Mexican Journal of Oncology
Gaceta Mexicana de Oncología

Check for updates

REVIEW ARTICLE

Pain measurement in pediatric cancer patients: A bibliometric analysis

Rubby Castro-Osorio, Yenny Díaz-Serrano, and Luisa Arce-Rodríguez*

School of Psychology, Universidad El Bosque, Bogotá, Colombia

Abstract

Background: *The experience of pain has physical, cognitive, affective and behavioral manifestations; however, its evaluation is usually oriented to aspects such as intensity and location, leaving out other equally relevant attributes. Its evaluation is a complex task because of its nature and the few tools to make assessments, especially in the cancer population.* **Objective:** *To carry out a systematic review to identify the different ways of evaluating chronic/oncological pain in patients under 18 years of age.* **Material and methods:** *Following the PRISMA method (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), the search was carried out in three databases.* **Results:** *27 articles were analyzed. The most used instruments evaluate various aspects in the sensory/discriminative dimension, especially co-administered and, to a lesser extent, the others.* **Discussion:** *There is a need for instruments that evaluate the entire subjective experience of pain, considering their technological development convenient to improve the opportunity to access medical care.*

Keywords: *Cancer pain. Chronic pain. Pain procedural. Pain measurement.*

Evaluación del dolor en paciente oncológico pediátrico: un análisis bibliométrico

Resumen

Antecedentes: *La experiencia de dolor tiene manifestaciones físicas, cognitivas, afectivas y conductuales, sin embargo su evaluación está habitualmente orientada a aspectos como intensidad y localización, quedando fuera otros atributos igualmente relevantes. Su evaluación es una tarea compleja precisamente por su naturaleza y por las escasas herramientas para hacer valoraciones, especialmente en población oncológica.* **Objetivo:** *Realizar una revisión sistemática para identificar las distintas maneras de evaluar el dolor crónico/oncológico en pacientes menores de 18 años.* **Material y métodos:** *Siguiendo el método PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), se realizó la búsqueda en tres bases de datos.* **Resultados:** *Se analizaron 27 artículos. Los instrumentos más utilizados evalúan diversos aspectos en la dimensión sensorial/discriminativa, especialmente coadministrada y en menor medida, las otras.* **Discusión:** *Existe la necesidad de instrumentos que evalúen toda la experiencia subjetiva del dolor, considerando conveniente el desarrollo tecnológico de los mismos para mejorar la oportunidad de acceso a la atención médica.*

Palabras clave: *Dolor en cáncer. Dolor crónico. Dolor asociado a procedimientos médicos. Evaluación del dolor.*

Correspondence:
*Rubby Castro-Osorio
E-mail: castrorubby@unbosque.edu.co

Date of reception: 07-12-2020
Date of acceptance: 12-10-2021
DOI: 10.24875/j.gamo.M21000224

Available online: 07-06-2022
Gac Mex Oncol. 2022;21(1):25-34
www.gamo-smeo.com

1665-9201/© 2021 Sociedad Mexicana de Oncología. Published by Permanyer. This is an open access article under the terms of the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

A chronic disease implies for the patient an alteration in different areas of adjustment: familiar, social, academic, occupational and personal, in addition to unexpected changes for which healthcare, social, psychological and economic resources that allow facing up to the situation need to be available[1,2]. That is the case of cancer, one of the chronic diseases with the highest prevalence rates worldwide and the main non-communicable disease diagnosed with the highest incidence between 2010 and 2030[3]. In Colombia, a study carried out by the National Cancer Observatory in 2010, estimated a rate of 2.5 cases per 100,000 individuals younger than 15 years of age[4], while in 2015, an estimated general prevalence of 501 cancer cases per 100,000 population was recorded, among which 3% corresponded to individuals younger than 18 years, with a general prevalence of 65 cases per 100,000 minors[5].

Cancer patients often must undergo intrusive, long-term procedures, recurrent hospitalizations, and face home care that alters usual functioning of roles at home[6]. During the diagnostic phase, there are episodes of pain that persist throughout treatment, especially during hospitalization periods, which makes it necessary for this symptom to be managed in order to achieve better adaptation to the situation[7].

The International Association for the Study of Pain defines it as an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage[8]. On the other hand, Melzack and Casey[9] define pain as a multidimensional experience made up of: a) the sensory/discriminative dimension, which is responsible for the parameters of location, intensity and duration of pain; b) the motivational/affective dimension, which constitutes the subjective aspects of pain, and c) the cognitive/evaluative dimension, which integrates the experience of pain according to the value it is assigned. Thus, pain is dynamic, based on biological factors that determine the sensory aspects, psychological factors that are associated with the coping and adjustment response, and social factors that involve the perception and meaning the individual gives to his/her pain.

Depending on its duration, pain can be classified as: a) acute, when it lasts less than three months and has a marginal psychological component, and b) chronic, which has an unlimited duration and contains a significant psychological component, with this pain being typical of cancer patients[10]. Moreover, acute pain is caused by a noxious or tissue-damaging stimulus as a result of bodily injury or disease, and rarely is primarily caused by psychological factors, whereas chronic pain is long lasting, caused by progressive disease, often unresponsive to treatment, and includes physical deterioration, decreased physical and social activity, emotional problems, and often leads to severe and prolonged disability when disease control and pain management have been unsuccessful[11].

Pain can be caused by the pressure exerted by the growth of a tumor on tissues, nerves or other organs of the body, but it can also be caused by the treatment of the disease[12]. The latter characteristic can be considered as one more of the multiple causes that can generate pain in cancer patients, which would lead to an additional classification of pain due to tumor invasion, secondary pain caused by treatments such as chemotherapy or radiotherapy, pain due to medical procedures such as extractions, biopsies, injections and aspirations, and pain associated with the tumor or pain due to concurrent disease[13].

In pediatric cancer patients, pain is the most important and common symptom for children, families and health professionals[14], which is why pain must be correctly treated, identified and evaluated[13]. In this sense, the goals of pain assessment are: a) pain characterization, by identifying the pain syndrome and its pathophysiology; b) evaluation of the impact of pain, and c) the role it plays in patient overall suffering[15].

For the above reasons, the purpose of this research is to carry out a bibliometric analysis in order to identify the existing alternatives for evaluating chronic/cancer pain in childhood and adolescence, as well as to identify which of these alternatives are based on the use of information and communication technologies, since according to surveys on the use of them at home, in 2020,[16] the percentage of information technology use is very high in children younger than 15 years. Due to the stress caused by medical procedures, this alternative would be of great help both for health professionals and pediatric patients and families, since with an adequate identification of the painful experience, the most appropriate treatment for each case can be chosen.

Material and Methods

Type of study

A bibliometric analysis was carried out, which is known as a study that, without being original, provides

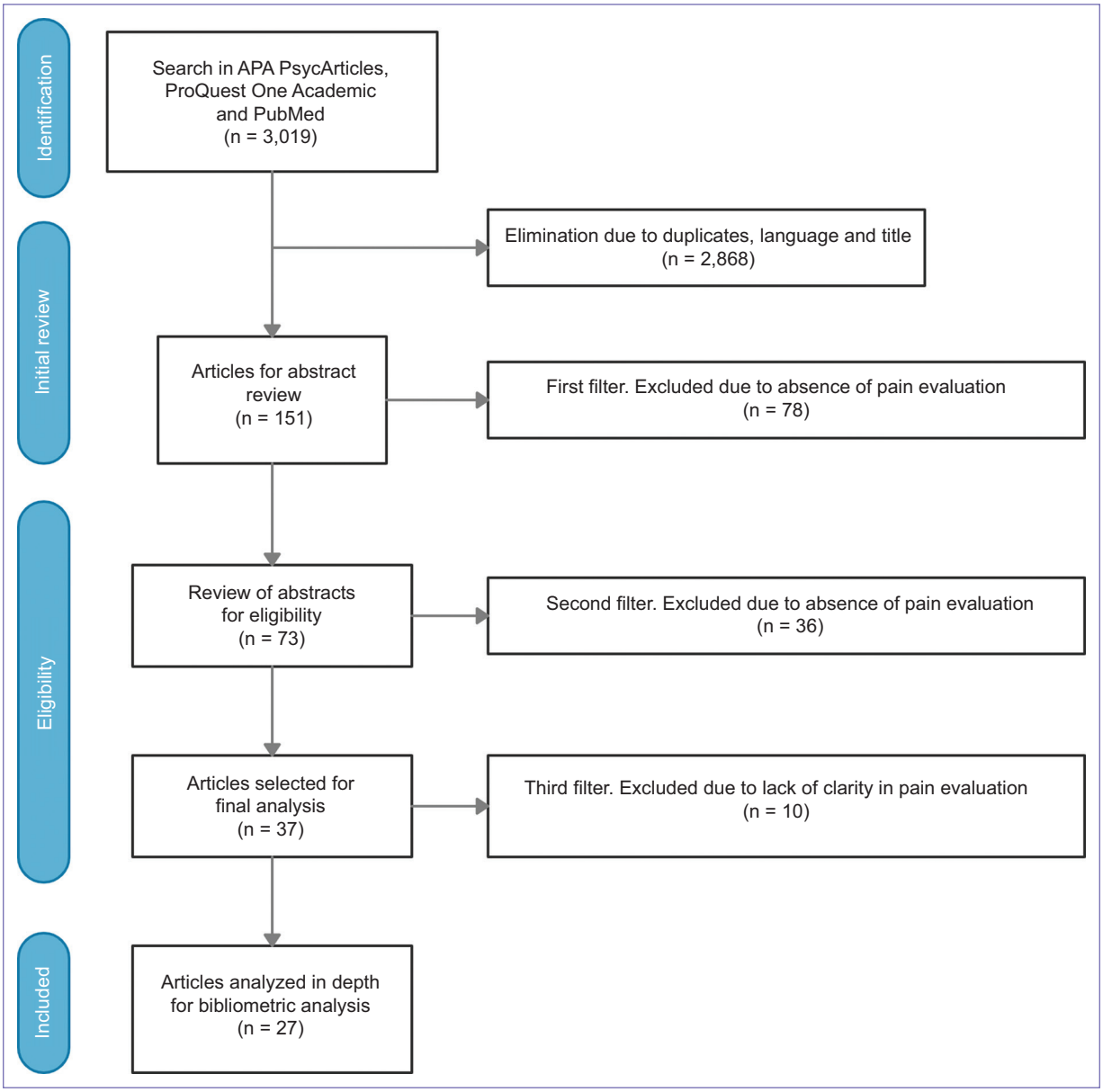


Figure 1. PRISMA flowchart.

an overview of a relevant research topic current state by means of a rigorous and reproducible process[17]. For this, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed for the identification, selection and evaluation of articles (Fig. 1).

The search was carried out in the following databases: APA PsycArticles, ProQuest One Academic and PubMed, without geographical or publication year restrictions, limited to January 2020. Inclusion criteria were: articles in English and Spanish, in populations younger than 18 years with cancer pain or chronic pain, and the instrument used to measure pain in study participants had to be mentioned in the documents.

Units of analysis

The defined keywords were: 'neoplasm', 'pain measurement', 'pain', 'cancer pain', 'chronic pain' and 'procedural pain'. These words were normalized using the Descriptors in Health Sciences (DECS) Thesaurus. The strategy used for the search was that of the following algorithm: (("pain" OR "cancer pain" OR "chronic pain") AND ("pain

measurement" OR "pain, procedural") AND (child OR adolescent) AND (neoplasm) NOT palliative).

Procedure

The search was carried out in the aforementioned databases by means of an advanced search in the title, abstract and keywords fields. With the articles retrieved using the aforementioned algorithm, and by applying advanced search filters (for keywords and original articles), articles were eliminated due to duplicity, language and title. Subsequently, a first exclusion filter was applied for those that did not correspond to the objective of the search, i.e., investigations that did not include information on how chronic or cancer pain was evaluated in patients younger than 18 years.

The articles that were pre-selected for eligibility were included in a grid for the reading and analysis of each study, out of which the following was recorded: article identification, publication year, authors, title, Uniform Resource Locator (URL) or Digital Object Identifier (DOI), journal, type of article, country where the study took place, language, database from which it was retrieved, objective of the research, participants (age and number), diagnosis (cancer or not), type of evaluated pain, pain dimension the evaluation corresponds to, instrument used for evaluation, how the instrument was administered, description of the instrument and whether or not it was recommended for final analysis. Subsequently, a second filter was applied by reading the abstracts for elimination based on previous criterion; as a result, total number of articles to be considered for final analysis was obtained. Of those that were recommended in the inclusion phase, each document was entirely read as shown in figure 1, with a double review being made by consensus between the researchers.

Results

Total number of articles recommended for bibliometric analysis was 27, with APA PsycArticles being the database with the highest percentage of selected articles (51.85%), followed by PubMed with 29.63% and ProQuest with 18.52%. The language of the articles was English.

Scientific production regarding these studies was reviewed according to the country where the study was carried out, with the USA being the country from which more articles reporting the use of pain measurement instruments or tools were retrieved (Fig. 2). Regarding the year of publication of the studies, no specific time range was taken into account; however, the upper limit was established in January 2020 (Fig. 3), and the year with the highest scientific production according to the criteria used in the search was found to be 2013 with 25.93%, followed by 2015 with 18.52%. The years 2011 and 2016 accounted for 11.11% each; the years 2012, 2014 and 2017, for 7.41% each; and, finally, the years 1983, 2006 and 2010, for 3.70% each.

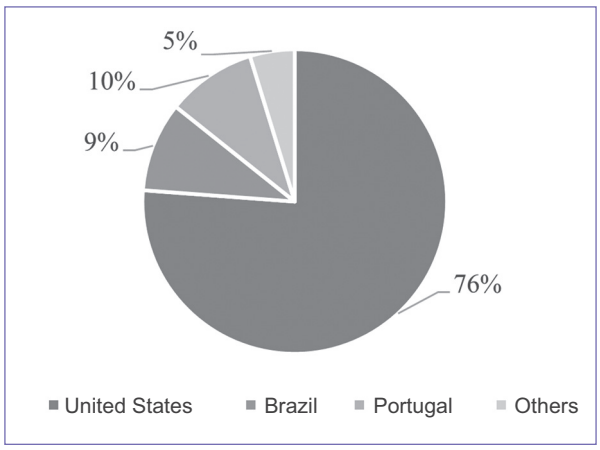


Figure 2. Scientific production by country of origin of the studies.

The publication criterion of the journal in which the publication was made was also considered for analysis, which allowed specialized resources on the subject of the review to be identified. Figure 4 shows the four journals with more publications involving the selected studies; the rest were grouped in the "others" category. The latter includes: *British Journal of Cancer*, *Bull Cancer*, *Colombiana de Psiquiatría*, *Jornal Pediatria*, *Journal of Child Neurology*, *Journal of Medical Internet Research*, *Journal of Opioid Management*, *Journal of the Peripheral Nervous System*, *Pain Management Nursing*, *Pediatric Blood & Cancer*, *Psychological Assessment*, *Revista de Enfermería Referência* and *The Clinical Journal of Pain*.

The type of study of said investigations was: a) empirical article (88.89%), and b) others (each with 3.70% for a total of 11.11%). In the latter group, the following types of study were found: instrumental studies, systematic reviews and syntheses. The age for pain assessment application identified in the reviewed studies was distributed as follows: a) from 9 to 18 years, 48.15%; b) from 0 to 18 years, 44.44%; and c) from 0 to 8 years, 7.41%. Finally, cancer-type pain was the most evaluated (Fig. 5) with 59.26%, followed by chronic pain (caused by the medical conditions or

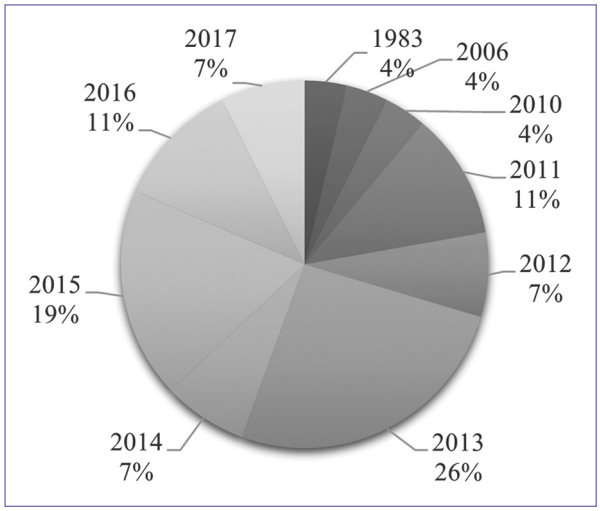


Figure 3. Scientific production by year of study publication.

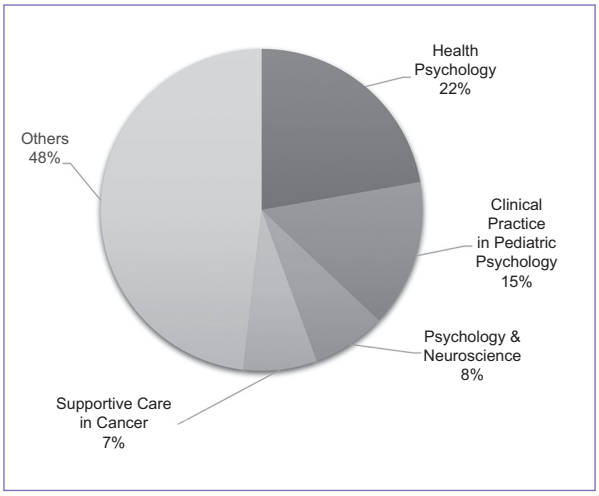


Figure 4. Scientific production per journal.

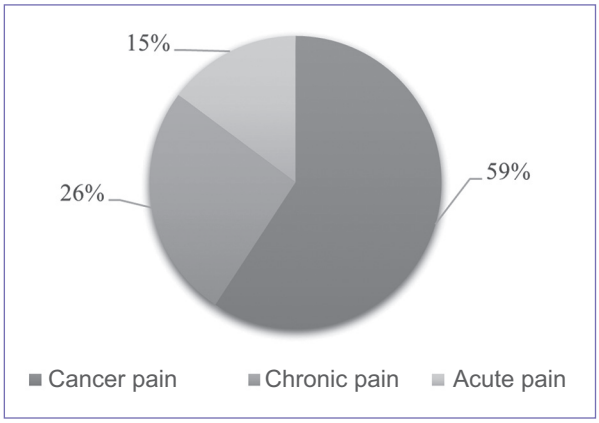


Figure 5. Scientific production by type of evaluated pain.

interventions related to the disease) with 25.93% and acute pain with 14.81%.

Pain measurement

The way the instruments referred to in the studies were applied had the following distribution: a) co-administered, with 70.37%, which include the patient and caregiver or professional; b) self-administered with 22.22%, and c) self-administered and co-administered, with 3.70%. In 3.70% it was not specified.

Bearing in mind that, according to Melzack and Casey, pain is a multidimensional experience that involves the sensory/discriminative, motivational/affective and cognitive/evaluative spheres[9], the instruments reported in the studies have been classified based on this taxonomy (for one or more dimensions) as follows: a) the most frequently evaluated is the sensory/discriminative dimension with 77.78%, whose instruments evaluate the pain location, intensity and duration parameters; b) sensory/discriminative and cognitive/evaluative with 11.11%; c) motivational/affective with 3.70%; and d) sensory/discriminative and motivational/affective with 3.70% and sensory/discriminative, motivational/affective and cognitive/evaluative with 3.70%. Based on the above, each one of the instruments is described below according to the dimension of pain they assess.

Sensory/discriminative dimension

It refers to identification, physical evaluation and localization of factors related to sensory perception of pain[9]. For its evaluation, the instruments explained below were found.

Numerical rating scale (NRS)

It allows pain severity to be identified on a 1-to-10-point scale. It is verbally answered through an evaluation made by the user, with 1 being the mildest pain and 10 unbearable pain. It is widely used in the hospital context, both by researchers and health personnel in a systematic way to control post-surgical pain[18].

Faces pain scale-revised (FPS-R) or Facial affective scale (FAS)

It measures the level of perceived pain severity in children through a scale of faces that represent

different pain severities where the child chooses the most similar to the perceived pain[19].

Wong Baker faces pain rating scale

It measures the level of perceived pain severity through a scale ranging from 0 (no pain) to 10 (hurts as much as one can imagine), where the person is asked to choose the face that best represents the pain he/she is experiencing[18].

Face, legs, activity, cry and consolability scale

Each one of these categories is measured according to a behavior rated from 0 to 2. Where 0 for the face is "no particular expression or smile"; for legs, "normal or relaxed position"; for activity, "lying quietly, in normal position, moves easily"; cry, "no cry"; consolability, "content, relaxed"; and 2 for tha face is "frequent to constant quivering chin, clenched jaw"; legs, "kicking or legs drawn up"; activity, "arched, rigid or jerking"; cry, "crying steadily, screams or sobs, frequent complaints"; and consolability, "difficult to console or comfort". The sum of all categories results in a score from 0 to 10, where 0 is relaxed and comfortable, 1-3 is mild discomfort, 4-6 is moderate pain, and 7-10 is severe discomfort or pain[18].

Poker chip tool

It is a pain measurement scale aimed at preschool children, where the presence and severity of pain is measured using poker chip images, in which one chip indicates mild pain, two chips symbolize a little more, three chips represent even more pain and four chips refer to a pain the minor has never experienced before[20].

Scale of pain frequency, severity and duration

The severity of usual pain and extreme pain is rated on a scale ranging from 0 (no pain) to 10 (worst imaginable pain) and pain frequency (number of days with pain per two-week period, 0-14)[21].

Visual analog scale

It allows pain severity to be measured with maximum reproducibility between observers. It consists of a 10-cm horizontal line, at whose ends the extreme expressions of a symptom appear. Absence or lower severity is located on the left and highest severity on the right. The patient is asked to mark the point on the line that indicates the severity and it is measured with a millimeter ruler. Severity is expressed in centimeters or millimeters[22].

Pain severity scale (PSS)

The patient is asked about the severity of pain using a 9-point Likert scale[23].

Pain thermometer

The patient is asked to rate his/her anticipated level of pain on a "pain thermometer". The pain thermometer is considered a visual analog of the experience of pain represented on a 0-to-100 scale[24].

Children's Hospital of Eastern Ontario pain scale

It includes a serial observation of behaviors: cry, facial expression, verbal expression, torso position, leg movements and attempts to touch the painful site. A score is assigned to each one of these behaviors by observing them for 30 seconds[20,25].

Procedure behavior checklist

This structured behavior observation instrument requires for observers to document the presence of discomfort reactions to pain or anxiety (e.g., verbalized pain, screaming, verbalized anxiety, physical resistance) and rate their severity (on a 1-to-5 scale) during an invasive procedure. It is appropriate for use in patients aged between 6 and 18 years and has good reliability and validity. Scores can range from 0 to 24[26].

Motivational/affective dimension

The constitution of subjective aspects of pain is identified,[9] with the following instruments evaluating it.

Pain catastrophizing scale (PCS-C and PCS-P)

It consists of measuring catastrophic beliefs when pain is present, among which it measures: a) rumination, "I can't keep it out of my mind"; b) magnification, "I am afraid that the pain will get worse", and c) helplessness, "there is nothing I can do to reduce the pain"[27].

Pain triggers assessment

Paper and pencil questionnaire to collect information on whether or not the minor believes that certain variables trigger his/her abdominal pain. Items on the list include dietary factors, emotional factors, negative stressors, positive stressors, environmental factors, disease, and not getting enough sleep[28].

Pain coping efficacy

It is a 39-item self-assessment questionnaire developed to evaluate the strategies and efficacy of pain treatment in minors. The pain coping efficacy subscale includes items that assess: a) ability to change pain; b) ability to deal with pain, and c) ability to change moods and feelings when in pain. Items are scored on a 5-point Likert scale ranging from 1 (never) to 5 (very often)[29,30].

Sensory/discriminative and cognitive/evaluative dimension

This dimension allows the integration between the experience of cortical pain and the perception of pain to be identified; this favors the combination of both dimensions of pain[9]. According to the results obtained in the present investigation, the following instruments evaluate it.

Chest pain questionnaire

It is used to assess chest pain severity, by means of the time elapsed and the number of episodes within last month. It answers the question: "Normally, how severe is the pain when you experience chest pain?" on a 10-point scale with verbal answer scores ranging from 1, which is no pain, to 10, which is extreme, the worst imaginable pain. The time elapsed since pain onset was recorded in months[31].

ChIMES

It helps to record the levels of pain and discomfort related to eating, swallowing and drinking. It consists of seven elements: a) amount of mouth or throat pain (ChIMES1); b) effect of pain on the mouth or throat when swallowing (ChIMES2); c) effect of pain on the mouth or throat when eating (ChIMES3); d) effect of pain on the mouth or throat when drinking (ChIMES4); e) reception of analgesics (ChIMES5); f) reception of analgesics for mouth or throat pain (ChIMES6), and g) presence of ulcers (ChIMES7). CHIMES1 to 4 each receive a score that ranges from 0 to 5, with 5 being the worst degree of symptoms. ChIMES5 receives a score of 1 if the patient had been administered medication for pain and ChIMES6 receives a score of 1 if the subject was administered pain medication for mucositis. Conversely, ChIMES5 and 6 receive a score of 0. Finally, ChIMES7 receives a score of 1 if oral ulcers were present and 0 if they were not[32,33].

Pediatric pain tool for adolescents

This tool uses a front and back view body contour diagram to locate pain, a 10-cm word graphic rating scale to assess pain severity, a list of 67 pain quality descriptors, and an open space for the minors to add more words. The descriptors are grouped into four dimensions: sensory (37 descriptors), affective (11 descriptors), evaluative (8 descriptors) and temporal (11 descriptors)[34].

Headache severity scale

It was designed based on the presence of headache and the need to lie down during a headache (no need to lie down is 0, need to lie down 50% of the time is 1, and need to lie down > 50% of the time is 2); number of days with headache within the last 30 days (no headache is 0, headache for 1-5 days is 1, headache for 6-10 days is 2, headache for 11-15 days is 3 and headache for 16 days is 4); presence of vomiting during a headache (none is 0, 50% of the time is 1, > 50% of the time is 2), and presence of photo- and phonophobia (absent is 0, present is 1). Total headache severity scores were graded as follows: 1-4, mild headache; 5-8, moderate headache; and 9-10, severe headache[35].

Motivational/affective and cognitive/evaluative dimension

This dimension allows the emotional aspect of pain to be identified and interprets its sensation. This favors the combination of both dimensions of pain[9]. According to the results obtained by the present investigation, the following instruments evaluate it.

PedsQL Cancer Module version 3.0

It is a specific instrument (in the cancer context) for pediatric quality of life evaluation; it consists of a

section of instructions and 27 items, contained in eight dimensions: a) pain and hurt (two items); b) nausea (five items); c) procedural anxiety (three items); d) treatment anxiety (three items); e) worry (three items); f) cognitive problems (five items); g) perceived physical appearance (three items) and h) communication (three items)[36].

Sensory/discriminative, motivational/ affective and cognitive/evaluative dimension

This dimension is the connection of all three dimensions of pain[9]. According to the results obtained by the present investigation, perception factors, emotional aspects of pain and analysis and interpretation thereof were identified, and the following instruments evaluate it.

Electronic diaries

This instrument evaluates pain severity, pain and its causes, emotional state, sleep, diet and stress level[18].

Several instruments are repeated in different articles and, according to their frequency of appearance, they are classified as follows: a) Visual analog scale, with 20.45%; b) Faces pain scale, with 11.36%; c) Electronic diary, with 9.09%; d) Numerical rating scale, with 9.09%; e) Wong-Baker faces pain rating scale, with 6.82%; f) ChIMES, Face, legs, activity, cry and consolability pain scale, Pain coping questionnaire and Pain catastrophizing scale, with 4.55% (which together add up to 18.18%), and g) Chest pain questionnaire, Scale of pain frequency, severity, and duration, Pain triggers assessment of, Pain severity scale, PedsQL Cancer Module version 3.0, Pain thermometer, Adolescent Pediatric Pain Tool (APPT), Headache severity scale, Procedure behavior checklist, Children's Hospital of Eastern Ontario Pain Scale, and the poker chip tool, each with 2.27%, and together adding up to 25%.

Discussion

Based on the results that were obtained, and in accordance with the purposes of this bibliometric analysis, the findings show that the instruments used in the studies mainly evaluate the sensory/discriminative dimension. This could be due to the fact that this type of evaluation allows a more accurate examination of the reactions patients have in the presence of pain[11], which are generally evaluated in a co-administered manner, demonstrating that there is a preference for estimating it together with the patient, caregiver and/or healthcare professional.

Furthermore, the fact that this dimension of the painful experience is the most frequently evaluated could be related to the moment at which the evaluation is carried out (during hospitalization or within contexts of research) and to the professionals who perform it (doctors, nurses and other health professionals), who, due to their area of expertise, are more interested in knowing information that allows them to make decisions for pharmacological-type treatment. The resources they have for performing said evaluations are often limited to those available at the working site.

The most widely used instrument is the Visual analog scale, which corresponds to one of the best tests to measure pain severity; given that there is measurement continuity, it is considered that it provides higher sensitivity than a numerical scale[37]; however, it should be noted that the original black and white scale is still used, and its graphic representations may not be easy to understand by pediatric patients from the digital world, but this is something that appears not to have been studied in order to establish if the instrument continues to be as effective as before, and invites health professionals and researchers to reflect on the validity and usefulness of these instruments in current world.

The other instruments identified in the analysis also provide accurate information on the dimension of pain that is evaluated. These observations are made by professionals who, in principle, are trained to detect symptoms and/or discomforts, as well as by parents and/or caregivers who know the patient through close contact and the bonds that have been created throughout the process of disease and even prior to it, with these actors being able to provide evidence of the complexity of the interaction of emotions, motivation and other agents that can affect the somatic sensation of the patient.

Other ways of assessing pain that were identified in this study are those related to the use of technology, which evaluate the severity, duration, frequency and location of pain, such as electronic diaries and/or applications on devices, which consist of giving a detailed description of what is felt, when is it felt and where is it felt. This registration is made each time the user perceives discomfort and/or pain, and it contains data such as date and time of occurrence, location in the body, type of pain, severity and duration of pain, activities related to it, associated emotions and other notes about what the patient thinks with regard to pain. Therefore, this evaluation system can be an effective method

when correctly applied and with clear specifications for the population, since it evaluates all three dimensions of pain.

Taking into account the changes at the level of globalization and technology, which advance faster every day, these findings are of great interest if a specialized device that evaluates the dimensions contained within the concept of pain is developed, since it would allow a decrease in the need for both patients and medical staff to travel for real-time symptom monitoring, as well as instant data collection, qualitative and quantitative inclusion of information from all dimensions of the painful experience, such as motivational and cognitive experience, which are often left aside, as demonstrated by this study, among others; this, without forgetting that the vigilance and commitment of patients and professionals in charge of each case are also important. This leads to questions for future research on the advantages and disadvantages of evaluating chronic pain, especially cancer pain in pediatric patients using electronic devices.

The main finding of the bibliometric analysis is the urgent need for pain assessments that include the three dimensions proposed by Melzack and Casey to be performed[9]. Although it is true that the sensory component of pain is necessary for treatment to be formulated, it only contributes to pharmacological decisions, but not to those of other disciplines that can provide equally effective and evidence-based resources for symptom reduction. The ultimate goal of any intervention is to provide the greatest possible well-being, which is why including the cognitive and motivational aspects that help for the experience of pain to be understood in its complexity provides equally valuable information for an interdisciplinary intervention that optimizes available resources and promotes the attainment of said well-being and quality of life.

In the case of pediatric patients, parenting patterns, myths and beliefs, as well as parental models, are often found to be the determinants of how pain is experienced and, therefore, how it is coped with. Therefore, knowing this information allows a better choice of alternatives for a comprehensive intervention that includes psychoeducation, multidimensional pain evaluation, pain communication strategies for patients, interdisciplinary intervention according to whatever is detected in the evaluation, and an effective follow-up in order to assess for possible adjustments that may be required in the intervention process until its withdrawal.

One of the limitations of this study was the paucity of information on measurement instruments exclusively intended for pediatric cancer pain, since the evaluated instruments are also used for other non-cancer (but chronic) types of pain, and most are aimed at evaluating pain in adult populations. Furthermore, the search was carried out resorting to three databases where the publication of studies in Latin America appears to be negligible, which is why no studies were retrieved on Colombian population, which is the country where the present study was developed. Including this aspect in future investigations is recommended.

Finally, the design of an evaluation instrument that takes into account the dimensions mentioned in this study and that incorporates technological development is suggested, which would fill in the two gaps that were found: availability of an instrument that evaluates the entire painful experience and that can be used within any context, given that technology has a range that physical means do not provide, as well as larger real-time coverage, which would favor patients in the identification of their painful experience and thereby a better selection of the treatment they require.

Acknowledgements

To Mariana Parra, Alexandra Rojas and Jessica Ruiz, clinical psychology and child development specialists at Universidad El Bosque, for their contributions in the screening of articles.

Funding

This research has not received any specific grants from agencies of the public, commercial or for profit sectors.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this research.

Confidentiality of data. The authors declare that no patient data appear in this article.

Right to privacy and informed consent. The authors declare that no patient data appear in this article.

References

1. Cruzado JA. Tratamiento psicológico en pacientes con cáncer. Madrid: Síntesis; 2010.
2. McGrath P. Taking control: Findings of a prospective study of an educational course for patients with leukaemia. Support Care Cancer. 2000;8(5):377-84.
3. Organización Mundial de la Salud. Cáncer [Internet]. Organización Mundial de la Salud; 2018 [citado: 07/12/2020]. Disponible en: https://www.who.int/es/news-room/fact-sheets/detail/cancer
4. Vera AM, Pardo C, Duarte MC, Suárez A. Análisis de la mortalidad por leucemia aguda pediátrica en el Instituto Nacional de Cancerología. Biomédica. 2012;32(3):355-64.
5. Alarcón B, Guarín N, Muñoz-Galindo I, Díaz J, Arévalo H. Prevalencia del cáncer en una aseguradora en salud en Colombia, 2013. Rev Colomb Cancerol. 2015;19(4):210-21.
6. Méndez X, Orgilés M, López-Roig S, Espada JP. Atención psicológica en el cáncer infantil. Psicooncología. 2004;1(1):139-54.
7. Tremolada M, Bonichini S, Altoè GM, Pillon M, Carli M, Weisner TS. Parental perceptions of health-related quality of life in children with leukemia in the second week after the diagnosis: A quantitative model. Support Care Cancer. 2011;19(5):591-8.
8. Reyes D, González JC, Mohar A, Meneses A. Epidemiología del dolor por cáncer. Rev la Soc Española Dolor. 2011;18:118-34.
9. Ceballos D. El dolor: diferencias en la percepción de sus características en función de la patología de origen. Repositorio Abierto de la Universidad de Cantabria; 2014 [citado: 17/04/2020]. Disponible en: https://repositorio.unican.es/xmlui/bitstream/handle/10902/6283/CEBALLOS LUENGAS%2C David.pdf?sequence=1&isAllowed=y
10. Puebla Díaz F. Tipos de dolor y escala terapéutica de la O.M.S. Dolor iatrogénico. Oncologia (Barc). 2005;28(3):139-43.
11. Jay SM, Elliott C, Varni JW. Acute and chronic pain in adults and children with cancer. J Consult Clin Psychol. 1986;54(5):601-7.
12. Regueira SM, Fernández MD, Díaz M de J. Generalidades del dolor oncológico. Rev Electrónica Dr Zoilo E Mar Vidaurreta [Internet]. 2014 Sep 15 [citado: 18/04/2020];40(10):14. Disponible en: http://revzoilomarinello.sld.cu/index.php/zmv/article/view/343/html_107
13. Garrido RH. Manejo del dolor en cáncer. Rev Med Clin Las Condes. 2013;24(4):661-6.
14. Fernández Urtubia B, Trevigno Bravo A, Rodríguez Zamora N, Palma Torres C, Cid Barria L. Uso de opiáceos en niños con cáncer avanzado en cuidados paliativos. Rev Chil Pediatr. 2016;87(2):96-101.
15. Gómez P. Semiología, evaluación y glosario del dolor en cáncer. En: Acevedo JC, editor. Dolor y cáncer. Bogotá: Asociación Colombiana para el Estudio del Dolor; 2009. pp. 1-18.
16. Ministerio de Tecnologías de la Información y las Comunicaciones. Boletín trimestral del sector TIC - Cifras segundo trimestre de 2020 [Internet]. 2020 [citado: 07/12/2020]. Disponible en: https://colombiatic.mintic.gov.co/679/w3-article-152244.html
17. Sobrido Prieto M, Rumbo-Prieto JM. The systematic review: Plurality of approaches and methodologies. Enferm Clin (Engl Ed). 2018;28(6):387-93.
18. Anghelescu DL, Faughnan LG, Hankins GM, Ward DA, Oakes LL. Methadone use in children and young adults at a cancer center: A retrospective study. J Opioid Manag. 2011;7(5):353-61.
19. Avian A, Messerer B, Weinberg A, Meissner W, Schneider C, Berghold A. The impact of item order and sex on self-report of pain intensity in children. Heal Psychol. 2016;35(5):483-91.
20. Oliveira NC, Linhares MB. Nonpharmacological interventions for pain relief in children: A systematic review. Psychol Neurosci. 2015;8(1):28-38.
21. Tran ST, Jastrowski KE, Anderson KK, Davies WH, Hainsworth KR. Patterns of anxiety symptoms in pediatric chronic pain as reported by youth, mothers, and fathers. Clin Pract Pediatr Psychol. 2016;4(1):51-62.
22. Bromberg M, Gil K, Schanberg L. Daily sleep quality and mood as predictors of pain in children with juvenile polyarticular arthritis. Pediatr Rheumatol. 2011;9(Suppl 1):P129.
23. Carter BD, Kronenberger WG, Threlkeld B, Townsend A, Pruitt A. The children's health & illness recovery program (CHIRP): Feasibility and preliminary efficacy in a clinical sample of adolescents with chronic pain and fatigue. Clin Pract Pediatr Psychol. 2013;1(2):184-95.
24. Jay S, Elliott CH, Fitzgibbons I, Woody P, Siegel S. A comparative study of cognitive behavior therapy versus general anesthesia for painful medical procedures in children. Pain. 1995;62(1):3-9.
25. García-Galicia A, Lara-Muñoz M del C, Arechiga-Santamaría A, Montiel-Jarquín ÁJ, López-Colombo A. Validez y consistencia de una nueva escala (facial del dolor) y de la versión en español de la escala de CHEOPS para evaluar el dolor postoperatorio en niños. Cir Cir. 2012;80(6):510-5.
26. Liossi C, White P, Hatira P. Randomized clinical trial of local anesthetic versus a combination of local anesthetic with self-hypnosis in the management of pediatric procedure-related pain. Heal Psychol. 2006;25(3):307-15.
27. Noel M, Rabbitts JA, Fales J, Chorney J, Palermo TM. The influence of pain memories on children's and adolescents' post-surgical pain experience: A longitudinal dyadic analysis. Heal Psychol. 2017;36(10):987-95.
28. Schurman JV, Friesen CA. Identifying potential pediatric chronic abdominal pain triggers using ecological momentary assessment. Clin Pract Pediatr Psychol. 2015;3(2):131-41.
29. Solé E, Castarlenas E, Miró J. A catalan adaptation and validation of the pain catastrophizing scale for children. Psychol Assess. 2016;28(6):e119-26.
30. Lynch-Jordan AM, Sil S, Cunningham NR, Joffe N, Slater SK, Tran ST, et al. Measuring treatment response in an outpatient pediatric pain program. Clin Pract Pediatr Psychol. 2015;3(1):1-11.
31. Lee JL, Gilleland J, Campbell RM, Simpson P, Johnson GL, Dooley KJ, et al. Health care utilization and psychosocial factors in pediatric noncardiac chest pain. Heal Psychol. 2013;32(3):320-7.
32. Jacobs MS. Psychological factors influencing chronic pain and the impact of litigation. Curr Phys Med Rehabil Reports. 2013;1(2):135-41.
33. Qutob AF, Allen G, Gue S, Revesz T, Logan RM, Keefe D. Implementation of a hospital oral care protocol and recording of oral mucositis in children receiving cancer treatment: A retrospective and a prospective study. Support Care Cancer. 2013;21(4):1113-20.
34. Fernandes A, Batalha L, Perdigão A, de Campos C, Nascimento L, Jacob E. Validação cultural do Adolescent Pediatric Pain Tool (APPT) em crianças portuguesas com cancro. Rev Enferm Ref. 2015;4:99-105.
35. Khan RB, Merchant TE, Boop FA, Sanford RA, Ledet D, Onar-Thomas A, et al. Headaches in children with craniopharyngioma. J Child Neurol. 2013;28(12):1622-5.
36. Fontibón LF, Ardila SL, Sánchez R. Adaptación transcultural del cuestionario PedsQL Cancer Module version 3.0 para su uso en Colombia. Rev Colomb Psiquiatr. 2017;46(3):161-7.
37. Kahl C, Cleland JA. Visual analogue scale, numeric pain rating scale and the McGill pain Questionnaire: an overview of psychometric properties. Phys Ther Rev. 2005;10(2):123-8.