THE ADJUVANT USE OF CONSCIOUS SEDATION WITH NITROUS OXIDE IN ODONTOPHOBIC PATIENTS AT THE UNIVERSITY DENTAL CLINIC OF THE INTA-UNINTA UNIVERSITY CENTER

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ABSTRACT

Anxiety and odontophobia represent significant barriers in the daily life of dental surgeons, directly impacting the quality and success of care. These conditions manifest at different levels and require varied management strategies, such as behavioral techniques, pharmacological sedation, and other complementary approaches. Overcoming such challenges is essential not only for the benefit of the patient, but also for the improvement of the professional's clinical practice. The present study aimed to evaluate the efficacy of conscious sedation with nitrous oxide (N_2O) in reducing anxiety and odontophobia in patients undergoing dental procedures. Five consultations were performed with conscious sedation in patients previously diagnosed with odontophobia. For the analysis, two evaluative instruments were applied: the Corah Dental Anxiety Test, used to measure anxiety levels before and after care, and the Trieger Test, used to assess changes in motor coordination resulting from sedation. In addition, vital signs, symptoms, and complications during the procedures were recorded and systematized for analysis. The results indicated that there were no significant changes in the Trieger Test scores before and after the

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consultations, suggesting that conscious sedation with nitrous oxide did not compromise the motor coordination of the patients. Stabilization or reduction of blood pressure was observed during the procedures, in addition to a noticeable reduction in anxiety levels, according to the data from the Corah Test. However, the intensity of odontophobia was shown to be associated with the complexity of the procedures performed. We conclude that the use of conscious sedation with nitrous oxide was effective in reducing anxiety in dental procedures, reinforcing its role as an adjuvant tool in the management of odontophobic patients. However, the results did not allow us to establish significant correlations between anxiety, age, or gender of the patients.

Keywords: Nitrous Oxide. Odontophobia. Conscious Sedation. Dentistry. Anxiety.

INTRODUCTION

Odontophobia represents a significant challenge in dentistry, negatively impacting the success of treatments. Patients with this condition often seek care only in emergency situations or in the face of a severely compromised oral health condition. The first contact between professional and patient is essential to reduce fear and anxiety; however, for cases of more severe trauma related to dental treatment, isolated behavioral approaches may be insufficient. In this context, conscious sedation with nitrous oxide stands out as a valuable tool, enhancing behavioral control, minimizing fear and anxiety, and favoring the conduct of care for both the dentist and the patient (PICCIANI, 2014).

Conscious sedation is an effective alternative in dentistry, especially indicated for patients whose level of phobia or anxiety prevents treatment Dental practice, often associated by patients with uncomfortable, painful and unpleasant experiences, can trigger different degrees of fear, anxiety or apprehension, varying in intensity according to the individual (PEDEN; COOK, 2014; MOURA, 2005).

In addition, according to Malamed (2012), pharmacological techniques play a fundamental role in dentistry, allowing the prescription and administration of drugs aimed at modulating the patient's state of consciousness. Currently, the dentist has a wide range of pharmacological resources, including agents with analgesic and sedative properties, which promote the effective control of fear, anxiety, pain and patient behavior. These agents make it possible to maintain a state of conscious sedation, in which the patient remains responsive to verbal commands, cooperative and fit for the dental procedure (APPUKUTTAN, 2016).

Nitrous oxide (N_2O), commonly termed laughing gas, laughing gas, or nitrous oxide, is a widely used inhalation agent due to its analgesic and anesthetic properties. It can be administered pure or in combination with oxygen (O_2), in concentrations usually ranging between 40% and 70%. In addition, it can be associated with other anesthetic agents, both inhalation and intravenously (Air Liquide Healthcare, 2022). N_2O has been widely used in dentistry, especially in the practice of conscious sedation, standing out for its efficacy in the management of anxiety and phobias related to dental procedures. This application has been consolidating and gaining increasing relevance, as its use demonstrates significant benefits in promoting comfort and patient adherence to treatment (SOARES, 2013; MACHADO et al., 2022).

This scenario reinforces the importance of nitrous oxide in dental practice, especially in the face of the challenges represented by dental anxiety and odontophobia. While dental anxiety is defined as a negative emotional state that can occur independently of previous

unpleasant experiences, such as severe pain or inadequate management by the dentist (SILVA et al., 2023; DADALTI et al., 2021; OLIVEIRA, 2019),

Odontophobia, in turn, is characterized as an irrational fear related to dental treatment, often accompanied by physiological and psychological manifestations, such as a feeling of terror, elevated blood pressure, tremors, and general malaise. In this context, the use of nitrous oxide stands out as a safe and effective strategy to minimize these adverse responses, promoting greater comfort and collaboration of patients during procedures. (MURAD et al., 2020). Odontophobia is recognized by the WHO (World Health Organization) as a real disease, and is divided into three levels: mild, moderate and severe odontophobia (DE STEFANO, 2019).

In these cases, it is extremely important that the control of pain and anxiety, which can manifest during dental treatment and in the presence of DC, has the use of nitrous oxide and oxygen associated or not, as it is effective and favors both the patient and the professional during dental care (MOURA, 2005). Understanding and reducing the patient's fear is of interest to the DC, when considering that it reduces stress in the work environment and reduces patient evasion, considering that there will be better reception in view of their condition (MURAD et al., 2020).

In order to study the current need to alleviate the expectation of pain and to evaluate the degree of anxiety/odontophobia of patients before, during and after the use of nitrous oxide in dental care, the objective of the present study is to verify the use of conscious sedation with nitrous oxide/oxygen, emphasizing its indications, contraindications, advantages and disadvantages, as well as the equipment used and its proper technique.

OBJECTIVES

GENERAL OBJECTIVE

To evaluate the decrease in the degree of anxiety of odontophobic patients with the use of nitrous oxide during dental care.

SPECIFIC OBJECTIVES

a) Identify the reasons for the patient's anxiety in the DC's office;
b) Observe the efficiency of the technique by this method;
c) Assess the threshold for changes and perception of pain, well-being and control of the patient's behavior;

THEORETICAL FRAMEWORK

NITROUS OXIDE

Nitrous oxide is a colorless gas with a sweet taste, it is an analgesic agent with an anxiolytic effect and can cause depression and euphoria in the central nervous system (CNS) (FIORILLO, 2019).

Conscious sedation allows the patient to remain awake and responsive while preserving all senses, protective reflexes, spontaneous breathing, and the ability to react to physical stimuli and verbal commands. This technique, which uses the combination of oxygen and nitrous oxide (O_2/N_2O), is widely used in dentistry, especially for its relaxing effect, which contributes to the control of anxiety, and not for its anesthetic properties (SOARES, 2013, RODRIGUES et., 2024).

This conscious sedation causes a minimum degree of depression of consciousness in the patient, maintaining his autonomy during spontaneous and continuous breathing. During its use, no intervention is necessary to maintain the appropriate air passage because it presents adequate spontaneous ventilation. Cardiovascular function is maintained at normal safety levels (FANGANIELLO, 2004).

The combination of nitrous oxide (N_2O) with oxygen (O_2) is widely used and well accepted in pediatric patients due to its rapid clinical action, which manifests itself within a few minutes. In addition, this technique allows the administration of doses gradually, both in increase and reduction, reinforcing the safety and efficacy of conscious sedation as a therapeutic method (RODRIGUES CHALA, 2016).

One of the determining factors for the choice of nitrous oxide (N_2O) in conscious sedation is its characteristic of not undergoing significant metabolization in the body. This property minimizes the occurrence of relevant side effects, since the gas is quickly eliminated through expiration, with minimal impact on vital signs. Approximately 99% of the administered N_2O is excreted by the lungs, without undergoing biotransformation in any organ, while a residual fraction is eliminated by secondary routes, such as skin, urine, and intestinal gases (FANGANIELLO, 2004).

In Brazil, there is an increase in the number of dentists who incorporate the use of nitrous oxide in their clinical practice, aiming to provide greater comfort, safety and tranquility to patients during care. This approach was endorsed by the Brazilian College of Dentistry (CCB) in 2004. However, it is important to highlight that many professionals have limited training and little practical experience in outpatient sedation, since this competence is not yet widely integrated into the curricula of undergraduate dental courses in the country (COSTA, 2004).

Indications

As with any sedation technique, the administration of nitrous oxide (N_2O) must be carefully indicated by the dentist, taking into account the specific characteristics and needs of each patient. The dosage of N_2O can vary according to the individual response, and it is essential that the professional adjust the concentration of the gas according to the patient's particularities (DE MOARES, 2019). In this process, the risks and benefits must be weighed, as well as the patient's clinical history, including pre-existing medical conditions and adverse reactions to sedatives (RODRIGUES CHALA, 2016).

The main indication for the use of nitrous oxide occurs in patients in whom conventional behavioral control techniques have not been shown to be effective. In this context, sedation with N_2O has been shown to be particularly useful to reduce fear and anxiety, making it possible to perform dental procedures in a calm and controlled manner (BRUNICK, 2008). The main indications include patients with intense fear, anxiety, hyperactivity, physical and/or mental disorders, as well as those who have allergies to other agents used in conscious sedation (SOARES, 2013).

In general, nitrous oxide sedation is recommended for patients classified as ASA I and ASA II in elective procedures, and for ASA III patients in emergency room visits. It is also indicated for non-cooperative pediatric patients, especially those who have a gag reflex, recurrent fainting episodes, difficulties in enduring prolonged procedures, or a history of odontophobia (SILVA, 2015). In addition, patients with clinical conditions such as anxiety, hypertension, diabetes, and controlled heart disease can also benefit from the technique, as long as the evaluation of the feasibility of the treatment is carried out together with the physician in charge (PEDRON; FALQUEIRO, 2013).

Contraindications

According to Knuf (2022), the adverse effects associated with nitrous oxide (N_2O) are mostly the result of interactions with other drugs or preexisting clinical conditions. One of the main adverse effects is respiratory depression, which can occur when N_2O is administered in conjunction with other sedatives, potentiating the depressant effect. In addition, diffusion hypoxia can be observed after N_2O interruption, since the concentration gradient of gases in the lung rapidly inverts, diluting the oxygen in the alveoli and leading to a reduction in circulating oxygen. To mitigate this risk, administration of 100% oxygen is recommended immediately after cessation of N_2O use.

Another relevant adverse effect is the increased risk of postoperative nausea and vomiting (PONV), especially in procedures lasting more than two hours. To prevent this

problem, antiemetic prophylaxis is indicated in order to reduce the incidence of PONV (MILLER, 2022).

Contraindications to the use of N_2O are relatively specific and may vary according to the individual characteristics of the patient. N_2O can inactivate methionine synthase through the oxidation of the vitamin B12 cobalt, which can result in megaloblastic anemia. Although in healthy patients the effects are subclinical, in individuals with a deficiency of this enzyme, the damage can be neurological and hematological. Patients with severe heart disease, in the first trimester of pregnancy, or in critical condition are among the groups contraindicated for the use of N_2O (KNUF, 2022).

In addition, the use of N_2O is contraindicated in patients with pneumothorax, small bowel obstruction, middle ear surgery, and ophthalmic procedures involving the retinas, due to the increased volume and pressure in enclosed spaces. This is due to the solubility of oxygen and the possibility of gas bubbles forming in places such as the eye or closed cavities (BUHRE, 2019).

According to Schulte (1982), sedation with N_2O should also be avoided in patients with pulmonary hypertension, due to the risk of increased pressure in the pulmonary artery, resulting from sympathetic stimulation. In patients with severe psychiatric disorders, the use of N_2O is also contraindicated, as the gas may induce vivid dreams and hallucinations.

Sedation with nitrous oxide should be avoided in procedures that involve cauterization in the head and neck region, since, although N_2O is not flammable, it can contribute to combustion. Patients with claustrophobia should also not be subjected to this technique, given the discomfort generated by the sensation of suffocation caused by the perceived tightness during the administration of gas.

Regarding breastfeeding, it is recommended that the mother breastfeed only after complete recovery from the effect of N_2O, since the half-life of the gas is short and there is no evidence of absorption by the baby (SOARES, 2013).

Other temporary contraindications include airway obstructions, allergic rhinitis, sinusitis, flu, and colds, since sedation with N_2O depends on the inhalation of the gas and requires an unobstructed airway. Finally, it is important to highlight that the use of N_2O is not associated with an increase in mortality, cardiovascular complications, or wound infections (KNUF, 2022).

Advantages

There are several advantages in using the combination of nitrous oxide and oxygen by inhalation. For example, a faster onset of action, change in the depth of sedation by the

inhalation route at any time due to the possibility of dosing the gases administered allowing the dose to be balanced according to the clinical condition obtained, equipment that provides significant safety in the use of nitrous oxide, flexibility of action and maintenance of the peak of clinical effect, in addition to the fast recovery time, due to the pharmacological characteristics of nitrous oxide and few side effects associated with the use of this sedation method (SOARES et al., 2013).

Disadvantages

The disadvantages of this technique are: the high cost of the equipment and the need to purchase gases, the fact that nitrous oxide is not a potent agent and may not achieve the desired clinical effects in a group of patients who are more tolerant, the minimum degree of patient cooperation, because if the patient becomes agitated before the use of sedation, its efficacy may be interfered with (SOARES, 2013).

Also as a disadvantage we have the need for an office with space compatible with the equipment, and the perception of the possibility of varying the dosage from patient to patient, and the need for specific training to manage the equipment in a theoretical and practical way (BARBOSA et al, 2014).

Rodrigues Chala (2016), in his study, also points out the possibility of the patient not accepting to wear the nasal mask.

THE GOSPEL OF THE GOSPEL

Dadalti et al (2021) defined dental anxiety as an excessive and irrational negative emotional state suffered by patients undergoing dental treatment. It may correlate with previous traumatic experiences such as severe pain or discomfort during and/or after a dental procedure and negative experiences with the dental surgeon's management.

Meanwhile, Murad et al (2020), defines the term odontophobia as irrational fear of dental treatment, which occurs simultaneously with signs of terror, hypertension, tremor, and malaise, as specified in the Diagnostic and Statistical Manual of Mental Disorders (DSM). Dental anxiety and odontophobia are quite similar, formed by similar elements that work in a similar way. Anxiety emotions are diffuse and non-specific, they are associated with fear and observed in various situations, and can be felt even when the feared stimulus is absent.

De Stefano in 2019, stated that odontophobia has been recognized by the World Health Organization (WHO) as a real disease. According to WHO estimates, it is believed to affect about 15 to 20% of the population.

THE USE OF NITROUS OXIDE IN DENTISTRY

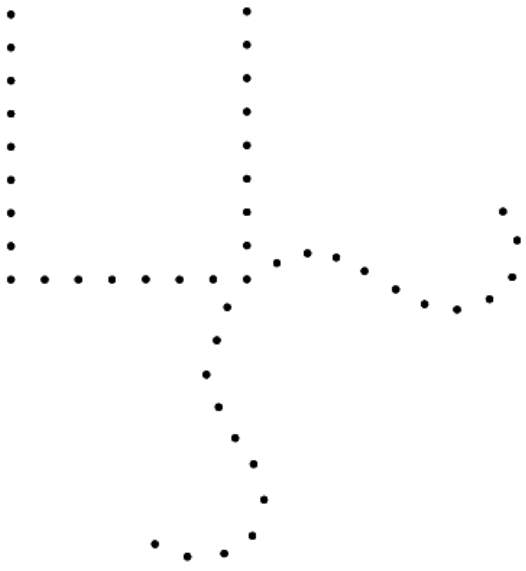
Anxiety and fear have been related to Dentistry since its origin, which generate great discomfort in patients with dental procedures. Especially with regard to the application of local anesthetics and rotating instruments, which are the main causes of transoperative anxiety (SOARES, 2013).

Understanding the relevance of patient fear during dental visits and the occurrence of dental anxiety has direct implications in dental practice. Identifying the exploratory factors will allow the dentist to properly plan their treatment plan to reduce dental phobia and anxiety, which consequently reduces stress in the workplace. (MURAD, 2020).

In addition to administering a personalized dose to each patient, this titration technique greatly reduces or almost avoids side effects (GILLMAN, 2019).

At the beginning of the inhalation sedation technique, it should be preceded by the Trieger Test (Figure 4), which consists of joining the points of a pre-established figure and should be applied in two moments at the beginning of the service and also at the end of the procedure. In short, in a simple, fast and effective way, the dentist will compare the results (based on the number of stitches lost and the time spent to complete the stitches) and verify the total removal of the effect of the gas on the patient (MALAMED, 2003).

Figure 4 - Trieger Test



Fonts: Ladewig, 2016

METHODOLOGY

STUDY DESIGN

This is an observational, cross-sectional study, with a quantitative and qualitative descriptive approach, aimed at assessing the degree of anxiety/odontophobia of patients, through a statistically valid representative sample (MANZATO; SANTOS, 2012).

LOCATION AND PERIOD

Held at the dental clinic of the INTA-UNINTA University Center, in Sobral-CE, between May and June 2023.

SAMPLING

The sampling consisted of convenience, selecting odontophobic patients seen at the clinic during the study period, provided that they met the inclusion and acceptance criteria of the Informed Consent Form (ICF).

INCLUSION AND EXCLUSION CRITERIA

Inclusion:

- Patients over 18 years of age undergoing dental treatment at INTA-UNINTA.
- Report or diagnosis of odontophobia with indication of conscious sedation.
- Patients with controlled systemic diseases (diabetes, hypertension, heart disease).

Exclusion:

- Patients who have dropped out of treatment.
- Subjects with upper airway obstruction or severe behavioral problems.
- Pregnant, claustrophobic, mouth breathers or with severe psychiatric conditions.

DATA COLLECTION

Data were collected using the Corah Scale for dental anxiety, applied before and after nitrous oxide treatment. In addition, the Trieger test was used to evaluate the recovery of sedation in the pre- and postoperative periods. After consent via informed consent, participants answered the questionnaire in subsequent consultations.

RISKS AND BENEFITS

Minimal risks include invasion of privacy and emotional discomfort when answering questions. On the other hand, the study promoted advances in knowledge about

odontophobia and contributed to the early identification of associated conditions, enabling an appropriate referral.

ETHICAL ASPECTS

This was followed by Resolution 466/12, with approval by the Ethics Committee (opinion No. 6.098.803 and CAAE 68169223.9.0000.8133). Participation was voluntary, upon signature of the ICF, ensuring confidentiality and respect for the rights of the participants.

MATERIALS AND METHODS

A meeting was held with clinical professors at the beginning of the 2023.1 academic semester to identify patients with odontophobia indicated for conscious sedation. The Corah questionnaire, validated to assess dental anxiety, was applied before and after the consultation, together with the Trieger test to monitor the effects of sedation.

STATISTICAL ANALYSIS

The data were organized and analyzed in Microsoft® Excel and Word. The analysis included simple frequency and tests of association between dependent and independent variables.

RESULTS

During the semester of 2023.1, the research was carried out with the approach of 09 patients, and after individual evaluation of each of the patients, observing the inclusion and exclusion criteria, we reached a number n=05 (five) of the total number of patients in the sample (Table 01). Each patient was numbered from 01 to 05, according to the chronological order of the consultations, as follows: Patient 01, Patient 02, Patient 03, Patient 04 and Patient 05. The patients in numbers 02 and 05 are female, and the other patients 01, 03 and 04, respectively, are male, table (01), obtaining in this study 60% of the male gender and 40% of the female gender. Another data obtained was related to the age of the patients interviewed, obtaining the mean age among the participants of 35 years.

Table 1. Gender of the patients participating in the Research

PATIENTS	01	02	03	04	05
Gender M (Male) F (Female)	M	F	M	M	F
Age of Patients	32	40	20	54	29

Source: Survey data, 2023

On the day of the dental procedure, before the beginning of the care and sedation with nitrous oxide, the CORAH Anxiety Scale (1969) was used, because it has good applicability, internal consistency and test-retest reliability, and is a reliable instrument to assess the characteristics of anxious patients.

This scale consists of the application of a questionnaire with four questions, each with five answer alternatives, which seeks to assess the feelings, signs and reactions of patients, related to dental treatment, which served to assess the degree of anxiety of odontophobic patients before the dental procedure, to assess their anguish, anxiety, signs and reactions of patients, related to dental treatment. Each answer alternative received a certain score (from 1 to 5), and at the end, the patients were classified according to their degree of anxiety based on the sum of these points, shown in Table 02).

In the Corah test, the following score was assigned: very little anxious (0-5 points), slightly anxious (6 to 10 points), moderately anxious (11 to 15 points) and extremely anxious (16 to 20 points).

Table 25. Response of the CORAH Rate of the Participating Patients

PATIENTS	01	02	03	04	05
Quantities	13	13	13	20	18

Source: Survey data, 2023

In the dental consultation, the collections and measurements were made at 03 different moments: before starting the service and with the patient at rest (05 minutes before), during the dental care and at the end of the dental care (05 minutes after). The following parameters were performed and evaluated: Heart Rate (HR), Blood Pressure (BP), and Oxygen Saturation (SO). Such measurements were performed using the VITA i80 – ALFAMED monitor, which served as a baseline data verifier of the physical parameters used to assess preoperative anxiety, as shown in table (03).

Table 3. Responses related to Heart Rate (HR), Blood Pressure (BP), and Oxygen Saturation (SO) at the moments before, during and after sedation.

PATIENTS Before sedation	01	02	03	04	05
FC	70	65	79	75	104
PA	12/8	14/8	12/7	15/9	12/8
SO	99%	99%	99%	98%	98%

Source: Survey data, 2023

PATIENTS During sedation	01	02	03	04	05
FC	54	59	66	65	110
PA	10/6	12/8	11/7	16/10	12/8
SO	100%	99%	100%	100%	99%

Source: Survey data, 2023

PATIENTS After sedation	01	02	03	04	05
FC	63	63	71	58	88
PA	10/7	13/8	11/7	17/9	11/8
SO	98%	99%	98%	98%	97%

Source: Survey data, 2023

The other data computed in the research is related to the reasons/triggers of anxiety/fear that required sedation to better perform the procedure is shown below in table (04).

Table 4. Reasons/triggers of anxiety/fear.

PATIENTS	01	02	03	04	05
reasons/triggers of the Anxiety/Fear	High and low rotation sound	Anesthesia and sound of high and low rotation	Anesthesia and sound of high and low rotation	Health professionals (doctors, dentists and nurses)	Dental procedures in general

Source: Survey data, 2023

Each subject in the sample was submitted to a type of procedure, whose nomenclatures were determined below in table (05), showing the breakdown of the procedures and classification according to the type of procedure and its sensations during the use of conscious sedation, table (06).

Table 5. Procedure performed during sedation with Nitrous Oxide.

PATIENTS	01	02	03	04	05
Procedure Made	RAR supra Gum	AC Clinical crown augmentation	AM Molar access	EXO Exodontia 3º molar	T ENDO Endodontic treatment

Source: Survey data, 2023

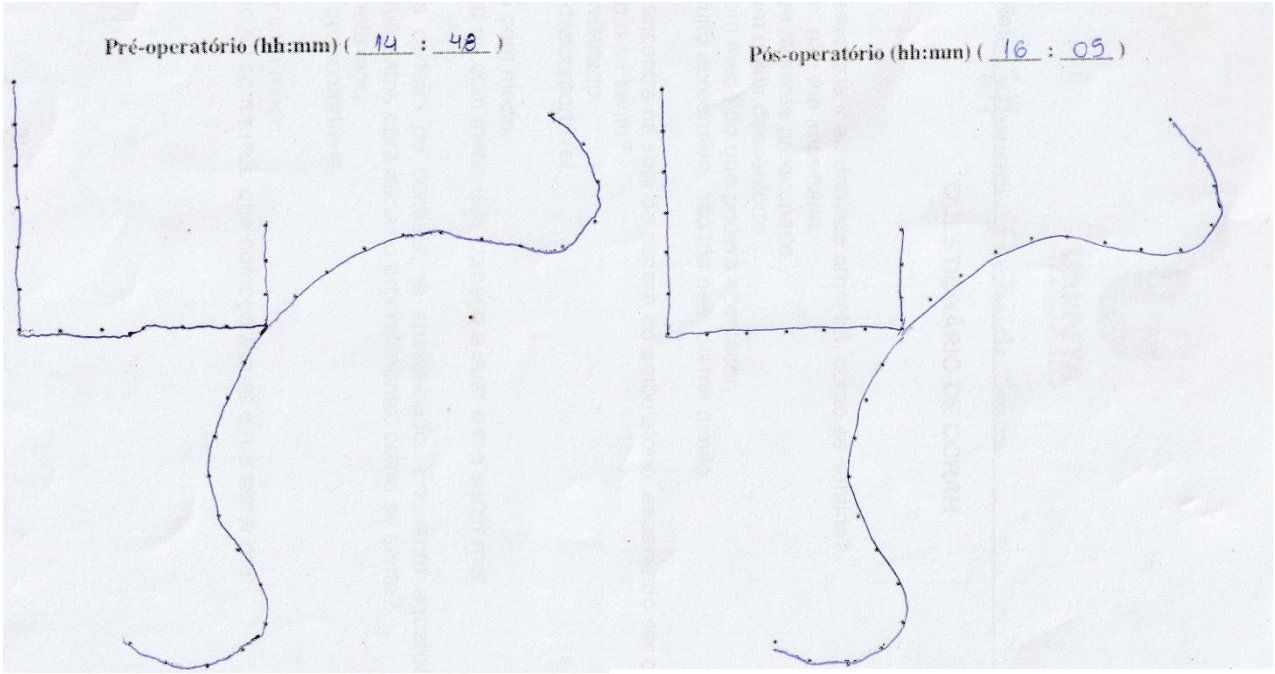
Table 6. Sensations reported during sedation with Nitrous Oxide.

PATIENTS	01	02	03	04	05
Sensations during Sedation	Anesthetized lips, heavy eyes, and decreased hearing	Anesthetized lips, heavy eyes and a feeling of floating	Numbness in the lips	He did not report sensations and changes	Anesthetized lips, heavy eyes, feeling like you're in a dream, and decreased hearing

Source: Survey data, 2023

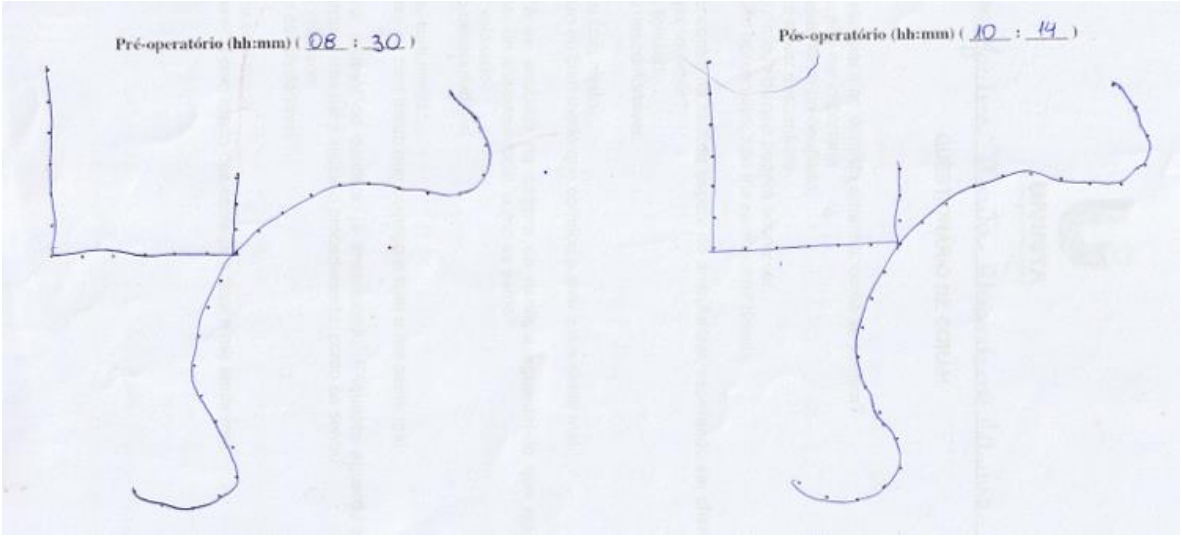
Finally, we have the Trieger test, which was applied before the use of sedation in the patient with N2O gas and after immediate care.

Figures 1: Patients' Trieger Test - Patient 1



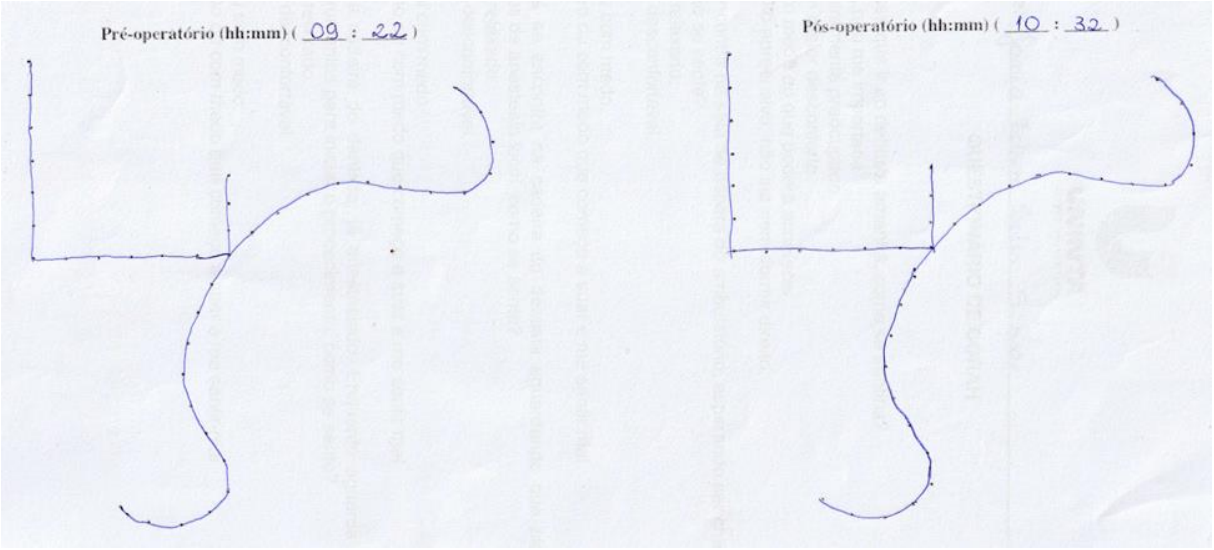
Source: Survey data, 2023

Patient 2



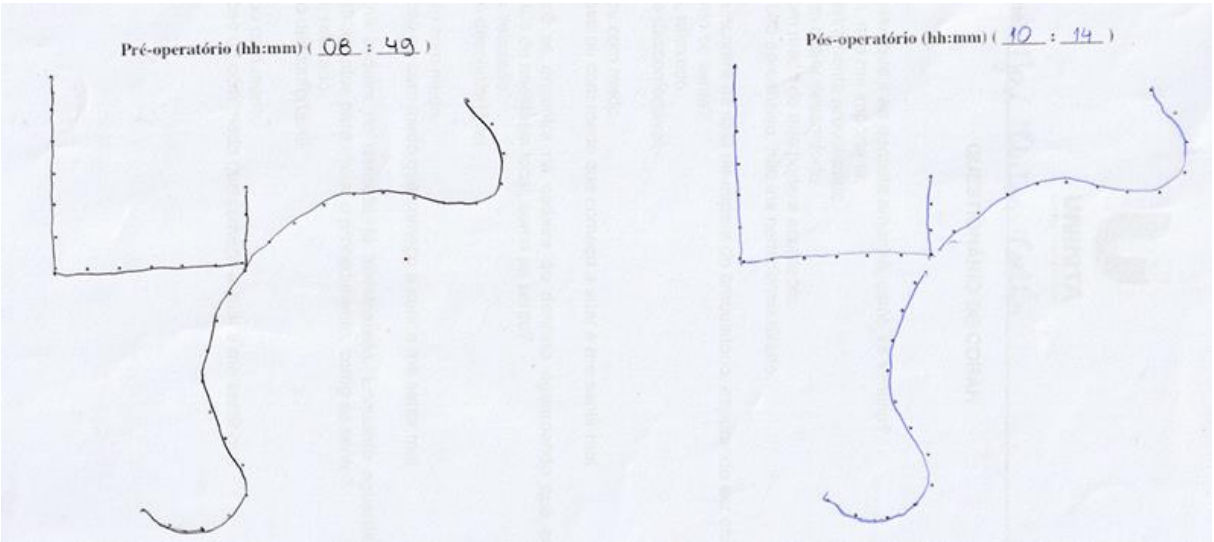
Source: Survey data, 2023

Patient 3



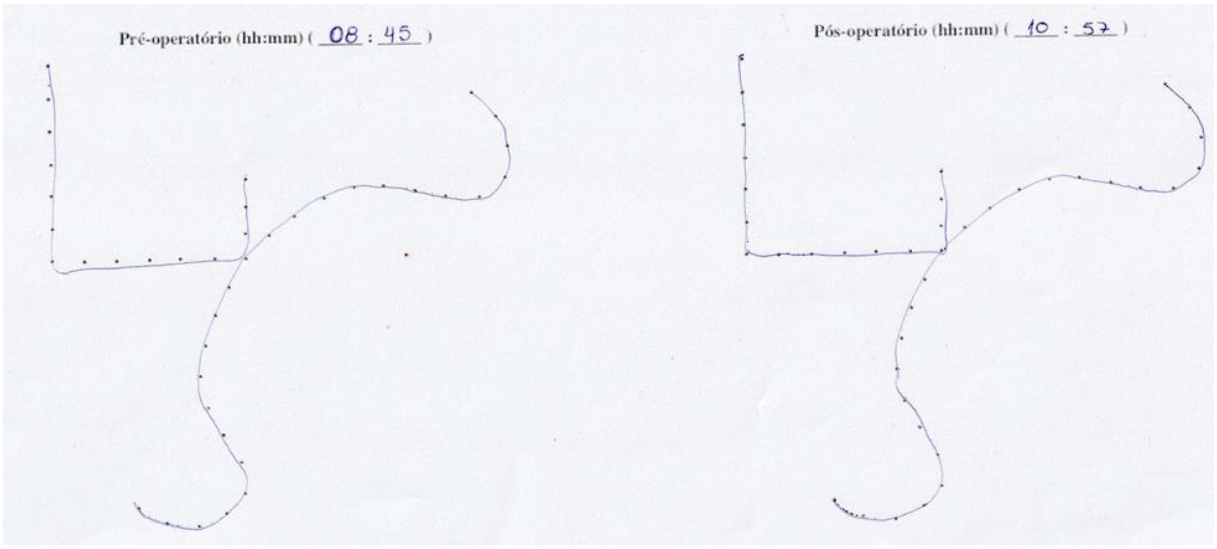
Source: Survey data, 2023

Patient 4



Source: Survey data, 2023

Patient 5



Source: Survey data, 2023

DISCUSSION

Anxiety in its general aspects can hardly be quantified, leaving as an alternative to measure it through visual, behavioral, and verbal scales, thus evaluating the physiological parameters of patients such as their change in heart rate, blood pressure, saturation, cortisol level, and salivary alpha-amylase levels (BASSANI et al., 2023; ROCHA, 2018). In addition, questionnaires should be administered immediately before starting dental care because, at that time, patients were experiencing all sensations, including any emotional responses, triggered by the impending care. Dental anxiety questionnaires have limitations because they are subjective and their results are influenced by patients' responses (DADALTI, 2021).

In this study, these changes were evident as mentioned above, and data were collected at 03 moments to be able to observe all these effects. After measuring vital signs, the patient was invited to take the Trieger test. This test aims to identify the patient's degree of psychomotor recovery, through comparative observation between the initial test, done before the sedation procedure, and the final one, applied right after the end of sedation. We used as analysis the accuracy of its completion by associating the number of wrong points and the time spent filling in the stippling of the initial test were compared to that of the final test. If the time and accuracy were approximately equal between the initial and final tests, it means that the volunteer presents psychomotor recovery, which is compatible with his prompt release (CALDAS, 2008). In the present study, no significant differences were observed in its clinical or statistical aspect when filling out the Trieger test.

The results obtained through the analysis of the genders in this study, considering the procedures performed, were not sufficient to determine which gender would be the most

anxious, due to the size of the sample, another fact that was observed and relevant is that, in the more complex procedures, they presented a higher degree of anxiety. Studies by SIVIERO et al., (2008); GUENTSCH et al., (2017); YAKAR et al., (2019); CALTABIANO, et al., (2018); CARVALHO (2012) and KHEIR et al. (2019), state that women have a higher degree of anxiety when compared to men, regarding dental treatments. Other studies have not found or cited differences in the degree of anxiety between genders (KLAGES, 2006; KANAFFA-KILIJANSKA, 2014; KANEGANE et al., 2009; and DOU, 2018) and for authors such as ARMFIELD, (2022); JEDDY, (2018) and FUENTES, (2009) state that the male gender has a higher degree of anxiety. The author MALVANIA (2011) emphasizes that the occurrence of the female sex being more prone to anxiety is related to a combination of emotional and social factors. There is a general readiness in the case of women to vent and recognize their feelings without further prejudice and judgment when in relation to men, for this reason the results would be more inclined to the female sex. These differences in the literature can be associated with personal and socioeconomic differences, as well as differences in the methodology applied, the type of study design, the method of analysis, the type of dental anxiety measure, and the sample size.

Works such as KANEGANE et al., (2009); ASTROM, (2011) and VAN WIJK (2012), demonstrated in their studies that dental procedures reported in the literature as stressful and causing anxiety and/or fear are minor oral surgeries, such as tooth extraction, and in periodontics periodontal scaling also appears as an anxiety-generating procedure. In our study, there was no significant difference between the patients submitted between the different dental treatments in relation to anxiety, which demonstrated that the reported oral surgery, regardless of the tissues and sites involved, generates similar levels of anxiety in odontophobic patients.

Regarding age and anxiety at work, it was observed that anxiety did not differ according to the patient's age. Comparing with the results in the literature, there are several divergences. Some studies associate greater anxiety in young and adult patients, when compared to elderly patients (MAGGIRIAS, 2002; GORDON et al, 2013; VIINIKANGAS et al., 2007 and CALTABIANO, et al., 2018), and other authors such as Liddel; Locker (1997) stated that anxiety tends to decrease over the years, while other studies show that the opposite occurs, that over the years, there is greater anxiety in elderly patients compared to younger ones, which is explained by traumatic situations and experiences already experienced previously in their lives, when they were young.

In the present study, this variable between the age of the volunteers and the exacerbation of anxiety was not concretely established, presenting results similar to those

of other authors who concluded that sociodemographic factors, such as age, do not have a correlation with anxiety levels (SIVIERO, 2008; SINHG, 2000; KANEGANE, 2009; KANAFFA-KILIJANSKA, 2014 and NASCIMENTO, 2011).

The blood pressure analysis showed that diastolic and systolic blood pressure was altered (increased) in the patient who underwent minor oral surgery, and this patient who in the Corah test had the highest degree of anxiety. In the other dental procedures on blood pressure, there was a decrease or maintenance of the same blood pressure measurement. Fiorillo (2022), states in his study that nitrous oxide causes a small depression in the heart flow while peripheral resistance increases slightly, and, due to this, blood pressure remains unchanged, but during the research it was observed that the BP of 04 patients decreased as the concentration of N2O in the body increased, not agreeing with data in the literature.

When it comes to heart rate, a decrease in this data was observed, and we can argue that in addition to the effect of gas for this decrease, many studies show that there is also an influence of several other factors, such as: gender, physical fitness, body position and age, the latter being one of the most important determinants of heart rate variation (DAVINI et al, 2004; ZHANG, 2007).

The saturation of patients who underwent nitrous oxide, practically all managed to reach 100%, it is known that the oxygen received from the device is greater than we have free in the atmosphere, which represents about 21% of the available volume, according to Sousa (2021). Another important factor to take into account is that, with aging, there is also a decrease in the maximum volume of oxygen, essentially due to the reduction in the patient's maximum heart rate (CHEITLIN, 2003).

Another relevant fact was explained by De Moares (2019), who concludes that due to its mechanism of action, the patient has decreased senses such as touch, hearing, vision, and pain. This statement was observed in the reduction of hearing in patients 01 and 03.

It is noteworthy that anesthesia was the moment that produced the greatest anxiety and variations in the patients' data, in relation to the other clinical time during the consultation, corroborating several studies that, in the literature, demonstrate that the stressful procedures that cause anxiety and/or fear are anesthetic injections and minor oral surgeries (BOTTAN, 2008; JEDDY, 2019), such as the extraction done by the patient in the research.

In JEDDY (2019), we see that the sensations of extreme relaxation, distant hearing and the sensation of floating are the most common during N2O care, still from this point of view for LADEWIG (2016), when the patient reaches the ideal analgesia stage, usually

associated with a low percentage of N2O, some characteristic signs and symptoms can be observed, such as: Feeling of numbness in the feet and hands (walking to the legs and arms); tingling sensation in the lips, tongue, palate, cheek, etc., eyelid spasms, nasal and cadenced voice, feeling of relaxation, reduction of anxiety or fear expansion of hearing where noises and conversations can bother.

Many of these characteristics were observed by the patients, except for patient (04), the most odontophobic and with a more complex procedure, in which case his anxiety may be "masking" the signs and symptoms of sedation, as patients are often not sensitive to these signs due to excessive nervousness, high tolerance to gas or inefficient inhalation, However, at the end of the service, he reported that he found the service better with sedation.

Continuous and direct observation of the patient is of utmost importance to verify that the patient does not show signs of over-sedation. These signs range from increased blood pressure, nausea and discomfort to vomiting and loss of consciousness, situations like this did not occur during this research (LADEWIG, 2016).

Thus, it is observed that phobia, anxiety and pain do not occur only as a result of invasive procedures, although it is most often associated with these procedures, but as previously mentioned, anesthesia itself seems to be among the most painful procedures and causes the greatest moment of tension in dentistry (KAUFMAN, et al., 2005).

FINAL CONCLUSIONS

We can conclude that in the present study, there was a positive difference in the reduction of the level of anxiety in the proposed dental procedures with the adjuvant use of nitrous oxide, but we cannot correlate these data with the relationship between anxiety and age or gender of the patients, due to the size of our sample, suggesting more studies with a larger number to determine these relationships.

A point of relevance was the relationship with the increase in heart rate and blood pressure during dental anesthesia at the time of greatest anxiety in the patients.

The use of this method with nitrous oxide is extremely important for patients with anxiety/odontophobia because positive effects during dental treatment have been observed in clinical practice and in the literature, further fostering the need for this practice of conscious sedation to be disseminated to everyone, professionals and patients.

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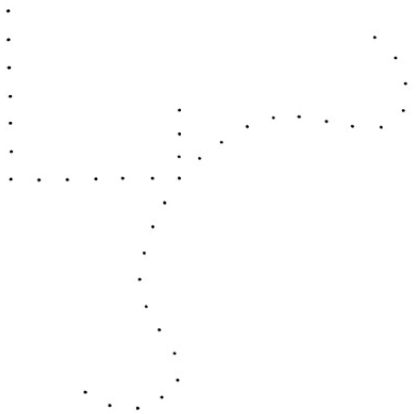
ANNEX A - TRIEGER TEST

Sedação – Teste de Trieger

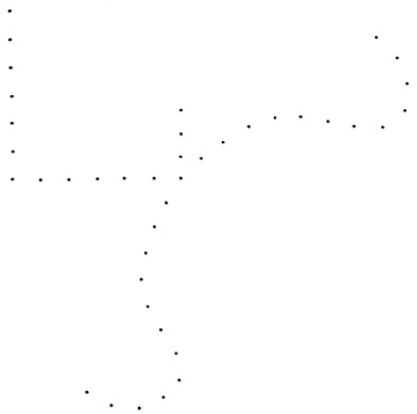
Paciente _____ Consulta _____

Acompanhante _____ Parentesco _____

Pré-operatório (hh:mm) (_____ : _____)



Pós-operatório (hh:mm) (_____ : _____)



ANNEX B – CORAH QUESTIONNAIRE

Patient: _____

CORAH'S QUIZ

If you had to go to the dentist tomorrow, how would you feel?

1. Alright, I wouldn't mind.
2. I would be slightly worried.
3. You would feel greater discomfort
4. I would be afraid of what might happen.
5. I would be very apprehensive, I wouldn't even sleep properly.

When you find yourself in the waiting room of the outpatient clinic, waiting to be called by the dentist, how do you feel?

1. Quiet, relaxed.
2. A little uncomfortable.
3. Tense.
4. Anxious or afraid.
5. So anxious or scared that I start sweating and feeling bad.

When you find yourself in the dentist's chair waiting for him to start local anesthesia procedures, how do you feel?

1. Quiet, relaxed.
2. A little uncomfortable.
3. Tense.
4. Anxious or afraid.
5. So anxious or scared that I start sweating and feeling bad

You're in the dentist's chair, already anesthetized. While waiting for the dentist to pick

up the instruments to start the procedure, how do you feel?

1. Quiet, relaxed.
2. A little uncomfortable.
3. Tense.
4. Anxious or afraid.
5. So anxious or scared that I start sweating and feeling bad

ANNEX C – APPROVAL OF THE ETHICS COMMITTEE

CENTRO UNIVERSITÁRIO INTA - UNINTA

Plataforma Brasil

PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: O USO ADJUVANTE DA SEDAÇÃO CONSCIENTE COM ÓXIDO NITROSO EM PACIENTES ODONTOFÓBICOS NA CLÍNICA UNIVERSITÁRIA ODONTOLÓGICA DO CENTRO UNIVERSITÁRIO INTA-UNINTA

Pesquisador: LUÍS HENRIQUE DOS SANTOS NOGUEIRA

Área Temática:

Versão: 2

CAAE: 68169223.9.0000.8133

Instituição Proponente: INSTITUTO SUPERIOR DE TEOLOGIA APLICADA - INTA

Patrocinador Principal: Financiamento Próprio

DADOS DO PARECER

Número do Parecer: 6.098.803

Apresentação do Projeto:

Trata-se de um estudo observacional, do tipo transversal, com abordagem quantitativa e qualitativa de natureza descritivo presencial construído especificamente para avaliar o grau de ansiedade/odontofobia dos pacientes. O presente estudo ocorrerá no município de Sobral – Ceará (CE) na clínica odontológica da universidade UNINTA. Terá como amostragem pacientes odontofóbicos que forem realizar tratamento odontológico. Esta amostra será escolhida por um processo que dará a todos os indivíduos as mesmas chances de serem selecionados e representará o número de pacientes odontofóbicos atendidos na clínica escola durante a pesquisa.

Objetivo da Pesquisa:

OBJETIVO GERAL

Avaliar o grau de ansiedade/odontofobia dos pacientes com o uso do óxido nitroso no atendimento

Endereço: Rua Coronel Antônio Rodrigues Magalhães, 700 - segundo andar - prédio sede 1
Bairro: Dom Expedito **CEP:** 62.011-230
UF: CE **Município:** SOBRAL
Telefone: (88)3112-3500 **E-mail:** cep@uninta.edu.br

odontológico, verificando as suas indicações e contraindicações e esclarecer as normas e procedimentos de segurança para a sedação com óxido nitroso.

OBJETIVO ESPECÍFICOS

a) Identificar quais os motivos de ansiedade do paciente no consultório do CD;

b) Observar a eficiência da técnica por esse método;

c) Avaliar o limiar as alterações e percepção de dor, bem-estar e controle do comportamento do paciente.

Avaliação dos Riscos e Benefícios:

De acordo com o pesquisador, os riscos são mínimos, invasão de privacidade, responder a questões sensíveis, tais como seus níveis de estresse, ansiedade, divulgação de dados confidenciais. Caso algum constrangimento seja relatado por parte do voluntário a participação deste pode ser paralisada. É muito importante que o acadêmico atue identificando e registrando no questionário todos esses requisitos.

Como benefício essa pesquisa irá contribuir para o avanço dos estudos sobre esse tema e relatar e identificar precocemente se estão relatando algum sinal ou sintoma de doença associada ao seu estado de saúde ou condição geral da sua saúde e com isso procurar acompanhamento de uma equipe multidisciplinar e ter um completo e total bem-estar.

Comentários e Considerações sobre a Pesquisa:

Pesquisa relevante para o paciente presente e futuros e o método de obtenção do consentimento foi corrigido.

Considerações sobre os Termos de apresentação obrigatória:

Este protocolo apresentou os seguintes termos: projeto na íntegra, folha de rosto carimbada e assinada, carta de anuência, TCLE, cronograma e orçamento.

Recomendações:

Este protocolo não apresenta pendências

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Conclusões ou Pendências e Lista de Inadequações:

Não apresenta óbices éticos, estando aprovado

Considerações Finais a critério do CEP:

Este parecer foi elaborado baseado nos documentos abaixo relacionados:

Tipo Documento	Arquivo	Postagem	Autor	Situação
Informações Básicas do Projeto	PB_INFORMAÇÕES_BÁSICAS_DO_PROJETO_2083062.pdf	01/06/2023 11:23:40		Aceito
Projeto Detalhado / Brochura Investigador	TCCMichelly.docx	01/06/2023 11:23:14	LUÍS HENRIQUE DOS SANTOS NOGUEIRA	Aceito
TCLE / Termos de Assentimento / Justificativa de Ausência	TCLE.docx	29/05/2023 14:52:17	LUÍS HENRIQUE DOS SANTOS NOGUEIRA	Aceito
Cronograma	cronograma.docx	29/05/2023 14:52:07	LUÍS HENRIQUE DOS SANTOS	Aceito
Declaração de Instituição e Infraestrutura	CartadeAnuencia.pdf	22/03/2023 15:04:32	LUÍS HENRIQUE DOS SANTOS NOGUEIRA	Aceito
Folha de Rosto	folhaderosto.pdf	22/03/2023 15:03:14	LUÍS HENRIQUE DOS SANTOS	Aceito

Situação do Parecer:

Aprovado

Necessita Apreciação da CONEP:

Não

SOBRAL, 02 de Junho de 2023

Assinado por:
ANTONIO EDIE BRITO MOURAO
(Coordenador(a))

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