

# Elaboration of a booklet for individuals with chronic pain

## *Desenvolvimento de uma cartilha educativa para pessoas com dor crônica*

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### ABSTRACT

**BACKGROUND AND OBJECTIVES:** Chronic pain is considered a public health problem. The best way to deal with it is still a challenge. However, socio-educational interventions have been recommended in national and international guidelines that deal with it. The objective of this study was to develop an educational booklet written in the Brazilian Portuguese language for people who face the problem of chronic pain.

**METHODS:** This study on the development of a light technology was conducted in three phases: the narrative of the literature review to identify the appropriate content; the approach of target audience through structured interviews; and the elaboration of a booklet by professionals specialized in the treatment of chronic pain.

**RESULTS:** The study resulted in the production of a booklet named “EducaDor,” ludically illustrated with 18 pages, divided into the following sections: 1. What is pain? 2. Acute pain: useful pain; 3. Chronic pain: the persistent pain; 4. Living with the pain; 5. False ideas about chronic pain, do not believe them; 6. Strategies to deal with the pain. Using plain language, the booklet provides data on neurophysiology and psychological and behavioral aspects related to chronic pain. The booklet can contribute to modifying misbeliefs about pain and bad behaviors, as well as to provide strategies to cope with chronic pain.

**CONCLUSION:** This study has successfully developed a light health technology which offers inputs for socio-educational programs to handle chronic pain.

**Keywords:** Chronic pain, Health education, Self-management.

### RESUMO

**JUSTIFICATIVA E OBJETIVOS:** A dor crônica é considerada um problema de saúde pública. A melhor forma de enfrentá-la ainda é um desafio. Contudo, intervenções socioeducativas têm sido recomendadas por diretrizes nacionais e internacionais que tratam do seu manejo. O objetivo deste estudo foi elaborar uma cartilha educativa escrita na língua portuguesa brasileira para pessoas que vivenciam o problema da dor crônica.

**MÉTODOS:** Este estudo de desenvolvimento de tecnologia leve foi realizado em três fases: revisão narrativa da literatura para identificar o conteúdo adequado; aproximação da população alvo, por meio de entrevistas estruturadas; e construção da cartilha por profissionais especializados no tratamento da dor crônica.

**RESULTADOS:** O estudo resultou na confecção de uma cartilha nomeada de “EducaDor”, ilustrada ludicamente, com 18 páginas, divididas nas seguintes seções: 1. O que é dor? 2. Dor aguda: a dor útil; 3. Dor crônica: a dor persistente; 4. A convivência com a dor; 5. Falsas ideias sobre a dor crônica, não acredite nelas; 6. Estratégias para lidar com a dor. Por meio de linguagem acessível, a cartilha fornece dados sobre neurofisiologia e aspectos psicológicos e comportamentais envolvidos com a dor crônica. A cartilha pode contribuir para a modificação de crenças errôneas sobre a dor e de comportamentos mal adaptativos, além de fornecer estratégias para o enfrentamento da dor crônica.

**CONCLUSÃO:** Este estudo desenvolveu com sucesso uma tecnologia leve em saúde que fornece subsídios para programas socioeducacionais para o manejo da dor crônica.

**Descritores:** Automanejo, Dor crônica, Educação em saúde.

### INTRODUCTION

Pain is the main reason why people seek health services<sup>1</sup>. Even though it is a physiological phenomenon when in the acute stage, as soon as it morphs into a chronic condition it becomes a morbidity, which produces negative impacts on contemporary societies<sup>2</sup>. Estimates of the prevalence of chronic pain (CP) range from 12 to 30% at a world level<sup>3</sup>, while in Brazil it affects about 40% of the population<sup>4,6</sup>. This is a complex condition, and the handling of this condition remains a challenge. Biomedical care is not enough to control CP. To understand CP, one must consider the relationships between biological changes and philosophical, social and emotional aspects<sup>7-9</sup>. CP is influenced by thoughts, beliefs, attitudes and expectations<sup>10</sup>. Incorrect and poorly adaptive beliefs are normally associated with the worst progression of the pain situation. These beliefs can be such as pain is a sign of a lesion; it is not possible to control pain; there is a need to avoid activities that could cause pain; it is disir-

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able to have the help of family and friends; there is no relation between emotions and pain; pain is incapacitating; pharmaceutical products are the best treatment; and there is a medical cure<sup>7,11-13</sup>. The biopsychosocial approach implies a change in the relationship between the health professional and the patient. The behavior of the person with CP in his or her therapeutic process is essential, so that the patient may take up an active posture<sup>14</sup>. In this regard, social and educational interventions have been recommended by international guidelines for dealing with CP<sup>15-17</sup>.

A study performed, with regard to the prevalence of CP in the city of Salvador, in the Brazilian state of Bahia, motivated the development of a light technology, aimed at people who experience the CP problem. Interventions based on education proved effective for the control of CP among the Australian population<sup>18</sup>. However, the direct application of an intervention of this type in another culture is not recommended. The scarce resources available in the Portuguese language have motivated the development of an own resource, ideal for the social, environmental, economic and educational conditions peculiar to Brazil.

Printed socio-educational materials, including books, booklets, and leaflets, can be considered as types of light technology. These materials expand the possibility of communication between the interested parties, also providing the uniformization of guidance as provided. They may also be taken home and referred to whenever necessary<sup>19,20</sup>.

Aimed at different target publics, we recommend that the preparation of such materials shall be preceded by a wide study of specialized literature, including an approximation to get closer to the target public, in order to get to know the social and cultural context, the expectations, the interests and concerns. Apart from the content to be addressed, criteria such as the language used, illustrations, and the layout of the material shall be followed, to make reading and understanding easier. There is also a need to consider social and cultural barriers, especially when associated with the level of schooling, which could make it more difficult to read and understand the instrument<sup>19,21-26</sup>.

The aim of the present study was that of preparing an educational booklet aimed at people with CP.

## METHODS

The methodology involved three phases: 1) a narrative review of specialized literature; 2) interlocution with patients with chronic pain, and 3) the preparation of the booklet.

With the aim of making sure that the content of the material was duly updated and based on scientific evidence<sup>7</sup>, I decided to review the specialized literature. The search was carried out on the Pubmed virtual library between February and May 2015. The search included studies in Portuguese, English or Spanish, published between 2000 and 2015, with the results of randomised clinical trials and reviews of specialized literature, which showed at least a socio-educational intervention for cases of CP among adults. The search strategy was: *((chronic pain) AND "patient education") AND ("patient education handout" or "models educational" or self-care or guideline or self-management or "educational program" or management or education or booklet or brochure or booklet) NOT (cancer or children)*.

The articles were selected based on their titles and abstracts, with the exclusion of those that did not address socio-educational inter-

ventions; those that were duplicated; those that were still under development; and those that addressed exclusive educational practices without any possibility of application by the multidisciplinary team. The second phase of the study involved getting closer to the main target public, which comprised patients from a reference center for the treatment of chronic pain, from the city of Salvador, State of Bahia, Brazil. Patients were registered with the Brazilian Society for the Study of Pain (SBED) and funded by the Brazilian Public Unified Health System (SUS).

The qualitative approach was considered the most appropriate to allow the expansion of the meanings of the health-disease process. An option was made, in favor of the strategy of a structured interview with closed questions, in a pre-set sequence<sup>27</sup>. Through the interviews, we sought to find out about the needs, the knowledge, the gaps, and the correct and incorrect beliefs about CP<sup>28</sup>.

Based on themes considered necessary for understanding the pain phenomenon by the IASP<sup>29</sup>, four different outlines were used in the thematic studies: concept, perception, processing, and control of pain. The interviews were recorded and transcribed, and their content was treated based on an analysis of content, by thematic analysis<sup>27,30</sup>.

A trained team applied the interviews. The collection of the information took place between June and August 2013. Although this environment was not reserved or quiet, the waiting room was chosen as the venue for the interviews since it is the place where patients normally exchange experiences.

There was the inclusion of patients aged over 18, with a diagnosis of chronic musculoskeletal pain, according to the criteria established by the IASP. There was the exclusion of some cases: those who reported that they were being monitored for oncological pain, and those who showed difficulty in communicating. Cases, where the patients were called for an appointment during the interview, were considered as lost cases.

During the planning of the survey, we estimated that we should interview 10 people using each outline; however, the collection of information was halted when the saturation criterion was reached<sup>30</sup>. The thematic analysis of the content comprised three steps: 1) prior analysis; 2) exploitation of the material, and 3) treatment, inference, and interpretation of the data.

In the first stage (prior analysis), there was a fluctuating reading of all the material. The goals of the study were taken up once again, and questions were then selected, among those that belonged to all four outlines that structured the content of this study. The reading of the selected questions was taken up again, and the raw data was organized in a table and grouped by similarity of themes to which they referred. The patient reports were encoded with the letter 'R' and an Arabic numeral for each patient.

In the second stage, the material was explored through categorization, thereby allowing the reduction of the texts, into significant words or expressions, which were grouped around the thematic categories.

In the study here addressed, the categories and subcategories used were aprioristic<sup>31</sup> (Table 1), established based on the narrative review of the specialized literature and related to the issues addressed in the booklet. The data was then examined and grouped into categories, no longer considering the pre-established questions and outlines.

In the third stage (treatment and analysis of data) interpretations of data were performed. This phase of the study was approved by

**Table 1.** Thematic categories and subcategories

Categories	Subcategories
1. What is pain?	Meanings of pain Causes of pain
2. Acute pain	Meanings of acute pain Processing of acute pain
3. Chronic pain	Meanings of chronic pain Processing of chronic pain The (co)existence with pain Associated factors Mistaken beliefs Strategies for tackling pain

Source: the authors

the Ethics Committee for Research with Human Subjects of the Climério de Oliveira Maternity Unit at the Federal University of Bahia (UFBA) as according to directives 098/2012 and 108/2011. All the recommendations set by Resolution No. 466/12 of the Brazilian National Health Council (CNS) were strictly followed.

Based on the data obtained in specialized literature and the interviews, a team consisting of six researching physiotherapists got together for the development of the booklet (third phase), which involved the definition of the goals; selection of content; writing and formatting.

The role of the illustrations was that of favoring interest in Reading, also creating a feeling of identification and relaxation<sup>23,26</sup>. During the production of the booklet, some pictures available on electronic pages were selected, pictures that could be a base for the preparation of the final illustrations, as we have observed the need to create our own illustrations, that could allow identity with the material produce and the notion of continuity.

As a way of aiding the understanding of the concepts presented, and to promote the identification of the reader, we have included some sections of the words of those interviewed. We have selected excerpts that show feelings and beliefs regarding pain, experiences of coexistence with chronic pain, and strategies to tackle pain. We have taken special care not to include sections that show catastrophic thoughts, or any kind of prejudice.

The public most affected by CP, both based on data collected from specialized literature as also based on the profile of the people inter-

viewed, consists mainly of people with a low level of schooling and low social and economic level. Among the written media, the booklet was most adequate for the proposal, as it allows the presentation of the content in an attractive form that the target public can understand.

The main recommendations, set out in scientific literature and used in the preparation of the booklet, were related to written language, illustrations and general layout (Table 2).

## RESULTS

In the first phase, the review of the specialized literature identified 704 studies, selected by title. Out of these, 179 were selected for reading the summary, and 43 were selected for the reading of the entire text. Out of these complete articles, eight were review studies, and 35 were clinical trials (Table 3).

The studies were very heterogeneous with regard to scientific methodology, didactics of the professional resources involved, duration and frequency of meetings, model of health approach, nomenclature, and content presented. Due to the need to choose the appropriate content for the preparation of the booklet, it was decided to focus on the themes addressed rather than on methodology.

The models of socio-educational approach were split between biomedical, biopsychosocial, and a mixed model. The main issues addressed, guidance and the main results are shown in table 4.

The studies that showed a predominance of biomedical content had the main themes of anatomy, biomechanics, epidemiology, and physiopathology of pain. The guidance given to the patients was mainly related to posture and correct movements during routine daily activities; about taking physical exercise; and about the importance of staying active. The reduction in the intensity of pain and incapacity were the most reported results.

Studies aligned with the biopsychosocial model addressed issues such as management of pain, medication, nutrition, physiology of pain, ergonomics, stress management, dysfunctional beliefs, and strategies to tackle pain. The guidance provided involved the taking of physical exercise, encouragement of movement, acceptance of pain, relaxation exercises, and active participation. As the main results, we identified a reduction in pain and disability,

**Table 2.** Recommendations used in the elaboration of the booklet

### Written Language

- Use of simple language, easy to understand and not technical, so that the content may be understood regardless of the reader's level of schooling<sup>19,20,22,24,26,32</sup>
- Ideas presented in a logical order<sup>20,22,26</sup>
- Use of analogies that are familiar to the target public<sup>20,22,32</sup>
- The tone shall not be childish or alarmist, but rather constructive, positive and encouraging<sup>20</sup>
- Information written as a conversation<sup>20,22,26</sup>
- No use of discriminatory expressions or words (or expressions) with double meaning<sup>24</sup>

### Illustration

- Images familiar to the target public, allowing the reader to gain identification to the message<sup>20,26</sup>
- Images used to relax the reader, to enliven, and to make the Reading lighter<sup>19</sup>

### Layout

- Black printing on a pale background<sup>20,32</sup>
- A legible font, larger than usual and with good definition<sup>20,22,26,32</sup>
- Information presented with maximum brevity, replacing long, verbose phrases by shorter ones<sup>20,26,32</sup>
- Good spacing between lines and paragraphs<sup>20,26</sup>
- No use of upper case or text with stylised fonts<sup>20,22,32</sup>
- Bold fonts used only for titles and highlighted points<sup>22,26,32</sup>
- Use of titles and subtitles, to make learning easier<sup>26,32</sup>

**Table 3.** Used articles

Biomedical model				
	Population	Intervention/comparison	Follow-up measures	Results
Udermann et al. <sup>32</sup>	Individuals with chronic low back pain	They received a copy of an educative book, written examination of its content, and two interviews by telephone.	Intensity of pain, episodes of pain, self-care behaviors, knowledge and opinion on the book.	Improvement in pain, in the understanding of the content and opinions on the text were positive in general. In 9 months of follow-up: significant improvement in pain, number of episodes and perceived benefit. After 18 months of follow-up, these benefits were maintained or have further improved.
Garcia et al. <sup>33</sup>	Individuals with chronic low back pain non-specific	Back school in groups / McKenzie individually. Both performed a set of daily exercises at home.	Pain intensity (visual analog scale (VAS)), disability (Roland-Morris), trunk flexion movement, quality of life (BREF)	The McKenzie method was slightly more effective than the Back school method for disability, but not for pain intensity immediately after the treatment. There was no untreated control group.
Hodselmans, Jaegers and Göeken <sup>34</sup>	Individuals with chronic low back pain	IG (intervention group): Back school program - somatic cognitive CG (control group): waiting list	Physical function and disability (RAND-36), ROM of the lumbar region,	The IG had a significant improvement in the functional status and perceived disability, probably attributable to appropriate perceptions of the physical symptoms.
Shirado et al. <sup>35</sup>	Individuals with chronic low back pain	Phase 1. A program run by an interdisciplinary team performed in groups with a 3-hour duration.	Pain intensity (VAS), the flexibility of the trunk and hamstrings (finger-floor distance, leg elevation), muscle strength and trunk endurance, and patient satisfaction.	The result was considered satisfactory for the treatment of patients with chronic low back pain. Teaching the mechanics of the body and perform therapeutic exercises, through a multidisciplinary team approach is essential for the management of chronic low back pain.
Tavafian et al. <sup>36</sup>	Women with chronic low back pain	Groups 1 and 2 were assessed and received treatment. Group 1 participated in the Back school program	Short Form Health Survey (SF-36)	The Back School" program was effective in the improvement of the quality of life of the patients. In the G2, the improvement was observed in three domains (pain, vitality and mental health), but these improvements were smaller than in G1.
Gaskell, Enright and Tyson <sup>37</sup>	Individuals with non-specific chronic low back pain	Nine group sessions of 2 hours each over 5 weeks.	Pain (VAS), disability (Roland Morris), anxiety and depression (HADS), perception of pain control, Fitness test and a 5-minute walking test	Levels of pain, disability, anxiety, and depression were significantly reduced. Fitness levels and perceived control improved significantly, suggesting that participants were more able to manage their low back pain. Limitations: There was no control group, and there was a high drop-out rate during the study.
Cecchi et al. <sup>41</sup>	Women with non-specific chronic low back pain	Back school, individual physiotherapy, and manipulation. All participants received a booklet with information about the anatomy and biomechanics of the spine, posture and ergonomics guidelines.	Disability Roland Morris Disability Questionnaire) and pain (Pain Rating Scale).	Spinal manipulation was better associated with functional improvement and long-term pain relief than back school or individual physiotherapy but received more additional treatment during the follow-up. Pain recurrences and drug consumption were also reduced in comparison to back school or individual therapy.
Sahinet al. <sup>38</sup>	Individuals with chronic low back pain	IG: performed exercises, physical treatment modalities, and a back school program. CG: performed exercises and received physical treatment modalities.	Pain intensity (VAS) and functionality (Oswestry Low Back Pain Disability Questionnaire)	Improvement in pain and functionality in both groups, but the difference between the scores at the end of the treatment and after 3 months of treatment was not significant.
Sadeghi-Abdollahi et al. <sup>39</sup>	Workers with chronic lower back pain	Back school Program	Pain intensity (VAS); quality of life (Short Form (SF-36).	Improvement, but not significant, of pain intensity. Three months after the end of the sessions, improvement became significant. No improvement in the quality of life was observed.
Andrade et al. <sup>40</sup>	Individuals with chronic low back pain	IG: Theoretical and practical program of the Escola de coluna (Spine School). CG: waiting list.	Pain intensity (VAS), functional capacity (Roland-Morris) and lumbar spine mobility (Schöber index).	Statistically significant improvement in pain intensity of pain, functional capacity and mobility of the lumbar spine in IG. A statistically significant difference was observed intragroup in the second and third assessments of the functional capacity and mobility variables of the lumbar spine.

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**Table 3.** Used articles – continuation

Abourazzak et al. <sup>42</sup>	Individuals with rheumatoid arthritis	Theoretical and practical education program	Knowledge of AR (self-questionnaire), disease activity (DAS 28), functional capacity (HAQ) and quality of life	Patient's knowledge 3 years after the education program has significantly improved. Disease activity was significantly lower in the education group after 3 years than at the beginning of the study.
<b>Biopsychosocial Model</b>				
	Population	Intervention/comparison	Follow-up measures	Results
Pieber et al. <sup>49</sup>	Individuals with chronic low back pain	Program: 40 sessions including endurance training, psychological interventions, ergonomics sessions and healthy eating habits.	Painless ROM, the strength of the spinal extensor muscles, pain (VAS), disability (Roland-Morris) and quality of life (SF-36).	All measurements improved significantly in the post-rehab assessment and remained in the 18 months after the intervention. There was no control group.
Buchner et al. <sup>56</sup>	Individuals with cervicalgia or chronic low back pain.	Multidisciplinary bio psychosocial therapy during 3 weeks of internment and 6 months of follow-up.	Return to the work, Quality of life (SF-36), pain intensity (VAS), functional capacity (Hannover back capacity score), and satisfaction with the therapy.	Both treatment groups had significantly improved all criteria. At the end of the follow-up period, there were no significant differences between the group with chronic neck pain and chronic back pain regarding the criteria to return to work, improvement in the quality of life, functional capacity, satisfaction with the therapy and pain reduction.
Morone et al. <sup>46</sup>	Patients with chronic low back pain	IG: Back school: Brief education and active exercises for the spine. CG: medical care. The medication was the same in both groups.	Pain intensity (VAS) quality of life (SF36) and disability (Oswestry Disability Index).	Quality of life and disability have significantly improved over time in the IG. The result of the perception of pain showed a reduction in both groups but was significantly lower in the IG at the end of the treatment and the two follow-ups.
Sorensen et al. <sup>52</sup>	Individuals with chronic low back pain	Educational program/ individual physical training program based on the symptoms.	Pain (Numerical Rating Scale), disability (Roland Morris), attitudes facing pain Fear-Avoidance Beliefs Questionnaire and Back Beliefs Questionnaire, quality of life, sick leave, use of medical services.	There was an improvement in disability and also in the beliefs of fear and avoidance in the education group. All the other variables were almost equally influenced by the two treatments
Rundelle Davenport <sup>57</sup>	70-year old woman with chronic low back pain.	Patient education based on the cognitive-behavioral theory.	Disability (Oswestry Disability Questionnaire), beliefs about pain (Fear-Avoidance Belief Questionnaire), symptoms of depression (Beck Depression Index) and self-efficacy (The Low Back Activity Confidence Scale).	Improvement in disability, fear-avoidance behaviors, depressive symptoms, and self-efficacy.
Coudeyre et al. <sup>58</sup>	Patients with subacute or chronic low back pain	IG: Back book and frequent physiotherapy. CG: frequent physical therapy along with non-standard oral information (restricted to the questions asked by patients)	Satisfaction, functional capacity; pain intensity (VAS), beliefs of fear and avoidance (Fear-Avoidance Questionnaire) and knowledge.	Receiving the "back book" had a significant impact on disability within 3 months, and also had a significant impact on the patients' knowledge and satisfaction, but little effect on the beliefs of fear and avoidance.
Wu et al. <sup>53</sup>	Individuals with knee osteoarthritis	The program provided information about osteoarthritis and coping skills.	Arthritis Self-efficacy Scale (ASE); The Survey of Pain Attitude (SOPA-35), consultations with healthcare professionals, number of days with pain and disability.	Significant differences were found in the beliefs of pain and days with pain after the intervention. After 8 weeks, there has been a significant improvement in self-efficacy, pain episodes and number of unplanned medical visits.

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**Table 3.** Used articles – continuation

Coleman et al. <sup>48</sup>	Patients with osteoarthritis	Specific self-management educational program together with written material.	Pain, physical function and mental health scales (WOMAC and SF-36)	There was an improvement in pain, function and mental health indexes.
Goeppinger et al. <sup>50</sup>	Patients with osteoarthritis	Specific intervention for people with arthritis (Arthritis Self-Help Course - ASHC) and other generic, Chronic Disease Self-Management Program (CDSMP).	Quality of life, self-management behaviors and self-efficacy for arthritis.	The ASHC group showed significant improvement in self-efficacy, stretching and muscle strengthening and general health. The CDSMP group showed significant improvement in self-efficacy, disability, pain, and general health. The CDSMP group produced better results.
Watson, Cosioe Lin <sup>47</sup>	Veterans with chronic idiopathic pain.	Classrooms Back School + handouts	Opinion, satisfaction and overall effectiveness of the program survey.	Participants reported learning new and useful "information", they considered the program "easy to understand", used the information learned, and recommended the program to others.
Salvetti et al. <sup>51</sup>	Individuals with chronic pain due to different diseases	A program that included physical exercises, psycho-educational group, sessions with an occupational therapist and a nutritionist.	Pain (VAS), disability (Oswestry Disability Index and Beck's Depression Inventory).	It was observed a significant reduction in pain intensity, disability, and depressive symptoms. These effects remained for a 6-month period.
Steihaug, Ahlsene Malterud <sup>54</sup>	Women with chronic muscle pain	From education to interaction: Eight treatment groups, each with 12 weeks duration, and three groups with 10 months duration.	Qualitative data analysis from field notes, focus groups, training videos, and discussion groups.	The training program is now focused on some simple exercises and is characterized by the awareness of the relationship between breathing and muscle tension. The groups become the main pillar of the program, characterized by safety and a feeling of belonging, reflection, and development.
Man et al. <sup>45</sup>	Patients with chronic pain	A program that includes education on pain, training in communication skills and coping strategies, physical exercises and functional activities.	Pain, catastrophism, self-efficacy, functional capacity and use of drugs.	Improvement in pain, quality of life, catastrophization, self-efficacy, functional capacity and improvement in employment rate.
Thorn et al. <sup>44</sup>	Heterogeneous group with chronic pain. Rural area	Cognitive behavioral therapy (CBT): addressed thoughts and feelings in response to pain and stress. Education (EDU): addressed facts about the body, pain, and learning.	Pain intensity (Wisconsin Brief Pain Inventory), disability (Roland-Morris), catastrophism, depression, satisfaction, and quality of life.	Patients in both conditions reported significant improvement in all results related to pain. A non-significant trend was found for depressive mood with better improvement in CBT than EDU. Treatment gains were kept at 6 months of follow-up.
Quintneret al. <sup>55</sup>	People with persistent pain.	Educational workshops Self-Training (STEPS): group educational program for 8 hours during two days, followed by optional medical visits initiated by the patient.	The number of patients who completed, costs per new patient, use of health care, perceived changes and pain management strategies.	The introduction of STEPS was associated with the reduction of public health services costs, increased use of pain management strategies and patient satisfaction.
Combined model - Neurophysiology				
	Population	Intervention/comparison	Follow-up measures	Results
Moseley <sup>59</sup>	Patients with chronic low back pain	Weekly, each patient had two physiotherapy sessions and one individual educational session on the neurophysiology of pain for four weeks.	Pain and disability (numeric pain scale and Roland Morris Questionnaire)	The physiotherapy program reduced pain and disability, and the effect of the treatment remained for one year.
Moseley <sup>16</sup>	Patients with chronic low back pain	An individual educational session on the lumbar spine and pain physiology.	Attitudes facing pain (SOPA), catastrophism (PCS) and physical performance.	There was a strong relationship between cognitive change and change in physical performance, mainly explained by the change in the catastrophic belief that pain means tissue damage.

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**Table 3.** Used articles – continuation

Van Oosterwijck et al. <sup>66</sup>	Patients with whiplash-associated chronic diseases.	Two educational sessions of 30 minutes each and a leaflet on the neurophysiology of pain.	Pain, kinesophobia, attitudes vis-à-vis the pain, cervical extension test, and brachial plexus test.	A significant decrease in kinesophobia and passive coping strategies.
Van Oosterwijck et al. <sup>60</sup>	Patients with fibromyalgia	IG: Education on the physiology of pain CG: self-management	Effectiveness of the inhibitory mechanism of pain, pressure pain threshold and questionnaires to assess pain cognitions, behavior, and health.	IG: improvement in the knowledge of pain neurophysiology, less concern with their short-term pain. Long-term improvements were observed in physical functioning, vitality, mental health and general health. In addition, the IG reported lower levels of pain and improvement of endogenous pain inhibition in comparison with the control group.
Ryan et al. <sup>62</sup>	Individuals with chronic low back pain	Education in the biology of pain and group exercise classes (EDEX) and pain biology learning in a single group (ED)	Pain (numerical scale) and disability Roland Morris), self-efficacy, tests of physical performance and monitoring of activities in daily life.	More favorable results in the ED group. In the short term, the teaching of the biology of pain was more effective than the combination of teaching the biology of pain and group exercise classes.
Louw, Puentedura and Mintken <sup>61</sup>	Individuals with chronic low back pain	Education in neuroscience; and refresher training before and during exercises and water therapy.	Pain (VAS), beliefs and fears facing pain (Fear Avoidance); depression (Zung Depression Scale) and disability (Oswestry Disability Index)	One patient reported improvement in the four measures, mainly in the beliefs and behaviors facing pain. In a 7-month follow-up, all the measures continued to improve.
Moseley, Nicholas and Hodges <sup>63</sup>	Individuals with chronic low back pain	IG: one individual session on the neurophysiology of pain. CG: a class on anatomy and physiology of the spine. At the end of the session, each participant received an exercise book with 10 sections.	Attitudes facing pain (SOUP); catastrophism (Pain Catastrophizing Scale); disability Roland Morris; physical performance tasks.	In the IG, it was observed a normalization in the attitudes and beliefs regarding pain, a reduction of the catastrophism and an improvement in the physical performance. Patients were less likely to seek care from other people, more likely to believe that they could control their own pain, that pain is influenced by emotional states, less likely to believe that pain is an indication of tissue damage, and perceived themselves as less disabled.
Moseley <sup>64</sup>	Case Study. A 36-year-old woman with chronic back pain.	Education in the physiology of pain: The initial physiotherapy session aimed at teaching the patient how to perform a task. Daily practice	McGill Pain Questionnaire, Roland Morris Questionnaire, Fear Avoidance Questionnaire and self-efficacy pain questionnaire.	A sharp reduction in cortical activation in areas usually involved in pain. Education on pain physiology can be an effective strategy to overcome the barriers to acquire normal trunk muscle control in patients with low back pain _
Gallagher, McAuley Moseley <sup>65</sup>	Individuals with chronic pain	Protocol: Two interventions, both using a booklet. Booklet 1 (IG): Metaphors and stories to help understand the biology of pain and concepts about pain management. Booklet 2 (CG): Advice on handling pain.	Questionnaire about pain biology, catastrophism, pain, and disability.	An increase of knowledge on the biology of pain in IG, but not in the CG. Higher reduction of catastrophic thoughts related to pain in IG than in the CG. Although both groups have improved over time, there was no differential effect on pain and disability.

and an improvement in the general state of health, quality of life, self-efficiency, and strategies to tackle pain. There was also a reduction in poorly adaptive beliefs.

The studies considered as mixed address content related to the neurophysiology of pain (characteristics, purpose, and processing of acute and chronic pain), sustenance factors, behavior, beliefs, and cultural values. As a strategy, we observed the use of illustrations, examples, and metaphors; delivery of an exercise book to take home; a log book of pain; an informative leaflet, and application of a questionnaire about the neurophysiology of pain. We also observed the inclusion of the practice of physical exercise and guidance for doing exercises at home.

In the second phase, 60 people with CP were interviewed. Out of this universe, 52 (86.6%) were female. The ages of the interviewees ranged

from 28 to 67 years old. One of the patients had to be removed from the study as this patient was called over for medical treatment. This meant that the answers of 59 patients were analyzed (Table 4). The four outlines were answered as shown in the flow chart (Figure 1).

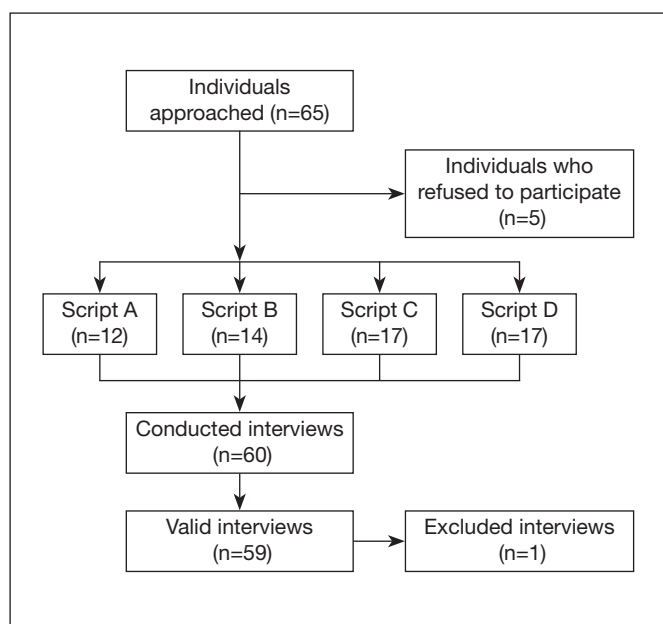
A summary of the results of the interviews, divided into scripts A, B, C and D is shown in table 5. The main findings of the interviews are presented in the following subcategories:

1. Meanings of pain, in which we noticed that pain was understood as being a kind of sensitive stimulus: *“everyone feels pain the same way”* (R27), *“Pain is always Pain”* (R35).
2. Causes of pain, where most patients established a link to physical causes: *carrying heavy weight; sitting down or standing up for long periods* – R2, R11, R12; and emotional causes: *pressure at work, and difficulty with interpersonal relationships* – R4, R6, and R14.

**Table 4.** Models with respective themes and guidance as addressed and results found

Models	Themes	Guidance/Strategies	Main Results
Biomedical	Anatomy and biomechanics <sup>32-40</sup> ; Epidemiology and pathophysiology of pain <sup>33,37,38,40,41</sup> .	Correct posture and movements in daily activities <sup>33,35-39,41</sup> ; Physical Exercise <sup>33,34,37,41</sup> ; Stay active <sup>35,37,41</sup> .	Reduction of pain <sup>32,33,35,37-40</sup> ; Reduction of incapacity <sup>34,37,38,40</sup> ; Improvement to quality of life <sup>36</sup> ; Awareness of the problem <sup>42</sup> ; Satisfaction <sup>42</sup> ; Improved spinal mobility <sup>40</sup> ; Reduction of anxiety and depression <sup>37</sup> ; Perceived Control <sup>37</sup> ; Improved physical ability <sup>37</sup> .
Biopsychosocial	Management of pain <sup>43,47</sup> ; Pharmaceuticals <sup>47,48</sup> ; Nutrition <sup>47,49-51</sup> ; Sleep <sup>44,47</sup> ; Anatomy and pathology <sup>47,49,53,53</sup> ; Basic physiology of pain <sup>44,51,54,55</sup> ; Ergonomics <sup>46,49,51,54,56</sup> ; Response to pain, management of stress and mental health, dysfunctional beliefs, poorly adaptive behaviours, and capacity to tackle pain <sup>43,45,51,53,56</sup> .	Physical exercise <sup>46,51,53,55</sup> ; Encouragement of spontaneous movements <sup>52</sup> ; Acceptance of pain and use of relaxation during routine daily activities <sup>56</sup> ; Stopping smoking <sup>47</sup> ; Weight control <sup>47,48</sup> ; Mapping of the problem <sup>52</sup> ; Counselling sessions <sup>53</sup> ; Principles of behavioral cognitive therapy <sup>48,50,51,55-57</sup> ; Explanatory leaflets <sup>48</sup> ; Activity sheets <sup>55</sup> ; Techniques for motivation and self-regulation <sup>43</sup> .	Reduction of intensity of pain <sup>44,46,48-51,56</sup> ; Reduction of physical incapacity <sup>44,46,47,49-51,53,56-58</sup> ; Improvement in general health and quality of life (QoL) <sup>44,46,47,49,50</sup> ; Improvement to self-efficiency and strategies for management and tackling of pain <sup>43,50,53</sup> ; Reduction of catastrophism and poorly adaptive beliefs <sup>44,52</sup> ; Reduction of symptoms showing depression and anxiety <sup>44,51</sup> ; Improved awareness <sup>43,58</sup> ; Satisfaction <sup>55,56,58</sup> ; Reduction of health expenses <sup>53,55</sup> ; Increased rate of return to work <sup>56</sup> .
Neurophysiology of pain	Characteristics, purpose, and processing of acute pain, and processing and sustenance factors for chronic pain, including emotions, stress, cognition, and behaviour <sup>16,59,60-66</sup> .	Use of illustrations, examples and metaphors <sup>61,64,66</sup> ; Exercise booklets for home <sup>59,63</sup> ; Pain log book <sup>64</sup> ; Informative leaflet <sup>60,66</sup> ; Questionnaire on the neurophysiology of pain <sup>65,66</sup> ; Practice of exercises <sup>59,61</sup> .	Pain education <sup>59-62</sup> ; Greater tolerance to pain <sup>62,66</sup> ; Reduction of incapacity <sup>59,61,61</sup> ; Normalization of attitudes and beliefs with regard to pain <sup>16,61-63</sup> ; Improvement in vitality and mental health <sup>60</sup> ; Reduction of catastrophism <sup>16,61-63,65</sup> ; Improvement to physical performance <sup>60,61,65,66</sup> ; Increased awareness about the biology of pain <sup>65</sup> ; Reduction of concern about pain in the short term <sup>60</sup> ; Improved endogenous inhibition <sup>60</sup> ; Changes to brain activities <sup>64</sup> .

(Prepared by the authors)



**Figure 1.** Flow chart for data collection  
(Prepared by the author).

3. Processing of pain, showing lack of awareness by most of the interviewees, as shown by the answer given by R23: “*this is a big question mark in our heads*”.

4. Mistaken beliefs. It was observed that, even among people who coexist with pain, there is a strong association between pain and lesions. “*Surely, this is why I say this is a warning light for us*” (R10); “*When you feel pain, it is a warn to you to stop*” (R1).

The ‘*EducaDor*’ booklet (<http://www7.bahiana.edu.br/ljspuil/handle/bahiana/540>) was designed in A5 size (14,8cmx21,0cm) with 18 pages. The sections were subdivided thus: 1) What is pain? 2) Acute Pain; Useful Pain; 3) Chronic Pain; Persistent Pain; 4) Coexistence with pain; 5) False ideas about Chronic Pain; Don’t Believe Them; 6) Strategies to deal with Pain.

An illustration of the brain (Figures 2 and 3) was created to clarify aspects related to neuromodulation and central pain sensitization.

At the end of the booklet there are the following recommendations: “be curious”, “observe the pain” and also “look beyond pain”, giving a positive reinforcement to any adjustments as may be necessary for a better quality of life, less disability, and less suffering, even if coexistence with pain is indeed necessary.



**Table 5.** Synthesis of the interviews scripts

## Script A - Theme: What is pain?

Do you think that the size of the body injury determines how much the person will feel pain?

The association between the size of the injury size and the pain presence was reported by 5 of the 12 interviewees, as can be observed in the speech of R12, which related the size of the injury to the greatest pain: *"I think the intense injury will generate a greater pain.... and in fibromyalgia you have to learn how to live with it, otherwise you get desperate ... sometimes I am feeling well, but at other times I cannot even get up. So, this is not compared to a small injury, it's compared to a big one"*. As for four individuals, this association does not exist, as exemplified by the report of R10 on its experience after a surgical procedure: *"When I did my heart surgery I felt a lot of pain, I got to take morphine. There were patients there who did the same surgery I did, and the pain was not such intense. So, no matter the size of the hurt, or injury, it has nothing to do"*.

**Do you think there is a possibility of a non-painful injury on the body?**

Most of the interviewees (8) stated that there is no possibility of an injury not to cause pain; some of them were emphatic, while others were not so sure. Two patients interviewed mentioned herniated disc as an example of an injury where pain relieves but does not cease with the use of medication. R12, however, referred to the herniated disc to justify her understanding that there may be an injury that does not cause pain, which is visible in her statement: *"It's possible once I've heard reports from several people saying they have three, four hernias and feel nothing"*. Another respondent, R2, mentioned leprosy, to exemplify the existence of a painless injury.

**Do you think pain can work as a warning system so that you stop doing what you're doing?**

Only one interviewee does not believe that pain can work as a warning system for the individual to stop what he is doing. The other interviewees, despite the chronic pain, stated that pain can act as a warning. One of them, R11, was emphatic in reporting: *"For sure, that's why I say it's a warning sign for us"*.

Do you think that the amount of money or study of a person has influences in how much pain he/she feels?

The question that investigated whether there is a relationship between the amount of money or study and the amount of pain that the person feels divided opinions. The interviewees related the financial condition to the possibility of seeking resources for their relief and even to discover the cure, but also related to increased stress and concerns. These data can be observed by the reports of two of them: R7 stated that *"no money can stop the pain ... not the chronic pain, as the chronic pain is even horrible"* and R11, when reflecting on his own history complained: *"I spent so many hours sitting, working, and then I harmed my own health. So today I look back and see the evil I've done to myself"*.

**Do you use the same treatment method when you feel a momentary pain or when this pain lasts for several months?**

When asked if they would use the same treatment method when experiencing both momentary pain and pain lasting for months, most of the answers were negative. Momentary pain, as has been made clear, has a short duration. The R12 speech exemplifies well this representation since she points that it is a pain that *"comes and goes"*. Regarding the handling of momentary pain, the responses indicated two strategies: the use of medications and the visit to the emergency. In turn, the pain that lasts has been considered to be the one that merely gets better, but it does not cease. Several methods were used for its handling, namely acupuncture, physical therapy, blockade, RPG, water aerobics, physical conditioning, chiropractic, swimming and also the ambulatory treatment of pain.

**Is there a discomfort difference between the pain that comes and goes and the one that lasts?**

Only one person said there is no difference between pain that comes and goes and another one that lasts, but she did not explain the reason. The lasting pain was mentioned as the pain that is not forgotten, that decreases its intensity, but it remains forever. It was also related to desperation, sleep disturbance, and drug dependence. For R12, the difference consists of the following: *"the pain that comes and goes, a headache that you take an analgesic and it ceases instantly. The pain that comes sneaky makes you nervous, stressed, you have to learn how to live with it, so to live well I have to get used to the pain"*.

## Script B - Theme: How does the body perceive and process pain?

**How do you think an aggressive stimulus turns into a pain in our body?**

The great majority of the individuals interviewed stated that they did not know how the transformation of an aggressive stimulus into pain happens, as can be seen in the R23 speech: *"It's a questioning in our mind"*.

**Are you able to differentiate a nerve, the marrow, and the brain? How could each be related to pain?**

Few interviewees knew differences between nerve, marrow, and brain. There have been some attempts, observed in speeches such as: *"each one hurts in one place"*, *"our body is a whole"*; *"everything is connected to the nervous system"*; *"may be linked to the emotional system that triggers pain throughout the body"*. Three of the interviewees highlighted the brain. One of them, R15, said: *"when we work our brain we can improve; when we put in our mind that we can, that we are capable of, we strive and we can improve"*. One of the interviewees attributed the pain he feels to the nerve: *"I think it hurts because of the nerve"*.

**Do you think that in the body there is some form or substance to decrease the pain felt by a person?**

Most interviewees believe that in the body there is some form or substance that can decrease the pain felt by a person. Some strategies for pain reduction were mentioned, such as: do exercises, stretches, rest, being joyful and being calm. One interviewee conditioned the improvement to the presence of a professional: *"if there is a professional who can guide us and say what we have, and what we can improve, and how we can collaborate"*. One person attributed the role of decreasing pain to antibodies, while another one mentioned the hormones. R26 was more specific: *"Endorphin, right? That stimulates us... when we are more joyful the pain decreases"*.

**How long have you been in pain? Do you think the painful information could be recorded in the body?**

The interviewees reported a varied time of pain coexistence. Most of them said they felt pain between 2 and 12 years. As for the questioning about the possibility of recording the painful information, opinions were divided. Among those who believe that the pain is recorded, R19, who has been living with chronic pain for 10 years, mentioned suffering as a cause: *"because we suffer so much that it gets marked"*. R16, who also has been suffering for 10 years, related the pain presence to the belief: *"And everything comes from the mind, right? If I say that the hand is aching and put it in my mind, it will hurt"*. R17 agreed about the pain record and explained as follows: *"because we see that place and looks like we're already in pain"*.

Continue...

**Table 5.** Synthesis of the interviews scripts – continuation**Do you believe that your emotional state influences your pain? Why?**

Only one interviewee said he did not believe that his emotional state influenced his pain: *“I do not think so, I think everything is the same”*. Other interviewees expressed the influence of the emotional state in many ways, as can be observed in the following speech: *“When I get nervous, I feel my whole body aching”*. Two interviewees commented that thinking influences the pain they feel. One of them was emphatic: *“Sure ... the more you think about pain, the more it hurts”*.

Script C - Theme: How do I influence my pain?

**Do you think a person's intellectual level influences how they feel the pain?**

The questioning about the intellectual level's influence on the way the pain is felt has divided opinions. Some aspects have been mentioned as favorable to those with a higher intellectual level, such as: having other means of dealing with their problem, knowing how to act, knowing how to care themselves, asking for help and being distracted. R33 believes that most important is how to deal with pain: *“If you're weak, you just think about your pain, that has no solution, and then it ends up getting worse. If you do not take it too seriously, think it will end up soon”*.

**Do you think culture affects pain?**

The great majority of interviewees (13) stated they do not believe that pain was influenced by culture. The way of treating pain, access to natural resources and receiving guidelines were mentioned as aspects influenced by culture. R37 highlighted the importance of how a person deals with the problem: *“I think pain is pain, it depends on how you look. I live like this for 20 years. Either you learn to live with this difficulty, or you die. And I rather live, because I've been almost dead. And my positive attitude influences other close people who do not know how to face the pain. We have to fight to live. There are people who give up living. The poorest people are more likely to deal with this situation”*.

Have you ever missed school or work because of the pain?

Most people interviewed (9) reported difficulty in reconciling work with pain. Difficulties relating to the working environment, the necessity of returning home, stress and visits to the emergency were the mentioned aspects. R38 attributed his absence from work to the pain: *“Today I do not work because of the pain, I'm away from work. It was very bad, I could not do my job properly, any movement would increase the pain, and that would steal my joy”*. Four people reported they never missed a day of work because of the pain. One of them, R30, despite saying that *“it was horrible”*, considered, *“it's the way I face my life”*. One interviewee reported she had stopped studying because she could not stand still. Another one, however, noted that during the classes she was distracted and forgot the pain.

**Do you believe that fat influences the pain a person feels?**

Only two people interviewed said they do not believe there is a relationship between obesity and pain. One of them, R29, justified her opinion with her own example: *“I guess it does not influence, because I was fat and now I'm not, and I still feel pain”*. However, most interviewees (15) believe that there is an association between obesity and pain. The justifications were related to the difficulty of walking, moving and carrying out daily activities. R33 considered: *“It's already difficult to bear the pain, let alone the weight”*.

**Who feels pain the most, man or woman?**

As for the questioning about the relationship between gender and pain, the great majority believes that women feel more pain than men. One of them, R34 justified the fact by the multiple activities developed by women: *“Because the woman works at home, in the field, she has sons. The woman's work exposes her more to the pain, because she falls, cuts the finger on the ax”*. Men were identified as having the lowest threshold and also a lower pain tolerance, as can be observed in the speech of R36: *“Because men feeling a little pain spend all day in bed. Most men are like that. I'm 'dying' of pain, and I'm always doing things”*. R37, who shares the same opinion, adds: *“When a man has pain he goes on saying he is 'dying'”*.

**Can physical activity influence pain?**

Almost all interviewees (15) stated that they believe that the practice of physical activity contributes to the pain improvement. R28, however, made a reservation: *“If physical activity is done properly, it improves pain”*. Interviewee R37 stated her doctor advised her to do physical activity, but realizes that she has no condition: *“I have arthritis, I cannot walk”*. One interviewee (R40) presented a point of view different from the others: *“There are people who do physical activity and report a pain worsening right after”*.

**Do you think that alcohol consumption influences the pain people feel?**

Alcohol consumption is associated with increased pain, in the opinion of the majority of interviewees to this question. Three people reported that they drink to temporarily relieve pain, stating that it *“softens”* (R30), *“dozes off”* (R37), *“anaesthetize”* the pain (R38). Some interviewees stated drinking is pointed out by others as associated with pain relief, as noted in R32's speech: *“I've seen a lot of people say that they drink to get better”*. It was observed a position opposite to the consumption of alcohol by some interviewees: *“Alcohol affects everything! It affects the judgment, the heart”*. (R35) *“I do not drink anymore, and I am against who drinks because I think it affects everything, morals, the body”* (R39).

Do you think that smoking influences the pain people feel?

Smoking is associated with increased pain, in the opinion of most of the interviewees. Many of them even made observations on other ravages caused by cigarettes. As with alcohol consumption, one interviewee considered that use of the cigarette *“anaesthetize”* the pain (R30). There was a strong rejection of cigarette use by some interviewees: *“Cigarette causes disease, worsens pain”* (R33); *“Smoking is not good. You get that itch in your throat, throat clearing, harming your lungs”* (R35); *“Smoking is bad for health, it causes several problems”* (R40).

**Do you think that spiritual practices influence the pain people feel?**

The relationship between spiritual practices and pain divided opinions. Interviewees who believe that spiritual practices contribute positively were more detailed in their observations, as noted in R39: *“I think it improves, we feel safer, we have to believe in something; otherwise things get worse”*. Prayers and beliefs were mentioned as pain relief factors. R42 believes that spiritual practices do not influence the pain's improvement or worsening, but they promote comfort, and he concludes: *“It gives us support, a peace of mind for us to be calm”*.

Continue...

**Table 5.** Synthesis of the interviews scripts – continuation**Script D - Theme: How to control pain?****What do you do when you are in pain?**

When asked about pain control, the main reference was the medication, mentioned by all interviewees. Some, like R42, have mentioned venous blockade as a form of pain control. *“It’s a palliative that is great for me! If I could, I would take it every day, so I did not have to feel ‘it’ (the pain)”*. *Because when we leave, we come out renewed, sleep is calmer*. In addition to medication, other practices have been mentioned for pain relief, such as prayer, rest, relaxation, physical activities, embroidery, massage, acupuncture, and physiotherapy.

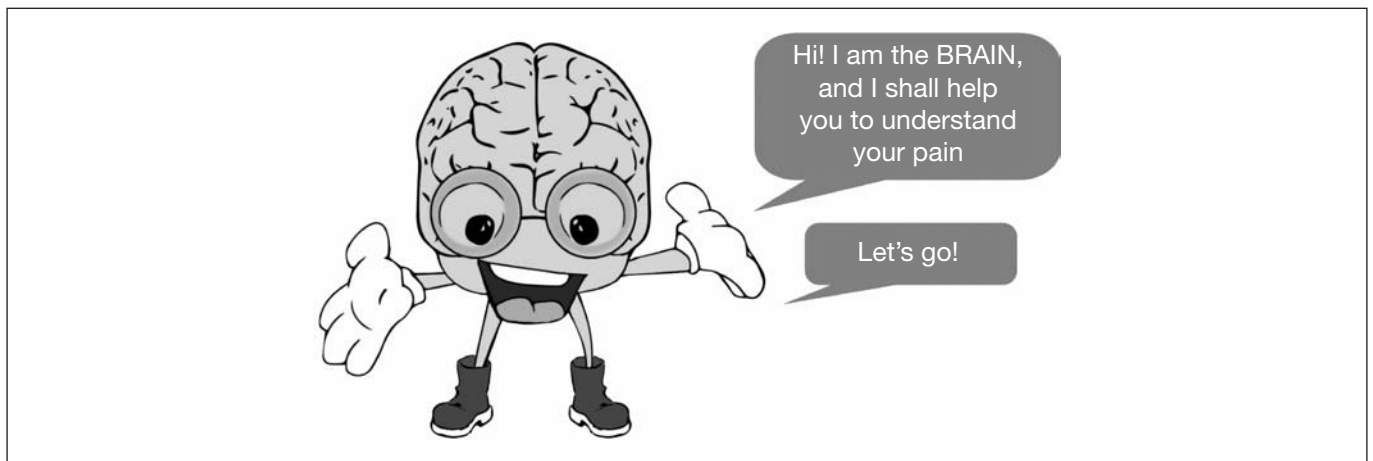
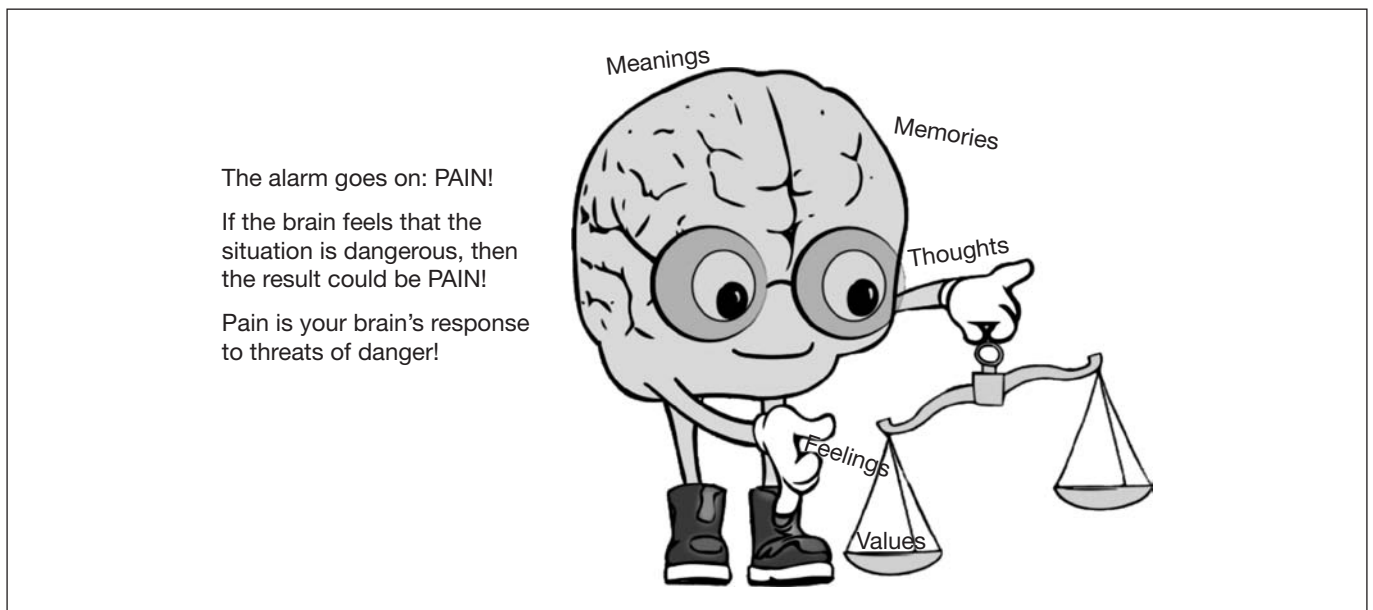
**Do you think there is a relationship between movement and pain?**

Most interviewees related the pain they feel to the movements they perform, as can be seen in the speech of R46: *“when I start to move, I start to feel pain”*. Some note that despite this, they need to move: *“I think when I stop it worsens, that’s where I have to move myself”* (R50). The same understanding was reported by R52: *“you have to keep doing things, I do, I’ve done all my life, I do not mind, I do them even when I feel pain, it ceases, then it comes back, it happens again, I live my life like this”*.

**Do you believe you can re-educate yourself so that you can move in spite of the pain?**

The great majority of interviewees stated they believe they can re-educate themselves to keep on moving in spite of the pain. Only R44 did not believe this possibility: *“no, only if I take medicine, for me it’s the medicine because I have not seen anything else to make it better, I do not see anything”*. R54 said he believed in re-education, although he did not have this experience: *“I know that for some people it works, I’ve never tried to do it myself”*.

Source: prepared by the authors

**Figure 2.** The brain, the leading actor of our booklet**Figure 3.** The brain, faced with a threat of danger

## DISCUSSION

The development process led to a booklet for people who live with CP. Its content, with both text and illustrations, sought to establish a new concept for chronic pain, and also to change mistaken beliefs about pain and poorly adaptive behavior when facing the problem. With the theoretical backing of scientific literature, together with the experience of physiotherapists specialized in the treatment of CP, the approximation of people who have lived through the problem and the analysis of similar resources available in other languages, we arrived at the final product as shown in the final study.

International guidelines recommend social and educational programs for dealing with CP<sup>15-17</sup>. The lack of understanding of the meaning of steady pain has been suggested as the factor responsible for the exacerbation of the symptom<sup>60</sup>. Lack of appropriate knowledge means that the subject regards pain as a threat, thus maintaining poorly adaptive behavior patterns<sup>28</sup> and preventing the development of strategies for effective strategies for tackling this problem. For this reason, socio-educational interventions have been tested, and have shown promising results for the treatment of people with CP<sup>7,16,67</sup>.

Aligned with the biopsychosocial model, this booklet sought to shed light on the subjective and individual character of CP, thereby proving the inability to generalize the problem<sup>10</sup>. In addition, socio-cultural aspects that perpetuate CP, and also the relevance of the person's change of behavior for more effective results of the control process<sup>68,69</sup>. Regarding the biological aspects of CP, there has been the inclusion of content about neurophysiology and neuromodulation, for which we have found evidence in the specialized literature that could justify their recommendation<sup>60</sup>.

The concepts were presented in a simple and objective manner, with the use of metaphors. Similar methodologies were applied in other studies, and have shown the positive impact regarding knowledge of, and level of satisfaction with, the information at hand. However, they mention very little effect upon beliefs, fear, and evitation<sup>58</sup>. These results suggest a need for widespread testing of the several bio psychosocial aspects, with outcomes that could be modified by this intervention model.

The group of specialists considered the density of the issues addressed as being appropriate for the target public. Studies that have assessed similar tools<sup>70,71</sup> have confirmed the importance of having the material suitable for the target public. Accessible language, written as if it were a conversation, with color illustrations and cuttings of the utterances of the patients: these have been just some of the resources that were used to make reading easier and more attractive<sup>19,21,26,71</sup>.

The 'meaning of pain' sub-category showed a need to expand the concept of pain, thereby reinforcing its subjective and individual character and showing the roles played by society and culture in this painful experience<sup>69</sup>. Characters in the booklet make it clear that pain is not synonymous with nociception and show the subjectivity of the painful experience. This aspect has the backing of the influence of social and cultural domains, and of feelings experienced in the processing of information by the central nervous system, with regard to CP. Knowledge of how pain is processed has been suggested as a strategy for its resignification<sup>72</sup>. Acute pain has been shown as a brain response to the threat of danger, while the CP was connected to the mistaken interpretation of information. The consequences are the amplification of sensory stimuli and the fact that fewer inputs would be sufficient for its activation, which could lead to pain<sup>73</sup>.

Nijs et al.<sup>72</sup> suggest that the phenomenon of central sensitization should be taught based on the book *Explain Pain*<sup>18</sup>, with dense content. Hence, there was the selection of essential topics that could be understood by the target population. A study carried out in 2013 by the Brazilian Ministry of Education identified 17.8% of functionally illiterate people in Brazil. This dire reality is even worse in the Brazilian Northeast, the region that has the highest levels of functional illiteracy<sup>74</sup>.

With regard to mistaken beliefs, we see that poorly adaptive behavior and the persistence thereof could lead to physical deconditioning and to the difficulty to resume domestic and work activities<sup>7</sup>. The understanding of the attitudes necessary for pain control and non-exposure to predictive factors have been widely recommended<sup>4,15,17</sup>.

The expectation of a medical cure and attribution of religious aspects for the problem or for its solution are the greatest factors for the perpetuation of the symptoms<sup>18</sup>. The control and management of CP require a complete awareness of reality and a positive attitude with regard to the problem.

One limitation shown by the work is the lack of social and demographic data about the patients. However, as this is a segment of the population seen to in a SUS outpatient center, most of the patients are people of a low social and economic level, with a low level of schooling, as has been shown in other studies based on this same population<sup>75</sup>. A systematic review in the future could provide better grounds for the development of light technologies, such as the one proposed in the present study.

## CONCLUSION

The 'EducaDor' booklet is an example of light technology in health-care, which provides grounds for social and educational programs to address chronic pain. Future studies shall validate and appraise its efficiency through a randomised clinical trial.

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