



(RESEARCH ARTICLE)



Management of pain in children with cancer admitted to the pediatric department of university hospital center

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Abstract

Pain management in pediatric cancer patients is a significant concern among caregivers, as it is the most prevalent symptom and often undertreated. This study conducted a review of the literature on pain management protocols for hospitalized cancer children, and also conducted a case report on pain management practices at a Central Hospital Pharmacy and Pediatric Oncology Ward. The study found that the majority of patients admitted to the pediatric oncology ward were diagnosed with lymphocytic leukemia, and that pain in children with cancer was not only caused by the cancer itself, but also by medical procedures such as myelograms and venipunctures. Abdominal pain and lower limb pain were the most common pain locations reported. The study revealed that pain management was not optimal, with only pharmacological tools being used and a limited number of analgesic and analgesic medications being available due to drug shortages. The majority of patients (65%) still experienced pain even after receiving pain medication, indicating a need for improved pain management protocols in pediatric oncology.

Keywords: Pain management; Cancer; Pediatric; Pharmacy; Analgesic

1. Introduction

Pain management in cancerous pediatric patients is a major concern among caregivers. Especially because it is the most prevalent symptom and it is undertreated [1]. The main sources of pain are: cancer treatment side effects and/or medical procedures. [2]

Efforts are constantly being deployed to palliate to this issue and to improve overall quality of life for children with cancer [3].

In order to better understand the existing relationships between pain management in cancer patients and the difficulties encountered in the field, a needs analysis to target treatment related issues, was conducted using data on hospitalized cancer children [4].

The aim of this work was to carry out an analysis of the pharmaceutical, clinical and evolutionary parameters related to pain management within the oncology units of the pediatric department of the University Hospital Center (UHC) Hussein Dey as well as to assess the impact of the pain medication treatment in children with cancer [5].

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2. Material and methods

This research is a single-institution descriptive retrospective study that targeted UHC Hussein Dey that was split into three steps:

First, a review of the literature was performed to evaluate the protocols followed in pain management for hospitalized cancer children.

The keywords used were: pain management, pain management in cancer children, pediatric oncology, clinical pharmacy.

The scientific journals that were considered for this study are: Google Scholar, PubMed, and ScienceDirect. Two timelines were chosen for two different purposes:

- 2015: for cancer studies and pain management tools used during the time where the surveys took place;
- 2022: for newly developed pain management protocols.

Second, a case report was conducted on two departments in UHC Hussein Dey: The Central Hospital Pharmacy (CHP) [5,6] and the Pediatric Oncology Ward (POW): OASIS and PRAIRIE units. This analysis was held between January 2015 and December 2016 [7,8].

The data was collected from both of these departments. Each one of them provided the following set of information:

- The CHP: it supplied the research with statistical data on medicine stocks and consumption. It also contributed to providing the data related to patient records and to the prescription (type of pain medication administered, treatment duration, indication, age of the patient) [5,6].
- The POW: two surveys were carried out in this department: one for hospitalized patients presenting with cancer and the other one targeted caregiver working in oncology units or in the pharmacy (nurses, doctors, pharmacists) [7,8].

Third, the data was collected on the Microsoft Excel software to generate the statistical results found in the following section.

3. Results

The findings were divided into two categories: the first category is the findings associated to the CHP and the second category is the findings associated to the POW.

3.1. Central Hospital Pharmacy: Statistical Data on Stocks and Consumption

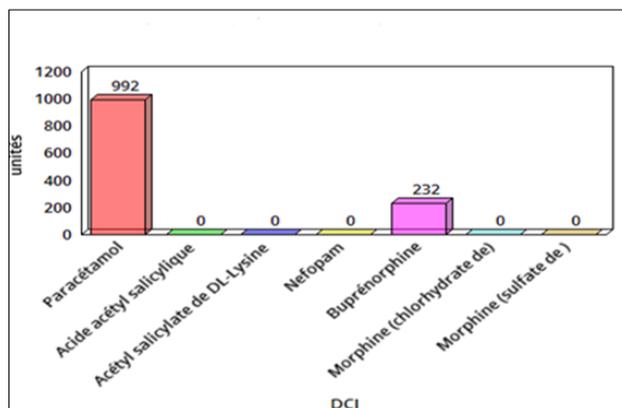
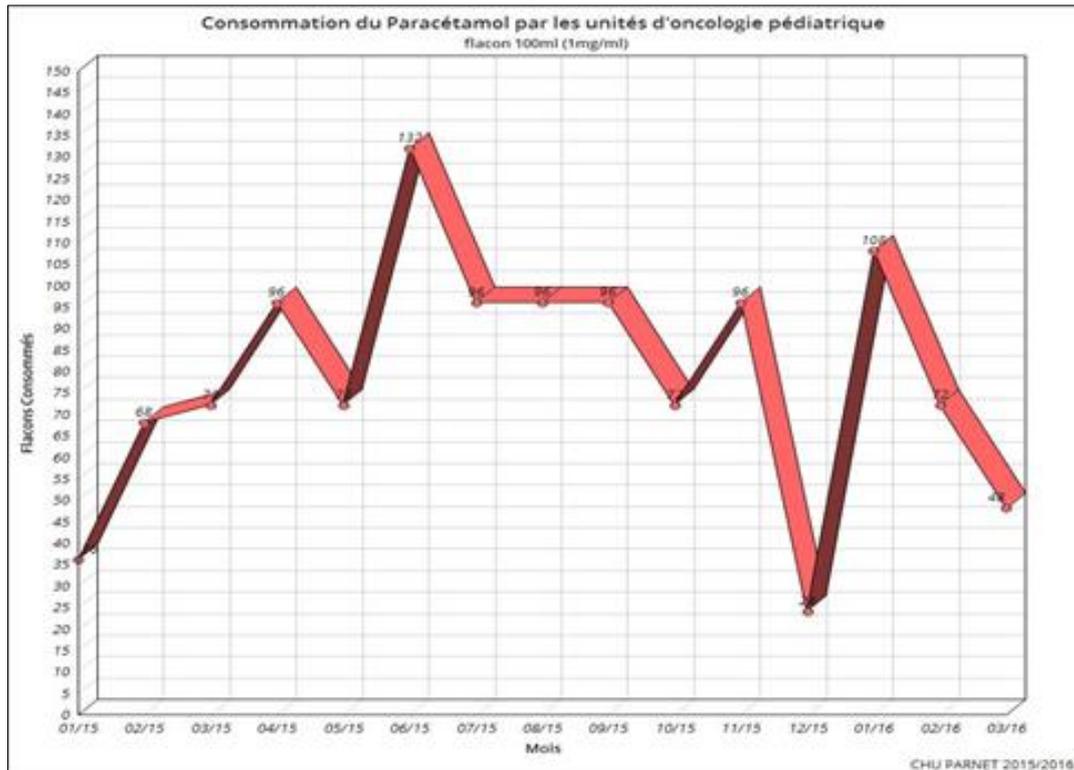
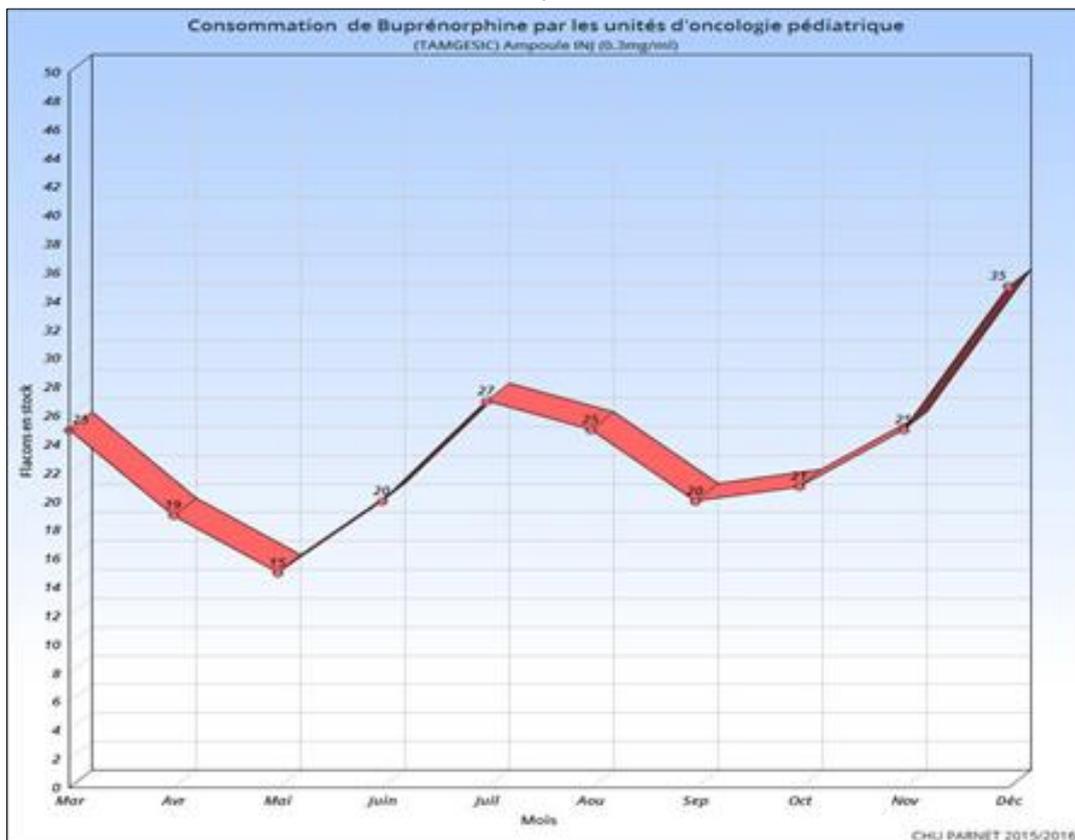


Figure 1 Use of Analgesics by Pediatrics (2015).

During the study period, two main pain killers were used to alleviate pain in pediatric cancer children: Paracetamol 1mg/ml (level 1 pain medication) and Buprenorphine 0,3mg/ml (level 3 pain medication). The use of Paracetamol (992 vials) exceeded that of Buprenorphine (232 vials) [5,6].



a



b

Figure 2 Consumption of Pain Killers by The Pediatric Oncology Ward (2015-2016) [(a) Paracetamol/ Acetaminophen, (b) Buprenorphine]

The 992 vials of Paracetamol (Acetaminophen) were administered in a period of 15 months (from January 2015 to March 2016), which resulted in a statistical average of 66 vials per month (Figure 2.a) [5,6].

As for Buprenorphine, the 232 vials were administered in a period of 10 months (from March 2015 to December 2015), which resulted in a statistical average of 23 vials per month (Figure 2.b).

3.2. Oncology Units: Clinical and Paraclinical Data

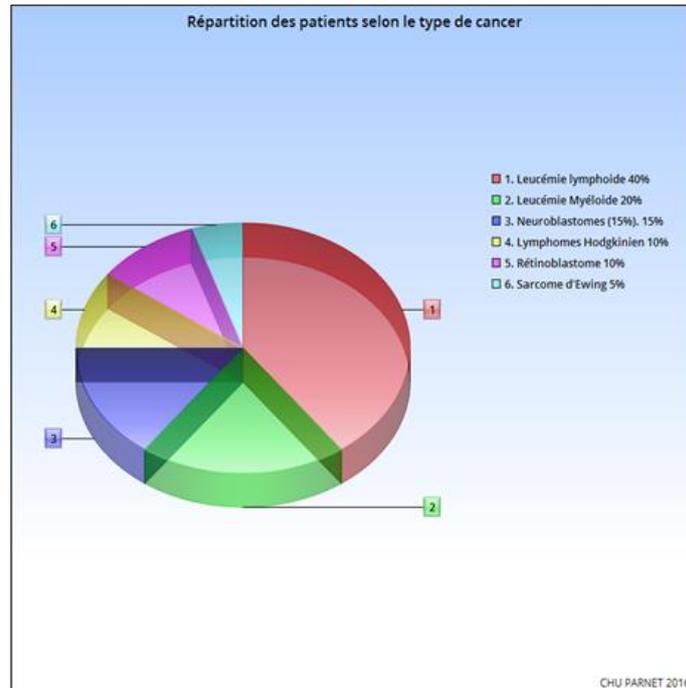


Figure 3 Distribution of Patients Admitted by Type of Cancer

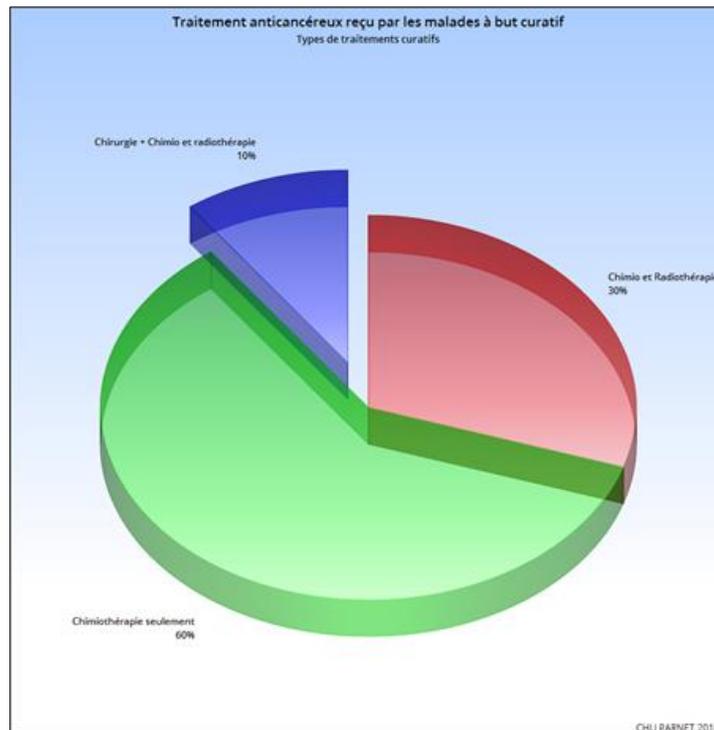


Figure 4 Types of Cancer Treatments Received by Patients

The majority of patients admitted the pediatric oncology ward (40%), were diagnosed with lymphocytic leukemia. The second type of cancer that was most common was myeloid leukemia (20%) and the other types had a prevalence under 20%: neuroblastoma (15%), Hodgkin lymphoma (10%), retinoblastoma (10%) and Ewing sarcoma (5%) (Figure 3) [7,8].

The cancer treatment protocols were divided into 3 groups: (i) chemotherapy (it was the leading cancer treatment (60%)), (ii) chemotherapy and radiotherapy (30%) used less than chemotherapy on its own, (iii) surgery, chemotherapy and radiotherapy: it was the least used protocol (10%) (Figure 4) [7,8].

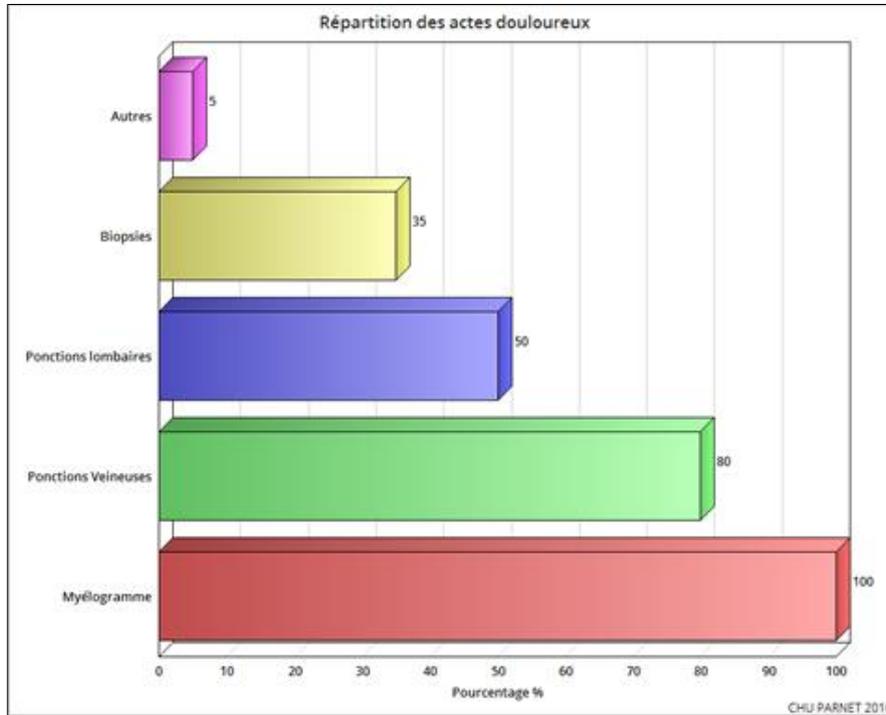


Figure 5 Distribution of Pain According to Medical Acts and Examinations

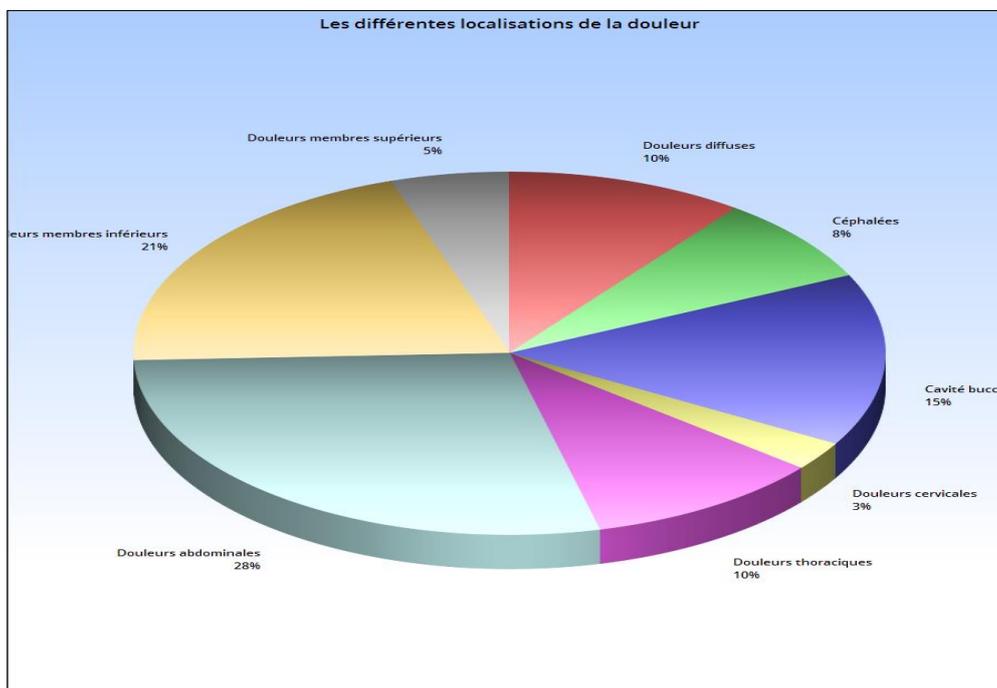


Figure 6 Different Pain Locations in These Patients

Pain in children with cancer was not only caused by the cancer itself, some medical acts also contributed to the phenomenon with the myelogram being the most painful medical act that led to pain in all of the cases (100%), followed by venipunctures (80%), lumbar punctures (50%), biopsies (35%) and other examinations (5%) (Figure 5) [9,10].

The most relayed pain manifestations in pediatric patients were abdominal pain (28%) and lower limbs pain (21%). Other pain locations were also registered in: the oral cavity (15%), the chest (10%), the head (8%), the upper limbs (5%) and the neck (3%). Widespread pain was also common in these patients (10%) (Figure 6) [9,10].

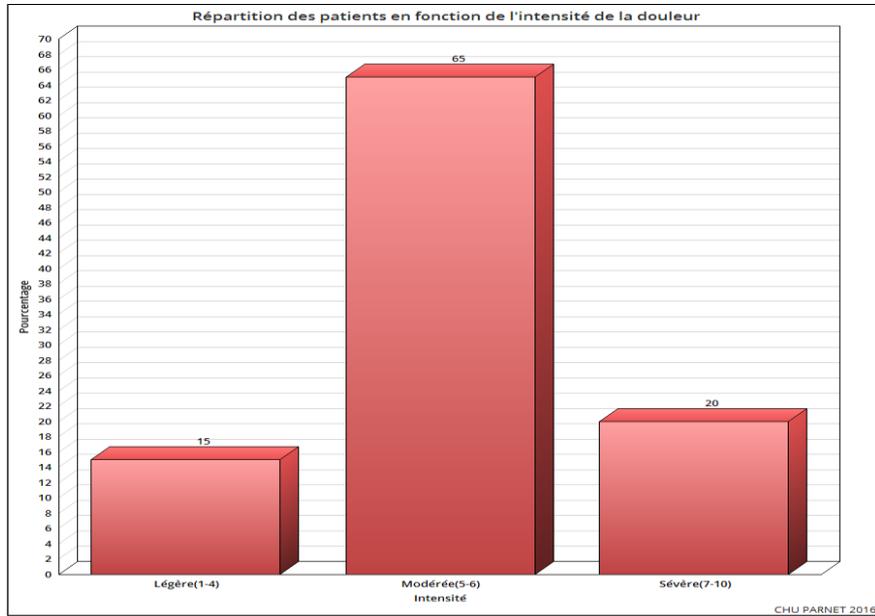


Figure 7 Distribution of Patients According to Pain Intensity

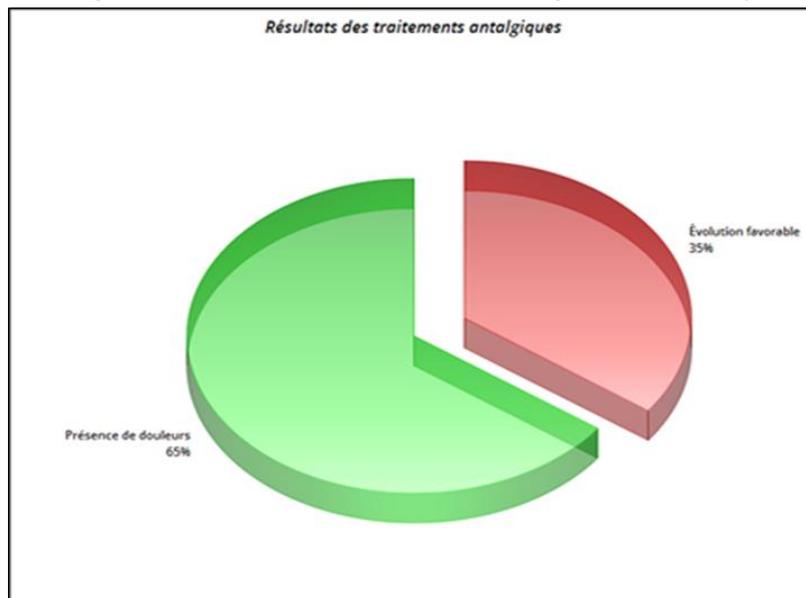


Figure 8 Evolution of The Response of Patients to Antalgic Treatments

The level of pain intensity varied in children with cancer, most of them reported moderate pain (65%) while the others tended to experience severe (20%) or mild pain (15%) (Figure 7) [9].

The majority of pediatric oncology patients (65%) still suffered from aches after receiving pain medication compared to the others (35%) who experienced pain relief (Figure 8) [11,12].

It is useful to point out that 35% of the patients received weak analgesics (level 1), 50% of them received in addition to the analgesic treatment, co-analgesics and that were treated with strong analgesics (level 3) [9,10].

4. Discussion

This survey allowed the evaluation of professional practices in pain management in children by analyzing a few parameters: (a) kinds of analgesic and antalgic medication and the amount used by the POW, (b) cancer related data: types of cancers, nature of the cancer treatment and the medical procedures associated to the diagnosis, (c) pain related data: pain intensity and pain locations [5,9].

The prevalent type of pediatric cancer was lymphocytic leukemia [3], followed by myeloid leukemia. The majority of cancer treatment consisted of only chemotherapy. In addition to the pain induced by the cancer itself, medical acts also contributed greatly in adding to the suffering of patients. The intensity of pain was largely reported to be moderate and only a small portion of children noticed an improvement. The treatment consisted of two molecules Paracetamol (the most used antalgic) and Buprenorphine (an opioid) according to the World Health Organization recommendations [7,12].

5. Conclusion

This case report showed that pain management was not optimal. It also revealed that only pharmacological tools were used to reduce pain in children and even the pharmacological tools were composed of a few antalgic and analgesic medication due to drug shortages.

It seems necessary to recommend some corrective measures to alleviate pain and offer a better quality of life for children with cancer. This can be done by following these suggestions:

- Promote information on: pain assessment and pain management treatment;
 - Improve access to analgesic drugs and other medication used to treat cancer pain;
 - Establish inter-disciplinary treatments to relieve malignant pain while integrating the 3P approach (pharmacological, physical/physiological and psychological strategies).
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Compliance with ethical standards

Acknowledgments

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Disclosure of conflict of interest

The authors and all co-authors declare that they have no conflicts of interest in connection with this document, and the material described is not in the process of being published nor is it intended for publication elsewhere.

Statement of ethical approval

"The present research work does not contain any studies performed on animals/humans subjects by any of the authors.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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