INFLUENCE OF ANALGESIC THERAPY ON THE AMPLIFICATION OF OROFACIAL PAIN: PHYSIOPATHOLOGICAL MECHANISMS

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Abstract: This study addresses the influence of analgesic therapy on the amplification of orofacial pain, focusing on the pathophysiological mechanisms involving central sensitization and hyperalgesia in patients with chronic pain. Prolonged administration of analgesics, especially opioids, has been associated with the development of central sensitization, a process in which the central nervous system becomes more sensitive to painful stimuli, making pain more intense and harder to treat. Moreover, the continuous use of these medications can alter pain signaling pathways, such as the activation of NMDA receptors and the release of excitatory neurotransmitters, contributing to pain exacerbation. The impact of psychosocial comorbidities, such as anxiety and depression, was also analyzed, as these conditions can potentiate pain amplification, further complicating the management of orofacial pain. The study proposes the need for alternative or complementary therapeutic strategies, such as acupuncture and cognitive-behavioral therapy, to minimize the adverse effects of analgesic therapy and promote a more effective and safe treatment. A critical analysis of these mechanisms and the search for individualized approaches are essential for more efficient management of chronic orofacial pain.

Keywords: Analgesic Therapy; Orofacial Pain; Central Sensitization; Psychosocial Comorbidities.

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INTRODUCTION

Orofacial pain is a complex problem that affects several structures of the face, such as teeth, gums, temporomandibular joints and masticatory muscles, and can be acute or chronic (De Almeida; De França Junior, 2022). The management of this pain often involves the use of analgesic therapies, which aim to relieve symptoms and improve the quality of life of patients. However, in some cases, the application of inappropriate analgesic therapies or in incorrect doses can lead to an amplification of pain, a phenomenon known as hyperalgesia, which makes treatment even more challenging (Bulla et al., 2024).

Orofacial pain amplification may occur due to a series of pathophysiological mechanisms, which involve alterations in pain signaling pathways in the nervous system. Orofacial pain is mediated by nociceptors that transmit pain signals to the higher centers of the brain, and interference with these processes, either through misdirected analgesic therapy or the presence of underlying conditions such as inflammation, can alter the perception and intensity of pain (Pinheiro, 2020).

In addition, long-term use of certain types of painkillers, such as opioids, can cause addiction and worsening chronic pain, a phenomenon called "opioid-induced pain" (OIH). This effect is particularly concerning in patients with chronic orofacial pain, where repeated administration of analgesics may result in a vicious cycle of pain amplification. The interaction between analgesics and the central nervous system, which regulates pain perception, is a key factor in the development of this condition, making the choice of analgesic and dosage fundamental to avoid adverse effects (D'Alessandro et al., 2019).

Another important aspect in the amplification of orofacial pain is the presence of comorbidities, such as anxiety disorders and depression, which are often associated with chronic pain. These psychosocial factors can interfere with the way the patient perceives pain and, in some cases, intensify hyperalgesia. Inadequate management of these concomitant conditions, without considering emotional and psychological aspects, can result in an increase in orofacial pain, even with the use of analgesic therapies (Lima et al., 2023).



Understanding the pathophysiological mechanisms involved in the amplification of orofacial pain is essential for the development of more effective therapeutic strategies. An individualized therapeutic approach, which takes into account the patient's clinical characteristics, the type of pain, the choice of analgesic, and the treatment of associated comorbidities, is essential to avoid pain amplification. To this end, the problem question of this article is to analyze the influence of analgesic therapy on the amplification of orofacial pain, investigating the pathophysiological mechanisms involved and their implications in the treatment of chronic pain.

The specific objectives are: (i) to investigate the effects of prolonged administration of analgesics, especially opioids, on orofacial pain amplification and changes in pain signaling pathways (ii) to analyze the pathophysiological mechanisms related to central sensitization and hyperalgesia in patients with chronic orofacial pain, in response to the use of analgesic therapies; (iii) to evaluate the relationship between psychosocial comorbidities, such as anxiety and depression, and orofacial pain amplification, considering the impact of analgesic therapies on pain perception; (iv) to propose alternative or complementary therapeutic strategies that can minimize the adverse effects of analgesic therapy, promoting a more effective and safe treatment for patients with chronic orofacial pain.

Chronic orofacial pain represents a significant challenge to public health, affecting the quality of life of patients. Analgesic therapy is often used to control this pain, but its prolonged use can lead to pain amplification, aggravating symptoms and complicating treatment. Understanding the pathophysiological mechanisms involved in the amplification of orofacial pain in response to analgesic therapy is essential to optimize treatment and reduce adverse effects. In addition, the search for more effective and safe therapeutic approaches is essential to improve the quality of life of patients.

METHODOLOGY

The methodology adopted for this research is an integrative literature review, an efficient method to consolidate, synthesize and analyze evidence on the influence of analgesic therapy on the



amplification of orofacial pain. The integrative review allows the inclusion of studies of different designs and contexts, providing a comprehensive understanding of the theme (Souza et al., 2010).

This approach is divided into four chapters, each corresponding to one of the specific objectives, addressing, in detail, the pathophysiological mechanisms of orofacial pain amplification, the efficacy of analgesic therapies, the factors that contribute to pain amplification, and the identification of best practices for the management of orofacial pain.

The review was conducted based on articles published in the last five years, ensuring the updating and relevance of the data. The selected studies were in both Portuguese and English, covering an international literature to ensure a broader view on the subject. Research sources included recognized databases such as SciELO, Google Scholar, and PubMed, which are widely used in academic and scientific studies.

Inclusion criteria will involve peer-reviewed articles, clinical trials, randomized trials, and systematic reviews. These studies should be directly related to the pathophysiological mechanisms of orofacial pain amplification and the different analgesic therapeutic approaches. Articles that do not present a clear methodology or that are not directly applicable to the research theme were excluded.

Data analysis was done qualitatively, organizing the evidence found to identify patterns, trends, and gaps in the literature. To ensure the robustness of the results, emphasis was placed on comparing the different analgesic methods, their implications for pain control, and how they can, in some cases, contribute to the amplification of orofacial pain, considering the pathophysiological mechanisms involved.

The integrative review provided a critical and grounded view of the influence of analgesic therapy on the amplification of orofacial pain. It is expected as a result a deeper understanding of the mechanisms underlying this condition and the identification of more effective therapeutic approaches, contributing to the advancement of the treatment of orofacial pain in clinical practice.

EFFECTS OF LONG-TERM ADMINISTRATION OF ANALGESICS, WITH EMPHASIS



ON OPIOIDS, ON OROFACIAL PAIN AMPLIFICATION AND CHANGES IN PAIN SIG-NALING PATHWAYS

Long-term administration of analgesics, particularly opioids, has been widely discussed due to their adverse effects, which may include amplification of orofacial pain. Although opioids are effective in controlling acute pain, their chronic use has been associated with the phenomenon known as opioidinduced hyperalgesia (OIH), which results in exacerbation of pain in response to the medication itself.

Studies demonstrate that activation of opioid receptors can lead to modulation of signaling pathways involved in pain perception, resulting in an increased sensitivity to painful stimuli (Lee, G. I., & Neumeister, 2020). Continuous administration of opioids can thus modify the normal physiological response of the nervous system, causing changes in pain control mechanisms. The amplification of orofacial pain due to long-term use of opioid analgesics is closely related to the process of central sensitization, which occurs when the central nervous system (CNS) becomes more reactive to painful stimuli. In patients with chronic orofacial pain, such as those with temporomandibular disorder, continued use of opioids may exacerbate this central sensitization. Increased neuronal excitation and decreased inhibition of circuits contribute to the intensification of pain (Vassalo, 2020).

These changes can be exacerbated by factors such as the time of exposure to analgesics and the dose used, with increasingly detrimental results for the effective control of orofacial pain. In addition, the interaction between opioids and other pain signaling pathways is a critical factor in pain amplification.

In terms of alteration in pain signaling pathways, chronic exposure to opioids can induce changes in neuronal receptors by increasing the activity of ion channels such as calcium channels, which play an important role in pain transmission. Sensitization of neural signaling pathways, such as those involving NMDA (N-methyl-D-aspartate) receptors, is a well-documented mechanism in the amplification of opioid-induced pain (Silva et al., 2023). These pathways are involved in the pain memory process and, when altered, contribute to the persistence of orofacial pain, even after the cessation of analgesic use.



In addition, the combination of opioids with other analgesic medications, such as nonsteroidal anti-inflammatory drugs (NSAIDs), has been shown to be ineffective in preventing orofacial pain amplification. Although NSAIDs offer some pain relief, their administration in conjunction with opioids may aggravate adverse effects on the central nervous system, amplifying the symptoms of hyperalgesia (Bouloux et al., 2024).

The amplification of orofacial pain related to the prolonged use of opioid analgesics reinforces the need for a review of chronic pain management strategies. The use of alternative therapies, such as non-pharmacological neural modulation techniques and physical therapies, has shown promise as a complement to conventional treatment, minimizing the adverse effects of opioids and promoting a more balanced approach to pain control (De Souza Soares et al., 2029).

In addition, it is crucial to implement more restrictive prescription policies that ensure the rational use of opioids and encourage the development of innovative therapeutic approaches for the treatment of chronic orofacial pain.

PATHOPHYSIOLOGICAL MECHANISMS OF CENTRAL SENSITIZATION AND HYPE-RALGESIA IN PATIENTS WITH CHRONIC OROFACIAL PAIN IN RESPONSE TO THE USE OF ANALGESIC THERAPIES

Central sensitization is a neurophysiological mechanism in which the central nervous system (CNS) becomes hypersensitive to painful stimuli, a common feature in patients with chronic orofacial pain. This phenomenon occurs when pain signals, which would normally be inhibited or modulated, are amplified by a dysfunction in the neuronal pathways of the CNS. Central awareness it is mediated by changes in neurotransmitters, such as glutamate and substance P, which are involved in the process of neuronal excitability and the development of chronic pain (Varão, 2022).

Patients with orofacial pain, such as those with temporomandibular disorder, often present with this alteration, in response to the continued use of analgesic therapies, especially opioids, which can



exacerbate this process. In addition, hyperalgesia, which is the amplification of pain perception, is one of the main effects of central sensitization. When the use of painkillers, such as opioids, is prolonged, it can result in pain intensifying rather than relieving it. This phenomenon is known as opioid-induced hyperalgesia (OIH) (Gentleman; Bonfante, 2019).

Studies indicate that OIH is characterized by an increased pain response in areas that would not normally be painful, contributing to the chronicity of orofacial pain. In patients with chronic orofacial pain, the continuous use of opioids can alter the response of nociceptive receptors, favoring pain amplification rather than pain relief (Lucena, 2023).

The activation of NMDA (N-methyl-D-aspartate) receptors, located in neuronal synapses, plays a crucial role in central sensitization. These receptors, when activated, contribute to the phenomenon of pain memory, facilitating the perpetuation of painful signals in the CNS. Excessive activation of NMDA receptors is one of the main pathophysiological mechanisms responsible for pain amplification, which is often observed in patients with chronic orofacial pain (Vicenzi, 2022).

In addition to pain modulation at the peripheral and central levels, psychosocial comorbidities also play a significant role in central sensitization and hyperalgesia in patients with chronic orofacial pain. Studies indicate that conditions such as anxiety and depression can increase the perception of pain, exacerbating the effects of analgesic therapies. The interaction between psychosocial and neurophysiological factors can potentiate pain, making it more difficult to control. Patients with psychosocial comorbidities often report greater pain intensity and a less effective response to analgesics, which suggests that treatment of these psychosocial conditions should be considered in conjunction with analgesic therapies (Lima et al., 2023).

The combination of central sensitization and hyperalgesia in response to long-term analgesic use highlights the importance of a multidisciplinary therapeutic approach in the management of chronic orofacial pain. In addition to careful pharmacological management, alternative therapeutic strategies, such as physical therapy, acupuncture, and cognitive behavioral therapy, have shown efficacy in modulating pain and reducing the adverse effects of analgesics.



PSYCHOSOCIAL COMORBIDITIES AND THEIR RELATIONSHIP WITH OROFACIAL PAIN AMPLIFICATION: THE IMPACT OF ANALGESIC THERAPY ON PAIN PERCEP-TION

Psychosocial comorbidities, such as anxiety, depression, and stress, have a significant relationship with the amplification of orofacial pain, and their impact is intensified with the use of analgesic therapies. Patients with chronic orofacial pain often have these psychosocial conditions, which can directly influence pain perception and the effectiveness of therapeutic interventions. Emotional stress can increase pain sensitivity, contributing to a vicious cycle of pain and suffering, which makes management more complex. Anxiety, for example, can amplify the response to painful stimuli, making pain more intense and persistent (Azevedo et al., 2020).

In addition, depression is closely related to increased pain perception, especially in chronic pain conditions such as orofacial. Depressed patients have a lower tolerance to pain and an exaggerated perception of painful signs. The psychological impact of chronic pain can also aggravate the patient's emotional state, creating a cycle of continuous suffering (De Oliveira Filho et al., 2021).

The use of analgesics, especially opioids, may not be effective in patients with psychosocial comorbidities, as pain relief does not always resolve the emotional component associated with chronic orofacial pain. The lack of control over emotional factors can even increase the sensation of pain and decrease the therapeutic response (Leal, 2020).

Another important aspect is the relationship between analgesic therapy and psychosocial effects. Long-term use of painkillers, especially opioids, can lead to dependence and the intensification of psychological disorders, such as depression and anxiety. These adverse effects of medications can increase the perception of pain, since the patient's emotional state becomes more fragile. Central sensitization, associated with the chronic use of analgesics, can amplify both pain and psychosocial symptoms, making the treatment of orofacial pain even more difficult (Da Conceição; Cordeiro, 2024).



Thus, the inappropriate use of analgesic therapies can exacerbate the physical and emotional suffering of patients, leading to a more complex picture of chronic pain.

In addition, the interaction between psychosocial and neurophysiological factors should be considered when treating chronic orofacial pain. Patients with anxiety and depression, when treated with pharmacological approaches alone, may not get the necessary relief, since emotional factors also play a key role in pain perception.

Treatment strategies that include psychological support, such as cognitive behavioral therapy and relaxation techniques, have been shown to be effective in reducing pain levels and improving patients' quality of life. These integrated therapeutic approaches can minimize the negative effects of analgesic therapies and optimize pain management (Da Silva; Miranda, 2024).

Therefore, the relationship between psychosocial comorbidities and orofacial pain amplification is complex, and the impact of analgesic therapies on pain perception needs to be comprehensively assessed. In addition to pain control, the treatment of emotional and psychological aspects should be considered, so that the patient has an overall improvement in his condition. A multidisciplinary approach, which includes psychotherapy and relaxation methods, may be the key to effective management of chronic orofacial pain, minimizing pain amplification and the adverse effects of analgesics.

ALTERNATIVE OR COMPLEMENTARY THERAPEUTIC STRATEGIES

Psychosocial comorbidities play a crucial role in amplifying orofacial pain, since factors such as anxiety, depression, and stress can intensify pain perception, making conventional treatment more challenging. Although analgesic therapies, especially opioids, are widely used for the management of chronic pain, the psychological impact of these conditions often contributes to the ineffectiveness of chronic pain treatment. This suggests that a more holistic approach, which takes into account both the psychosocial and physiological aspects of pain, is essential to optimize the management of chronic orofacial pain, as pointed out by Da Silva et al. (2024).

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Traditional analgesic therapies, such as opioids, may have a palliative effect, but they do not fully address the underlying factors that exacerbate pain (Tambeli et al., 2023). Long-term opioid use, for example, is associated with the risk of addiction and emotional disorders, such as depression and anxiety, which, in turn, can amplify the perception of pain.

This highlights the need for a more personalized and multidisciplinary approach to treating chronic orofacial pain, incorporating not only medications but also psychological support and alternative therapies that treat the patient as a whole.

Within this context, alternative or complementary therapeutic strategies emerge as promising to minimize the adverse effects of analgesics and improve pain control. Acupuncture, for example, has shown significant benefits in the treatment of chronic orofacial pain, helping to reduce pain intensity and improve patients' quality of life. Studies indicate that acupuncture can promote pain relief by stimulating specific points, which favor the release of endorphins, natural substances that act as analgesics in the body. The use of this therapy can be an effective alternative for those who seek to minimize the use of medications (Bezerra et al., 2024).

In addition, cognitive behavioral therapy (CBT) has been shown to be highly effective in treating patients with chronic orofacial pain and psychosocial comorbidities. CBT aims to modify negative and dysfunctional thought patterns that can contribute to increased pain perception, teaching the patient to cope more adaptively with the stress and anxiety associated with chronic pain. CBT, when combined with pharmacological interventions, can significantly reduce pain intensity and improve the patient's overall well-being (Rota, 2020).

The use of manual therapies, such as physical therapy, has also been shown to be effective in the management of chronic orofacial pain. Myofascial release techniques, massage therapy, and stretching exercises can help relieve muscle tensions that are often associated with orofacial pain. Physical therapy can also improve functionality and reduce muscle stiffness, factors that often aggravate the pain. The combination of physical therapy with other complementary therapies can be particularly useful for patients with chronic orofacial pain, as it treats both the physical and psychosocial aspects of



the condition (Silva; Petkovicz, 2025).

In terms of alternative pharmacological strategies, the use of herbal medicines can be an interesting option. Substances such as ginger extract, curcumin (from turmeric) and capsaicin have shown analgesic and anti-inflammatory properties, and can complement conventional treatment safely and effectively. The use of these natural compounds, in combination with non-pharmacological therapies, can reduce dependence on traditional analgesics and improve the overall efficacy of treatment (De Carvalho et al., 2024).

While the combination of alternative and complementary therapies is promising, it is critical that treatments are tailored to the specific needs of each patient. Personalization of treatment is crucial to ensure that all facets of chronic orofacial pain are addressed, including the physiological, emotional, and psychosocial components. Collaboration between healthcare professionals, such as doctors, psychologists, physiotherapists, and complementary therapists, can result in more effective and holistic treatment.

Therefore, the combination of traditional and alternative therapies offers a more comprehensive approach to the management of chronic orofacial pain, considering both physical and emotional aspects. This multidisciplinary approach can not only help reduce pain but also improve patients' quality of life by providing a more balanced and personalized solution for the treatment of chronic orofacial pain.

Finally, it is essential that health professionals are aware of the interactions between conventional and alternative treatments. Ongoing education and research on the effectiveness of complementary therapies are essential so that these strategies can be safely and effectively integrated into treatment plans. With an integrated and personalized approach, it is possible to significantly improve the management of chronic orofacial pain, ensuring better patient outcomes.

FINAL CONSIDERATIONS

Analgesic therapy plays a central role in the management of orofacial pain, but its prolonged



use, especially in the case of opioids, can lead to pain amplification through complex pathophysiological mechanisms. Continuous administration of analgesics can induce central sensitization, where the central nervous system becomes more sensitive to painful stimuli, aggravating pain perception. This phenomenon is exacerbated by the interaction between the effects of opioids and pain signaling pathways, creating a vicious cycle in which pain becomes more difficult to control with traditional painkillers.

In addition, long-term use of analgesics can affect neuronal plasticity, resulting in changes in pain signaling pathways, such as activation of NMDA receptors and excessive release of excitatory neurotransmitters. These changes contribute to hyperalgesia, a condition in which pain becomes more intense and persistent, making it resistant to conventional therapies. In patients with chronic orofacial pain, these mechanisms are often exacerbated by the presence of psychosocial comorbidities, such as anxiety and depression, which can influence pain perception, making treatment even more challenging.

Therefore, it is essential that the treatment of chronic orofacial pain considers not only immediate symptom relief through analgesics, but also a holistic approach that takes into account the underlying pathophysiological mechanisms. Alternative and complementary therapeutic strategies, such as acupuncture, cognitive behavioral therapy, and mindfulness, can be explored to help minimize the adverse effects of analgesic therapy and promote a more effective and sustainable approach to pain management. Personalization of treatment, which takes into account the physiological and emotional particularities of each patient, is essential to avoid pain amplification and improve the quality of life of patients with chronic orofacial pain.

One of the limitations of this study is related to the lack of standardization in therapeutic approaches and diagnostic criteria for orofacial pain. Treatment for chronic pain, including the use of opioids, is often adjusted according to the individual needs of each patient, which can make it difficult to compare results between the different studies analyzed.

In addition, the heterogeneity of pain measurement methods, which vary between studies, may have influenced the interpretation of data on the efficacy of analgesic therapies and the pathophysiological mechanisms underlying pain amplification.



Another important limitation refers to the scarcity of studies that investigate in an integrated manner the interaction between analgesic therapies and psychosocial comorbidities in patients with chronic orofacial pain. While some research addresses separate aspects, such as the effects of opioids on central sensitization or the influence of emotional disturbances on pain perception, few studies explore the complexity of this interaction in a comprehensive manner.

The inclusion of more longitudinal studies and greater methodological rigor could provide a clearer understanding of how psychological factors contribute to pain amplification and how analgesic therapies can be adjusted to improve outcomes in the management of chronic orofacial pain.

REFERENCES

AZEVEDO, Ludmila Menezes Alves de et al. Construção de instrumento de triagem biopsicossocial para abordagem de pacientes com dor orofacial. 2020.

BEZERRA, Lucas Mainardo Rodrigues et al. ABORDAGENS MULTIDISCIPLINARES NO TRATAMENTO DA DOR CRÔNICA EM IDOSOS: UMA REVISÃO BIBLIOGRÁFICA. RECIMA21-Revista Científica Multidisciplinar-ISSN 2675-6218, v. 5, n. 3, p. e535022-e535022, 2024.

BOULOUX, Gary F. et al. Guidelines for the management of patients with orofacial pain and temporomandibular disorders. Journal of Oral and Maxillofacial Surgery, 2024.

BULLA, Leticia Lazzarini et al. DIFERENCIAÇÃO ENTRE NEURALGIA DO TRIGÊMEO E DOR OROFACIAL. Brazilian Journal of Implantology and Health Sciences, v. 6, n. 10, p. 2813-2821, 2024.

CAVALHEIRO, Scheila Taís; BONFANTE, Juliana da Silva. Hiperalgesia induzida por opioides. Encontro Acadêmico de Produção Científica de Medicina Veterinária, 2019.

DA CONCEIÇAO, Jaynara Senna; CORDEIRO, Ana Luísa Gomes. TRANSTORNOS POR USO DE SUBSTÂNCIAS PSICOATIVAS (TUS) E SEUS EFEITOS NO SISTEMA NERVOSO CENTRAL (SNC). Encontro de Saberes Multidisciplinares, v. 2, n. 1, p. e45-e45, 2024.



DA SILVA, Ana Caroline Gonçalves et al. LASERTERAPIA NO TRATAMENTO DAS DORES OROFACIAIS. Revista Ibero-Americana de Humanidades, Ciências e Educação, v. 10, n. 12, p. 1146-1158, 2024.

DA SILVA, Camila Meury Albino; MIRANDA, Joelina Da Silva. ESTRATÉGIAS DE ENFERMAGEM PARA O MANEJO DA DOR EM PACIENTES COM DOENÇAS CRÔNICAS. Revista Cedigma, v. 2, n. 3, pág. 15-26, 2024.

D'ALESSANDRO, Walmirton Bezerra et al. Medicina & Saberes II. Editora Kelps, 2019.

DE ALMEIDA, Cariny Regino; DE FRANÇA JUNIOR, Mosaniel Falcão. Dor orofacial e mecanismos de dor referida. Research, Society and Development, v. 11, n. 15, p. e203111537036-e203111537036, 2022.

DE CARVALHO, Guilherme Dias; LINS, Larissa Souza Santos; MOREIRA, Paula Milena Melo Casais. USO DO CANABIDIOL PARA O CONTROLE DA DOR OROFACIAL CRÔNICA: REVISÃO DE LITERATURA. Revista Ciências e Odontologia, v. 8, n. 2, p. 113-122, 2024.

DE OLIVEIRA FILHO, Francisco Hildebrando Moreira et al. Manifestações dos sintomas da depressão em pacientes com fibromialgia. Research, Society and Development, v. 10, n. 15, p. e63101522587-e63101522587, 2021.

DE SOUZA SOARES, Eliane Cristina et al. Guia prático para manejo da dor. 2019. LEAL, Rafhael. Uso indevido e dependência de opioides: da prevenção ao tratamento. Revista de Medicina de família e Saúde mental, v. 2, n. 1, 2020.

LEE, Greg I.; NEUMEISTER, Michael W. Pain: pathways and physiology. Clinics in plastic surgery, v. 47, n. 2, p. 173-180, 2020.

LIMA, Guilherme Machado Alvares de et al. Análise do fenótipo clínico de pacientes com neuralgia do trigêmeo atendidos no Ambulatório de Dor Orofacial do Hospital Universitário Pedro Ernesto. 2023.

LUCENA, Caio César Jucá. DEPRESSÃO E DOR CRÔNICA. Neuropsicogeriatria: Uma abordagem



integrada, p. 29, 2023.

PINHEIRO, Flávio Eduardo. Disfunções temporomandibular e dor facial. 2020. Dissertação de Mestrado. Egas Moniz School of Health & Science (Portugal).

ROTA, Alexandre Cardoso. Avaliação e implementação de nova forma de tratamento para a Disfunção Temporomandibular. 2020.

SILVA, Ana Cristina Freitas da; PETKOVICZ, Fabiana. Perfil dos pacientes atendidos pelo núcleo de dor orofacial da UNESC.

SILVA, Ana Cristina Freitas da; PETKOVICZ, Fabiana. Perfil dos pacientes atendidos pelo núcleo de dor orofacial da UNESC. 2025.

SILVA, Guilherme Gomes et al. Desenvolvimento de um modelo de dor persistente induzido por carragenina na pata de ratos. 2023.

SOUZA, Marcela Tavares de; SILVA, Michelly Dias da; CARVALHO, Rachel de. Revisão integrativa: o que é e como fazer. Einstein (São Paulo), v. 8, p. 102-106, 2010.

TAMBELI, Claudia Herrera et al. Abordagem integrativa do uso terapêutico da cannabis nas dores orofaciais. BrJP, v. 6, p. 49-53, 2023.

VARÃO, Juliana Portela Duarte. A terapia neural no tratamento de dores crónicas da cabeça e pescoço. 2022. Dissertação de Mestrado. Egas Moniz School of Health & Science (Portugal).

VASSALO, Ana Filipa Pepino. A Relação Entre Depressão e Dor Crónica: Modelo Neurobiológico e Intervenção Terapêutica Integrada. 2020. Dissertação de Mestrado. Universidade de Lisboa (Portugal).

VICENZI, Cristina Balensiefer. Avaliação da confiabilidade de um modelo de dor orofacial inflamatória crônica induzido pela administração intra-articular de adjuvante completo de Freund (CFA) em Ratos Wistar. 2022.

