**Department of Dental Sciences**

**Final Internship Report**
**Master of Science in**
**Dentistry**

# Anthropology of pain

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**Gandra, May 20, 2019**

# Declaration of Integrity

I, Anna Frémont, student of the Master of Science in Dentistry at the University Institute of Health Sciences, declare to have acted with absolute integrity in the preparation of this Internship Report entitled: "Anthropology of Pain".

I confirm that in all the work leading to its preparation, I have not resorted to any form of falsification of results or the practice of plagiarism.

Furthermore, I declare that all the sentences that I have taken from previous works, belonging to other authors, were referenced or written with new words, in which case I have placed the citation of the source.

Report presented at the University Institute of Health

Sciences. Supervisor: Maria João Calheiros-Lobo

Gandra, May 23, 2019

The student: Anna Frémont

## Acceptance of the Supervisor

I, Maria João Calheiros-Lobo, with the professional category of Invited Assistant Professor of the University Institute of Health Sciences, having assumed the role of Supervisor of the Final Internship Report entitled "Anthropology of Pain", of the student of the Integrated Master in Dental Medicine, Anna Frémont, declare that I am in favor so that the Final Internship Report can be presented to the Jury for Admission to exams leading to the achievement of the Master Degree.

Gandra, May 23, 2019

The Supervisor: Maria João Calheiros-Lobo

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**CHAPTER TWO: internship report**

**Abstract:**

Pain, an unpleasant sensory and emotional experience, is the main reason for dental consultation. Humans experience dental pain outside of the clinic through neuralgia symptoms and may also experience pain during consultation. Effectively, the degree of pain one experiences is relative and dependent on one's perception of it. The perception of pain is unique to each individual and can be influenced by a variety of factors and can change according to different social and historical contexts. Pain may, for example, have a religious value or connotation of virility through physical and psychological hardening of suffering, or may be overreacted by apprehension and fear, and in some cases, it may even be considered unacceptable to feel it by the contemporary right to anesthesia. Analgesia and anesthesia thus reveal an interpretation and response to pain that varies over time and becomes revealing of values and ethics.

Key Words: dental pain, suffering, anthropology, history of dentistry, resilience

**Resumo**:

A dor, uma experiência sensorial e emocional desagradável, é o principal motivo de consulta dentária. Os seres humanos experimentam a dor dentária fora da clínica através de sintomas de nevralgia, e podem também experimentar a dor durante a consulta. Efetivamente, a dor, como experiência, depende da perceção que o sujeito tem dela. Essa perceção da dor é única para cada indivíduo, com tendências e influências através da história e do contexto social e cultural. A dor pode, por exemplo, ter valor religioso ou conotação de virilidade através do endurecimento físico e psicológico pelo sofrimento, podendo também ser sentida com exagero por causa da apreensão e do medo, podendo em alguns casos ser até considerado inaceitável senti-la pelo o direito contemporâneo à anestesia. A analgesia e a anestesia relevam assim uma interpretação e resposta a dor que variam ao longo do tempo e tornam-se reveladoras de valores e éticas.

Palavras-chave: dor dentária, sofrimento, antropologia, história da odontologia, resiliência

## CHAPTER ONE

### I . BACKGROUND

Pain is "an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage," according to The International Association for the Study of Pain. This definition appreciates the multidimensional nature of pain. In this way it seems to qualify the role of tissue damage, opening up prospects for a biopsychosocial model of pain[1].

Indeed, there is not a unique, objective or true way of defining pain. There is a fundamental difference between the medical and the anthropological approaches to pain: while Medicine focus on particular modalities of the corporal experience, Anthropology questions how this experience falls within the context of relationships[2]. However if sensory and emotional characteristics are mentioned in the previous definition, social components and nonverbal behaviors remain obscure.

While pain is obviously linked to medicine, its universality in the human condition makes it an important topic for anthropologists, since Anthropology may be defined as the cross-cultural and comparative study of human behavior, culture being a set of societal rules and standards developed over time and shared by the members of a particular society[3]. An anthropological and sociological analysis of pain aims to understand the social and cultural construction of pain. It aims to examine the deepest intimacy of the suffering man in order to know how he appropriates a biological fact through his own behavior and what meaning he attributes to it[4].

Dental pain is one of the most excruciating experience a human can have[5]. The relation of Mankind with dental pain has evolved throughout history, in function of medical progress and cultural changes, indicating its sociological pertinence. Indeed, culture is the essence of a society and is an evolutionary process that changes over time[3]. Pain is also about a whole human suffering. To cure a patient is to take care of a person. To efficiently alleviate pain, medicine needs to be focused on the person beyond biological parameters[6].

Human sciences use rational speech and empiric demonstration. Paradigms can be methodological or purely theoretical as long as they convince through argument, counter-argument or empiric facts. The validity of a paradigm in human science is evaluated by the intersubjective community of the researchers[7].

However, dental medicine being mainly based on hard sciences, practitioners might tend to define pain through a purely physiological point of view. Thus, to highlight an anthropological view of pain in order to emphasize the importance of overcoming objective bodily concern of pain, emphasizing the uniqueness of each human sensibility and experience, is a need.

This work is a narrative review. First, it gives an overview of the anthropology of pain; then, shows how pain is relevant to Dentistry. Finally, it analyzes how our perception and understanding of pain can influence the patient's well-being.

By reading this work the reader will be able to better understand the pain and collect some clues for better patient care.

## II. OBJECTIVES

The main aim of this study was to perform a narrative review on the anthropology of pain.

To highlight some differences in cultural features and appeals to history of medicine and odontology without claiming exhaustivity.

The physiological processes of pain are not the topic.

## III. METHODOLOGY

A literature search was conducted using the following electronic databases: MEDLINE/PubMed (via National Library of Medicine), ScienceDirect (Elsevier), Web of Science (Thomson Reuters Scientific), Google Scholar (Google). The following search terms were used: dental pain OR suffering, anthropology, history of dentistry OR odontology AND pain resilience. A manual search of the reference lists in the selected articles was also performed. The inclusion criteria encompassed articles published in the English, French or Portuguese language, up to January 3, 2019, and available with full text, and as case report, research article, clinical trial, review article, or systematic review format. Selected articles were individually read and analyzed concerning the purpose of this study. 60 articles were identified, 35 were excluded and 25 were selected.

Additionally, several chapters of three books and one tv-film were used for theoretical complementation.

## IV. DEVELOPMENT OF THE TOPIC

### A - Overview on the Anthropology of Pain

"Pain is not a physiological fact, but a fact of existence. It is not the body that suffers but the whole individual. Deracinated from the Human, physiology becomes a veterinary medicine that then misses out on the sick person." Le Breton D (2012)[8].

#### A.1 - Experience and symbolism

From the Antiquity to the end of the 18th century, medical language was marked by a descriptive obsession. In the 2nd century after Christ, Galen defined a typology of pain (pulsific, gravative, tensive, pungitive) used until modern times. The body itself only appeared as a historical object at the end of the 18th century[9]: "This body of anatomists or physiologists is radically different from the body of pleasure and pain. In the perspective of sensualism, which triumphs when the period studied in this book begins [late 18th century], the body is the place of sensations. The fact of experiencing oneself constitutes life, the origin of the experience, the lived temporality, which places the body on the side of pathetic subjectivity, flesh, sensitivity"[10]. Moreover, the discovery of the nervous system in the 18th century links the body and the mind: to live is to feel[9]. From the mid XVII to the mid XVIII centuries, modern medicine emerges with its clinical anatomical approach. The two pillars of modern medicine are the environmental, global approach as well as the physiological, localist approach (more technical and revolutionary)[10]. Today, the medical vocabulary of the body and its functioning allows us to distance ourselves from it and to conjure up concerns while guiding the representation and experience of the body.

Western medicine has not eliminated the existence of the patient and the autonomy of the individual. The medical representations of the last two centuries have made the body an organism dependent on its environment and the behavior of the person who owns it. Thus, "Pain" is a subjective experience, a "psychological event" that is embedded in the body and shapes its memory and the practices of self-pain, the

ways of listening to it, the ways of welcoming it and expressing it gradually build identity[10].

Nowadays, the universality of pain as a part of the human condition has been established by the research of many biological, physical, and social scientists, and ethnographers, physicians, and public health experts describe pain complaints for a variety of modern, industrial societies and traditional, undeveloped societies.

Paradoxically, while pain is known and shared all over humanity, suffering is intimate and unique to each human being. Pain isn't only a sensation but also an individual meaningful perception. There is no pain without suffering, defined by Le Breton D (2012)[4] as an "affective meaning reflecting the shift of a physiological phenomenon to the heart of the individual's moral consciousness". According to Ricœur (1992)[11]: "while pain corresponds to affects localized in particular organs of the body, suffering corresponds to affects open on reflexivity, language, relationship to the self and to the other, to the meaning and questioning."

Le Breton D (2012)[12] explains, that the experience of pain, is a violence within the individual. It gives a feeling of immediacy without perspective, it breaks the unity of a Man to himself and his relation to the surrounding world. Indeed, when we are healthy we tend to forget the physical rooting of our existence. While the feeling of joy is natural and familiar, related to expansion, the pain is perceived as aberrant, it is about interiority and closure. When the mind is limited by the consciousness of the body limits, it represents a threat for the feeling of identity. "Pain takes the individual out of the world, it takes him away from his activities, even those he loved. By losing elementary trust in his body, the individual loses trust in himself and in the world, his own body becomes a sneaky and implacable enemy leading his own life"[12].

An important feature of the experience of pain is its incommunicability. A feeling can never be described by words that accurately reflect what is being felt. The suffering happening in one's universe of pain is fundamentally inaccessible to any other person, and the attempts of communication are always approximations limited by the language code. A patient trying to describe his pain uses metaphors and adjectives (dependent on his own education level) but usually only achieves to give a certain idea, an impression of his perception[12].

The failed attempt to express suffering occurs particularly on the face. The screams and tears reveal a gap between the will of saying and the helplessness of saying[11]. Furthermore, the attempt to express pain is never supported by absolute evidences, so it often only raises suspicion on the receptor person.

The experience of pain is then strongly connoted with loneliness and insularity, as stated Le Breton D[12]: "If a man says the intensity of his pain, he knows in advance that no one feels it in his place or shares it with him". Clinical medicine has elaborated several ways to try to evaluate the pain intensity, such as the Visual Analogue Scale (VAS) or the Numeric Pain Rating scale, but even if they can give us useful indications, they never are completely accurate and reliable, as "The pain said is never the lived pain"[12].

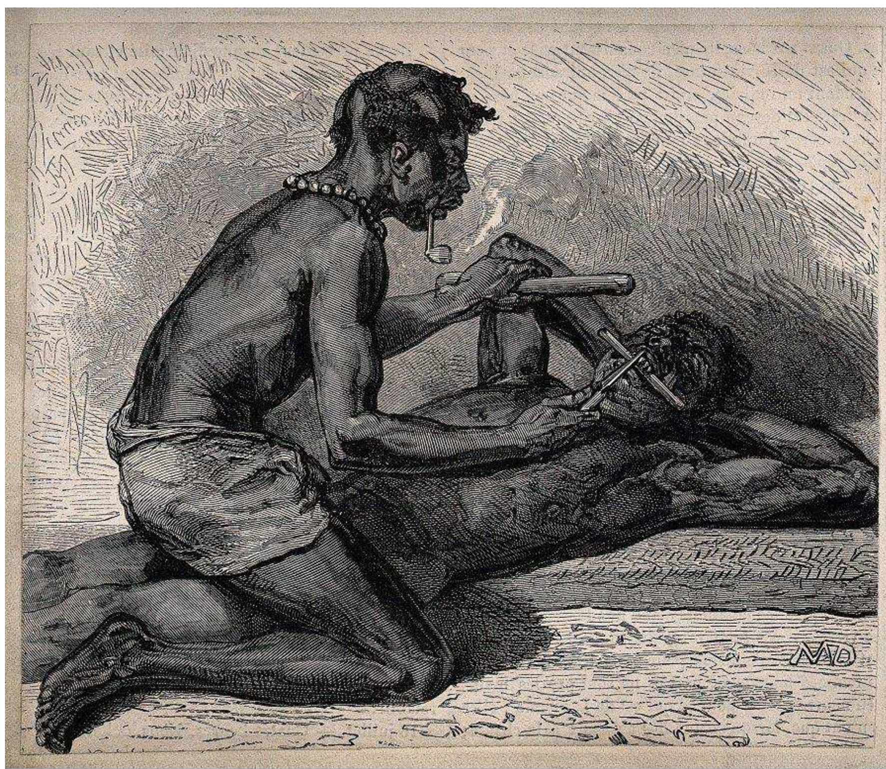
Man's relationship with the surrounding world (through physical modalities) take shape in social bonds and thus symbolic dimension[8]. The way men involve and perceive their body goes beyond the physiology of their organism. From there we can understand the importance of the symbolic dimension of pain, as suffering has an ethical and philosophical dimension because it is on one hand passive (we are subjected to it) and on the other hand active through the demand for meaning[11]. If a suffering person does not understand the reason, the meaning or the origin of its pain, the pain will be doubled by the non-sense. A meaning must be found to someone's pain to calm the violence of incomprehension, and this meaning of the pain cannot be limited to a physiological origin since it always takes place within the symbolic dimension of one society[12]. Anthropology is important to help to understand pain for this reason. Members of a society develop and learn cultural concepts over time, constituting the source of all the appropriate behaviors in that society. "The way of perceiving, expressing, and controlling pain is one of these learned behaviors that, when manifested, is culture-specific"[3].

### A.2 - Pain and society, education and culture

Human societies develop the meaning and the shape of their own universe. As any human related thing, the body is part of a social and cultural construction. The body refers to unconscious, social, cultural and individual significations[8].

According to their social and cultural background, to their education, people won't have the same reaction to pain. Pain is intimate but also rooted in a social link. Physiology does not happen in a pure context, in a "biological virginity"; it falls within history, social and cultural contexts, collective unconscious and unconscious selves. There is a social, cultural and psychological sieving of painful impulses. Every human societies include pain in their world view, by giving it a meaning or even value. Giving things a meaning, is what societies do to soften the brutality of the world, to turn it coherent and predictable. People give a collective meaning to pain and express it in a ritualized way, hence they gain control over their suffering and destiny, as humans. Pain affects a man according to his personal capacity to resist, but this capacity comes from what he knows and witnessed from others. The personal resistance falls within the social group one belongs to. Indeed, a social group has accumulated experiences of pain that allow its members to know what to expect[13].

For instance, before a dental treatment the patient has already heard advice and impressions from friends who already went through it, so the Individual expression of pain is then ritualized and responds to what witnesses might expect, but the expressed suffering seems out of proportion with the traditional social scope it will raise suspicion.



An African dentist performs an operation on a patient that he is restraining with a wooden stick. Date unspecified. *Wellcome Library, London*

Violating pain's rites means running the risk of embarrassment. In a context where firmness is required, for instance as in the Army, over expressing pain will lead to disapproval. To the contrary, in a context where dramatization is expected, someone who internalizes his pain will deceive his loved ones. There are implicit norms, that judgment does not control, who determines the relation to pain. Pain cannot only be a biological fact since its humanization is a condition for it to reach consciousness, and through different places and times people do not suffer in the same way[13].

Family is an intense place of socialization, where the corporal modalities and the relationship to the world take shape. The first years of an individual and the attitude of the parents toward pain have an impact on how this individual will react to pain. Gestures, words of comfort, caring or complete indifference create an affective environment, that will mark the relation to pain. Le Breton D (2012)[13] gave some examples of how education can influence the perception of pain. First, through gender, as occidental societies have been associating, for a long-time, virility with pain resistance, and femininity with sensitivity. Family and school education prompt boys to be firm, while encouraging girls to develop affectivity. A little girl can embrace her pain and be comforted while the little boy must "show he is a man" and retain his tears. This social conditioning influences many men to avoid expressing their pain for their lifetime.

According to Pieretti *et al.* (2016)[14], in "Gender differences in pain and its relief", large-scale epidemiological studies consistently revealed a higher female prevalence of several painful diseases, and women report more severe levels of pain, more frequent pain in more areas of the body and pain of longer duration, than men do. The author points out that science does not yet completely understand the mechanisms underlying the disparity between men and women, but that "an interaction of biological, psychological and socio- cultural factors probably contributes to these differences". Secondly, Le Breton D (2012)[13] takes the example of the relation that parents have with their children. Distant and unavailable parents who suddenly take care of their child that is in pain, might create an association between pain and love, leading him to seek suffering when he lacks affection. To the contrary, a neglected or beaten child can

become hardened, and might not relate his suffering as something he can share and talk about but will keep it to himself to maintain a sense of control. To decrypt an unpleasant sensation as suffering, is learned data. It requires implicit and suggested categories which orientate perception and decline a common way of feeling and expressing.

The content of consciousness is not equal to the physical content. There is an unconscious elaboration made by the individual in between. The interpretation of what one seems to be feeling is influenced by his worldview and values. Culture is interiorized by an individual and orientates his sensorial perceptions and his categories of thoughts, and can lead either to anxiety or indifference[13]. According to Free MM (2002)[3], individual behavior mirrors, at least in part, the behavior of the group to which a person belongs. A recent study by Yu-Hsin *et al.* (2016)[15] explored cultural differences about the experience of pain among four ethnic groups (African, Americans, Caucasians, Asian-Americans, and Hispanics). The methodology used for the study is particularly relevant, because instead of testing reaction to pain in a laboratory, data were analyzed based on a qualitative thematic content analysis. Semi-structured interviews were conducted, and cultural differences emerged in how various groups give meaning to pain, express pain, cope with pain, or utilize social support. This methodology is especially relevant as experimental studies about pain measure "pure sensation in the moral comfort of the subjects", as Le Breton D (2012)[13] recalls. Indeed, a pain inflicted in a laboratory allows the subject to stop the experience at any moment and pain if purified of all its incontrollable components. It cannot say anything about the most important, which is the intimate relationship of a person facing a pain whose origin and future consequences upon his life are unknown.

Laboratory pain experiences are more about the sensory experience of pain rather than the affective experience of suffering. In Yu-Hsin *et al.* study(2016)[15], discussion through interviews exploring subject's true pain experiences, allows a better understanding of suffering as a human feeling influenced by culture. After the identification of the main themes of the interviews, the additional analysis identifies differences and similarities within ethnic groups in relation to pain beliefs and behaviors. For instance, Caucasian and African American participants were more likely to define pain as being a negative experience, "simply because it hurts". On the contrary, Asian and Hispanic participants gave pain experience a positive meaning

because they believe that pain brings spiritual and self-growth, maybe reflecting a sense of resiliency of these two ethnic groups. Moreover, Hispanic and African American participants were more likely to report that pain intruded on their daily activities. Cultural differences in displaying rules of pain were found. African-Americans and Hispanics were more comfortable and likely to express pain openly. According to the authors:" Perhaps, individuals from Hispanic culture feel comfortable with pain expression because there is less stigma associated with expressing physical pain with emotional distress within this culture." In this way, this study gives good examples of how perception and reaction to pain is modulated by the interiorized values of one's culture.

In another study by Chen *et al.* (2018)[16], facial expressions of the extreme positive and negative states of physical pain or sexual pleasure have been analyzed from the point of view of mental representations in individuals from Western and East Asian cultures. These mental representations have been mathematically modeled and went through a machine learning, a human perceptual discrimination task and an information-theoretic analysis. The results of the study were that for each culture, mental representations of the facial expressions of pain and orgasm are distinct, comprising opposing face movements (pain with movement that contract the face inward, orgasm with movement that expand the face outward). The researchers then confronted their results with evidence from 14 real-world production studies that show that physical pain and orgasm do in fact produce similar facial expressions. While face movements are primarily a physiological response, social context influences facial behaviors in different cultures. Indeed, their data show that distinct facial expressions can be used to convey these two extreme affective states.

### A.3 - Pain and religion

Religion may be considered an institutionalized set of transcendent ideas, while spirituality is personal and a subjective dimension of religious experience in search of sacred[17]. For different religions, pain raises the great question of the significance of evil. Religious systems had to integrate human suffering in their explication of the universe, so in many cultures, religion gives a meaning to pain and dictates how the suffering man must behave. Le Breton D (2012)[18] depicts these differences. In Biblical tradition,

suffering is a consequence of the rupture between man and the divine, and pain, illness and death appear following the first fault in Eden. Suffering strikes whoever causes divine anger. “An inescapable metaphysics is exercised on the human condition and ensures that only the exact proportion of the fault committed is punished. […] Pain is a sign of a fault. The stain of the soul precedes and makes possible the stain of the body: pain and sickness are the somatic versions of sin.” If we accept that a great question then arises: Why some good men suffer while some bad ones go unpunished?[18]

Christianity puts man in a welcoming position in the presence of suffering. Pain becomes an opportunity to participate in the sufferings of the Christ on the cross, and accepting pain is a form of devotion that brings man closer to God and purifies the soul. From Antiquity to the Middle Ages pain is a form of grace. Dolorism, especially in the Catholic branch, spiritually tests the believer and allows him to show his merits. "The man of faith accepts the suffering that tears him apart because it affects him with meaning and value”[18]. The Catholic tradition has departed from Dolorism by opening itself to contemporary values, as it is no longer the offering of suffering but the offering of love that is highlighted in the Passion of the Christ, being that suffering is no longer valued in itself
but as an ability to maintain one's soul strength through love. Modern times allowed a re- reading of the founding texts because pain is now avoidable thanks to medicine, and if it is still an experience of a “particular value”, it now deserves relief.

In Protestantism, the relationship to pain differs from Catholicism. Man is in debt to his creator and corrupted by nature because of original sin. Since pain arises from God's disapproval, man does not suffer in proportion to his personal faults but suffers because it is the fulfilment of human destiny, as "all pain is a carnal memory of the fall and a current participation in Adam's inaugural fault. There is no Dolorism in Protestantism because the pain, rationalized, must be avoided. It is legitimate to fight it and pleasing to be attached to it. This religious culture is transformed into a cultural unconsciousness and influences the behavior and values of a society as stated by Le Breton D (2012)[18], to whom French doctors, often with Catholic traditions have long tended to prescribe low doses of morphine to relieve chronic pain or pain at the end of life. Still in 1987, Denmark and the other Scandinavian countries (with a Protestant tradition) used twenty times more morphine in proportion.

Jewish history, marked by repeated hardships, has made the suffering of the just an elusive enigma, as “Jewish tradition keeps the debate between the creator and his creature open, it even allows revolt." Suffering is then an incomprehensible evil that man can complain about, and thought is foreign to the pain intentionally inflicted. Contrary to other religions, pain is fought by the community, especially with the support of relatives. In a pioneering article on the influence of culture in the perception of pain, Zborowski (1952)[19] witnessed these religious impacts in Jewish patients. In a survey comparing four populations (Italian, Jewish, Irish and American patients) Zborowski[19] noted that Italian and Jewish patients stand out for their sensitivity and exacerbated pain, and Jewish indeed manifested their pain in a completely uninhibited way, seeking attention and care as the whole family participated in the suffering and the patients could not stand any social isolation.

Islam has a completely different attitude towards pain. While God is love for Christians and Jews, he is absolute power for the Muslim. The paradox of the just suffering person is thus less problematic. The Muslim does not rebel and lament in the face of
suffering, he submits to God's decrees. Pain is a test to evaluate his faith, since “the faithful patiently place himself in God's hands and testify of his endurance in the face of trial."(18) Medicine and prayer are means given by God to fight suffering, then it is legitimate to try to reduce or eliminate it, but any despair would be a blasphemy, a doubt against the power of God. A recent article by Muhammad (2018)[17] recognizes that spiritual needs are as crucial as biological and social needs for the state of health, and his study focuses on Muslim patients, who we said are urged to resilience. In his data analysis, spirituality appears to offer meaning to suffering, as illustrated by a patient that said for instance: “God has made me suffer this disease and the pain of this disease. God (Allah) knows best why he punished me. I was an innocent man. I never hurt anyone. But god knows better. He has power to do anything. I do not have any right to question god. I seek forgiveness from God (Allah).” This study shows how religiosity is relevant to the pain experience. While the interviewed patients have different gender, age, socioeconomic statuses and education there is a great similarity in their responses. “It all relates the fact that a substantial majority of Muslim patients respond similarly in the

situation of crisis”[17].

In Eastern religions, suffering is at the heart of existence. Pain is the mathematical consequence of a fault in a past life. The human condition is painful, and only discipline can liberate from it. "Buddhism fully associates existence with suffering, accepting that life is a torment, and a spread of pain leading to gradual purification”[18]. Pain forges determination and broadens self-awareness. In “Pain and suffering as viewed by the Hindu Religion”, Whitman S (2007)[20] recalls that religion and spiritual practices are among the resources used by patients to cope with chronic pain. She describes the concept of pain in Hinduism: it is not a punishment but a natural consequence of the moral laws of the universe (Karma). “Hindu traditions promote coping with suffering by accepting that suffering is not random”. As we are in human form on earth we necessarily experience physical suffering, but “the Self” or soul is not affected. Suffering can then be positive if it leads to spiritual progress. Indeed: “Detachment is a positive state of objectivity toward this world, where relationships, objects, and circumstances hold no power over one’s state of mind. […] When one achieves perfect detachment, no problem or circumstance, including pain, can cause one to suffer.” To achieve detachment, one must become unconcerned, neutral in the face of whatever occurs. This may challenge the outcome orientation of Western medicine: “an approach based in Hindu traditions would suggest continuing to try one’s utmost to heal patients but not becoming upset by failure”[20].

## B - History of dental medicine: an history of pain

### B.1 - Teeth as an historical source of suffering

Dental pains are various and can be extreme. Dentin exposure for instance gives a sharp sudden pain. Pulpitis leads to a dull, throbbing pain while the blood pressure increases in the inflamed but confined and inextensible pulp. Irreversible pulpitis gives “prolonged, painful responses to thermal stimulation or the presence of spontaneous tooth pain with no obvious stimulus. Unlike reversible pulpitis, painful reactions to temperature may last from minutes to hours and is the typical reason patients seek dental treatment, as spontaneous pain can also last for hours and awaken patients from sound sleep[21].

Teeth have been a constant source of suffering throughout history. Archeological records, dating back to the Late Upper Paleolithic Era, provide evidence of a kind of “proto- dentistry”. Teeth have been found showing signs of drilling and filling with beeswax, as well as carvings on the cavity wall with a micro-tool, probably for therapeutic-palliative purposes. In the two millennia BC, Egyptian and Greek physicians used both plants (such as papaver somniferum - opium poppy) and incubation (a forerunner of modern hypnosis) in the attempt to provide some form of therapy and painless surgery, already taking into account subjectivity and mind-body approaches[22].

All those who wrote on dental pain agree to recognize its exceptional intensity. In the article "Dental pains in the 16$^{th}$ and 17$^{th}$ centuries. Testimonies.”, Ruel-Kellermann (2014)[5] gathers precious writings from French personalities, at a time when tooth extraction was one of the only solutions for relief. The author quotes surgeon Guillemeau J, who wrote in 1602 "Often the tooth pain is so great to be eroded, rotten and pierced to the nerve, that the person runs the streets, he becomes senseless, and considering that all the remedies are useless to ease the pain, he prefers that we pull it out, which is what we have to do". Still at the end of the century, in 1693, the doctor and surgeon Verduc JB declared, according to the author, that "The pain of teeth is sometimes so sensitive that we have seen people becoming furious until they kill themselves". The pain is always present in the testimonies and its intensity is recognized as exceptional. Another testimony found by the author is the one of Paré A (1573): dental pain was for him "the greatest and most cruel pain of all, without death." The article also analyses the attitude towards pain of two great French authors: Michel de Montaigne (1533-1592) and Blaise Pascal (1623-1662). Montaigne M., who was generally known to run away from doctors, calls in this case all those who can help him relieve the intensity of his pain. His story is clinically and emotionally rich. While he describes without much emotion how he expels his kidney stones, the dental pain is above his tolerance level:

"Over the twenty hours, it caught me again with so much violence and on both cheeks that I could no longer stand on my feet, the strength of the evil made me want to vomit. Sometimes I was all sweaty and sometimes I shivered. As I felt pain everywhere, it

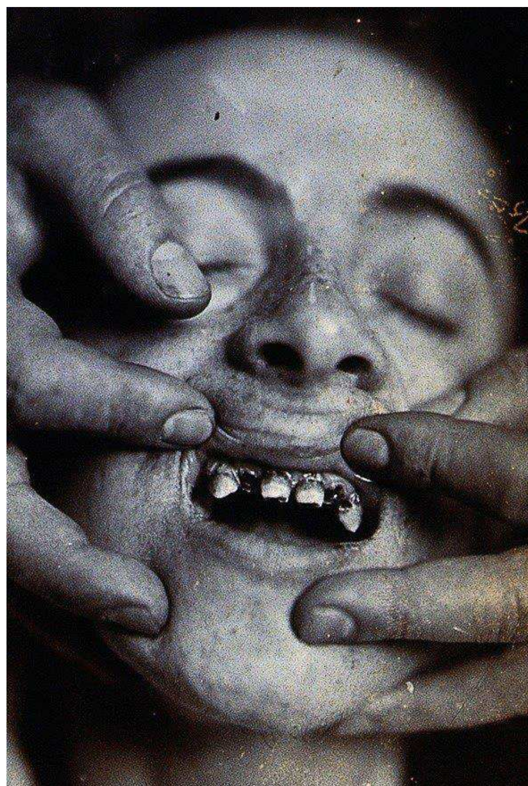
made me believe that the pain did not come from a spoiled tooth. Although the worse pain was on the left side, it was sometimes very violent on both temples and chin, and extended to the shoulders, to the throat, even on all sides; so that I spent the cruellest night that I remember having spent of my life: it was a true rage and a fury." (*Journal de voyage en Italie*, Michel Eyquem de Montaigne, 1580-1581, ed. Louis Conard, Paris 1928, T II, p.223-249)

Pascal reacts in a very different way, overcoming his pain by engaging in mathematical research that will be at the origin of the discovery of integral calculation. As his niece narrates:

"One evening, the Duke of Roannez left him in very violent pain, he went to bed and his pain only increasing, he decided to relieve himself, to apply himself to something that by its great strength attracted the spirits to the brain so well that it diverted him from thinking about his evil. For this reason, he thought of the roulette wheel proposal made by Father Mersenne in the past, which no one had ever been able to find and which he had never stopped at. He thought about it so well that he found the solution and all the demonstrations. This so vivid application diverted his toothache and when he stopped thinking about it after finding it, he felt cured of his pain." *(L'Oeuvre de Pascal*, Jacques Chevalier, Bruges, Pléiade, 1950, p.97-99).

Pascal's contempt for pain in favor of mathematical resolution illustrates the Christian vision in 17th century where pain must be a penance to strengthen the spirit.

In a BBC documentary "Drills, Dentures and Dentistry: An Oral History" Bourke (2015)[23] gives some examples of how dental problems afflicted the British population over the past centuries. Long dead Londoners skulls are guarded in the Museum of London archives, show how Medieval and earlier population suffered from dental attrition. Diet was then different and harder to shew, teeth worn down to the dentin leading to exposition of the nerve and constant suffering. In the 18th and 19th centuries, sugar became more commonplace in the diet, leading to an age of mass tooth decay.



A young child with rotten teeth at Friern Hospital in London. 1890. *Wellcome Library, London*

During the Boer War at the end of the 19th century many British soldiers had their teeth so damaged that mincing machines were needed to allow them to eat. During the First World War, the British army went to war in August 1914 without a single dentist, a general got a toothache and a French civilian had to ease his suffering. By the end of 1914 there were 20 dentists at the front and 850 by the war's end, demonstrating how dental pain can lead to inability. Again, during the Second World War, there were serious problems in the Royal Air Force at the Battle of Britain and while bombing missions over Germany: many pilots were suffering toothaches while in the air (because of the change of pressure) and 5% of the missions had to be aborted[23].

History makes it very clear that since the early age of dentistry, the prime reason for seeking dental treatment was the relief of pain. The elimination of pain is the priority for the suffering person, overshadowing any other considerations. "The relief of oral pain, therefore, is the highest priority of the profession. Although pain receives substantial attention from all healthcare providers, many patients consider pain and dentistry to be synonymous"[24].

**B.2 - The very painful first dental cares**

In Medieval England, the beginning of modern dentistry was violent. The local blacksmith treated those who didn't have much money, grounded in a general knowledge of how to make and repair many things thanks to his skills for forging the metal. In the meantime, the barber surgeon was taking care of those who had money, cutting hair, doing bloodletting and extracting teeth, with a training relying on watching the master and then doing an apprenticeship. The extractions often led to grab a lot of the bone and skin with the teeth[23]. Speed was the most important feature of the surgical act: "In the early days of performing dental extractions; expediency was an important factor in the evolution of extraction instruments. Prior to the introduction of analgesics and anesthetics, in theory, the quicker the tooth could be removed the less pain would be inflicted on the patient"[25].

There was a high chance of infection and a high chance of having to go back. "Having a toothache in the medieval era could be more than painful, it could be fatal. In 1665, 10% of all fatalities in London were due to teeth. (excluding the victims of the Great Plague)"[23].

In this way, dentistry was associated with horror and death for much of the past 500 years. Furthermore, extractions were even performed as a form of torture and punishment. Those who ate meat during Lent would have their front teeth pull out as a warning to other "sinners"[23].

For a long time, Dentistry was riddled with absurd theories and populated by charlatans and fraudsters. Even in the 17$^{th}$ century a myth persisted that toothache was caused by worms living in the teeth. The profession was held in very low regard. For dentistry to move beyond tooth pulling, dentists would need to understand the causes of toothache and the anatomy of the teeth. The 17$^{th}$ and 18$^{th}$ centuries mark a major change with the embrace of reason and logic to understand the world, movement called the Enlightenment. Dentistry also went through this intellectual revolution, and scientific rigor started to be applied for the first time to teeth[23].

According to Lynch C.D. (2006)[26], Pierre Fauchard, a French dentist who worked

in the first half of the $18^{th}$ century, is widely acclaimed as the "Father of Modern Dentistry". He made a significant break with the tradition of the time with his first comprehensive dental textbook in 1728 "Le Chirurgien Dentiste ou Traité des Dents" (The Surgeon Dentist or Treatise on the Teeth)[1]. The standards of dental treatment were primitive in Fauchard's time. There were no formal training courses and no formal regulated bodies. Some patients could afford the services of general surgeons with a special interest in teeth, but the majority relied on tooth pullers who often attended at markets and fairs, some of them being undoubtedly charlatans.

"Pierre Fauchard was born in Brittany in 1678. […] When he was about 15 years old he began training as a surgeon in the French Navy […]. While serving at sea, Fauchard observed many oral diseases including scurvy, which was very common at that time and not only among seafarers. Readers unfamiliar with case reports of those days should consider how familiar conditions like a periapical abscess or a fractured jaw might progress without the benefits of practical advice, surgical intervention or modern therapeutics. Add to these the disadvantages of malnutrition, poor hygiene, inadequate accommodation and inappropriate treatment, and we begin to appreciate what Fauchard encountered during his long career"[26].

Many of Fauchard suggestions were radical for practice of that time: he advised seating procedures (conventional approach was to lay the patient on the floor), he dismissed the presence of worms in teeth as a causative agent of dental decay, he encouraged knowledge of the preclinical sciences in the delivery of dental care. He condemned the reckless extraction of primary molars, realizing it caused drifting of the permanent dentition, urged caution in the use of endodontic reamers, warning against breakage and swallowing. His recommendations were accepted, and colleagues started to share information freely with each other. The practice of dentistry was permanently changed for the better[26].

John Hunter was another pioneering surgeon and anatomist who helped turning dentistry into a modern science[23]. His book in 1771 "The natural history of the human teeth" was the first comprehensive look at the anatomy of the teeth and the jaws in English. It also popularized the transplanting of human teeth, but only few of the

transplanted teeth took permanent route and there was a real risk of contracting diseases like syphilis. First the teeth of the poor became a prized asset to be bought and sold, then the teeth of the dead. In the early 19$^{th}$ century, human teeth became an increasingly valuable commodity, grave robbers stole teeth from corpses, they were used to make lifelike dentures for the rich. After the Battle of Waterloo in June 1815, where 50,000 men were slaughtered , teeth were pulled from the dead and dying people, it flooded the British market, giving new access to dental dentures to the middle classes[23]. For extraction to stop being the main solution to relieve teeth pain, dentistry had to find ways to repair the teeth damage and prevent further decay. A Victorian solution was to hammer small lumps of gold into the cavity, but it was a long and painful procedure. The use of silver amalgam around the mid- 19$^{th}$ century allowed dentist to fill cavities fast. The hand drill in the 19$^{th}$ century removed decay by twisting the drill between the fingers, it was a very slow technique. Once powered by a foot operated treadle, dentists were able to save teeth from extraction[23]. The main difficulty remained to overcome screaming, struggling patients. There was little pain relief, at best some whiskey or some comfort from prayers to the Saint Apollonia the Patron Saint of Dentistry. In the early 20$^{th}$ century, dental care was so expensive that some people would choose to have all their teeth extracted in order to avoid a lifetime of dental cost and suffering. Having all teeth removed was a perfect gift for a 21$^{st}$ birthday or a newly married bride[23].

"Dental work looks painful." 1905. *Kirn Vintage Stock/Corbis/ Getty Images*

**B.3 - The revolution of anesthesia**

In “Histoire du corps”, Faure O (2005)[27] explains that, before the appearance of anesthesia, the apology of suffering impregnates the whole society. Adversity would have beneficial effects. Physical punishment is required at school because pain is considered formative. Winter is a revealer of moral values where bearing the cold reflects the valor of individuals. Peasants and workers endure wounds with stoicism or risk being discredited.[9] Vitalism considers that a life force triggers illness and restoration of health, pain being a sign of this reaction and a necessary step in healing[27]. These assessment systems triumph when analgesia, antalgia and anesthesia appear. Reverse logics will induce a transformation of the status of pain and a lowering of tolerance thresholds, supported by the advent of the sensitive soul at the end of the 18th century. Vitalism is overshadowed, pain is no longer considered useful for healing but is a nuisance during operations. The surgical pain, coming from the man's hand, recalls the torture. The surgical scenes are dramatic, offering all the spectacle of pain: screams, struggle or contortions. The surgeon before the anesthesia is required to be insensitive and firm and evaluated by his speed[9]. Dentists were the first to use ether, it perhaps reveals how intense and problematic the pain of the treatments was. The first surgical intervention using etherization took place in the United States in January 1842, and was a dental extraction, operated by Dr. Elijah on Miss Hobbie, with the ether vapors administered via a towel by William Clarke[9].

At this time, nitrous oxide or laughing gas had been used as a recreational drug for decades, and in 1844, the American dentist Horace Wells spotted its potential. In a public demonstration he failed to give his patient enough gas and was humiliated, so his discovery got discredited in the eyes of the medical profession[23]. Tests multiplied for the use of chemicals, and William Morton achieved a successful demonstration with ether at Massachusetts General Hospital, in 1846, and exported the idea to Europe, soon followed by the utilization of chloroform[9]. There were a few fatalities, with chloroform particularly, around 1860 dentist went back to use the much safer nitrous oxide. In 1884, Karl Cola, in Vienna, discovered the anesthetic properties of cocaine. In parallel the hypodermic syringe was invented, enabling dentist to deliver cocaine to a

specific part of the jaw. The needle wasn't thin and the injections were painful[23].

The practice of anesthesia has encountered resistance and took about 3 years to set up, because it raised ethical questions at the time because the patient remained completely handed over to the doctor and no longer had any control on the operation. The female patient dependence on the dentist raised concerns about possible abuse[9]. The anesthesia in that time was dangerous, sometimes causing asphyxiation, intoxication or sudden death[23]. From a philosophical point of view even and in the tradition of Aristotle, some thinkers did not imagine that life can be pain-free. Some virtuoso surgeons, because of their speed, may also lose the reason for their notoriety[9]. These resistances do not reveal so much a contempt for pain as they reveal a transitional phase in an era when pain is of great interest to medicine. At the end of the $18^{th}$ and beginning of the $19^{th}$ century, pain was at the center of research on sensitivity, it was observed according to its intensity and form and was considered a guide[27]. Anesthesia was finally diffused at the end of the 19th century, accompanied by the progress of analgesia with opium and morphine. A new regime of sensitivity was then initiated, and as Corbin A (2005)[9] stated "The $19^{th}$ century therefore corresponds, at the same time, to a lowering of tolerance thresholds, a profound transformation of the status of pain, now perceived as a complex emotional construct, and an effective fight against it through analgesia, antalgia and anesthesia."

The arrival of pain relief was a major turning point in the history of dentistry, as from that moment dentist could perform more and more complex procedures. Nowadays, perfect smiles tend to become a norm and dentistry relies on pain-free procedures. A visit to the dentist is unrecognizable from that of a hundred years ago. However, many people remain terrified by dental care or even phobic. It must be said that the mouth is a very intimate and sensitive part of the body, leading to strong reactions. Mostly, the past strongly influences current attitudes and fears. The history of dentistry seems to have traumatized our collective memory for a long time. "Millenia of pain and terror deeply embedded within the fabric of our society"[23].

## C - The perception and understanding of pain affects the quality of life and well-being of patients

### C.1 - History of the subjectivity of pain

We talked about history of dentistry and pain in dentistry relating facts, events and innovations, but history is also about perceptions. The perception of pain has evolved along the time, leading to stigma or to understanding. According to Faure O (2005)[27] in "Histoire du Corps", before physiological works ,the clinicians and physicians had access to pain only through the narrative of the patient. There were already prejudices against the common people who were suspected to complain and exaggerate their problems. The narrative of pain was then a negotiation between the patient and the doctor, as "They end up imposing on their interlocutors the recognition of the individual nature of pain"[27].

According to Goldberg D (2017)[28] in his article "Pain, objectivity and history: understanding pain stigma", "most approaches eschew even an attempt to trace connections between historical attitudes, practices and beliefs towards pain and the stigmatization so many pain sufferers currently endure". His article tends to situate the historical roots of what it means to cite the "subjectivity" of pain as a problem, exploring two crucial intellectual schemes of the 19$^{th}$ and 20$^{th}$ centuries: mechanical objectivity and somaticism. Goldberg D (2017)[28] also stated that one of the principal reasons pain seems to incite so much doubt, is that it is subjective, yet there are no criteria for objectivity and subjectivity adequately theorized.

Objectivity has its own history as mechanical objectivity is a concept from the early- to-mid-19$^{th}$ century and has two main features: 1) the ideal representation features the elimination of human subjective influence over the knowledge-making process"[28]. Only where the subjectivity of human agency is excised can the mechanical processes of nature "speak for themselves" and reveal truth; and 2) the ideal representation is one that "maintains fidelity to the specimen under investigation, no matter how imperfect it may be[28]. Mechanical objectivity might be linked to the birth of the clinic act, centered on the sight of the body. The essence of the clinic act is to

identify dysmorphologies that can be clinically correlated with the patient's illness complaint. Therefore, the "truth" of the patient's illness lies on these structures[28]. At that time, signs and lesions were more important than the patient complains to the eye of physician invested in this epistemic framework. Among the 19th century physicians of the Anglophone world only two kinds of pain were considered: the one with an apprehended structural lesion and the one for which the lesion had not yet been located. The possibility that pain without lesion could exist was simply denied. The social legitimacy of disease depended more and more on a "somatic identity"[28] by the end of the 19th century. This epistemic framework can be called "somaticism", because of its emphasis on material pathologies inside the body.

"Pathological objects that could be correlated with pain complaints were difficult if not impossible to find. By the first quarter of the 20th century, such pain complaints were increasingly sites of doubt and contest between illness sufferers and physicians"[28]. The most relevant historical example of controversial illness experiences is the one of railway spines. It refers to symptoms that people experienced after a railway accident. Pain was almost always a central feature of "railway spine" and skepticism over feigned illness was central, enhanced by the introduction of medicolegal concerns "the history of railway trauma is co-extensive with a dramatic rise in tort litigation". But what is the criteria that can distinguish actual from unreal disease? At the time:

> "It is the presence of the lesion that grounds the clinical reality of railway spine. In the absence of pathology there is no actual disease. There is only the presence of what in the 20th century would come to be called litigation or traumatic neurosis, which is a neurotic condition subsequent to a traumatic incident that is fueled by the possibility of compensation. […]The key is that legitimacy of railway spine turned on the existence of lesions that could be clinically correlated with the patient's illness complaints, which often centered on chronic, non-specific symptoms such as pain and lethargy"[28].

This skepticism about a patient's experiences of pain and suffering can be qualified as stigma. Prejudice due to the epistemological context has denied the

patient's ability to narrate their own illness experiences. Phantom limb posed a similar problem to late 19$^{th}$ physicians, they couldn't make sense of it since they didn't have corresponding material pathologies. Pain without lesion defies knowledge making processes that relies on clinical correlation between pathologies and the patient's complaints. "While somaticism and mechanical objectivity are 19$^{th}$ century frameworks in origin, as ethnographies of pain demonstrates, they remain viable and active conceptual schemes through which pain and illness are negotiated in the West today." People in pain cannot deny the reality of their pain, but by internalizing a stigma often directed at people in pain they end up denying its legitimacy. The modern history of pain without lesion shapes attitudes, practices and beliefs towards pain and those who suffer. According to the author, pain stigma has been an enduring feature of the experience in the West and reducing this stigma is an ethical imperative. Understanding the roots of pain-shaming through an historical approach can then help reduce the stigma and improve the wellbeing of patients in general. Nowadays, the subjectivity of pain tends to be accepted as a very feature of pain, that should not raise suspicion about the reality of the pain. Indeed, in the recent article "The Odyssey of Dental Anxiety: From Prehistory to the Present. A narrative Review" Facco E and Zanette G (2017)[22] sum up what is pain in a way that reveals an overcoming of somaticism : "In short, pain is a matter of experience, a subjective psychological state that does not necessarily have a detectable organic cause". Free MM (2002)[3] comes to the same conclusion in her article "Cross-cultural conceptions of pain and pain control", adding an anthropologic feature to the subjectivity of the human experience : "In summary, cross-cultural investigations of aspects of pain show that, while it is a ubiquitous condition of human beings, the definitions, descriptions, and perceptions of pain and pain control are culturally specific. But the absolute bottom line is that pain and pain control are inner and subjective experiences of the person who is in pain"[3].

#### C.2 - Pain as a relationship to the world

In "Illness as a phenomenon of being-in-the-world with other: Plato's Charmides, Kleinman and Merleau-Ponty" Bredlau S (2018)[29] claims that illness should be understood in terms of a person's being-in-the-world with others, rather than a physical or mental disorder. As Merleau-Ponty discusses about the "phantom limb", the body isn't a physical object, it is an experiencing subject, it is our way of having a world. Indeed, a person with an amputated limb often feels and acts as if the limb were still present[30]. "The significance that things and people have for us are achieved through our body's engagement with them"[29]. According to Houseman M(2006)[2], ethnology questions the experience of pain as something that is part of a network of relationships. Pain is perceived as an inflicted phenomenon. An intuitive strategy to deal with it is the subjectivation of pain. Personalizing pain makes it a more humane experience and lightens ontological uncertainty.

"During any ritual treatment of suffering, whatever the tradition concerned, the suffering person is led to place his unfortunate experience in a relational network involving at least three types of agents: the suffering individual, the authority that attacks him and the mediating and therefore fundamentally ambiguous character that is the therapist. this triangular configuration allows the patient to consider his suffering explicitly in intentional terms[2].

When pain is chronic, it can monopolize the patient's life[31]. Patient relationship to the world changes. He lives in a "separate universe" whose characteristics are the disruption of the perception of time and space, the confusion between the inside and outside of the body, the threatened self-apprehension. All this defining a phenomenon of duplication that helps the patient to situate himself towards pain[2]. Professionals struggle today to defeat chronic pain, they focus on improving the patient's quality of life despite the pain. A global understanding of the chronic pain is necessary. Gillot F (2012)[31] proposes a complex approach to pain beyond its negative connotations. Sometimes, the pain brings a surprising filling. The patient lives and feels through his pain. It can even become a sort of "passion". Gillot F. quote the psychanalyst Lacan : "it is only at this level of pain that a whole dimension of the organism can be experienced, which otherwise remains veiled"[32]. Pain allows us to receive attention, to exist for ourselves and for others through it. Thus, for the doctor, it is necessary to work on the expectation and desire regarding the disappearance of pain: "The well-established

affliction is anchored and persistent and it is rare for it to disappear miraculously"[31]. Chronic pain changes the habits, the behaviors, the emotions and the relationship with the patient's family and friends, when it disappears it removes landmarks. Thus, a patient released from pain may find himself lost and still in a form of suffering. To make pain physiologically completely disappear would not always be appropriate, pain is linked to a body that belongs to someone but also defines a person.

"Since pain remains an inherently subjective phenomenon that opens the way to a more complex experience, suffering, we are convinced that the effectiveness or failure of an interesting treatment will depend on the consideration of a large number of factors, such as the personality of the painful person, the secondary benefits that he can sometimes derive from his pain, the defense mechanisms that he has been able to put in place... "[3].

**C.3 - Example of applications in dentistry today**

We will take three examples that show how pain in dentistry is analyzed as a complex human experience in recent scientific articles.

In "Association between dental pain and depression in Korean adults using the Korean National Health and Nutrition Examination Survey" by Yang SE (2016)[33] 40 participants with depression were found to present more dental pain than those without depression. The author underlines the importance of psychological factors in perceived pain: "Although psychological stress, anxiety and depression might often be ignored in assessing dental, elevated levels of psychological factors have the potential to intensify perceived pain, reduce an individual's capacity to tolerate pain and affect overall well- being". Indeed, the results of the study showed higher prevalence of self-reported pain for patients with depression, whereas the dentist diagnosed pain or not. General characteristic such as socio-economic factors, stress and oral health factors were also analyzed and affected the prevalence of self-reported dental pain. The causal direction of depression and pain is unclear, one theory is the psychodynamic perspective where "pain is regarded as a defense against unresolved emotional conflict and chronic pain in the absence of the obvious cause is suggested as a variant of depression"[34]. It is also pointed out in the discussion that the definition of dental pain

was a concern, self-reported dental pain being a “particularly subjective experience”. The authors conclude that mental problems should be considered risk factors for dental pain, therefore dentist should consider possible psychopathology when treating patients with dental pain and consult mental health professionals if necessary.

In “Virtual Reality Analgesia for Pediatric Dental Patients” by Atzori B (2018)[35] the effectiveness of immersive virtual reality as an attention distraction analgesia is evaluated.

The author points out that “Dental procedures often elicit pain and fear in pediatric dental patients”. By making dental visits “less painful and more fun”, children’s learned aversion to visiting the dentist could be prevented. Techniques to reduce patients’ pain and anxiety can be pharmacological and psychological. Distraction is a simple psychological technique that “can reduce the amount of attentional resources the patient’ brain has available to process incoming neural signals from pain receptors, with the result of reduced subjective pain experience”[36]. The patient being immersed in virtual reality, his brain is flooded with information and while the medical procedure is painful in itself the subjective experience of suffering is reduced. The results of the study indeed were that patients experienced less pain, including the cognitive, affective and sensory components of pain. These components were evaluated by asking to rate the worst pain, how much time was spent thinking about the pain, how unpleasant was the pain stimulus, how much fun was experienced during the pain stimulus. This article reveals interest for a multidimensional, psychological and subjective approach of pain, and it shows how it can be useful to reduce pain during dental treatment[35].

In “The role of negative and positive memories in fear of dental treatment” by Staugaard SR (2017)[37] the hypothesis is that fear of dental treatment in the young adult is influenced by memories of positive and negative childhood experiences with dental care. Pain, physical discomfort and dentist behaviors were the central themes of negative memories. These negative memories were frequently described and associated with dental fear and symptoms of posttraumatic stress, including the experience of physical reactions, a feeling of travelling back in time, fragmented and spontaneous remembering. Thus, the dental fear facilitates the vivid reliving of negative episodes. Older memories were found to be more emotionally negative: the earlier the negative experience happens in childhood the more traumatizing it becomes. Also, anxious

patients remember painful dental procedures as being worse after an interval of weeks compared with their report immediately after treatment. The authors conclude that "it is possible that negative expectations of dental treatment can be affected by restructuring the patients' memories of previous treatment sessions. This could be accomplished through cuing of previous situations to facilitate concrete remembering and focusing on positive behaviors to build a sense of accomplishment."

## V – FINAL CONSIDERATIONS

1. Pain occurs as the confrontation of a bodily event with a universe of meaning and value.
2. Suffering is the intimate resonance of pain, it is what man does with his pain. The pain is individual, subjective, inexpressible. Its perception and expression are modulated by factors such as culture, religion, gender and education.
3. Dental pain is recognized as one of the worse that humans can experience. Before the arrival of effective dental care, men suffered terribly from their teeth. The first dental treatments themselves were extremely painful, to such an extent that the fear of the dentist passed through the generations.
4. Understanding the history of pain and pain perception, particularly in the dental field, participates to restructure a traumatized collective memory.
5. Human sciences are sometimes called "soft sciences" because they hardly can establish strictly measurable criteria in their investigations. A limitation to this work is thereby the limited number of scientific articles from the perspective of human sciences. The bibliography of the present work uses scientific articles as well as sociological and philosophical references; older material as well as recent ones. It remains relevant because we are interested by changes of perceptions through times, and because rational arguments can state some lasting truths.

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# CHAPTER TWO: INTERNSHIP REPORT

1. internship in General Dental Clinic

The internship in General Dental Clinic was held in the Clinical Unit of Gandra, at the University Institute of Health Sciences, in Gandra - Paredes. It took place between September 10, 2018 and June 14, 2019, on Wednesdays, from 7pm to 12am, totaling 280 hours.

This internship was supervised by Mestres João Batista, Luís Santos and Sónia Machado.

Being multidisciplinary, this internship portrayed the day-to-day experiences in the practice of Dental Medicine, also providing the opportunity for students to develop and apply the knowledge acquired throughout the course.

The clinical acts performed in this internship are detailed below in the table 1.

2. Internship in Hospital Clinic

The internship at Hospital Clinic was held at the Amarante Hospital. It took place between September 10 and June 14, on Wednesday, from 9am to 12:30pm, totaling 196 hours.
This internship was supervised by Prof. Tiago Resende.

This internship in a hospital environment allowed the students to develop the skills that cover the various areas of Dental Medicine for the opportunity they had to work with countless patients with the most diverse pathologies, limitations and peculiarities, demanding autonomy, responsibility and dynamism from them.

The clinical acts performed in this internship are detailed below in the table 1.

3. Internship in Community Oral Health

The Internship in Community Oral Health was composed of two phases, accounting for a total of 196 hours. The first phase consisted of performing 3 challenges, described

below. Each binomial had to carry out 3 community intervention projects in the area of Oral Health, presenting and justifying their objectives, intervention strategies and the material and human resources necessary for their implementation. The intervention projects selected were a prison, a mercy hospital and a street project.

1. First Challenge: community intervention project in the area of Oral Health in a Prison Establishment

The first challenge presented the students with the following situation: the students were invited by the management of a Prison Facility in the north of Portugal, with approximately 700 prisoners, to carry out a community intervention project in the area of Oral Health. The project was presented in PowerPoint format.

2. Second Challenge: community intervention project in the area of Oral Health ina Prison Establishment

The second challenge presented the students with the following situation: the students were invited by the Presidency of a Municipal Council, in partnership with a Hospital da Misericórdia, to carry out a project of community intervention in the area of Oral Health, developed with the premise of 2 equipment to operate in community care. The project was presented in PowerPoint format.

3. Third Challenge: project of community intervention in the street in the area of Oral Health

The third challenge presented the students with the following situation: the students were invited to carry out a community intervention project in the area of Oral Health, in a place of great affluence. The project had to include all the necessary documentation to request authorization from the competent authorities. The project was presented in PowerPoint format. Our intervention strategy consisted in organizing a game on the avenue "Norton de Matos" in Matosinhos. Children had to draw a food they considered

good for oral health and stick it on a Christmas tree. We then corrected while taking the opportunity to do oral prevention. In the second phase, the projects described above were implemented. Depending on the assigned work map, the students were distributed to 2 different health units, as well as putting the third challenge into practice.

1. Health Unit 1: Paços de Ferreira Prison - held between October 8, 2018 and June 14, 2019, on Fridays, from 9am to 12:30pm. This internship was supervised by Prof ; Dr. Catarina Barbosa.

2. Health Unit 2: Médio Ave Hospital Center - Santo Tirso Unit - took place between November 26, 2018 and June 14, 2019, on Fridays, from 9am to 12:30pm. This internship was supervised by Prof. Dr. Raul Pereira.

There were three more challenges (4th, 5th and 6th Challenges) in which the students were able to acquire and recycle knowledge on various topics related to the repercussions that some systemic pathologies have in the oral cavity during childhood and adolescence. Two options were made available for these three challenges: to attend the 9th Annual Meeting of the Portuguese Society of Pediatric Dentistry (SPOP), which took place on February 23, 2018, in Guimarães, and to carry out a Report in the form of Guidelines for each of the three challenges or to conduct a research on each theme supported by Evidence Based Medicine.

In the fourth challenge, the student had to demonstrate, recycle or acquire knowledge on the theme: "Systemic pathologies with repercussions in the oral cavity. Know and know how to proceed". In the fifth challenge, the student had to demonstrate, recycle or acquire knowledge on the subject: "Benign soft tissue pathology in pediatric dentistry.
Diagnosis and therapy in outpatient clinics". In the sixth challenge, the student had to demonstrate, recycle or acquire knowledge on the subject: "Malignant oral pathology in pediatric dentistry. Diagnosis and what to know to do outpatient therapy".

In this stage, students were able to apply and deepen the knowledge acquired throughout the course, as well as provide direct contact with patients with the most varied clinical pictures through the implementation of Dental Medicine consultations in two different health units. The clinical acts performed in this stage are detailed below in table 1.

| Clinical acts | Internship in general clinic | Hospital internshi p | Internship in Community Oral Health | Total |
|---|---|---|---|---|
| Clinical triage | Operator: 0<br>Assistant: 0 | Operator: 2<br>Assistant: 0 | Operator: 2<br>Assistant: 3 | Operator: 4<br>Assistant: 3 |
| Dentistry | Operator: 14<br>Assistant: 3 | Operator: 43<br>Assistant: 17 | Operator: 2<br>Assistant: 7 | Operator: 59<br>Assistant: 27 |
| Endodontics | Operator: 5<br>Assistant: 0 | Operator: 5<br>Assistant: 4 | Operator: 2<br>Assistant: 2 | Operator: 12<br>Assistant: 6 |
| Scaling | Operator: 6<br>Assistant: 2 | Operator: 23<br>Assistant: 5 | Operator: 0<br>Assistant: 2 | Operator: 29<br>Assistant: 9 |
| Exodontia | Operator: 0<br>Assistant: 2 | Operator: 15<br>Assistant: 6 | Operator: 6<br>Assistant: 7 | Operator: 21<br>Assistant: 15 |
| Fix prosthodontics | Operator: 0<br>Assistant: 0 | Operator: 0<br>Assistant: 0 | Operator: 0<br>Assistant: 0 | Operator: 0<br>Assistant: 0 |
| Removable prosthodontics | Operator: 0<br>Assistant: 0 | Operator: 0<br>Assistant: 0 | Operator: 0<br>Assistant: 0 | Operator: 0<br>Assistant: 0 |
| Other | Operator: 1<br>Assistanto: 0 | Operator: 7<br>Assistant: 4 | Operator: 4<br>Assistant: 1 | Operator: 12<br>Assistant: 5 |

**Table 1 - Designation of clinical acts performed during the internship in General Dental Clinic, the internship in a Hospital Clinic and the internship in Community Oral Health**