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NON-PHARMACOLOGICAL MEASURES IN THE PERSON WITH PAIN:
SENSITIVE RESULTS OF NURSES' INTERVENTION
SYSTEMATIC REVIEW OF LITERATURE

Amélia Matos – RN, MsC, Hospital Center Lisboa North, Portugal
Ruben Cardoso – RN, MsC, Hospital Center Lisboa North, Portugal
Sónia Coisinha – RN, Hospital Center Lisboa North Portugal
Sónia Silveira – RN, MsC, Hospital Center Lisboa North, Portugal
Vanessa Lotra – RN, Hospital Center Lisboa North, Portugal
César Fonseca – UPhD, University of Évora, Investigator POCTEP 0445_4IE_4_P, Portugal

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ABSTRACT

Objective: to identify the sensitive results of nursing interventions at the level of non-pharmacological measures in the person with pain.

Methodology: systematic review of the literature with research in EBSCO (CINAHL and MEDLINE), between January 2012 and October 2017, using the PI[C]O method. We selected 9 articles for analysis.

Results: Sensitive results identified for chronic pain – symptom control (decrease in pain intensity), functional status (increase in joint amplitude), effective adaptation strategies (improvement of well-being and comfort) and self-care (satisfaction); for acute pain – symptom control. Training is fundamental for self-management for people with pain and for the development of nurses' competences.

Conclusions: complementary non-pharmacological measures in comparison to conventional therapies have positive effects on pain control in adults and on the elderly.

Keywords: Nursing; nursing care; nursing intervention; ache; pain management; alternative therapies; non-pharmacological measures and quality of life.

INTRODUCTION

Pain is one of the main causes of human suffering; it compromises one's quality of life and interferes with their physical and psychosocial well-being. It's an unpleasant multidimensional experience, transversal to all phases of the cycle of life, with sensorial, emotional and motivational characteristics consisting four components: Sensorial discriminatory, effective and emotional, cognitive and behavioral. In addition to the quality and quantity aspects of the painful sensation and the different emotions involved, one has to consider that the meanings given to pain, by the person in pain, are influenced by several sociocultural factors, their family and personal history, as well as behavioral components, regarding the expression of pain and their way of managing of pain, in its several components[1].

According to the International Association for the Study of Pain[2], pain is existing all over the world, affecting different parts of the body and with different levels of intensity. We verified that 95% of the population globally as experienced pain in their body and over half the world population suffers in pain regularly. Throughout life, pain is one of the main reasons to go to a medical consult, taking medication and of labor absence[3].

In Portugal, according to the Pain Proposal[4] study, about 36% of the population suffers with chronic pain, being that 16% of cases is moderate to strong and affects the execution of domestic and labor activities, with big repercussion in the emotional well-being (depression).

With the elderly, the chronic pain tends to be multi-focused and multi-factorial, associated with depression, the decrease of socializing and functional capability, the sleep disorders, the walk and the mobility syndrome[5]. Pain[6] triggers a cycle of disuse and inactivity, reducing the amplitude of articular movements as a consequence of the inhibition of reflective muscles, resulting in muscle weakness and loss of physical functions. The incapacity increases with more intensity and a higher number of places of pain. The treatment must have as a goal to reduce pain to a level that allows preserving one's physical capabilities.

Several studies define de use of pharmacologic strategies as the most important and effective way to mitigate pain, but that increase health costs[7] in which, after a prescription of opioids, the daily cost per person in pain doubles. The isolates use of pharmacologic resources appears insufficient, so the non-pharmacologic strategies contributed an important resource in the mitigation of pain, especially when combined with the medicine regime, with the potential to reduce the health costs of a conventional medicine practice[11].

In that same line of thought, for the National Institute of Health and Care Excellence[9], its more beneficiary for the management of pain the implementation of non-pharmacologic interventions conjugated with pharmacologic interventions. We must consider the holistic and multidisciplinary approach regarding its subjectivity and the complexity of the fenomenon of pain.

It's up to the nurse to evaluate, diagnose, plan and execute the necessary interventions, judging the results. To do so, there should be someone else involved in the process, inform about pain and control measures, educate about pharmacologic and non-pharmacologic measures, so all the possibilities are known and they can participate in the choice of strategies to adopt[10].

According to the Nurses Order[11], the non-pharmacologic interventions work as an important resource for pain relief, either being used isolated or in a set of pharmacologic interventions. These shall be chosen according to the patient's preferences, the goals of treatment and scientific evidence available. The non-pharmacologic interventions are classified in physical (like, thermotherapy, exercise, massage and crosscut electric stimulation); Cognitive – behavioral (like distraction, guided imagination, cognitive reconstruction, relaxation, biofeedback, exercise) and of emotional support (as a therapeutically touch and comfort)[10].

In this sense, when we verify in our practice the limitations of the exclusively pharmacologic interventions, and for recognizing that the systemic and systematic approach allow to focus the attention on the pain considering all the evolving system, we intend to know the actual evidence about the efficacy of the non-pharmacologic measures done by nurses in pain control.

This systematic review of literature has as a goal to identify the sensible results of the Nursing interventions to the level of non-pharmacologic measures in the person in pain.

Concepts

"**Pain** is a sensorial and emotional and unpleasant experience associated to the tissue injury real or potential, or described in terms of said injury"[2] and it can be classified as sharp when occurs after an injury in the body, associated to the inflammatory response and persists as the healing occurs, being associated to physical signs, goal and of short duration; or chronic when it persists for over three months, beyond the healing time of the injury that caused the pain in the first place. Chronic pain may have nociceptive and neuropathic components, which requires a combination of medication and non-pharmacologic treatments[12].

A **nursing intervention**, according to the International Classification to the Practice of Nursing[13], it's the "action taken in response to a Nursing diagnosis as to obtain a Nursing result". Autonomous Nursing interventions are, according to the Regulations of Nursing Practice (Regulamento do Exercício da Prática Enfermagem (REPE))[14], "the action taken by nurses, under their own exclusive initiative and responsibility, according with the respective professional qualifications,, being caregiving, management, education, training or advice, with the contributes in the nursing investigation".

The **non-pharmacologic measures** may a group into cognitive-behavioral interventions and in physical/physical agent's measures. The cognitive-behavioral interventions include, among others, educational intervention, relaxation exercises, guided imagination, distraction and biofeedback. The physical/physical agents measures include, the application of heat and/or cold, massage and exercise[12].

The **sensible results to the nursing care** may define as all those relevant, based on the domain and intervention from the nurses, to which we have empiric evidence that relates the nurse's input and the result of the intervention[15]. Several were the national and international studies done to turn measurable or visible the health results, sensible to the Nursing care, such as the functional status, self-care, symptom management, pain, safety/control of adverse effects, efficient adaptation of strategies, satisfaction with the care, mortality and the use of the health services[15].

METHODOLOGY

First, the following starting question was put, in format PI[C]O[16] (Population, Intervention, Comparison and Outcome/Result), respectively: **Which are the indicators of the results (O) of the Nursing Interventions to the levels of non-pharmaceutical measures (I) in the person in pain (P)?**

The electronic data base used in this case was (MEDLINE with Full Text, CINAHL Plus with Full Text), the research being done retrospectively from January 2012 to October 2017.

The descriptors were validated at the MeSH (Medical Subject Headings) and at the CINAHL Headings and researched in the following order: ["nursing" OR "nursing care" OR "nursing intervention"] AND ["pain" OR "pain management"] AND ["alternative therapies" OR "non-pharmacological" OR "quality of life"].

As inclusion criteria, we privileged the articles with quality and/or quantity methodology resources that clarified which were the sensible to the nursing care results of the non-pharmaceutical interventions in the person in pain.

We defined as exclusion criteria, articles with an unclear methodology, that were repeated in the data base (N=2), with data prior to the defined, without correlation with the object of our study, literature revisions, editorials and commentaries/opinions.

We obtain a total of nine articles, which were analyzed, and afterwards preceded to the critical evaluation and systemization of its knowledge, as in the scheme on Chart 1.

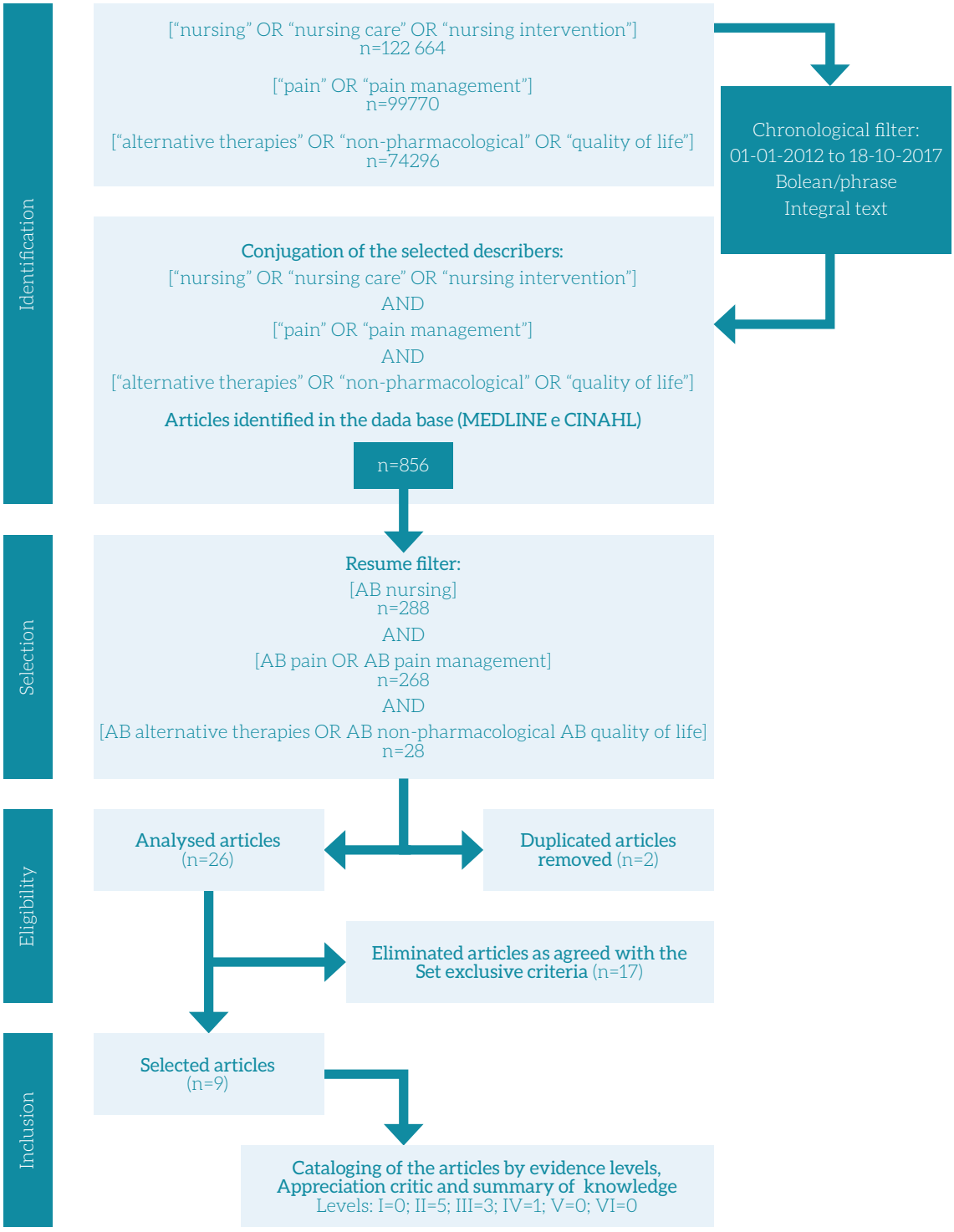

Chart 1 – Flow chart of the research and selection process.

To evaluate the evidence levels on the articles, we resorted to the contributes of Melnyk and Fineout-Overholt[17] (2005), who define six levels of evidence: *Level I* – Systematic revisions or guides of good practice, based in random, controlled and relevant studies (RCT´s); *Level II* – Evidence obtained from, at least, um RCT well drawn; *Level III* – Evidence obtained from a controlled study well drawn, not randomly, almost experimental; *Level IV* – Evidence obtained from a study of controlled case, well drawn; *Level V* – Evidence obtained from descriptive and quality studies; *Level VI* – Evidence obtained from entities recognized and/or reports of panels from experts.

RESULTS

The way to explain the methodology used, clear and perceptible, is presented in table 1 and listed in the nine articles that consisted on the source for the elaboration of this discussion and its respective conclusions.

Table 1 – Analysed articles summary.

Study	Interventions	Results
Jaibunnisha, Gomathi B., Upma Goerge (2017)[18] • Evidence level II • Participants (n) = 70 Nursing students with regular Menstrual cycle and primary moderate dysmenorrhea to severe	They were divided into 2 groups randomly: The experimental group (n=35) completed a program of stretching exercises for 8 weeks (six days/week, 10 minutes/day). The control group (n=35) didn't participate in any physical exercise program until the end of the study.	After 8 weeks of exercises of muscular stretching, there was a decrease in the intensity of pain in the participants of the experimental group. The control group didn't have any significant results in reducing the intensity of pain. It was determined that the use of muscle stretches may work, as a non-pharmaceutical measure, in the primary Dysmenorrhea for its action in the intensity of pain
R. Silva, M. M. Martins, H. G. Jardim (2016)[19] • Evidence level IV • Participants (n) = 260 people submitted to a major surgery form June to September of 2014 in the BO central and who found themselves in uncontrolled pain.	There were scheduled and performed visits form nurses to post-operation people (in the 24 hours after surgery, any time of the day) with uncontrolled pain. There were taken interviews to understand which measures works best to the relief of pain.	Pharmaceutical and non-pharmaceutical measures contributed each other in the relief of pain in the patient. Of the non-pharmaceutical measures, the most contributing to the pain relief were emotional support (88, 5%) and the positioning (75,8%). Cryotherapy was also referred from 23,1% of patients as being a pain reliever.
Santhna L. P., Norhamdan M. Y., Damrudi M. (2015)[20] • Evidence Level III • Participants (n) = 40 with Sharp pain in post-operation period (surgery of total knee replacement)	The study compared the pain-killers consume in the 5 day post-operation. The participants were divided into two groups: The experimental group (n=20) was submitted to pharmaceutical therapy and, at the same time, to musical therapy, having been used music (by phones) depending on the participants (music without lyrics, within the following options: relaxation and soothing; meditation – sounds of nature; "soul relaxation"; Romantic piano; classical; or violin music). The control group (n=20) was submitted only to pharmaceutical therapy.	In the experimental group the pain was less intense regarding the control group, whose results were taken from the application of the following instruments • PRI evaluation (pain rating intensity) – at days 1, 3 and 5 • VAS (visual analogue scale) - at days 1 and 5 Furthermore, the use of paracetamol, celecoxib and tramadol was minor in the experimental group, but the difference wasn't statistically significant.

Table 1 – Analysed articles summary.

Study	Interventions	Results
Tse M., Tang S., Wan V., Vong S. (2014)[21] • Evidence level II • Participants (n) = 396 people, over 60 years old, with muscle-skeleton chronic pain, living in nursing home's (Hong Kong)	The participants were divided into 2 groups: The experimental group (n=225) completed the Physical Exercise Program - (PEP), during 8 weeks (1h x week) which consisted in muscular build exercises, stretches, balance, self-administration of acupressure and massage. At the end of each session, the group was given flyers with images of the exercises form that day, to promote their practice individually. The control group (n=171) didn't participate in any program.	When compared with the control group, those who performed PEP showed a significant reduction in the pain intensity. Also, there was a significant improvement in the psychological well-being (happiness and live satisfaction, less levels of loneliness and depression). Furthermore, we verified a significantly statistically improvement in the amplitude of the painful joints movements, but not in the capacity of mobility.
Eghbali M., Safari R., Nazari F., Abdoli S. (2017)[22] • Evidence level II • Participants (n) = 50 Nursing professionals (men and women) with chronic low back pain, working in hospital units.	The participants were divided into 2 groups: In the experimental group (n=25) they were submitted to reflexology. In the control group (n=25) were submitted to non-specific massage. In both groups, interviews were taken on the participants that were submitted to treatment sessions of 40 minutes, 2xday, 3x/weeks, during 2 weeks.	After treatment there was a reducing of pain in both groups, experimental and control. In the experimental group (reflexology) the reduction of pain intensity was significantly higher. This reduction of pain, form moderate to light, was verified at 6 weeks, and also at 12 and 18 weeks.
Townsend, C. S., Bonham, E., Chase, L., Dunscomb, J., & Mcalister, S. (2014)[3] • Evidence level II • Participants (n) = 22 people with chronic pain	The participants were divided into 2 groups/ protocols, depending on the sealed and opaque envelope they chose. Protocol A included a massage in the hands, arms and shoulders and B pressure in the occipital region of the brain. Both included musical therapy and aroma therapy. Each protocol consisted in tow sessions of 30 minutes each.	The protocols A and B show results with a significant level of pain reduction. The equally show a significant level at the comfort score, as in the improvement of the satisfaction and motivation scores. However, the protocols don't show any significant differences form each other.
Topcu, S. Y., Findik, U. Y. (2012)[23] • Evidence level III • Participants (n) = 60 adult People in post-operation submitted to superior abdominal surgery - between 2006 and 2007 in a surgery clinic	The participants learned and (for 30 minutes) some relaxing techniques (breathing, concentration contraction and relaxing groups of muscles), using an audio support, which included pleasant music and the sound of water running in the background. After practice the level of pain was evaluated.	The results of this sturdy show that the relaxation exercises perform an effective role in pain control, after abdominal surgery. There was a significantly pain reduction after applying the relaxation techniques in 71,7% of the participants. Specifically, there was a higher number of people without pain and decrease in, not only the irritating pain but also in the very severe kind of pain.

Table 1 – Analysed articles summary.

Study	Interventions	Results
Bastami, M., Azadi, A., Mayel, M. (2015)[24] • Evidence level III • Participants (n) 61 adult participants, admitted in the emergency room	The participants were divided into 2 groups randomly: In the treatment group (n=31) an ice plate was applied, fixated with ligature lacquer, during 5 minutes, before the arterial puncture. In the control group, on the other hand (n=30) no technique was used.	It was possible to determinate that applying the ice plate, before the procedure, reduces the perception of pain in the patients: • During the arterial puncture, as the reported pain by the participants of the treatment group was inferior to the control group; • Five minutes after the arterial puncture, the pain reported by the treatment group is inferior to the control group.
Justina Y. W. Liu, Phd, Rn, Claudia K. Y. Lai, Phd, Rn (2017)[25] • Evidence level II • Participants (n) = 128 residents in nursing home's with advanced dementia and, at least, one painful condition.	It was used the visual analogic scale of pain intensity. The participants were divided into 2 groups: In the experimental group (including 2 nursing homes, n=64) were performed interventions (non-pharmaceutical measures of hot/cold, massages, TENS), Being that each cycle as the durationof 16 weeks – 4 preparation and 12 of implementing the protocol. There were performed Workshops to the nurses for the learning of the protocol. In the control group (including 2 nursing home's, n=64) there was no specific intervention, it was only requested that every interventions and their results were registered in case the participants felt pain.	The implementation of the observing management protocol of pain brings benefits in the management of pain in a nursing home where its residents with dementia, since in the experimental group, the number of non-pharmaceutical interventions was higher and the pain intensity decreased. However, there was no reduction on the used medication.

DISCUSSION OF RESULTS

As a result on the analyses of the articles mentioned above, five approach sharp pain[18,19,20,23,24] and four focus on chronic pain[3,21,22,25], being, mostly, complementary to conventional therapies.

In the case of sharp pain, the non-pharmaceutical measures studied with positive effects in the control of pain consist in muscular stretching[18], positioning[19], relaxation[23], cryotherapy[19,24] music therapy[20] and emotional support[19] (chart 2). Regarding chronic pain, the measures studied focus on massage[3], reflexology[22], Acupressure[3], TENS[25], thermic therapy (hot/cold)[25] and associating different measures in a program (heating exercises, muscles built, stretches, balance practice and massage)[21]. Globally, the non-pharmaceutical measures seem to have as much impact in adults and the elderly[3,19,20,22,23].

Control of signs and symptoms: Improvement of pain intensity	**Functional status:** Improvement of the joint amplitude	**Adaptation of effective strategies:** Improvement of the psychological well-being (happiness, loneliness, life satisfaction and depression)
Chronic Pain Evidence level II • Program (A - Massage, Music therapy and Aroma therapy, B - Pressure in the occipital region of the brain Music therapy and Aroma therapy)[3] • Physical Exercising Program (muscle build exercises, stretches, balance, self-administration of acupressure and massage)[21] • Massage[22] • Reflexology[22] • observing management protocol of pain (hot/cold techniques, massage, TENS)[25] **Sharp Pain** Evidence level II • Muscles Stretches[18] Evidence level III • Music therapy[20] • Relaxation exercises in pain control post-operation[23] • Put Ice[24] Evidence level IV • Emotional support (88,5%), positioning (75,8%) and cryotherapy (23,1%)[19]	**Chronic Pain** Evidence II • Physical Exercising Program (muscle build exercises, stretches, balance, self-administration of acupressure and massage)[21]	**Chronic Pain** Evidence II • Physical Exercising Program (muscle build exercises, stretches, balance, self-administration of acupressure and massage)[21]
Adaptation of effective strategies: Improvement of Comfort		**Self-care:** Satisfation
Chronic Pain Evidence level II • Program (A - Massage, Music therapy and Aroma therapy, B - Pressure in the occipital region of the brain Music therapy and Aroma therapy)[3]		**Chronic Pain** Evidence level II • Program (A - Massage, Music therapy and Aroma therapy, B - Pressure in the occipital region of the brain Music therapy and Aroma therapy)[3]

Chart 2 – Sensible results of the non-pharmaceutical measures and the respective evidence levels.

Based on the sensible results to the Nursing Caregivers (and respective wins in health) already studied by Doran[16] (2011), and in the analysis made, we could identify the following: control of symptoms (decrease in the pain intensity)[18-25], functional status (increase of the joint amplitude)[21], adaptation of effective strategies (improvement of well-being and comfort)[3,21] and self-care (satisfaction)[3]. From the analysis performed, we could also identify the sensible results of the non-pharmaceutical measures applied by nurses, by type of pain – sharp or chronic, as we can see in the Chart 3.

Of the analyses articles, we can see that the intervention in chronic pain shows a range of all sensible results mentioned above, as in sharp pain it only shows the sensible result of symptom control – reduction of pain intensity, being that it consists in the only common result to chronic and sharp pain.

On the other hand, we can also conclude that, facing the identified sensible results, the non-pharmaceutical measures potential respond to the multiple dimensions of chronic pain.

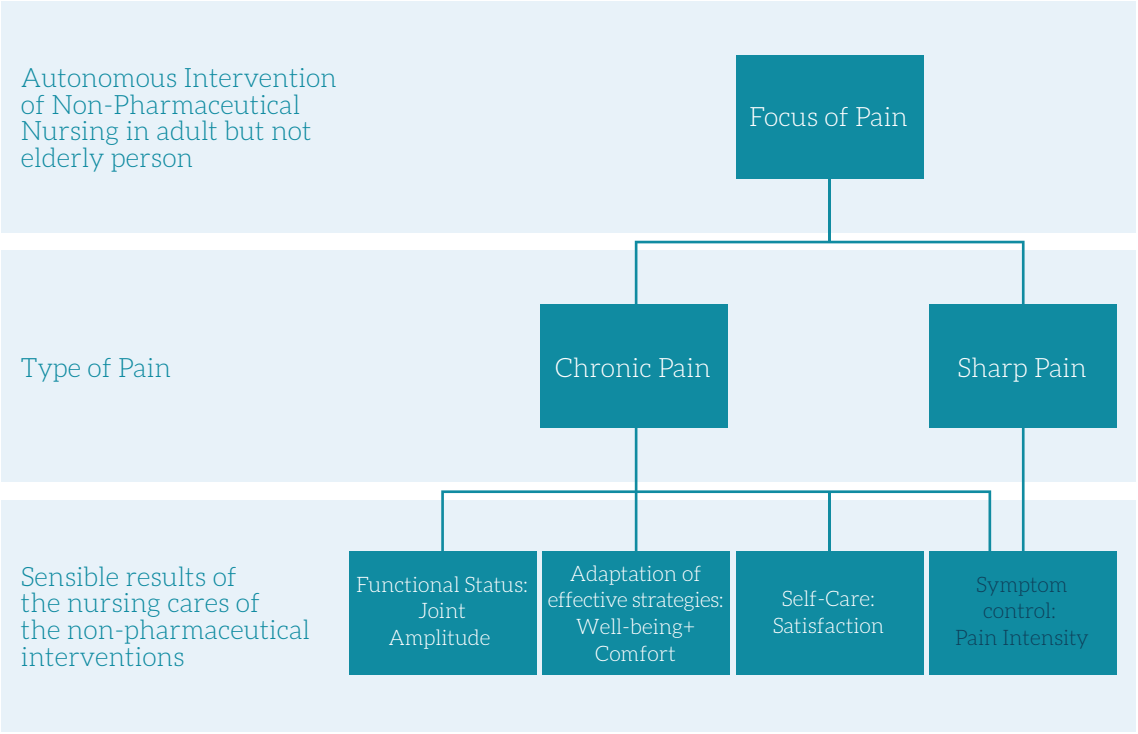

Chart 3 – Sensible results of the non-pharmaceutical measures by Type of Pain.

The articles analyzed show the formation and education as a fundamental vector of intervention to people in pain, and also to their caregiving nurses.

Regarding the people in pain, it is possible to identify in some studies, the adoption of teaching strategies with audio and written supports in a certain technique, encouraging its training and post self-administration, as much for the sharp pain as to the chronic pain. As it's supported by the evidence of the efficiency of education and self-management programs, with resources to communication, written support and telephone monitoring[16].

As for the nurses, several articles show that this professional's exhibit reduced knowledge and training in pain management and in non-pharmacologic measures, propositioning higher investment in continued training[26, 27, and 28]. In this sense, of the analysis, we verify that the experimental groups that included training for the nurses in pain and non-pharmacologic measures obtained better control over pain intensity, as well as higher use of the non-pharmacologic measures, unlike the respective control[21, 23].

Therefore, we can conclude that the inadequate capability of health professionals to treat and/or care for the complex and multi-dimensional needs of a person in pain[29], could be a significant factor to inflate the health costs, derivative of the attempted and adequate intervention deficit[30].

CONCLUSION

Pain is still one of the most common reasons as to why people resort to health professionals, as many, with sharp or chronic pain, can't experience the proper relief for their pain. The answer form the pharmacological strategies, hasn't been, therefore, enough and has represented an increase of cost to the health systems. Several studies have been proving that the complementary of non-pharmaceutical measures may constitute an improvement not only in pain control, but also introduce a potential reduction in the systems costs. In the analyzed studies, the non-pharmaceutical measures were, mostly complementary to the conventional therapies, with positive effects in the control of pain in adults and the elderly.

In the case of chronic pain, the measures consisted in massage, reflexology, acupressure, TENS, thermic therapy (hot/cold) and associating the different measures in a program (heating exercises, built muscle, stretches, balance practice and massage) and they showed, as sensible results to these interventions, the control of symptoms (decrease of

pain intensity), the functional status (increase of the joint amplitude), the adaptation of effective strategies (improvement of well-being and comfort) and self-care (satisfaction). In sharp pain, the measures consisted in muscular stretches, positioning, relaxing, cryotherapy, music therapy and emotional support show, uniquely, as a sensible result, the control of symptoms (decrease of pain intensity).

The articles analyzed show the formation and education as a fundamental vector of intervention to people in pain, in the sense of improving their self-management, and also in the use of non-pharmaceutical measures, just like it happened in the experimental groups when faced with the control groups of the analyzed articles.

Implications at the professional practice

This review reinforces the need of future studies that focus in other non-pharmaceutical measures applied by nurses, as to validate its application and efficiency in pain management.

The necessity to optimize the intervention in the person in pain, encouraging the use of more non-pharmaceutical measures by the nurses, implementing an isolated or systematic way structured interventions with associated measures.

There should be, equally promoted training programs for nurses in pain management, including the several non-pharmaceutical measures, according to the contexts and the intervention opportunities.

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Correspondence: cfonseca@uevora.pt