiety inducing situations in the dental clinic, included in the DAS questionnaire can be identified as a limitation of this study. In the study conducted by Caltabiano et al. (60) on dental anxiety in patients attending a student dental clinic, the modified dental anxiety scale (MDAS) questionnaire was utilized for measuring anxiety levels (the MDAS includes an additional question asking about patients mood during local anaesthesia) (33), concluding significant differences in the anxiety levels (females had higher MDAS scores than males and younger patients had higher MDAS scores than older patients). This fact could lead to the assumption, that the presence of the local anaesthesia question might have an impact on the results of the anxiety levels.

Another limitation of this study is the fact that the sample sizes of 224 in implants and 274 in ortho (with a confidence interval of 95% and alpha risk 0.05) were not met. This leads to the results of this study not having the expressiveness as previously planned. Therefore the author recommends the findings of this study to be interpreted with caution.

It is also considerable to take into account that all surveys in this study were collected solely at the masters clinic of the European University in Valencia. This factor reduces the sample group to a specific population in a given context, and location. This means in this specific study no patients in other populations, in different context, clinic, city, and country aren’t considered, and could lack generalisability of the study results.

Furthermore the sample group is consisting only of patients that voluntarily contributed to the survey, meaning that the sample is not representative of those who refrained from participating in the questionnaire. Those patients who abstained from participating, could potentially be in the pool of more anxious patients, avoiding confrontation in an already stressful situation for them.

Anxiety and its symptoms are subjective to the person feeling and confronting them, meaning that it's a difficult concept to measure and compare in a numeric way. The DAS questionnaire questions the person about their feelings under certain circumstances, which can be considered as subjective and bias. Not only can an individual experience and rate their symptoms different from another individual, but the same individual can experience and rate their symptoms differently from day to situation. One also must take into consideration that given the setting, it is unknown if the questions were answered truthfully, adding another subjective bias.

Further studies might be needed to confirm the results presented in this observational study, in a student dental clinic setting, comparing anxiety of patients in the given speciality, as well as the other factors of age, gender, education, first visit and treatment necessity.

10. CONLUSION

10.1 General Conclusion

The most prevalent anxiety level in both masters program have concluded to be “mild anxiety”, and the results can be considered as similar between both groups. The masters program does not have an effect on the anxiety level experienced in the patient.

10.2 Specific conclusions

1. There is no significant correlation between gender and level of anxiety ($p>0.05$); the gender didn’t affect the level of anxiety the patient experienced.
2. There is no significant correlation between age group and level of anxiety ($p>0.05$); the age didn’t affect the level of anxiety the patient experienced.
3. There is no significant correlation between education and level of anxiety ($p>0.05$); the level of education didn’t affect the level of anxiety the patient experienced.
4. There is no significant correlation between nature of necessity of treatment and level of anxiety ($p>0.05$); the nature of treatment didn’t affect the level of anxiety the patient experienced.
5. There is no significant correlation between first visit and level of anxiety ($p>0.05$); the number of visit (having been at the clinic before, or coming in for the first time) didn’t affect the level of anxiety the patient experienced.

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12. ANNEXES

Annex 1: Permission of Comission of Investigation UEV

Universidad Europea

Comisión de Investigación

Villaviciosa de Odón, 10 de noviembre de 2023

Estimado/a investigador/a,

La Comisión de Investigación de la Escuela de Doctorado e Investigación, una vez revisada la documentación e información, remitida por el investigador responsable con fecha 28 de julio de 2023, relativa al proyecto abajo indicado, autoriza su desarrollo en la Universidad Europea.

Título del proyecto:	Anxiety levels in adult patients in the dental office of the universities' master degree programs in advanced orthodontia, and advanced oral surgery and implantology: an obversational study
Tipo de proyecto:	TFG
Investigador/a responsable:	PERDOMO LOVERA- MONICA ISABEL
Código CI:	2023-357
Código OTRI:	Sin especificar
Código Departamento:	Sin especificar
Dictamen:	APROBADO

Atentamente,

Fdo. Óscar García López

Director de la Escuela de Doctorado e Investigación

ci@universidadeuropea.es

Annex 2: Questionnaire

(Spanish version)

Niveles de ansiedad en pacientes en la consulta odontologica de cirugia oral avanzada e implantologia / Ortodoncia Avanzada

Esta investigación es realizada por: Georgia Schmitt Gómez y Mónica Isabel Perdomo Lovera, aprobado por el Comisión de Investigación.

El objetivo de este estudio es determinar y comparar los niveles de ansiedad en pacientes que acuden a la clínica dental para ser tratados por los programas master (cirugía oral avanzada e implantología y ortodoncia avanzada) a través de un cuestionario.

La información recogida en este estudio es confidencial, anónima y no será utilizada para ningún otro fin que no sea el de esta investigación.

Al responder a este cuestionario, está dando su consentimiento informado para que esta información se utilice en esta investigación de forma anónima, y que su participación es voluntaria.

Si está tomando medicamentos para controlar/tratar la ansiedad, no responda a este cuestionario.

(General/Personal data collection of patient)

1) ¿Está tomando medicamentos para controlar/tratar la ansiedad? (si la respuesta es afirmativa, no continúe con el cuestionario)

- Si
- No

2) Indique su sexo

- Femenino
- Masculino
- Otro

3) Indique su rango de edad

- 18-26
- 27-35
- 36-44

- 45-53
- 54-62
- 63-71
- 72-80
- >80

4) Indique el ultimo nivel de educacion obtenido

- Primaria
- Secundaria
- Bachilerato
- Licenciatura
- Posgrado
- Ninguna

5) ¿Cuál es la naturaleza de la necesidad del tratamiento que está recibiendo hoy?

- Médicamente necesario
- Tratamiento por elección (motivos esteticos)
- No sabe (no contesta)

6) ¿Ha sido tratado aquí anteriormente (para su respectiva necesidad principal) o viene por primera vez?

- Primera vez
- Ya he recibido tratamientos anteriormente

(DAS questionnaire)

7) Si usted tuviera que ir al dentista mañana, cómo se sentiría?

- Pensaría en ello como una experiencia razonablemente agradable
- No estaría preocupado
- Estaría un poco intranquilo
- Tendría miedo due que fuera desagradable y doloroso
- Tan ansioso, que ropmería a sudar o casi me sentiría enfermo

8) Cuándo usted está esperando su turno en la consulta del dentista, cómo se siente?

- Relajado

- Un poco intranquilo
- Tenso
- Ansioso
- Tan ansioso, que rompería a sudar o casi me sentiría enfermo

9) Cuándo usted esta en el sillón del dentista esperando; mientras él sostiene el taladro listo para empezar el trabajo en sus dientes, cómo se siente?

- Relajado
- Un poco intranquilo
- Tenso
- Ansioso
- Tan ansioso, que rompería a sudar o casi me sentiría enfermo

10) Usted está en el sillón del dentista preparado para una limpieza dental. Mientras usted está esperando, el dentista está sacando los instrumentos que él usará para sus dientes alrededor de las enciás, cómo se siente?

- Relajado
- Un poco intranquilo
- Tenso
- Ansioso
- Tan ansioso, que rompería a sudar o casi me sentiría enfermo

Annex 3: STROBE Checklist

	Item No	Recommendation
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract - **Page 0**
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found – **Page 1-4**
Introduction		
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported – **Page 8-15**
Objectives	3	State specific objectives, including any prespecified hypotheses – **Page 20**
Methods		
Study design	4	Present key elements of study design early in the paper – **Page 22**
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection – **Page 22**
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants – **Page 22-23**
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable – **Page 26-28**
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group
Bias	9	Describe any efforts to address potential sources of bias
Study size	10	Explain how the study size was arrived at – **Page 23**
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why – **Page 26-28**
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding – **Page 26**
		(*b*) Describe any methods used to examine subgroups and interactions
		(*c*) Explain how missing data were addressed
		(*d*) If applicable, describe analytical methods taking account of sampling strategy
		(*e*) Describe any sensitivity analyses – **Page 26**
Results		
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed – **Page 30**
		(b) Give reasons for non-participation at each stage
		(c) Consider use of a flow diagram
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders – **Page 30-34**
		(b) Indicate number of participants with missing data for each variable of interest
Outcome data	15*	Report numbers of outcome events or summary measures
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included – **Page 35-39**
		(*b*) Report category boundaries when continuous variables were categorized
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period

Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses – **Page 39-41**
Discussion		
Key results	18	Summarise key results with reference to study objectives – **Page 43-46**
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias – **Page 46-47**
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence – **Page 43-46**
Generalisability	21	Discuss the generalisability (external validity) of the study results – **Page 46**
Other information		
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based

ANXIETY LEVELS IN ADULT PATIENTS IN THE DENTAL OFFICE OF THE UNIVERSITIES' MASTER DEGREE PROGRAMS: ADVANCED ORTHODONTICS VERSUS ADVANCED ORAL SURGERY AND IMPLANTOLOGY. AN OBSERVATIONAL STUDY

Short title: Anxiety levels in university dental clinic: orthodontics versus implantology

Authors:

Georgia Victoria Schmitt-Gomez[1], Mónica Isabel Perdomo Lovera[2]

[1] 5th year student of the Dentistry degree at the European University of Valencia, Valencia, Spain

[2] DDS, PhD, MSc Dentistry, Professor at the Faculty of Dentistry, European University of Valencia, Valencia, Spain

Correspondence

Mónica Isabel Perdomo Lovera

Paseo de la Alameda 7, Valencia

46010, Valencia

MONICAISABEL.PERDOMO@universidadeuropea.es

Abstract

Introduction: Dental anxiety is categorized by fear triggered by the thought and action of visiting the dentist, or over dental procedures. Dental anxiety affects the patient with fight or flight, exhaustion, fears, as well as avoidance related to eating, hygiene, and social interactions. If not diagnosed, understood or prevented it can complicate, delay or completely prevent the realization of the needed treatments.

Objectives: To determine if the masters degrees (advanced orthodontics, advanced oral surgery and implantology), as well as gender, age, education, nature of necessity of treatment, as well as previous treatment, influence anxiety levels in patients.

Materials and Methods: A total of 71 patients surveys were collected between January and April 2024, of which 31 were from the implantology masters program, and 40 from the orthodontics masters program. The survey used in this study was the Dental Anxiety Scale in a QR format, including questions to inquire about their gender, age, education level, nature of treatment coming in for, and first time visit. A sample of patients who met inclusion and exclusion criteria were selected. A confidence level of 95% was established, chi-square test and Mann-Whitney test were done, and results with p-value of <0.05 were considered statistically significant.

Results: For all objectives stated, results showed that there was no statistical significance ($p>0.05$) on either of the groups (masters degree, age, gender, education, treatment necessity, first visit) on the level of anxiety the patients experienced.

Conclusion: The most prevalent anxiety level in both masters programs have concluded to be “mild anxiety”. The masters program, gender, age group, education level, necessity of treatment, first time visit didn’t have an influence on the level of anxiety of patients.

Keywords: dental anxiety, DAS, orthodontics, implantology, dental university clinic

Introduction

When the trigger of anxiety is the thought and action of visiting the dentist, or over the dental procedures in itself, it is specified as dental anxiety; which is categorised as the fifth most common cause of anxiety (1).

The majority of studies focusing on anxiety in the dental field investigate and write about dental anxiety rather than dental phobia. Dental anxiety is defined by an increased fear towards field related procedures, that may or may not be categorised as dental phobia. There's also not a definite way of differentiating between the two, because anxiety is subjective, and all diagnosing procedures are self reporting measures (2). This study will utilise the term dental anxiety as inclusion to all, and to encompass dental fear, anxiety and phobia in writing. Dental phobia is a by the WHO classified disease, and it is estimated to affect approximately 15-20% of the population (2). Dental phobia manifests itself similarly to anxiety but with different triggers. Dental phobia is in close relations with the dentist himself, hence it is important for him to properly detect, diagnose, identify and handle the situation. Patients suffering from dental phobia often react in postponing their treatments, hanging onto painkillers or antibiotics, essentially worsening the treatment outcome. Their triggers very often include stimuli such as syringes, ultrasonic scaler, and the instruments itself (3). Dental anxiety also affects the patient, not only with momentary symptoms such as fight or flight response, exhaustion, fears and negative thoughts, but also avoidance related to eating, hygiene, crying, aggression, sleep health and social interactions (1). Dental anxiety has a high prevalence worldwide, and that with dental pain is one of the main causes of dental emergencies in the clinic, hence their diagnosis and prevention is of importance to ensure patient safety, and care (4). Its' aetiology is difficult to define and track back, it could be derivative of lack of control and uncertainty in a clinical setting, but also conditioning, or indirect and direct previous experiences and learning, could play a role in its aetiology (5). Its important to understand what can cause, or trigger these states and symptoms in patients, to be able to prevent these unpleasant outcomes and difficulties for the patient. This study was carried out due to little information present on anxiety levels in patients comparing them with dental postgraduate courses, specifically comparing patients of orthodontics and surgery, nor indicating that specific master programs induce more anxiety than others, in patients.

MATERIALS AND METHODS

Design of the study: A non experimental study was carried out, based on questionnaires of patients that received treatments from the respective master programs (Advanced oral Implantology and Advanced Orthodontia) of the dental clinic of Universidad Europea de Valencia from January 2024 to March 2024 using the dental anxiety scale. The study protocol was approved by the commission of investigation affiliated to the Universidad Europea de Valencia with the code CI 2023-357. The structure of the work was done considering the criteria of the STROBE guideline.

PICO Question

P: adult patients in the dental office of the masters programs of UEV
I: patients in the university master's degree in advanced oral surgery and implantology.
C: patients in the university master's degree in advanced orthodontics
O: anxiety levels in the respective masters and differences between them, usinsg the dental anxiety scale.

Sample selection

Inclusion critera: Patients that are over 18 years of age; patients of any nationality; patients that attend the dental clinic of the Universidad Europea de Valencia; patients that visit the clinic to be treated by the advanced orthodontia master program; patients that visit the clinic to be treated by the advanced oral surgery and implantology master program; patients that visit the clinic in the respective master programs and undergo both invasive or non invasive treatments; patients that enter the clinic between January and March of 2024, patients that voluntarily signed and accepted the informed consent given to them to participate in the survey

Exclusion criteria: Patients that refuse to complete the questionnaire; patients that are not undergoing any treatment in the respective master programs (Advanced oral surgery and implantology and advanced Orthodontics)**;** patients that are under medications to control or treat their anxieties or incapacities; patients that suffer from functional disabilities or impairment that hinders them from answering and completing the questionnaire; patients that suffer from psychological impairments that hinders them from answering and completing the questionnaire; patients that are unable to complete the questionnaire due to the fact that its delivered via QR format

Sample size: 1. For the calculation of the minimum sample of subjects (Advanced oral surgery and implantology master's program), the patient was chosen as the experimental statistical unit and the number of patients that visited the dental clinic of the UEV for advanced oral surgery and implantology treatment in 3 months on average (n=531) was used to determine the number of surveys to be applied in the study, accepting an alpha risk of 0.05 and a confidence interval of 95%. The obtained estimate amounted to 224.

2. For the calculation of the minimum sample of subjects (Advanced orthodontics master's program), the patient was chosen as the experimental statistical unit and the number of patients that visited the dental clinic of the UEV for advanced orthodontics treatment in 3 months on average (n=950) was used to determine the number of surveys to be applied in the study, accepting an alpha risk of 0.05 and a confidence interval of 95%. The obtained estimate amounted to 274.

The average of patients visiting the dental clinic of the UEV in the time interval of 3 months was calculated with the total number of patients visiting each respective master program in the 2023 period (accounting for both locations of the master's program's place of residence in the 2023 period):

- Total number of patients in 2023 (Advanced oral surgery and implantology): 2125
- Total number of patients in 2023 (Advanced orthodontics): 3800

The 3-month average of patients of each respective master's program was used as "n" in both calculations of the sample size, due to the surveys being carried out in a 3-month time interval of January 2024 to March 2024.

Material used: The data has been collected using a questionnaire that consisted of questions collecting personal and general information about the patient, and the Dental Anxiety Scale (6). The Dental anxiety scale is made up of four questions to determine the level of dental anxiety that the patient experiences in corresponding situations. Each question can be scored between 1-5; 1 meaning not anxious, to 5 meaning (highly anxious), allowing the patient to answer accordingly to their perception. The score is added together to a total score that indicates their level of anxiety, ranging from 4-20 points (highly anxious being 15-20) (6). Both the general and personal inquiry of the questionnaire as well as the DAS questions included in the

questionnaire were translated to Spanish for their use in the clinic of the Universidad Europea de Valencia.

Procedure description: Permission to carry out the study was requested by the ethics committee of the European university in Villaviciosa de Odon by sending all necessary documentation. After the approval has been received, the collection of data began via the questionnaires (from January until March 2024). In the description of the questionnaires via google forms, the aims and purpose of the study have been explained, as well as the fact that the data collected would be treated in a completely anonymous matter, solely for this study and not for any other purpose outside of this research project. The description explained that the questionnaire is done on a completely voluntary basis and that by continuing and answering the questions, they would be agreeing to the informed consent and the voluntary basis of this survey. The consent form and the questionnaire was given to the patients either before or after their corresponding treatments in form of a QR code. The data from correctly and completed filled out questionnaires were analysed.

Data collection: The collection of the data has been done in a completely anonymous manner and on voluntary basis through Google forms. After the data has been collected, filtered out and organized, the results have been statistically analysed and presented in the results section of this study and discussed consecutively.

Statistical analysis: The statistical analysis entails a comprehensive descriptive analysis utilizing measures such as mean, standard deviation, minimum, maximum, median, and 25th and 75th percentiles (IQR, interquartile range). The inferential analysis incorporated statistical tests to compare frequencies across various groups. The Chi-squared test was employed to assess disparities between the orthodontics and implantology groups concerning categorical survey questions. Additionally, the potential impact of gender and age can be explored. The Mann-Whitney test was utilized to examine differences between the orthodontics and implantology groups regarding categorical survey questions with ordinal nature. The reference level of significance was set up to 5% ($\alpha=0.05$)

Variables of the study: The main (dependent) variable of this observational study collected was the anxiety level in patients that came to the clinic to be treated in either of the master programs of the university (Advanced oral surgery and implantology or advanced orthodontics). The other independent secondary variables collected in the study are gender, age, level of education obtained, nature of necessity of treatment, and either first time visit/previously received treatment at said clinic.

RESULTS

Study population: After applying the inclusion and exclusion criteria, the final sample of advanced implantology consisted of 30 patients, and in advanced orthodontics of 37 patients.

Descriptive analysis

Sample group characteristics: In advanced orthodontics the most common gender that participated in the study was female, the most prevalent age group was 18-26, the most prevalent education level was Spanish baccalaureate, the most prevalent reason for visiting was aesthetic motives, the majority that came in have previously received treatment. In advanced implantology the most common gender that participated in the study was female, the most prevalent age group was 54-62, education level was Spanish baccalaureate and reason was medically necessary.

Analytic analysis

Anxiety levels (DAS) according to masters program: Mild anxiety was the most prevalent anxiety level in both masters programs, with 67.7% in advanced orthodontics, and 66.7% in advanced implantology. To evaluate the effect the group might have on the patients anxiety level, Mann Whitney test was carried out, with a non significant effect ($p>0.05$). Anxiety level can be considered similar between both groups (See table 1 and 2).

Anxiety levels (DAS) according to gender: Mann Whitney test concluded no significative effect of the gender on the patients anxiety levels ($p>0.05$). No gender presents a significantly higher anxiety than the other in each of the respective master programs.

Anxiety levels (DAS) according to age: Chi squared test indicated no significative effect of the age group on the patients anxiety levels ($p>0.05$).

Anxiety levels (DAS) according to educational level: Chi squared test indicated no significative effect of the educational level on the patients anxiety levels ($p>0.05$).

Anxiety levels (DAS) according to treatment necessity: Mann Whitney test indicated no significative effect of the treatment necessity on the patients anxiety levels ($p>0.05$).

Anxiety levels (DAS) according to previous treatment: Mann Whitney test indicated no significative effect of the previous treatment on the patients anxiety levels ($p>0.05$).

DISCUSSION

Key Results: With respect to the general objective of this study, we can conclude that the most prevalent anxiety level in both masters programs, according to the DAS assessment, revealed to be “mild anxiety”, and can be considered as similar between both groups. Tests, that have been carried out by the statistician to determine the significance of the results regarding the ‘general objective’, also confirm that whether the patients visited the orthodontics or implantology master program, didn’t affect their anxiety level. Herewith the null hypothesis that was formulated at the beginning of the study can be confirmed, stating patients attending the masters degrees in oral surgery and implantology will have similar levels of anxiety as patients attending the masters degree in orthodontics. Regarding the specific objectives, the results of this study were able to conclude that there is no significative effect of the gender on the patients anxiety levels, in either of the masters programs. Hence no gender presented a significantly higher anxiety than the other in each of the masters programs.

Studies done by Yavan (7) et al and by Łazarz-Półkoszek et al. (8) are in concordance to the results collected in this study, stating that there was no statistically significant difference between gender and anxiety levels. Studies by Tarrosh et al. (9), Avramut et al. (10), and Sukumaran et al. (11) came to the conclusion that females

exhibited higher anxiety levels. When looking at and comparing these different results and studies with each other, as well as the results collected in this study, one can conclude that gender poses an inconclusive effect on anxiety levels. The second specific objective of this study considered age and anxiety level amongst patients, and from the results of this study it can be concluded that the age group has no significative effect on the patients anxiety level. Studies by Cianetti et al. (12), Mohammed et al. (13), and Hong et al. (14) demonstrated that higher dental anxiety was more likely occurring in younger adults. Studies by Łazarz-Półkoszek et al. (8), Saatchi et al. (15), and and Berberoğlu et al. (53) demonstrated that dental anxiety wasn't affected by age, which is again in concordance to the results collected in this study. On the other hand, the study by Yavan et al. (7) showed that adults had higher anxiety than adolescents. When looking at and comparing these different results and studies with each other, as well as the results collected in this study, one can conclude that age poses an inconclusive effect on anxiety levels. Regarding the third specific objective of this study considering the influence of the education level on the anxiety levels of the patients, it has been deducted that there is no significative effect of the educational level on the patients' anxiety levels. Studies by Saatchi et al. (15), Łazarz-Półkoszek et al. (8), Berberoğlu et al. (16), and El Hajj et al. (17), all concluded that the level of education didn't have an influence on the anxiety levels of the patients included in their study, which is in concordance to the results collected in this study. A study by Egbor et al. (18) stated patients with secondary school education had the highest DAS score, whilst a study by Muneer et al. (19) stated patients with higher education level were more dentally anxious. Regarding the fourth specific objective of this study considering the influence of the nature of treatment necessity on the patients anxiety level, it has been concluded that there is no significative effect, of whether the patient came in for medically necessary reasons or aesthetic motives, on the level of anxiety on the patient. Regarding the fifth and last specific objective of this study, considering whether coming in for the first time, or having had received previous treatment, had an influence on the anxiety level of the patient, also concluded to be insignificant. A study by Yu et al. (20), concluded that there was a significant difference found in regard to the frequency of visits to the dentist, and length of time since the most recent dental visit. These results might be comparable to this study, in relation to the first visit at the masters clinic versus having previously come here; predicting that according to their results, and applying them to this study, it might be concluded that patients who have

attended before (regularly visited), manifest less anxiety than first time visitors. A study by Erten et al. (21) found that patients who never visited the dentist had the highest anxiety scores. When considering his study and comparing it to this studies objective, one might say that a patients first time visit at the clinic would manifest more anxiety in the person than the one having come in before.

Limitations: With respect to the results concluded in this present observational study, the lack of questions, regarding specific anxiety inducing situations in the dental clinic, included in the DAS questionnaire can be identified as a limitation of this study. In the study conducted by Caltabiano et al. (60) on dental anxiety in patients attending a student dental clinic, the modified dental anxiety scale (MDAS) questionnaire was utilized for measuring anxiety levels (the MDAS includes an additional question asking about patients mood during local anaesthesia) (33), concluding significant differences in the anxiety levels (females had higher MDAS scores than males and younger patients had higher MDAS scores than older patients). This fact could lead to the assumption, that the presence of the local anaesthesia question might have an impact on the results of the anxiety levels. Another limitation of this study is the fact that the sample sizes of 224 in implants and 274 in ortho (with a confidence interval of 95% and alpha risk 0.05) were not met. This leads to the results of this study not having the expressiveness as previously planned. Therefore the author recommends the findings of this study to be interpreted with caution. It is also considerable to take into account that all surveys in this study were collected solely at the masters clinic of the European University in Valencia. This factor reduces the sample group to a specific population in a given context, and location. This means in this specific study no patients in other populations, in different context, clinic, city, and country aren't considered, and could lack generalisability of the study results. Furthermore the sample group is consisting only of patients that voluntarily contributed to the survey, meaning that the sample is not representative of those who refrained from participating in the questionnaire. Those patients who abstained from participating, could potentially be in the pool of more anxious patients, avoiding confrontation in an already stressful situation for them. Anxiety and its symptoms are subjective to the person feeling and confronting them, meaning that it's a difficult concept to measure and compare in a numeric way. The DAS questionnaire questions the person about their feelings under certain circumstances, which can be considered as subjective and bias. Not only can an

individual experience and rate their symptoms different from another individual, but the same individual can experience and rate their symptoms differently from day to situation. One also must take into consideration that given the setting, it is unknown if the questions were answered truthfully, adding another subjective bias. Further studies might be needed to confirm the results presented in this observational study, in a student dental clinic setting, comparing anxiety of patients in the given speciality, as well as the other factors of age, gender, education, first visit and treatment necessity.

CONCLUSION

The most prevalent anxiety level in both masters program have concluded to be “mild anxiety”, and the results can be considered as similar between both groups.
The masters program does not have an effect on the anxiety level experienced in the patient.

1. There is no significant correlation between gender and level of anxiety ($p>0.05$); the gender didn’t affect the level of anxiety the patient experienced.
2. There is no significant correlation between age group and level of anxiety ($p>0.05$); the age didn’t affect the level of anxiety the patient experienced.
3. There is no significant correlation between education and level of anxiety ($p>0.05$); the level of education didn’t affect the level of anxiety the patient experienced.
4. There is no significant correlation between nature of necessity of treatment and level of anxiety ($p>0.05$); the nature of treatment didn’t affect the level of anxiety the patient experienced.
5. There is no significant correlation between first visit and level of anxiety ($p>0.05$); the number of visit (having been at the clinic before, or coming in for the first time) didn’t affect the level of anxiety the patient experienced.

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Table 1: Anxiety level by Group

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
Mild	45	67.2	25	67.6	20	66.7
Moderate	17	25.4	10	27.0	7	23.3
High	3	4.5	1	2.7	2	6.7
Severe	2	3.0	1	2.7	1	3.3

Table 2: Effect of the group (orthodontics vs. implants master) over DAS

Table 2. Effect of the group over DAS: Results of Mann Whitney test and Mann Whitney test for ordinal variables

	p-value
Anxiety level	0,854

*p<0.05; **p<0.01; ***p<0.001

NIVELES DE ANSIEDAD EN PACIENTES ADULTOS EN LA CONSULTA ODONTOLÓGICA DE LOS MÁSTERES UNIVERSITARIOS: ORTODONCIA AVANZADA FRENTE A CIRUGÍA ORAL AVANZADA E IMPLANTOLOGÍA. UN ESTUDIO OBSERVACIONAL

Título corto: Niveles de ansiedad en la clínica dental universitaria: ortodoncia versus implantología

Autores:

Georgia Victoria Schmitt-Gomez[1] , Mónica Isabel Perdomo Lovera[2]

[1] Estudiande de 5° curso de la Licenciatura de Odontología de la Universidad Europea de Valencia, Valencia, España

[2] DDS, PhD, MSc Odontología, Profesor de la Facultad de Odontología, Universidad Europea de Valencia, Valencia, España

Correspondencia

Mónica Isabel Perdomo Lovera

Paseo de la Alameda 7, Valencia

46010, Valencia

MONICAISABEL.PERDOMO@universidadeuropea.es

Resumen

Introducción: La ansiedad dental se categoriza como el miedo desencadenado por el pensamiento y la acción de visitar al dentista, o sobre los procedimientos dentales. La ansiedad dental afecta al paciente con lucha o huida, agotamiento, miedos, así como evitación relacionada con la alimentación, la higiene y las interacciones sociales. Si no se diagnostica, comprende o previene, puede complicar, retrasar o impedir por completo la realización de los tratamientos necesarios.

Objetivos: Determinar si las titulaciones de máster (ortodoncia avanzada, cirugía oral avanzada e implantología), así como el sexo, la edad, la educación, la naturaleza de la necesidad de tratamiento, así como el tratamiento previo, influyen en los niveles de ansiedad de los pacientes.

Materiales y métodos: Entre enero y abril de 2024 se recogieron las encuestas de un total de 71 pacientes, de los cuales 31 pertenecían al máster de implantología y 40 al máster de ortodoncia. La encuesta utilizada en este estudio fue la Escala de Ansiedad Dental en formato QR, que incluía preguntas para indagar sobre su sexo, edad, nivel de estudios, naturaleza del tratamiento por el que acudían y primera visita. Se seleccionó una muestra de pacientes que cumplían los criterios de inclusión y exclusión. Se estableció un nivel de confianza del 95%, se realizaron pruebas de chi-cuadrado y de Mann-Whitney, y los resultados con un valor $p < 0,05$ se consideraron estadísticamente significativos.

Resultados: Para todos los objetivos planteados, los resultados mostraron que no había significación estadística ($p > 0,05$) en ninguno de los grupos (máster, edad, sexo, educación, necesidad de tratamiento, primera visita) sobre el nivel de ansiedad que experimentaban los pacientes.

Conclusiones: El nivel de ansiedad más prevalente en ambos programas de máster ha resultado ser "ansiedad leve". El programa de máster, el sexo, el grupo de edad, el nivel educativo, la necesidad de tratamiento y la primera visita no influyeron en el nivel de ansiedad de los pacientes.

Palabras clave: ansiedad dental, DAS, ortodoncia, implantología, clínica dental universitaria

INTRODUCCIÓN

Cuando el desencadenante de la ansiedad es el pensamiento y la acción de visitar al dentista, o sobre los procedimientos dentales en sí mismos, se especifica como ansiedad dental; que se clasifica como la quinta causa más común de ansiedad (1).
La mayoría de los estudios centrados en la ansiedad en el ámbito odontológico investigan y escriben sobre la ansiedad dental más que sobre la fobia dental. La ansiedad dental se define por un mayor temor hacia los procedimientos relacionados con el campo, que puede o no clasificarse como fobia dental. Tampoco hay una forma definida de diferenciar entre ambas, porque la ansiedad es subjetiva y todos los procedimientos de diagnóstico son medidas de autoinforme (2). En este estudio se utilizará el término ansiedad dental como inclusión a todos, y para englobar por escrito el miedo, la ansiedad y la fobia dental. La fobia dental es una enfermedad clasificada por la OMS, y se estima que afecta aproximadamente al 15-20% de la población (2). La fobia dental se manifiesta de forma similar a la ansiedad, pero con diferentes desencadenantes. La fobia dental está en estrecha relación con el propio dentista, de ahí la importancia de que éste detecte, diagnostique, identifique y maneje adecuadamente la situación. Los pacientes que padecen fobia dental a menudo reaccionan posponiendo sus tratamientos, aferrándose a analgésicos o antibióticos, lo que esencialmente empeora el resultado del tratamiento. Sus desencadenantes suelen ser estímulos como las jeringuillas, el raspador ultrasónico y el propio instrumental (3). La ansiedad dental también afecta al paciente, no sólo con síntomas momentáneos como respuesta de lucha o huida, agotamiento, miedos y pensamientos negativos, sino también evitación relacionada con la alimentación, la higiene, el llanto, la agresividad, la salud del sueño y las interacciones sociales (1). La ansiedad dental tiene una alta prevalencia en todo el mundo, y la que cursa con dolor dental es una de las principales causas de urgencias odontológicas en la clínica, de ahí que su diagnóstico y prevención sea de importancia para garantizar la seguridad del paciente, así como su atención (4). Su etiología es difícil de definir y rastrear, podría ser derivada de la falta de control y la incertidumbre en un entorno clínico, pero también el condicionamiento, o las experiencias previas indirectas y

directas y el aprendizaje, podrían desempeñar un papel en su etiología (5). Es importante comprender qué puede causar o desencadenar estos estados y síntomas en los pacientes, para poder prevenir estos resultados desagradables y las dificultades para el paciente. Este estudio se llevó a cabo debido a la poca información existente sobre los niveles de ansiedad en los pacientes comparándolos con los cursos de postgrado odontológico, concretamente comparando pacientes de ortodoncia y cirugía, ni indicando que programas de máster específicos induzcan más ansiedad que otros, en los pacientes.

MATERIALES Y MÉTODOS

Diseño del estudio: Se realizó un estudio no experimental, basado en cuestionarios a pacientes que recibieron tratamientos de los respectivos programas máster (Implantología oral avanzada y Ortodoncia avanzada) de la clínica dental de la Universidad Europea de Valencia desde enero de 2024 hasta marzo de 2024 utilizando la escala de ansiedad dental. El protocolo del estudio fue aprobado por la comisión de investigación adscrita a la Universidad Europea de Valencia con el código CI 2023-357. La estructura del trabajo se realizó teniendo en cuenta los criterios de la guía STROBE.

Pregunta PICO

P: pacientes adultos en la consulta dental de los másteres de UEV
I: pacientes del máster universitario en cirugía oral avanzada e implantología.
C: pacientes del máster universitario en ortodoncia avanzada
O: niveles de ansiedad en los respectivos maestros y diferencias entre ellos, utilizando la escala de ansiedad dental.

Selección de muestras

Criterios de inclusión: Pacientes mayores de 18 años; pacientes de cualquier nacionalidad; pacientes que acudan a la clínica dental de la Universidad Europea de Valencia; pacientes que acudan a la clínica para ser tratados por el máster de ortodoncia avanzada; pacientes que acudan a la clínica para ser tratados por el máster de cirugía oral avanzada e implantología; pacientes que acudan a la clínica en los respectivos másteres y se sometan a tratamientos invasivos o no invasivos;

pacientes que ingresen en la clínica entre enero y marzo de 2024, pacientes que voluntariamente hayan firmado y aceptado el consentimiento informado que se les ha dado para participar en la encuesta.

Criterios de exclusión: Pacientes que se nieguen a cumplimentar el cuestionario; pacientes que no estén recibiendo ningún tratamiento en los respectivos programas de máster (Cirugía oral e implantología avanzadas y Ortodoncia avanzada)**;** pacientes que estén bajo medicación para controlar o tratar sus ansiedades o incapacidades; pacientes que sufran discapacidades o deficiencias funcionales que les impidan responder y cumplimentar el cuestionario; pacientes que sufran deficiencias psicológicas que les impidan responder y cumplimentar el cuestionario; pacientes que no puedan cumplimentar el cuestionario debido a que se entrega mediante formato QR.

Tamaño muestral: 1. Para el cálculo de la muestra mínima de sujetos (Máster de cirugía oral avanzada e implantología), se eligió al paciente como unidad estadística experimental y se utilizó el número de pacientes que acudían a la clínica dental de la UEV para recibir tratamiento de cirugía oral avanzada e implantología en 3 meses de media (n=531) para determinar el número de encuestas a aplicar en el estudio, aceptando un riesgo alfa de 0,05 y un intervalo de confianza del 95%. La estimación obtenida ascendió a 224.

2. Para el cálculo de la muestra mínima de sujetos (Máster de ortodoncia avanzada), se eligió al paciente como unidad estadística experimental y se utilizó el número de pacientes que acudían a la clínica dental de la UEV para recibir tratamiento de ortodoncia avanzada en 3 meses de media (n=950) para determinar el número de encuestas a aplicar en el estudio, aceptando un riesgo alfa de 0,05 y un intervalo de confianza del 95%. La estimación obtenida ascendió a 274.

Se calculó la media de pacientes que visitaron la clínica dental de la UEV en el intervalo de tiempo de 3 meses con el número total de pacientes que visitaron cada programa de máster respectivo en el periodo de 2023 (teniendo en cuenta ambas ubicaciones del lugar de residencia del programa de máster en el periodo de 2023):

- Número total de pacientes en 2023 (Cirugía oral avanzada e implantología): 2125
- Número total de pacientes en 2023 (ortodoncia avanzada): 3800

La media de 3 meses de pacientes de cada programa de máster respectivo se utilizó como "n" en ambos cálculos del tamaño de la muestra, debido a que las encuestas se realizaron en un intervalo de tiempo de 3 meses de enero de 2024 a marzo de 2024.

Material utilizado: Los datos se han recogido mediante un cuestionario que constaba de preguntas que recogían información personal y general del paciente, y la Escala de Ansiedad Dental (6). La escala de ansiedad dental se compone de cuatro preguntas para determinar el nivel de ansiedad dental que experimenta el paciente en las situaciones correspondientes. Cada pregunta puede puntuarse entre 1 y 5; de 1, que significa nada ansioso, a 5, que significa (muy ansioso), lo que permite al paciente responder de acuerdo con su percepción. La puntuación se suma para obtener una puntuación total que indica su nivel de ansiedad, que oscila entre 4 y 20 puntos (siendo muy ansioso de 15 a 20) (6). Tanto la pregunta general y personal del cuestionario como las preguntas DAS incluidas en el cuestionario fueron traducidas al español para su uso en la clínica de la Universidad Europea de Valencia.

Descripción del procedimiento: Se solicitó permiso para realizar el estudio al comité ético de la universidad europea de Villaviciosa de Odón enviando toda la documentación necesaria. Tras recibir la aprobación, se inició la recogida de datos a través de los cuestionarios (desde enero hasta marzo de 2024). En la descripción de los cuestionarios a través de google forms, se han explicado los objetivos y finalidad del estudio, así como que los datos recogidos serían tratados de forma totalmente anónima, únicamente para este estudio y no para ningún otro fin ajeno a este proyecto de investigación. En la descripción se explicó que el cuestionario se realiza de forma totalmente voluntaria y que, al continuar y responder a las preguntas, estarían aceptando el consentimiento informado y la voluntariedad de esta encuesta. El formulario de consentimiento y el cuestionario se entregaron a los pacientes antes o después de sus tratamientos correspondientes en forma de código QR. Se analizaron los datos de los cuestionarios cumplimentados correctamente.

Recogida de datos: La recogida de los datos se ha realizado de forma totalmente anónima y voluntaria a través de formularios de Google. Una vez recogidos, filtrados y organizados los datos, se han analizado estadísticamente los resultados, que se

presentan en la sección de resultados de este estudio y se discuten consecutivamente.

Análisis estadístico: El análisis estadístico conlleva un análisis descriptivo exhaustivo que utiliza medidas como la media, la desviación estándar, el mínimo, el máximo, la mediana y los percentiles 25 y 75 (IQR, rango intercuartílico). El análisis inferencial incorporó pruebas estadísticas para comparar frecuencias entre diversos grupos. Se empleó la prueba de Chi-cuadrado para evaluar las disparidades entre los grupos de ortodoncia e implantología en relación con las preguntas categóricas de la encuesta. Además, se puede explorar el impacto potencial del género y la edad. Se utilizó la prueba de Mann-Whitney para examinar las diferencias entre los grupos de ortodoncia e implantología en relación con las preguntas categóricas de la encuesta de naturaleza ordinal. El nivel de significación de referencia se fijó en el 5% (α=0,05).

Variables del estudio: La variable principal (dependiente) de este estudio observacional recogida fue el nivel de ansiedad en los pacientes que acudieron a la clínica para ser tratados en cualquiera de los programas master de la universidad (Cirugía oral e implantología avanzada u Ortodoncia avanzada). Las otras variables secundarias independientes recogidas en el estudio son el sexo, la edad, el nivel de estudios obtenido, la naturaleza de la necesidad de tratamiento y el hecho de acudir por primera vez/haber recibido tratamiento previamente en dicha clínica.

RESULTADOS

Población de estudio: Tras aplicar los criterios de inclusión y exclusión, la muestra final de implantología avanzada estuvo formada por 30 pacientes, y en ortodoncia avanzada por 37 pacientes.

Análisis descriptivo

Características del grupo muestral: En ortodoncia avanzada el sexo más frecuente que participó en el estudio fue el femenino, el grupo de edad más prevalente fue el de 18-26 años, el nivel de estudios más prevalente fue el bachillerato español, el motivo de visita más prevalente fue motivos estéticos, la mayoría que acudió había recibido tratamiento previamente. En implantología avanzada el sexo más frecuente que

participó en el estudio fue el femenino, el grupo de edad más prevalente fue el de 54-62 años, el nivel de estudios más prevalente fue el bachillerato español y el motivo de visita fue por necesidad médica.

Análisis analítico

Niveles de ansiedad (DAS) según el programa de máster: La ansiedad leve fue el nivel de ansiedad más prevalente en ambos programas de máster, con un 67,7% en ortodoncia avanzada, y un 66,7% en implantología avanzada. Para evaluar el efecto que el grupo pudiera tener sobre el nivel de ansiedad de los pacientes, se realizó la prueba de Mann Whitney, con un efecto no significativo ($p>0,05$). El nivel de ansiedad puede considerarse similar entre ambos grupos (Véanse los tablas 1 y 2).

Niveles de ansiedad (DAS) en función del sexo: La prueba de Mann Whitney concluyó que no existe un efecto significativo del género en los niveles de ansiedad de los pacientes ($p>0,05$). Ningún género presenta una ansiedad significativamente mayor que el otro en cada uno de los respectivos másteres.

Niveles de ansiedad (DAS) en función de la edad: La prueba de Chi cuadrado no indicó ningún efecto significativo del grupo de edad en los niveles de ansiedad de los pacientes ($p>0,05$).

Niveles de ansiedad (DAS) según el nivel educativo: La prueba de Chi cuadrado no indicó ningún efecto significativo del nivel educativo sobre los niveles de ansiedad de los pacientes ($p>0,05$).

Niveles de ansiedad (DAS) según la necesidad de tratamiento: La prueba de Mann Whitney no indicó ningún efecto significativo de la necesidad de tratamiento sobre los niveles de ansiedad de los pacientes ($p>0,05$).

Niveles de ansiedad (DAS) según el tratamiento previo: La prueba de Mann Whitney no indicó ningún efecto significativo del tratamiento previo sobre los niveles de ansiedad de los pacientes ($p>0,05$).

DISCUSIÓN

Principales resultados: Con respecto al objetivo general de este estudio, podemos concluir que el nivel de ansiedad más prevalente en ambos programas de máster, según la evaluación DAS, reveló ser "ansiedad leve", y puede considerarse similar entre ambos grupos. Las pruebas realizadas por el estadístico para determinar la significación de los resultados en relación con el "objetivo general" también confirman que el hecho de que los pacientes cursaran el máster de ortodoncia o el de implantología no afectó a su nivel de ansiedad. De este modo, se confirma la hipótesis nula formulada al inicio del estudio, según la cual los pacientes que cursan los másteres de cirugía oral e implantología presentan niveles de ansiedad similares a los de los pacientes que cursan el máster de ortodoncia. En cuanto a los objetivos específicos, los resultados de este estudio permiten concluir que no existe un efecto significativo del género sobre los niveles de ansiedad de los pacientes, en ninguno de los dos másteres. Por lo tanto, ningún género presentó una ansiedad significativamente mayor que el otro en cada uno de los programas de máster.

Los estudios realizados por Yavan (7) et al y por Łazarz-Półkoszek et al. (8) concuerdan con los resultados recogidos en este estudio, al afirmar que no había diferencias estadísticamente significativas entre el género y los niveles de ansiedad. Los estudios de Tarrosh et al. (9), Avramut et al. (10) y Sukumaran et al. (11) llegaron a la conclusión de que las mujeres mostraban mayores niveles de ansiedad. Al observar y comparar estos diferentes resultados y estudios entre sí, así como los resultados recogidos en este estudio, se puede concluir que el género tiene un efecto no concluyente sobre los niveles de ansiedad. El segundo objetivo específico de este estudio tenía en cuenta la edad y el nivel de ansiedad de los pacientes, y de los resultados de este estudio se puede concluir que el grupo de edad no tiene un efecto significativo en el nivel de ansiedad de los pacientes. Los estudios de Cianetti et al. (12), Mohammed et al. (13) y Hong et al. (14) demostraron que era más probable que la ansiedad dental fuera mayor en los adultos más jóvenes. Los estudios de Łazarz-Półkoszek et al. (8), Saatchi et al. (15), y Berberoğlu et al. (53) demostraron que la ansiedad dental no se veía afectada por la edad, lo que de nuevo concuerda con los resultados recogidos en este estudio. Por otro lado, el estudio de Yavan et al. (7) demostró que los adultos presentaban mayor ansiedad que los adolescentes. Al observar y comparar estos diferentes resultados y estudios entre sí, así como los

resultados recogidos en este estudio, se puede concluir que la edad plantea un efecto no concluyente sobre los niveles de ansiedad. En cuanto al tercer objetivo específico de este estudio, considerando la influencia del nivel educativo en los niveles de ansiedad de los pacientes, se ha deducido que no existe un efecto significativo del nivel educativo en los niveles de ansiedad de los pacientes. Los estudios de Saatchi et al. (15), Łazarz-Półkoszek et al. (8), Berberoğlu et al. (16), y El Hajj et al. (17), concluyeron que el nivel educativo no influía en los niveles de ansiedad de los pacientes incluidos en su estudio, lo que concuerda con los resultados recogidos en este estudio. Un estudio de Egbor et al. (18) afirmó que los pacientes con estudios secundarios presentaban la puntuación más alta en la DAS, mientras que un estudio de Muneer et al. (19) afirmó que los pacientes con un nivel de estudios superior presentaban más ansiedad dental. En cuanto al cuarto objetivo específico de este estudio, considerando la influencia de la naturaleza de la necesidad de tratamiento en el nivel de ansiedad de los pacientes, se ha llegado a la conclusión de que no existe un efecto significativo, tanto si el paciente acude por motivos médicamente necesarios como por motivos estéticos, en el nivel de ansiedad del paciente. En cuanto al quinto y último objetivo específico de este estudio, considerar si acudir por primera vez, o haber recibido tratamiento previo, influía en el nivel de ansiedad del paciente, también se concluyó que no era significativo. En un estudio realizado por Yu et al. (20), se llegó a la conclusión de que existía una diferencia significativa en cuanto a la frecuencia de las visitas al dentista y el tiempo transcurrido desde la última visita. Estos resultados podrían ser comparables a los de este estudio, en relación a la primera visita a la clínica de maestros frente a haber acudido con anterioridad; prediciendo que según sus resultados, y aplicándolos a este estudio, se podría concluir que los pacientes que han acudido con anterioridad (visitas regulares), manifiestan menos ansiedad que los que acuden por primera vez. En un estudio realizado por Erten et al. (21) se observó que los pacientes que nunca habían visitado al dentista presentaban las puntuaciones de ansiedad más elevadas. Al considerar su estudio y compararlo con el objetivo de este estudio, se podría decir que un paciente que acude por primera vez a la clínica manifestaría más ansiedad que el que ha acudido antes.

Limitaciones: Con respecto a los resultados concluidos en el presente estudio observacional, la falta de preguntas, relativas a situaciones específicas que inducen

ansiedad en la clínica dental, incluidas en el cuestionario DAS puede identificarse como una limitación de este estudio. En el estudio realizado por Caltabiano et al. (60) sobre la ansiedad dental en pacientes que acudían a una clínica dental para estudiantes, se utilizó el cuestionario de la escala de ansiedad dental modificada (EADM) para medir los niveles de ansiedad (la EADM incluye una pregunta adicional sobre el estado de ánimo de los pacientes durante la anestesia local) (33), concluyéndose diferencias significativas en los niveles de ansiedad (las mujeres obtuvieron puntuaciones más altas en la EADM que los hombres y los pacientes más jóvenes obtuvieron puntuaciones más altas en la EADM que los pacientes de más edad). Este hecho podría llevar a suponer que la presencia de la pregunta sobre la anestesia local podría influir en los resultados de los niveles de ansiedad. Otra limitación de este estudio es el hecho de que no se alcanzaron los tamaños muestrales de 224 en implantes y 274 en ortodoncia (con un intervalo de confianza del 95% y un riesgo alfa de 0,05). Esto hace que los resultados de este estudio no tengan la expresividad prevista. Por lo tanto, el autor recomienda que los resultados de este estudio se interpreten con cautela. También es considerable tener en cuenta que todas las encuestas de este estudio se recogieron únicamente en la clínica de másteres de la Universidad Europea de Valencia. Este factor reduce el grupo de la muestra a una población específica en un contexto y una ubicación determinados. Esto significa que en este estudio específico no se tienen en cuenta pacientes de otras poblaciones, en contextos, clínicas, ciudades y países diferentes, lo que podría impedir la generalización de los resultados del estudio. Además, el grupo de muestra está formado únicamente por pacientes que contribuyeron voluntariamente a la encuesta, lo que significa que la muestra no es representativa de los que se abstuvieron de participar en el cuestionario. Aquellos pacientes que se abstuvieron de participar, podrían estar potencialmente en el grupo de pacientes más ansiosos, evitando la confrontación en una situación ya estresante para ellos.

La ansiedad y sus síntomas son subjetivos para la persona que los siente y afronta, lo que significa que es un concepto difícil de medir y comparar de forma numérica. El cuestionario DAS interroga a la persona sobre sus sentimientos en determinadas circunstancias, lo que puede considerarse subjetivo y sesgado. No sólo un individuo puede experimentar y valorar sus síntomas de forma diferente a otro individuo, sino que el mismo individuo puede experimentar y valorar sus síntomas de forma diferente de un día a otro. También hay que tener en cuenta que, dado el contexto, se

desconoce si las preguntas se respondieron con sinceridad, lo que añade otro sesgo subjetivo. Podrían ser necesarios más estudios para confirmar los resultados presentados en este estudio observacional, en un entorno de clínica odontológica estudiantil, comparando la ansiedad de los pacientes en la especialidad dada, así como los otros factores de edad, sexo, educación, primera visita y necesidad de tratamiento.

CONCLUSIÓN

Se ha concluido que el nivel de ansiedad más prevalente en ambos másteres es el de "ansiedad leve", y los resultados pueden considerarse similares entre ambos grupos.

El programa de máster no influye en el nivel de ansiedad que experimenta el paciente.

1. No existe una correlación significativa entre el sexo y el nivel de ansiedad ($p>0,05$); el sexo no afectó al nivel de ansiedad que experimentó el paciente.
2. No existe una correlación significativa entre el grupo de edad y el nivel de ansiedad ($p>0,05$); la edad no afecta al nivel de ansiedad que experimenta el paciente.
3. No existe una correlación significativa entre la educación y el nivel de ansiedad ($p>0,05$); el nivel de educación no afectó al nivel de ansiedad que experimentó el paciente.
4. No existe una correlación significativa entre la naturaleza de la necesidad de tratamiento y el nivel de ansiedad ($p>0,05$); la naturaleza del tratamiento no afectó al nivel de ansiedad que experimentó el paciente.
5. No existe una correlación significativa entre la primera visita y el nivel de ansiedad ($p>0,05$); el número de visitas (haber estado antes en la consulta o venir por primera vez) no afectó al nivel de ansiedad que experimentó el paciente.

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Tabla 1: Nivel de ansiedad por grupo

	GROUP					
	Total		Orthodontics		Implantology	
	N	%	N	%	N	%
Total	67	100.0	37	100.0	30	100.0
Mild	45	67.2	25	67.6	20	66.7
Moderate	17	25.4	10	27.0	7	23.3
High	3	4.5	1	2.7	2	6.7
Severe	2	3.0	1	2.7	1	3.3

Tabla 2: Efecto del grupo (master de ortodoncia vs. implantes) sobre la DAS

Table 2. Effect of the group over DAS: Results of Mann Whitney test and Mann Whitney test for ordinal variables

	p-value
Anxiety level	0,854

*p<0.05; **p<0.01; ***p<0.001