Original Research Article

Clinical Approaches to Pain Relief: Diagnosis and Intervention From a Hospital Surgical Center Perspective

Abstract:

Background/Objectives: Pain is an unpleasant somatic experience that negatively affects patients' daily lives. Both surgical and non-surgical methods have been applied for pain management, and the evidence underscores the importance of characterizing pain relief concerning the procedures employed to establish future consensus on therapeutic approaches. Assessing pain relief enables the estimation of the effectiveness of services, interventions, and healthcare organization. Therefore, this study evaluated the level and profile of pain relief in a hospital surgical center. **Methods**: A longitudinal study was conducted in the surgical center of a hospital located in a large-population municipality in Brazil. Pain was assessed using a visual analogue scale before and immediately after surgical procedures. Patients' medical records were analyzed to extract additional information. All patients who underwent pain relief procedures in the hospital's surgical center and completed the pain scale before and after the procedure were included. Descriptive and bivariate analysis were conducted adopting a significance level of 5%. **Results**: 100 patients were included. Patients had an average pain level of 6.13 (± 3.42) before their procedures. After the procedures, the average pain dropped to 0.39 (± 3.42), equivalent to an average reduction of 5.74 (± 3.35) on the scale. A higher level of pain reduction (five points or more) was observed in patients diagnosed with chronic pain and among those undergoing denervation. Greater pain relief on the scale (five or more points) was related to the diagnosis ($p = 0.001$) and intervention ($p < 0.001$). **Conclusions**: Our findings show that patients experienced reduced postoperative pain levels when treated in a hospital surgical center. Patients suffering from chronic pain and who underwent denervation for pain management experienced significantly greater relief.

Keywords: pain; hospital; pain relief; denervation.

1. Introduction

Pain is a somatic and multidimensional experience involving physiological and/or emotional mechanisms, with or without an injury [1,2]. Thus, pain encompasses aspects of sensory, subjective/affective, and cognitive dimensions, which are not directly correlated to tissue damage [3]. In a neurological context, tissue damage triggers the release of mediators that promote hypersensitivity, making even minor stimuli perceived as painful sensations [4]. Therefore, the symptomatology depends on the intensity, location, source, quality/type of the stimulus and characteristics of patients [5]. Left untreated, pain may affect the entire human body and different biological systems, mainly in individuals affected by other conditions such as systemic diseases or the presence of different lesions [3]. Furthermore, pain also activates inflammatory and immune pathways, potentially leading to systemic consequences, especially in its acute phase [4]. Since pain is influenced by individual perceptions, it is directly affected by cognitive factors of individuals and the surrounding context in which it is experienced [6].

Previous evidence has shown a significant prevalence of pain worldwide, particularly chronic pain, emphasizing the importance of evaluating this outcome. In the United States in 2019, an estimated 20.5% (50 million) of adults reported experiencing pain on most days or daily, mainly in the back and hips [7]. In Brazil, a systematic

review indicated a mean prevalence of pain among adults ranging from 23-41% [8]. Therefore, pain is a significant public health concern due to its high prevalence and negative impact on individuals' quality of life, leading to substantial limitations [9]. Consequently, the assessment and interventions aimed at pain relief have become paramount for researchers and clinicians, primarily to enhance pain management and improve patient outcomes. In fact, evidence has shown that pain relief approaches can enhance patients' quality of life and reduce opioid use [10]. Therefore, evaluations of pain management are essential to reduce the impact of pain on people's overall lives.

The advancement of pharmacological and pain mechanisms understanding alongside progress in the neurobiology of pain, highlights the multidisciplinary approach in pain relief care. For pain control, it is vital to recognize that the therapeutic process includes the evidence available, protocols, individual clinical traits of patients, pharmacokinetics and pharmacodynamics of medications, and clinical expertise [11]. Furthermore, several factors, including pain intensity, medication usage, non-pharmacological interventions, trust in healthcare professionals, and overall health conditions, have been linked to pain relief [12]. Therefore, a multidisciplinary approach may be crucial for pain management, mainly considering the ongoing advancements in novel techniques and intervention options [13]. Both surgical and non-surgical methods are being applied for pain relief, and the evidence underscores the importance of characterizing pain relief concerning the procedures employed to establish future consensus on therapeutic approaches [13]. Considering the pain severity, pharmacological therapy alone may not be able to achieve pain relief, showing the need for surgical interventions [14]. Among the surgical interventions modalities used for pain management, denervation is commonly applied for pain relief, along with other approaches targeting local sensory nerves [13,14]. Moreover, neuromodulation techniques and ablative methods have also been explored for pain management [13].Therefore, evaluating pain relief in healthcare facilities, identifying associated factors, and profile of involvement are essential for guiding future research aimed at developing effective protocols for pain management and improving patient care.

Pain management has been an important focus in hospital care [15]. Moreover, different factors have been associated with patient satisfaction regarding pain relief, including educational level and prior surgical history [16]. Importantly, most of the evidence has focused on evaluating pain relief for specific health conditions or testing specific management approaches. Hospital care is widely used for pain management, mainly in emergency cases. In this context, depending on the diagnosis and recommended intervention, pain management is achieved through surgical procedures [17]. A multidisciplinary team is responsible for providing pain relief. Pain has been a common reason for hospitalization, and some barriers to pain relief in a hospital setting have been identified, such as fear of adverse effects and costs [18]. Understanding the surgical center and hospital environment to provide pain relief, considering the type of pain and interventions applied, may offer useful information to guide clinical practice and improve pain management.

Therefore, this study evaluated the level of pain relief, as well as the patients' and procedures' profiles within a hospital surgical center, mainly in terms of diagnoses and procedures applied. This data could offer pivotal insights for delineating effective pain management protocols suitable for hospital settings. Thus, we investigated whether specific diagnoses and interventions are associated with greater pain relief in a surgical center setting.

2. Materials and Methods

2.1 Ethics

The study was approved (May, 2022) by the local ethics research committee (protocol: 58139922.6.0000.5146). All participants signed a consent form to participate in the research and for the use of their data.

2.2 Design

An exploratory, longitudinal study with a quantitative approach was conducted in the surgical center of a cancer hospital (Oncovida Hospital) located in a large-population municipality in Brazil (Montes Claros, Minas

Gerais). Although the hospital focuses on oncology, the surgical center attends to patients with various health issues who need therapeutic interventions, such as pain relief. To address this, a multidisciplinary team covers the surgical center and are able to manage pain diagnosis and relief. The multidisciplinary team is composed of doctors, nurses, and nursing assistants.

2.3 Patients

All patients who reported pain, underwent pain relief procedures in the hospital's surgical center, and completed the pain scale before and after the procedure in 2022 were included, regardless of their diagnoses. Although recruited from an oncological hospital, patients treated in the surgical center did not necessarily have an oncological profile. Therefore, patients with various health conditions were included as long as they underwent procedures for pain relief. The sample size was determined based on data from a previous study [19] using the proportion of chronic and acute pain reported, a power of 80 and α 5%. As a result, patients with different health issues were included, all presenting with pain symptoms and answered pain scale. No restrictions in terms of age, gender, or diagnosis were applied. Pain diagnoses and interventions were decided by the doctors according to the patients' profiles and needs.

2.4 Pain assessment

Pain was assessed using a visual analog scale, ranging from 0 to 10, where '0' represented no pain and '10' represented extreme pain. The scale was administered by trained nurses who were involved in patient care in the surgical center for pain relief procedures. Two experienced nurses (with more than 5 years of hospital work) were trained and calibrated (Kappa >0.80) to explain the pain scale to patients and apply it before and after all pain relief interventions. For reliability and calibration, 10 patients who were not included in the study, reported pain, and underwent pain relief procedures were interviewed separately by both nurses, with a one-hour interval between interviews regarding pain levels before and after the interventions. The agreement was then calculated using the Kappa test. The scale was administered both before the procedure and immediately after the therapeutic intervention for pain relief, regardless of the type of pain intervention or its cause. For pain evaluation after procedures, post-anesthetic recovery was considered. For this, the physiological condition after recovery was evaluated using the Aldrete-Kroulik index to confirm post-anesthetic recovery [20]. The pain scale was only applied after complete recovery. Each patient was evaluated for only one nurse. After explaining the pain scale, patients were asked to rate their pain level based on the scale before and after the intervention.

2.5 Sociodemographic characteristics and interventions evaluation

In addition to pain relief, the patients' medical records were analyzed to extract the following information: age, sex, diagnosis (reason for the pain), therapeutic intervention for pain relief, and prior conservative treatment (medication/physiotherapy/multidisciplinary). Diagnosis was determined based on clinical evaluation by the medical team and, when necessary, confirmed by complementary exams. Based on the diagnosis and location, the intervention was determined by the medical team. Some patients underwent more than one intervention at different times, and the pain scale was applied for each intervention. However, for this study, only the pain relief before and after the first intervention was considered. Prior conservative treatment was collected from patient interviews and described in the patients' medical records.

2.6 Statistics

Data were analyzed using descriptive and bivariate statistics. Absolute values and percentages were estimated for categorical variables (sex, diagnosis, intervention, conservative treatment). Mean and standard deviation were calculated for quantitative variables (age, pain scale before and after intervention, scale difference). Pain level reduction after interventions (before – after) was calculated for all patients. Then, the total average value of the difference in pain scale before and after the therapeutic intervention was estimated. This average was used as a cut-off point, separating the patients into those equal to or below the average and those above the average in terms of pain relief. Thus, it was used to create a categorical and dichotomous variable: equal to or below the average pain reduction vs. above the average pain reduction. This created variable was used as the dependent variable for bivariate analyses, where patients were compared across all other variables

(independent variables) to evaluate statistical differences in the higher pain relief (above the average) distribution. The chi-square test was used to estimate the relationship and differences between dependent variable and independent variables. Odds ratio and 95% confidence interval was estimated. The SPSS software (version 20.0) was used. A significance level of 5% was adopted.

3. Results

100 patients undergoing interventions for pain relief in the surgical center and who answered to the pain scale before and after the procedures were included in the study. Most of included patients were women (56.0%) and had a mean age of 46.1 years (± 14.62) (Table 1). The most prevalent diagnosis (reason for pain) was chronic pain (chronic pain/intractable chronic pain/refractory chronic pain/chronic cervical pain), representing 47.4% of the diagnoses (Table 1).

Table 1. Descriptive analysis of the evaluation of all patients included in the study and assessed for pain relief. The data were presented as n and % for categorical variables, and as average and standard deviation (SD) for quantitative variables.

Variable	**n**	*%*
Sex		
Woman	56	56.0
Men	44	44.0
Diagnosis*		
Chronic pain/intractable chronic pain/refractory chronic pain/chronic cervical pain	46	47.4
Low back pain/refractory low back pain	16	16.5
Facet syndrome	7	7.2
Basal cell carcinoma	4	4.1
Radicular pain	3	3.1
Refractory pain	3	3.1
Other	18	18.6
Intervention*		
Denervation	56	62.2
Autonomic nervous system block	9	10.0
Rhizotomy	8	8.9
Excision	4	4.4
Biopsy	4	4.4
Other	9	10.0
Conservative treatment*		
Physiotherapy	23	45.1
Physiotherapy/Medication	21	41.2
Multidisciplinary	4	7.8
Other	3	5.9
Variable	**Average**	**SD**
Age	46.1	14.62

Scale BEFORE	6.13	3.42
Scale AFTER	0.39	3.42
Scale difference (before – after)	5.74	3.35

* Change in the number of patients is due to a lack of information in the medical records.

Patients undergoing interventions for pain had an average pain level of 6.13 (± 3.42) on the scale before procedures (Figure 1A). However, after the procedures, the average pain dropped to 0.39 (± 3.42), resulting in a reduction of 15 times, equivalent to an average reduction of 5.74 (± 3.35) on the scale. Moreover, the main reasons for pain (chronic pain, low back pain, and facet syndrome) showed a drastic reduction in the scale after intervention, approaching or equivalent to zero pain level on the scale. Low back pain was the diagnosis with the highest average on the pain scale before intervention (Figure 1B). It is observed that the main pain management modalities used (denervation, autonomic nervous system block, and rhizotomy) resulted in almost complete elimination of pain post-intervention (Figure 1C).

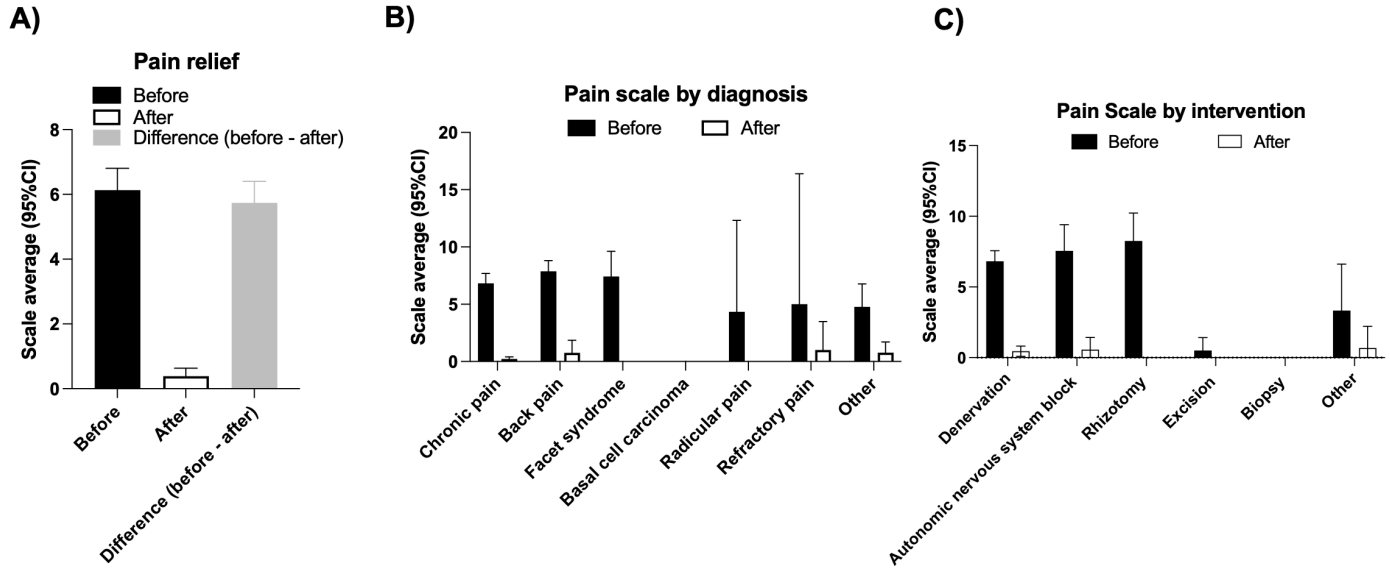

Figure 1. Evaluation of the visual pain scale before and after the intervention procedures. (A) Overall average pain scale before and after procedures. The overall mean difference for each patient between before and after was also estimated. (B) Mean pain level on the scale scale before and after intervention according to each diagnosis. (C) Mean pain level before and after intervention according to each intervention.

Regarding pain intervention procedure, denervation was the most applied modality for pain relief (62.2%). Table 2 shows the proportion of patients treated with each intervention modality (column) for each diagnosis (row). When distributing the diagnoses with interventions for pain, denervation was the main choice for pain relief intervention for the most diagnoses found (Table 2).

Table 2 – Descriptive analysis of interventions performed according to the pain diagnosis. The data were presented as %.

	Intervention						
Diagnosis	Denervation	Autonomic nervous system block	Rhizotomy	Excision	Biopsy	Other	**Chi-square test**
Chronic pain	65.9	19.5	7.3	0	0	7.3	
Back pain	80.0	0	20.0	0	0	0	
Facet syndrome	83,3	0	16.7	0	0	0	p<0.001
Basal cell carcinoma	0	0	0	0	100.0	0	
Radicular pain	100.0	0	0	0	0	0	
Refractory pain	100.0	0	0	0	0	0	
Other	31.3	6.3	6.3	25.0	0	31.3	

60% of patients experienced pain reduction exceeding the overall average reduction (5 points on the scale), according to the pain scale applied before and after intervention. Thus, we evaluated the profile of patients that presented pain relief lower or higher than overall average (5 points) by bivariate analyses (Table 3). An association ($p<0.05$) was identified between the level of pain reduction (lower or higher than 5 points – pain relief average) and diagnosis ($p=0.001$) and intervention ($p<0.001$). A higher level of pain reduction (five points or more) was observed in patients diagnosed with chronic pain and among those undergoing denervation (Table 3).

Table 3 - Bivariate analysis of associations of pain relief (greater than the mean - five points) and other independent variables. The data were presented as % for categorical variables and as average for quantitative variables. The chi-square test was used to compare the levels of pain relief (below or above the average on scale - five points) among patients. Significance level of 5% was adopted.

	Pain relief (%)	
Variable	**Equal or**	**More than 5**

	lower than 5				
Sex	%	%	**OR**	**CI95%**	**p value**
Woman	56.8	55.6	1		
Men	43.2	44.4	1.05	0.46-2.38	0.907
Diagnosis					
Chronic pain/intractable chronic pain/refractory chronic pain/chronic cervical pain	31.4	56.5	1		**0.001**
Low back pain/refractory low back pain	8.6	21.0	1.36	0.32-5.67	
Facet syndrome	2.9	9.7	1.88	0.20-17.41	
Basal cell carcinoma	11.4	0.0	0.00	0.00	
Radicular pain	5.7	1.6	0.15	0.01-1.90	
Refractory pain	5.7	1.6	0.15	0.01-1.90	
Other	34.3	9.7	0.15	0.04-0.51	
Intervention					
Denervation	47.1	71.4	**1**		**0.001**
Autonomic nervous system block	5.9	12.5	1.40	0.26-7.47	
Rhizotomy	2.9	12.5	2.80	0.31-24.62	
Excision	11.8	0	0.00	0.00	
Biopsy	11.8	0	0.00	0.00	
Other	20.6	3.6	0.11	0.02-0.61	
Conservative treatment					
Physiotherapy	46.2	44.7	1		0.149
Physiotherapy/Medication	23.1	47.4	2.11	0.45-9.84	
Multidisciplinary	15.4	5.3	0.35	0.04-3.09	
Other	15.4	2.6	0.17	0.01-2.31	
	Average				
Age	48.0	45.0	0.98	0.95-1.01	0.126

OR – odds ratio. CI95% - Confidence interval 95%

4. Discussion

Considering the negative impacts of pain on affected individuals, the implementation of measures and interventions for pain control and relief is essential in healthcare, aiming to reduce suffering and improve quality of life [9,21]. Understanding the profile of pain intervention procedures and its effectiveness allows for the identification of promising approaches in pain management, as well as appropriate healthcare management to address pain relief and to reduce patient suffering. In the present study, the effectiveness of interventions used in a hospital surgical center to achieve pain relief was identified. Almost complete elimination of pain was observed after intervention procedures. It is noteworthy that bivariate analyses showed that the diagnosis (reason for the pain) and the intervention performed are directly associated with greater pain relief, especially among patients with chronic pain and those undergoing denervation. Such a profile can guide the organization of services in surgical centers focusing on pain relief. Pain is among the primary reasons for seeking medical assistance worldwide, as well as one of the leading causes of morbidity, thus making the effectiveness of its control the focus of managers, clinicians, researchers, and society [22].

Chronic pain was the most prevalent diagnosis and associated with greater pain relief. Although acute pain often occurs in response to inflammatory processes or tissue damage, its management may no longer be urgently necessary once this period has passed. There is no consensus on the timing and period when acute pain transforms into chronic pain, but it is estimated to occur when pain persists beyond the recovery/healing period, with a suggested timeframe of weeks or months [2,23]. Chronic pain may be associated with other diseases and can lead to depression, anxiety, systemic complications, and impact on quality of life [2]. Approximately half of the included patients were diagnosed with chronic pain. Interventions for the relief of chronic pain included denervation, autonomic nervous system block, and rhizotomy. A significant relationship was identified between a reduction of five points or more on the pain scale (average reduction of patients) and the diagnosis, with greater pain relief identified for patients with chronic pain. Therefore, patients reporting and diagnosed with chronic pain can have their suffering relieved in a surgical center, resulting in significant pain relief. Chronic pain often results in medical costs and lost productivity, leading to expenses exceeding $500 billion per year in the USA [24]. Moreover, chronic pain has a multidimensional dynamic, including psychological and social aspects, which can lead to poor sleep and even depression [25]. Thus, evaluations of pain profiles and relief are important to guide strategies for pain management and to prevent such negative impacts. Since hospital care is a primary setting where patients seek relief from pain, how multidisciplinary teams in surgical centers provide pain relief should be better explored to improve the organization of care and the effectiveness of interventions.

Interestingly, the most common procedure performed for chronic pain relief was denervation, being the main management option for most of all diagnoses reported in the study. Denervation was the procedure that showed the highest proportion of patients with greater pain relief (five points or more on the scale), and this relationship was statistically significant. Therefore, patients with chronic pain who underwent denervation experienced significantly greater pain relief, suggesting this approach as an important choice in pain management in a surgical center. Obviously, pain management depends on different factors, such as diagnosis, patient's clinical conditions, therapeutic options, clinician's skills, and facility infrastructure. Denervation has commonly been used for pain relief in different pain situations, such as osteoarthritis [26], cancer-related pain [27], metabolic disorders [28], and others. Therefore, denervation is a promising, effective approach, commonly used in different pain situations, and showing efficacy in pain relief from the patient's perspective.

Different denervation approaches have been tested in the literature, focusing on pain relief for various types of diagnoses. Radiofrequency denervation has been recently widely explored as a modality for pain relief, particularly for chronic pain [29]. Surgical denervation has also been explored as an effective alternative in pain management. Selective and complete denervation have shown high rates of return to work and patient satisfaction for chronic pain [30]. Importantly, evidence highlights the need to improve knowledge regarding nerve identification and proper surgical techniques to enhance outcomes [30]. Moreover, denervation has proven to be a promising therapeutic modality for patients with refractory painful conditions following conservative treatments, such as in cases of refractory knee osteoarthritis [31]. In our results, denervation was applied for pain relief for different diagnoses, such as chronic pain, back pain, facet syndrome and radicular pain, and refractory pain. Importantly, more than 70% of patients treated with denervation showed a pain relief greater than 5 points on the pain scale after the procedure. Further studies should explore how this modality can be applied in

different hospital settings, for various types of patients and diagnoses, focusing on safe and effective long-term pain relief. The outcome findings, as well as the high level of pain relief after the procedure, may be attributed to the effective intervention modality chosen, which needs to be better elucidated. As described, interventions such as denervation have shown high effectiveness for pain management. The choice of this modality, which was the most commonly used in this study, may explain the high level of immediate pain relief observed. The procedures applied for pain management can significantly impact pain relief levels and patient satisfaction.

Such assessment, especially in a surgical center, is of paramount importance to evaluate the efficacy and safety of procedures performed for pain relief in patients with specific diagnoses who do not respond to non-surgical interventions. These findings not only allow for a personalized approach in pain management but also help identify potential areas for improvement in operative care protocols. In this context, the clinical team, comprising physicians, medical staff, and nurses, plays a pivotal role in understanding the process, familiarizing themselves with the available procedures, and taking into account patients' perceptions before and after interventions to gauge the effectiveness of pain relief and procedures.

Since pain management may also involve surgical protocols, hospital-based surgical centers have been commonly used for the care of patients experiencing pain. Importantly, pain relief is a specific outcome, and various factors can affect patient satisfaction in hospital-based surgical centers [32]. Hospital care is expected to provide treatments that are shorter in duration and highly effective, particularly in terms of pain relief, which significantly impacts patients' lives and may result in higher satisfaction rates. Ambulatory surgical center rooms have increased drastically in hospital care, primarily to manage a wide range of disease conditions [33]. Moreover, these centers generally have shorter usage times compared to Hospital Outpatient Departments, making them suitable for managing various diagnoses that involve pain. However, their use and effectiveness depend on several factors, including patient characteristics, diagnoses, available interventions, and clinician expertise. Therefore, further studies should explore whether pain relief is associated with patient satisfaction, considering various aspects such as the medical team, hospital infrastructure, and modulating factors like patient characteristics.

Importantly, the significant relationship between greater pain relief and specific factors related to the patients, procedures, and diagnoses highlights the need for personalized pain management strategies. Such personalized interventions not only improve pain relief but also enhance the overall efficiency of healthcare services by directing resources toward interventions that yield the greatest benefit. Moreover, the multidisciplinary team involved in the care of the patients included in this study also highlights the importance of such a team in managing pain in a surgical center. Evidence has highlighted the importance of multidisciplinary teams in pain management, demonstrating high effectiveness, cost-efficiency, and superiority compared to single-discipline strategies or outpatient non-multidisciplinary approaches [34].

It is important to note that pain measures, as well as pain relief, are multidimensional constructs, influenced by various aspects such as cognitive capacity, behaviors, emotional and physical domains, among others [35]. Although the visual analogue scale has been widely used to measure pain levels and relief, being a fast and effective tool, evidence suggests the use of multidimensional tools to evaluate the different dimensions related to the pain experience [36]. These dimensions include how pain affects daily life, physical activities, sleep, mental conditions, and other aspects. Therefore, further studies should explore how these dimensions are affected by the presence of pain and changes after interventions in a surgical center to provide information for individualized and effective strategies.

The study has some limitations, such as the sample size, limited information from patients' records, local context, and the evaluation of pain relief only on the same day as the procedure. Although the surgical center was located in a cancer hospital, this specific center provided care for any patient requiring surgical interventions, regardless of the presence of cancer. Therefore, patients sought the surgical center for pain relief, presenting with a wide range of health conditions and pain-related diagnoses, which may reflect the typical profile of a general surgical center offering pain management approaches. However, as it is a private surgical center, the conditions and characteristics of its patients cannot be directly generalized to other contexts. Moreover, further studies should also explore other factors that may mediate pain relief levels, including those related to patients, such as sociodemographic and medical conditions, and those related to the professional team, such as clinical skills and education level. Additionally, specific details related to the denervation procedures and chronic pain should also be considered to understand the reasons for achieving such relief, such as the pain location and the type of denervation. Moreover, the study evaluated the immediate pain relief after the procedure and was not

able to assess the long-term efficacy of the procedures. However, some strengths of the study should be highlighted: (1) the efficacy of a general surgical center in pain management; (2) the relationship between chronic pain and denervation in achieving significant pain relief; and (3) the use of the visual analogue scale to monitor changes in pain levels in a surgical center settings. The assessments of pain relief can contribute to the prevention of complications associated with postoperative pain, reducing the negative impact on patients' quality of life and promoting faster recovery [37,38]. Therefore, this topic is paramount to be evaluated in further studies to enhance pain management approaches aimed at providing relief for patients suffering from such symptoms.

Additionally, surgical centers in various hospital settings should implement conventional measures to evaluate pain relief for all patients undergoing pain management approaches, with particular attention to the multidimensional nature of this symptom. Such evaluations could guide strategies to improve care, promote a multidisciplinary team approach, enhance patient satisfaction, and effectively address problem-solving. Furthermore, further pain evaluations after surgical procedures need to consider the post-recovery anesthetic effect and pain relief over time, and they should also be assessed after days and weeks.

5. Conclusions

The findings showed that the hospital surgical center performed procedures for pain relief for various reasons and patients experienced reduced postoperative pain levels. Moreover, the greatest relief was significantly higher in patients with chronic pain who underwent denervation procedures. The findings can aid in improving healthcare and reducing the consequences of pain for patients. The use of pain scales is a useful tool for assessing the effectiveness of the healthcare provided, specially in a surgical center.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by Ethics Committee of Unimontes (protocol code: 58139922.6.0000.5146).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest: The authors declare no conflicts of interest.

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