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What pain assessment scales are usable in general population? A systematic literature review of Cochrane library according to the PRISMA statement

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FACULTÉ DE MÉDECINE

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What pain assessment scales are usable in general population ? A systematic literature review of Cochrane library according to the PRISMA statement

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SERMENT D'HIPPOCRATE

« Au moment d'être admis à exercer la médecine, je promets et je jure d'être fidèle aux lois de l'honneur et de la probité.

Mon premier souci sera de rétablir, de préserver ou de promouvoir la santé dans tous ses éléments, physiques et mentaux, individuels et sociaux.

Je respecterai toutes les personnes, leur autonomie et leur volonté, sans aucune discrimination selon leur état ou leurs convictions. J'interviendrai pour les protéger si elles sont affaiblies, vulnérables ou menacées dans leur intégrité ou leur dignité. Même sous la contrainte, je ne ferai pas usage de mes connaissances contre les lois de l'humanité.

J'informerai les patients des décisions envisagées, de leurs raisons et de leurs conséquences. Je ne tromperai jamais leur confiance et n'exploiterai pas le pouvoir hérité des circonstances pour forcer les consciences.

Je donnerai mes soins à l'indigent et à quiconque me le demandera. Je ne me laisserai pas influencer par la soif du gain ou la recherche de la gloire.

Admis dans l'intimité des personnes, je tairai les secrets qui me seront confiés. Reçu à l'intérieur des maisons, je respecterai les secrets des foyers et ma conduite ne servira pas à corrompre les mœurs.

Je ferai tout pour soulager les souffrances. Je ne prolongerai pas abusivement les agonies. Je ne provoquerai jamais la mort délibérément.

Je préserverai l'indépendance nécessaire à l'accomplissement de ma mission. Je n'entreprendrai rien qui dépasse mes compétences. Je les entretiendrai et les perfectionnerai pour assurer au mieux les services qui me seront demandés.

J'apporterai mon aide à mes consœurs et confrères ainsi qu'à leurs familles dans l'adversité.

Que les hommes et mes confrères m'accordent leur estime si je suis fidèle à mes promesses ; que je sois déshonorée et méprisée si j'y manque. »

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ABSTRACT

Background: Pain is one of the most common symptom reported in general practice. For this purpose, one-dimensional and multidimensional pain scales have been developed to assess acute or chronic pain. There is no gold standard in pain assessment in general practice. This study aimed to list all pain scales studied for the general population.

Method: A systematic review questioning Cochrane database, according to the PRISMA protocol, was conducted until February 2018. Only English articles assessing pain scales in general population were included. The bibliography of selected studies and recent systematic reviews had been examined to include additional articles in a second search.

Results: On 1431 results found on Cochrane, 4 relevant articles were included. With the second search, 203 additional articles were detected and 84 were added. Finally, 88 articles were selected and 35 pain scales were found: 6 unidimensional-scales with 13 variants and 12 multidimensional scales with 4 variants.

Discussion: Pain scales were different by explored dimensions and the number of item. Some of them are not studied in this current review by a lack of articles available on the database responding to eligibility criteria. Reliability data of available pain assessment scales were recently collected in a systematic review. It will be necessary to consider external validity data in further studies and to choose which pain scale is the most appropriate for daily practice.

RESUME

Introduction : La douleur est un des symptômes les plus courants signalé en médecine générale. Dans ce but, des échelles uni et multidimensionnelles de douleurs ont été développées pour évaluer la douleur aigüe ou chronique. Il n'y a pas de gold standard dans l'évaluation de la douleur en médecine générale. Cette étude avait pour but de lister toutes les échelles d'évaluation de la douleur étudiées en population générale.

Méthode : Une revue de littérature questionnant la base de données Cochrane a été réalisée jusqu'en février 2018, basée sur le protocole PRISMA. Seuls les articles anglais évaluant les échelles de douleurs en population générale étaient inclus. La bibliographie des articles sélectionnés et de récentes revues de littératures ont été examinées pour inclure des articles supplémentaires dans une seconde recherche.

Résultats : Sur 1431 résultats trouvés sur Cochrane, 4 articles pertinents étaient inclus. Avec la deuxième recherche, 203 articles supplémentaires étaient détectés et 84 ont été ajoutés. Finalement, 88 articles ont été sélectionnés et 35 échelles de douleurs étaient trouvées : 6 échelles unidimensionnelles avec 13 variantes et 12 multidimensionnelles avec 4 variantes.

Discussion : Les échelles d'évaluation de douleur étaient différentes par les dimensions explorées et le nombre d'items. Certaines d'entre elles n'ont pas été étudiées dans cette revue par un manque d'articles répondant aux critères d'éligibilité, disponibles sur la base de données. Les données de validité des échelles d'évaluation de douleur disponibles ont récemment été collectées dans une revue systématique. Il sera nécessaire de tenir compte des données de validité externe dans d'autres études et de choisir quelle échelle d'évaluation de douleurs est la plus appropriée pour une pratique quotidienne.

INTRODUCTION

Pain is one of the most common symptom reported in the general population(1). It is recognized as “a major global healthcare problem”(2) by its repercussions on the quality of life, its cost for the society and its societal representation. The overall prevalence of pain complaints in primary care was 45,2% in a Malaysian study, (3), 40% in a Finnish study (4), 30% in Swedish study(5) and 43 % in a French study (6). Furthermore moderate-severe chronic pain occurs in 19% of European adults, seriously affecting their daily, social and working lives(7).

Whether acute or chronic, pain has a warning role. Some describe it as the « Fifth vital sign »(8), as blood pressure, pulse, breathing or temperature. It holds a major place in any clinical examination and shows the importance of using the best assessment tool as possible.

Pain is a subjective, complex and multidimensional symptom. The measurement of pain intensity is complicated by its nature as a “personal, subjective experience influenced by cultural learning, the meaning of the situation, attention, and other psychological variables”(9). Its evaluation is the basis of pain management. There is no gold standard for pain assessment. Because of their ease of use, unidimensional scales have become popular tools to quantitate pain relief and pain intensity but tend to focus only on pain intensity with increased risk of oversimplification of the experience. So unidimensional pain scales are more appropriate in the setting of acute pain than chronic. The assessment of chronic pain often requires multidimensional scales or more complex evaluation tools(10) which explored disabilities, belief, quality of life, etc.

This study aimed to list all pain scales studies in the general population in a literature review using Cochrane database.

General population included subjects who have no particular disease, no particular pain and no age limit. This population underwent pain assessment to test pain scales. As there is no gold

standard, there is no pain scale comparator required. The study of pain scales in general population is the main outcome sought in this review.

A recent study examined the psychometric values of the pain scales selected in a first study from a different database. (11) (12) Then the best pain scales to use in a GP activity will be chosen. For the present review, no particular study design is needed to be included. This study is meant to be an update of the 2017 study which used Medline database.

METHOD

1) GENERAL FRAMEWORK

This study was a systematic review of literature according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol (13). The purpose of this method was to obtain a reproducible systematic review from a 27 items list called “PRISMA 2009 Checklist”.

2) INCLUSION AND EXCLUSION CRITERIA

Eligibility criteria were the same as the literature review based on Medline database. They were chosen during a study group composed by training doctors, students and directed by senior researchers. Decisions were undertaken using everyone's knowledge and were validated during this study group.

a. Inclusion Criteria

- About pain

Pain had to be non-focused on a site and non-specific to a particular disease. It could be an acute or a chronic pain. Musculoskeletal pain had been included because of this non-specific site.

- About scales

Only scales assessing pain were included, whether one-dimensional and multidimensional scales. Were included pain self-assessment scales and observational rating scales.

- About population

To be included, studies had to evaluate general population. General population meant that the studied population did not have a particular disease (were accepted studies which included 3 or more different diseases). Studied populations had not to be selected according to their age.

- About studies

Studies had to be written in English, in an IMRAD format, to have an abstract available, to deal with human. All types of studies were accepted but they had to study pain scales.

b. Exclusion criteria

- About pain

Pain caused by a particular disease or focused on a site were excluded.

- About scales

Were excluded all scales which the principal purpose was not pain evaluation (quality of life scales, behavior scales, etc.) as well as scale for diagnosis (Ex: neuropathic pain scales).

- About population

Studies with specific population were excluded (for example: children, old people, pregnant women etc.).

- About studies

Studies about laboratory tests; experimental researches; therapeutic evaluations; tests evaluations; evaluation of health care providers' knowledge; studies about practices and pain belief, research strategies, algorithms, cost analyzes, statistics model evaluation, studies about pain risk factors, predictive factors of therapeutic efficacy or of diseases/diagnosis were excluded.

3) INFORMATION SOURCES

Studies were identified by questioning the Cochrane library database. A previous study questioned Medline database with the same purpose. Only English studies were included and there was no restriction with the writing date. The systematic review was conducted between December 2017 and February 2018. The bibliography of included studies and of recent systematic reviews had been screened to include additional articles. All the articles found were include in an excel file (Appendix 3).

4) SEARCH

The first step was to create a search equation. This study is meant to be an update of the previous study based on the Medline literature review. A librarian from university of Brest in collaboration with a librarian from university of Paris Descartes helped to create the final search equation. The keyword “general population” was not included because of its lack of use at international.

First, the « pain measurement » [MeSH] (Medical Subject Headings) term restricted to « Instrumentation, Methods, statistics and numerical data » gave 2243 results.

To have a finest selection, an association of psychometrics keywords was added: (MeSH descriptor: [Reproducibility of Results] or MeSH descriptor: [Sensitivity and Specificity] or MeSH descriptor: [Predictive Value of Tests] or MeSH descriptor: [Psychometrics] or Youden or Cronbach or Cohen).

A new keywords combination was obtained using the « Constructeur de Requête Bibliographiques Médicales du Cismef » which corresponds to the whole words included in the [MeSH] term “Pain measurement”.

By adding these different combination, it gave 1121 results with the EQUATION 1 (APPENDIX 1). After a quick screening, only 4 articles could be included.

By simplifying the equation constructed with the « Constructeur de Requête Bibliographiques Médicales du Cismef », 675 articles were found, giving EQUATION N°2. An other quick reading showed that only 4 articles could be included.

In front of too many off topics, the search equation (EQUATION N°3) was reworked with a librarian of the university of Paris Descartes. It gave finally 1431 results with only 4 articles which could be included.

5) STUDY SELECTION

All articles obtained from the search equation were included in an excel spreadsheet (Appendix 3). Collected informations helped to create this spreadsheet: title; author; year of publication, abstract available or not. For each article, only titles and abstracts were read. Off Topics, thereby selected, were classified into different categories (Appendix 2). Articles which was not written in English, and in IMRAD format, were excluded. From there; if the subject answered the question research; inclusion and exclusion criteria were applied.

6) DATA COLLECTION PROCESS AND DATA ITEM

All included articles were fully read. Scales were divided in two categories: one-dimensional scales and multidimensional scales. For each one-dimensional scale, following parameters were exposed: number of time quote in an article, number of time used as a reference, number of derived scales, the explored dimension, is a graphic support needed and the type of evaluation used. Concerning multi-dimensional scales, parameters were a little different: number of time quote in an article, number of time used as a reference, number of item, did it derived from another scale, the explored dimension and the type of evaluation used.

7) RISK OF BIAS IN INDIVIDUAL STUDIES

A quality assessment was applied on included articles to reduce the risks of bias. It followed the “Exercer” quality grid (Appendix 4) which is based on 18 points. The studies were included if the score of 9 was reached. Less, they were excluded.

RESULTS

1) STUDY SELECTION

This systematic review was conducted between December 2017 and February 2018. The search returned 1431 results. Then, articles were screened on basis of titles and abstracts: 1332 studies were excluded. Among them, 1316 were off topics (with 38 duplicates), 5 were not written in English, 7 had not an available abstract and 4 were not written in an IMRAD format.

Next, the application of inclusion/exclusion criteria allowed to exclude 95 articles: 6 were duplicates and 89 met exclusion criteria. 4 studies were therefore included.

A quality assessment with the “Exercer” grid was applied (APPENDIX 4). This grid allows to limit the number of bias. Finally, the 4 articles were included with 6 different available scales.

To use the studies cited by but unavailable in Cochrane database, a review of the bibliography of each included article was added. Another screening of the first study’s bibliography (based on Medline) was also realized. 203 studies were found. 21 were excluded because there were 2 duplicates and 19 not available on database. After application of inclusion criteria, 98 articles were excluded with 15 off topics, 2 which were not written in an IMRAD format, 5 because full articles were not available, 33 because of a specific population and 43 with a specific pain. After the same quality assessment as first part of the search, 84 articles were added to the 4 first. A total of 88 studies were included and 35 pain scales were found. See Figure 1.

In Table 1, are listed the 88 included studies. APPENDIX 2 exhibits different off topics.

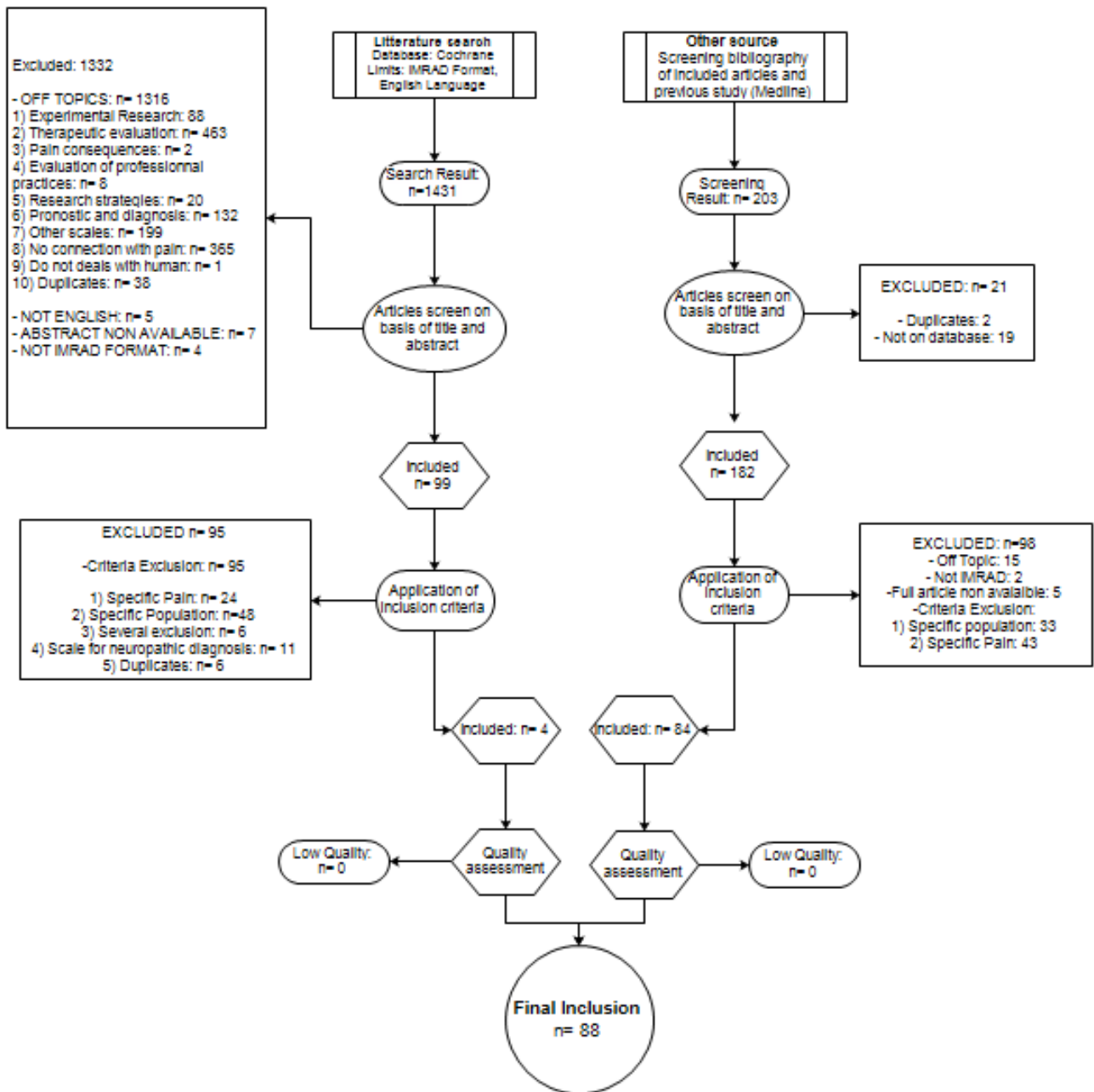


Figure 1: Flow Diagram

Title	Author	Year	Revue
Comparative Responsiveness of the PROMIS Pain Interference Short Forms, Brief Pain Inventory, PEG, and SF-36 Bodily Pain Subscale(14)	Kean J, Monahan PO, Kroenke K, Wu J, Yu Z, Stump TE, Krebs EE	2016	Medical care
Establishing a common metric for self-reported pain: linking BPI Pain Interference and SF-36 Bodily Pain Subscale scores to the PROMIS Pain Interference metric(15)	Cook KF, Schalet BD, Kallen MA, Rutsohn JP, Cella D.	2015	Qual Life Res
Associations between pain drawing and psychological characteristics of different body region pains(16)	Hayashi K, Arai YC, Morimoto A, Aono S, Yoshimoto T, Nishihara M, Osuga T, Inoue S, Ushida T.	2015	Pain Pract
Validity, reliability, and assessment sensitivity of the Japanese version of the short-form McGill pain questionnaire 2 in Japanese patients with neuropathic and non-neuropathic pain(17)	Maruo T, Nakae A, Maeda L, Shi K, Takahashi K, Morris S, Hosomi K, Kanatani H, Matsuzaki T, Saitoh Y.	2014	Pain Med
Using multiple daily pain ratings to improve reliability and assay sensitivity: how many is enough?(18)	Heapy A, Dziura J, Buta E, Goulet J, Kulas JF, Kerns RD.	2014	The Journal Of Pain
Psychometric properties and validation of the Italian version of the Mainz pain staging system as a tool for pain-patients referral selection.(19)	Samolsky Dekel BG, Gori A, Vasarri A, Adversi M, Di Nino G, Melotti RM.	2014	J Eval Clin Pract
Validation of the Japanese version of the pain self-efficacy questionnaire in Japanese patients with chronic pain.(20)	Adachi T, Nakae A, Maruo T, Shi K, Shibata M, Maeda L, Saitoh Y, Sasaki J.	2014	Pain Med
One, two, or three? Constructs of the brief pain inventory among patients with non-cancer pain in the outpatient setting.(21)	Lapane KL, Quilliam BJ, Benson C, Chow W, Kim M.	2014	J Pain Symptom Manage
Depression and pain interference among patients with chronic pain after ED encounters.(22)	Wilson M, Roll J, Pritchard P, Masterson B, Howell D, Barbosa-Leiker C.	2014	J Emerg Nurs
Acute pain evaluation with Algoplus scale in Cambodian patients.(23)	Pickering ME, Bunna P, Rat P, Madeline G, Lebost C, Serrie A, Pereira B.	2013	Pain Med

The reliability of body pain diagrams in the quantitative measurement of pain distribution and location in patients with musculoskeletal pain: a systematic review.(24)	Southerst D, Côté P, Stupar M, Stern P, Mior S.	2013	J Manipulative Physiol Ther
Characteristics of pain in hospitalized medical patients, surgical patients, and outpatients attending a pain management centre.(25)	Rockett MP, Simpson G, Crossley R, Blowey S.	2013	Br J Anaesth
Cross-cultural adaptation and validation of the profile of chronic pain: screen for a Brazilian population.(26)	Caumo W, Ruehlman LS, Karoly P, Sehn F, Vidor LP, Dall-Ágnol L, Chassot M, Torres IL.	2013	Pain Med
Prevalence of chronic pain among Libyan adults in Derna City: a pilot study to assess the reliability, linguistic validity, and feasibility of using an Arabic version of the structured telephone interviews questionnaire on chronic pain.(27)	Elzahaf RA, Tashani OA, Johnson MI.	2013	Pain Pract
Pain questionnaire development focusing on cross-cultural equivalence to the original questionnaire: the Japanese version of the Short-Form McGill Pain Questionnaire(28)	Arimura T, Hosoi M, Tsukiyama Y, Yoshida T, Fujiwara D, Tanaka M, Tamura R, Nakashima Y, Sudo N, Kubo C.	2012	Pain Med
Reliability, validity, and sensitivity measures of expanded and revised version of the short-form McGill Pain Questionnaire (SF-MPQ-2) in Iranian patients with neuropathic and non-neuropathic pain(29)	Adelmanesh F, Jalali A, Attarian H, Farahani B, Ketabchi SM, Arvantaj A, Raissi GR.	2012	Pain Med
Reliability and validity of the Global Pain Scale with chronic pain sufferers.(30)	Gentile DA, Woodhouse J, Lynch P, Maier J, McJunkin T.	2011	Pain Physician
Turkish version of the Cornell Musculoskeletal Discomfort Questionnaire: cross-cultural adaptation and validation.(31)	Erdinc O, Hot K, Ozkaya M.	2011	Work
Establishing the psychometric properties and preferences for the Northern Pain Scale.(32)	Ellis JA, Ootoova A, Blouin R, Rowley B, Taylor M, Decourtney C, Joyce M, Greenley W, Gaboury I.	2011	Int J Circumpolar Health
Computer-aided surface estimation of pain drawings - intra- and inter-rater reliability(33)	Persson AL, Garametsos S, Pedersen J.	2011	J Pain Res

Comparative responsiveness of pain outcome measures among primary care patients with musculoskeletal pain.(34)	Krebs EE, Bair MJ, Damush TM, Tu W, Wu J, Kroenke K.	2010	Med Care
Examining the cross-cultural validity of the english short-form McGill Pain Questionnaire using the matched moderated regression methodology.(35)	Zinke JL, Lam CS, Harden RN, Fogg L.	2010	Clin J Pain
The end of the line? The Visual Analogue Scale and Verbal Numerical Rating Scale as pain assessment tools in the emergency department.(36)	Mohan H, Ryan J, Whelan B, Wakai A.	2010	Emerg Med J
Cross-cultural adaptation and validation of a Brazilian Portuguese version of the chronic pain grade.(37)	Bracher ES, Pietrobon R, Eluf-Neto J.	2010	Qual Life Res
Exploring alternative approaches to routine outpatient pain screening.(38)	Lorenz KA, Krebs EE, Bentley TG, Sherbourne CD, Goebel JR, Zubkoff L, Lanto AB, Asch SM.	2009	Pain Med
Systematic review of cross-cultural adaptations of McGill Pain Questionnaire reveals a paucity of clinimetric testing.(39)	Menezes Costa Lda C, Maher CG, McAuley JH, Costa LO.	2009	J Clin Epidemiol
How reliable is pain as the fifth vital sign?(8)	Lorenz KA, Sherbourne CD, Shugarman LR, Rubenstein LV, Wen L, Cohen A, Goebel JR, Hagenmeier E, Simon B, Lanto A, Asch SM.	2009	J Am Board Fam Med
Development and test-retest reliability of an extended version of the Nordic Musculoskeletal Questionnaire (NMQ-E): a screening instrument for musculoskeletal pain.(40)	Dawson AP, Steele EJ, Hodges PW, Stewart S.	2009	J Pain
Psychometric testing of the brief screening version of Multidimensional Pain Inventory (Swedish version).(41)	Jakobsson U.	2009	Scand J Caring Sci
Development and initial validation of the PEG, a three-item scale assessing pain intensity and interference(42)	Krebs EE, Lorenz KA, Bair MJ, Damush TM, Wu J, Sutherland JM, Asch SM, Kroenke K.	2009	J Gen Intern Med
French translation of the Multidimensional Pain Inventory: L'inventaire multidimensionnel de la douleur.(43)	Laliberté S, Lamoureux J, Sullivan MJ, Miller JM, Charron J, Bouthillier D.	2008	Pain Res Manag

Responsiveness of five condition-specific and generic outcome assessment instruments for chronic pain.(44)	Angst F, Verra ML, Lehmann S, Aeschlimann A.	2008	BMC Med Res Methodol
What do the numbers mean? Normative data in chronic pain measures(45)	Nicholas MK1, Asghari A, Blyth FM.	2008	Pain
Trial of a new pain assessment tool in patients with low education: the full cup test.(46)	Ergün U, Say B, Ozer G, Yildirim O, Kocatürk O, Konar D, Kudiaki C, Inan L.	2007	Int J Clin Pract
Nonmalignant chronic pain evaluation in the Turkish population as measured by the McGill Pain Questionnaire(47)	Oksuz E1, Mutlu ET, Malhan S.	2007	Pain Pract
Evaluating chronic pain impact among patients in primary care: further validation of a brief assessment instrument.(48)	Karoly P, Ruehlman LS, Aiken LS, Todd M, Newton C.	2006	Pain Med
Measurement of pain using the visual numeric scale.(49)	Ritter PL, González VM, Laurent DD, Lorig KR.	2006	J Rheumatol
Adapted version of the McGill Pain Questionnaire to Brazilian Portuguese.(50)	Varoli FK, Pedrazzi V.	2006	Braz Dent J
Thai Short-form McGill Pain Questionnaire (51)	Kitisomprayoonkul W, Klaphajone J, Kovindha A.	2006	J Med Assoc Thai
Lack of interchangeability between visual analogue and verbal rating pain scales: a cross sectional description of pain etiology groups.(52)	Lund I, Lundeberg T, Sandberg L, Budh CN, Kowalski J, Svensson E.	2005	BMC Med Res Methodol
Visual Analog Scale pain reporting was standardized.(53)	Kane RL, Bershadsky B, Rockwood T, Saleh K, Islam NC.	2005	J Clin Epidemiol
Self-report and pain behavior among patients with chronic pain.(54)	McCahon S, Strong J, Sharry R, Cramond T.	2005	Clin J Pain
Pain: a review of three commonly used pain rating scales(55)	Williamson A1, Hoggart B.	2005	J Clin Nurs

The development and preliminary validation of a brief measure of chronic pain impact for use in the general population(56)	Ruehlman LS, Karoly P, Newton C, Aiken LS	2005	Pain
Computerized dynamic assessment of pain: comparison of chronic pain patients and healthy controls.(57)	Jamison RN, Fanciullo GJ, Baird JC.	2004	Pain Med
The evaluation of change in pain intensity: a comparison of the P4 and single-item numeric pain rating scales.(58)	Spadoni GF, Stratford PW, Solomon PE, Wishart LR.	2004	J Orthop Sports Phys Ther
Development and validation of a brief, descriptive Danish pain questionnaire (BDDPQ)(59)	Perkins FM1, Werner MU, Persson F, Holte K, Jensen TS, Kehlet H.	2004	Acta Anaesthesiol Scand
Validation of the Brief Pain Inventory for chronic nonmalignant pain(60)	Tan G, Jensen MP, Thornby JI, Shanti BF.	2004	J Pain
Minimum clinically significant VAS differences for simultaneous (paired) interval serial pain assessments(61)	Yamamoto LG, Nomura JT, Sato RL, Ahern RM, Snow JL, Kuwaye TT	2003	American journal of emergency medicine
Signaling does not adequately improve diary compliance.(62)	Broderick JE, Schwartz JE, Shiffman S, Hufford MR, Stone AA.	2003	Ann Behav Med
Comparison of a verbal numeric rating scale with the visual analogue scale for the measurement of acute pain(63)	Holdgate A1, Asha S, Craig J, Thompson J.	2003	Emerg Med (Fremantle)
Cross-cultural adaptation of the Nordic musculoskeletal questionnaire(64)	De Barros EN, Alexandre NM.	2003	Int Nurs Rev
Validation of a verbally administered numerical rating scale of acute pain for use in the emergency department(65)	Bijur PE, Latimer CT, Gallagher EJ.	2003	Acad Emerg Med
Clinical importance of changes in chronic pain intensity measured on an 11-point numerical pain rating scale(66)	Farrar JT, Young JP Jr, LaMoreaux L, Werth JL, Poole RM.	2001	Pain
Reliability of the visual analog scale for measurement of acute pain.(67)	Bijur PE, Silver W, Gallagher EJ.	2001	Acad Emerg Med

Prospective validation of clinically important changes in pain severity measured on a visual analog scale.(68)	Gallagher EJ, Liebman M, Bijur PE.	2001	Ann Emerg Med
An examination of the psychometric structure of the Multidimensional Pain Inventory(69)	Deisinger JA, Cassisi JE, Lofland KR, Cole P, Bruehl S.	2001	J Clin Psychol.
Confirming the theoretical structure of the Japanese version of the McGill Pain Questionnaire in chronic pain (70)	Hasegawa M, Mishima M, Matsumoto I, Sasaki T, Kimura T, Baba Y, Senami K, Kanemura K, Takano O, Shibata T.	2001	Pain Med
Psychometric properties of a Spanish version of the McGill Pain Questionnaire in several Spanish-speaking countries(71)	Lázaro C, Caseras X, Whizar-Lugo VM, Wenk R, Baldiaceda F, Bernal R, Ovalle A, Torrubia R, Baños JE.	2001	Clin J Pain
The McGill Pain Questionnaire, Japanese version, reconsidered: confirming the theoretical structure (72)	Hasegawa M, Hattori S, Mishima M, Matsumoto I, Kimura T, Baba Y, Takano O, Sasaki T, Kanemura K, Senami K, Shibata T.	2001	Pain Res Manag
Changes in chronic pain severity over time: the Chronic Pain Grade as a valid measure (73)	Elliott AM1, Smith BH, Smith WC, Chambers WA.	2000	Pain
Concordance between ratings using different scales for the same variable(74)	Svensson E1.	2000	Stat Med
Internal structure and validity of the multidimensional pain inventory, Italian language version(75)	Ferrari R1, Novara C, Sanavio E, Zerbini F.	2000	Pain Med
Simple pain rating scales hide complex idiosyncratic meanings(76)	de C Williams AC1, Davies HT, Chadury Y.	2000	Pain
Some empirical evidence regarding the validity of the Spanish version of the McGill Pain Questionnaire (MPQ-SV)(77)	Masedo AI, Esteve R.	2000	Apr Pain
Comparative reliability and validity of chronic pain intensity measures.(78)	Jensen MP, Turner JA, Romano JM, Fisher LD.	1999	Pain
Psychometric properties of the Multidimensional Pain Inventory, Dutch language version (MPI-DLV)(79)	Lousberg R1, Van Breukelen GJ, Groenman NH, Schmidt AJ, Arntz A, Winter FA.	1999	Behav Res Ther

Comparative study of methods of measuring acute pain intensity in an ED.(80)	Berthier F, Potel G, Leconte P, Touze MD, Baron D.	1998	Am J Emerg Med
Does the clinically significant difference in visual analog scale pain scores vary with gender, age, or cause of pain? (81)	Kelly AM.	1998	Nov Acad Emerg Med
Reliability and factor structure of the Multidimensional Pain Inventory--Swedish Language Version (MPI-S)(82)	Bergström G1, Jensen IB, Bodin L, Linton SJ, Nygren AL, Carlsson SG.	1998	Pain
The Chronic Pain Grade questionnaire: validation and reliability in postal research(83)	Smith BH, Penny KI, Purves AM, Munro C, Wilson B, Grimshaw J, Chambers WA, Smith WC.	1997	Pain
The minimum clinically important difference in physician-assigned visual analog pain scores.(84)	Todd KH, Funk JP.	1996	Acad Emerg Med
Confirmatory factor analysis of a 4-factor model of chronic pain evaluation.(85)	De Gagné TA, Mikail SF, D'Eon JL.	1995	Pain
Increasing the reliability and validity of pain intensity measurement in chronic pain patients(86)	Jensen MP, McFarland CA.	1993	Pain
Grading the severity of chronic pain(87)	Von Korff M, Ormel J, Keefe FJ, Dworkin SF.	1992	Pain
Questionnaire development: an examination of the Nordic Musculoskeletal questionnaire(88)	Dickinson CE, Campion K, Foster AF, Newman SJ, O'Rourke AM, Thomas PG.	1992	Appl Ergon
The development of a Norwegian pain questionnaire(89)	Strand LI, Wisnes AR.	1991	Pain
Self-monitored pain intensity: psychometric properties and clinical utility(90)	Kerns RD, Finn P, Haythornthwaite J.	1988	Behav Med
Test-retest reliability of the pain drawing instrument(91)	Margolis RB, Chibnall JT, Tait RC.	1988	Pain
The German counterpart to McGill Pain Questionnaire(92)	Stein C, Mendl G.	1988	Pain

The McGill Pain Questionnaire constructed for the Dutch language (MPQ-DV). Preliminary data concerning reliability and validity(93)	Vanderiet K, Adriaensen H, Carton H, Vertommen H.	1987	Pain
The measurement of clinical pain intensity: a comparison of six methods (94)	Jensen MP, Karoly P, Braver S.	1986	Pain
The West Haven-Yale Multidimensional Pain Inventory (WHYMPI)(95)	Kerns RD, Turk DC, Rudy TE.	1985	Pain
The McGill Pain Questionnaire: a replication of its construction.(96)	Reading AE, Everitt BS, Sledmere CM.	1982	Br J Clin Psychol
A pain vocabulary in Finnish-The Finnish pain questionnaire(97)	Ketovuori H, Pöntinen PJ.	1981	Pain
Reproducibility along a 10 cm vertical visual analogue scale(98)	Dixon JS, Bird HA.	1981	Ann Rheum Dis
Graphic representation of pain(99)	Scott J, Huskisson EC.	1976	Pain
The McGill Pain Questionnaire: major properties and scoring methods(100)	Melzack R.	1975	Pain

Table 1: Included articles

Type of the 88 studies								
Cross Sectional	Randomized placebo controlled paired trial	Cohort	Translation	Systematic Review	Construction	Meta-analysis		
55	1	6	15	3	7	1		

Aim of the 88 studies								
Minimum clinically significant differences	Clinical importance of changes	Reliability	Comparison	Daily Assessment	Translation	Translation + Reliability	Construction	Construction + Reliability
1	5	30	25	1	2	16	5	3

Table 2: Type and aim of studies

2) SYNTHESIS OF RESULTS

a. *One-dimensional pain scales*

One-dimensional pain scales are mostly used to assess acute pain. They evaluate only one parameter, which is commonly pain intensity.

Visual Analog Pain Scale

Visual Analog scale (VAS) is the most commonly used scale because of its ease of use and its simple construction. It was introduced in the first part of the 20th century. It's a graduated 100-mm line with one-hand marked as "No pain" and the other hand marked as "worst possible pain". Patients move the cursor themselves where it better corresponds to their current pain. Finally, the distance from "no pain" to the cursor is measured in millimeters. See figure 2.

This scale was studied in 16 articles in this current review. (36,52,53,55,61,63,67,68,74,76,80,81,84,94,98,99)

It was used 14 times as a reference (16,28,29,31,35,46,47,49,51,59,65,71,72,75).

Five variants (considered as variants of the Visual Analog Scale because they need graphic support and evaluate only pain intensity) were found in this current review: the full cup test(46) (developed to patients with low education), the Visual Numeric scale (49) (which combines strong visual cues with an 11-point numeric rating scale), the Horizontal Numerical Graphic Rating Scale (54), the Dynamic VAS (computerized version of VAS)(57) and the 11-points Box Pain Scale (94) (a 11-item tool represented by boxes).

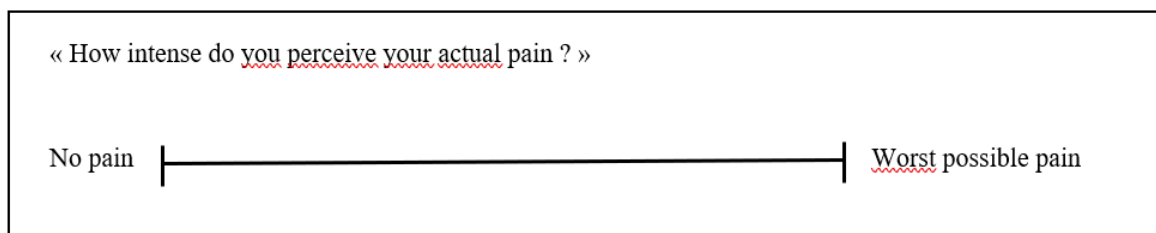


Figure 2: Visual Analog Pain Scale

Visual Rating Scale (VRS)

The Verbal rating Scale is a 5-item one-dimensional pain scale with eligible alternatives -no pain, mild, moderate, severe, worst possible pain. Patients must choose the best adjective that correspond to their current pain. See Figure 4.

This scale was studied in 4 articles in this current study(52,55,80,94).

It was used as a reference in 3 articles (25,71,72)

Four variants were found: the Dynamic Verbal Ratings (computerized version)(57), the Self-Monitored Pain Intensity(90), the 4-points Verbal Rating Scale(94) and the 5-points Verbal Rating Scale(94).

The Self-Monitored Pain Intensity is a tool which allowed to patients to record their perceived pain intensity on an hourly basis for 2 weeks, with a 6-points verbal scale like Present Pain Intensity part of the McGill Pain Questionnaire (0 = No pain, 1 = mild, 2 = discomforting, 3 = distressing, 4 = horrible, 5 = excruciating).

Pain intensity	Score
No pain	0
Mild pain	1
Moderate pain	2
Severe pain	3
Excruciating pain	4

Figure 4: Verbal Rating Scale

Algoplus

This 5-item hetero-evaluation pain scale had been initially developed in 2011 for detecting acute pain in elderly patients with the inability to communicate. But this behavior scale can also be used for strangers who don't share a common language in order to assess pain severity. The 5 items studied are facial expression (frowning, grimacing etc.), complaints ("ouch-ow", "that hurts" etc.), the look (inattentive, distant etc.), body position (refuses to move, withdrawn etc.) and atypical behavior (agitation, aggressivity etc.)

This scale was studied in one article in this current review(23). See Table 3.

Dimension assessed	Item	Response
Pain Behaviour	Facial expressions: frowning, grimacing, wincing, clenched teeth, unexpressive	Yes = 1, No = 0
	Look: Inattentive, blank stare, distant or imploring, teary-eyed, closed eyes	Yes = 1, No = 0
	Complaints: "ow-ouch", "that hurts", groaning, screaming	Yes = 1, No = 0
	Body position: withdrawn, guarded, refuses to move, frozen posture	Yes = 1, No = 0
	Atypical behaviors: agitation, aggressivity, grabbing onto something or someone	Yes = 1, No = 0

Table 3: Algoplus (11)

Wong and Baker Faces Pain Scale

This scale was created in 1988(102). This auto evaluation pain scale represents 6 various facial expressions progressing from a smiling face at one end, correlating with no pain, to an extremely unhappy face at the other end, correlating with the worst pain. The patient chooses the one that best fits his current pain. See Figure 5.

This scale was studied in 1 article (32). It was not used as a reference.

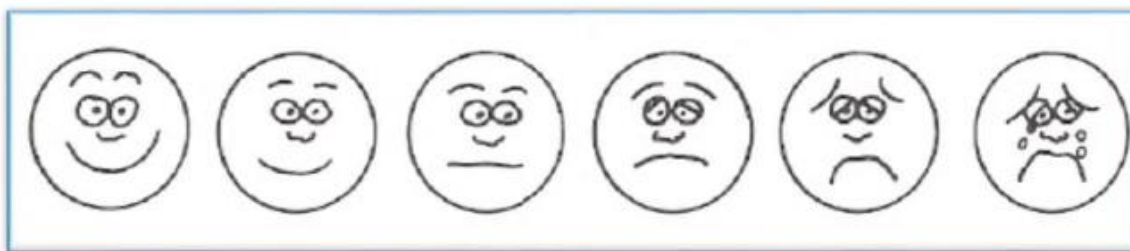


Figure 5: Wong and Baker Faces Pain Scale (102)

Pain Drawing

In this pain scale, patients must mark on a human line drawing (anterior and posterior view) the localization of their pain. Different versions of pain drawing exist but they are not consensual (including pain intensity, organic pain or not etc.). Therefore, this scale is classified as a one-dimensional pain scale. See Figure 6.

This scale was studied in four articles in this current review(16,24,33,91). It was not used as a reference.

One variant was found: Dynamic Pain Drawings (computerized version) (57)

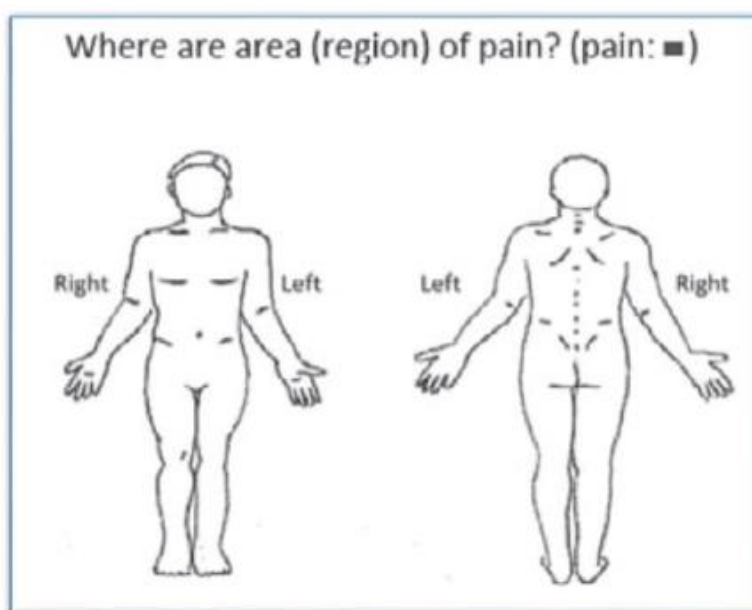


Figure 6: Pain Drawing

b. Summary of one-dimensionnal scales

Different parameters of one dimensional scales are provided in Table 4.

	Number of time quote in an article	Number of time used as a reference	How many derived scales were found?	The explored dimension	Is a graphic support needed?	The type of evaluation used
Visual Analog Pain Scale	16	14	5	Intensity	Yes	Number given by a cursor on a 10cm line
Numeric Pain Rating Scale	14	5	4	Intensity	Yes or No	Number from 0 to 10
Verbal Rating Scale	4	3	4	Intensity	No	Number given by a list of adjectives
Algoplus	1	0	0	Pain Behavior	No	Yes/No Hetero-evaluation
Wong and Baker Faces Pain Scale	1	0	0	Intensity	Yes	Number given by the chosen face
Pain Drawings	4	0	0	Localization	Yes	Mark on a pictorial body

Table 4: Summary of one dimensional scales parameters

c. Multidimensional scales

Multidimensional scales are useful to evaluate chronic pain severity. Composed by several items, they evaluate pain intensity but also pain interferences, disabilities etc....

Short Form-36 Bodily Pain Subscale (SF-36 BPS)

The MOS 36-Item Short-Form Health Survey (SF-36) was created in 1993 as a physical, mental and psychosocial health assessment scale (103). This scale has been declined in eight different subscales. (15,34,44)

The 2-item Bodily pain subscale (SF-36 BPS) is studied in 4 articles in this current review(14,15,34,44). It was used as a reference in 3 articles (20,37,42).

This subscale assesses the pain during the 4 past weeks. One item evaluates pain interference on a 1-5 verbal rating scale. The other item assesses pain severity on a 1-6 verbal rating scale. See Table 5 on APPENDIX 5

Brief Pain Inventory (BPI)

BPI was created in 1993 initially to estimate pain in a cancer population(104). This 11-item pain scale; using a 0-10 NRS, a pain drawing and questions about treatment; measures two domains of pain: a seven-item about interference dimension and a four-item about severity dimension.

This scale was studied in 5 articles in this current review (14,21,25,34,60). It was used as a reference in 6 articles (8,19,22,38,42,62). See table 6 on APPENDIX 5.

Ultra-Brief 3-item PEG (UB-3-PEG)

This scale, derived from the Brief Pain Inventory, was created in 2009. The PEG (“P” for pain intensity, “E” for enjoyment of life, “G” for interference with general activity) comprises 1 intensity item and 2 interference items using a 0-10 NRS.

This scale was studied in 3 articles in this current review (14,34,42). It was not used as reference. See table 7 on APPENDIX 5

Chronic Pain Grade (CPG)

This pain scale was created in 1992. This is a seven-item instrument which provide a pain severity score distributed into 4 hierarchical classes: low disability--low intensity (Grade I); low disability--high intensity (Grade II); high disability--moderately limiting (Grade III); and high disability--severely limiting (Grade IV). Using NRS, sub-scale scores evaluate pain intensity, frequency of pain and limitation of activities due to pain.

This scale was studied in 5 articles (34,37,73,83,87) in this current review. It was used once as a reference (42). See Table 8 on APPENDIX 5.

Profile of Chronic Pain: Screen (PCP: S)

This 15-items multidimensional pain scale, created in 2005, comprised a 4-items severity scale, a 6-items interference scale and a 5-items emotional burden scale.

This scale was studied in 3 articles(26,48,56). It was not used as a reference. See Table 9 on APPENDIX 5.

Structured Telephone Interviews Questionnaire on Chronic Pain (STIQ on CP)

This multidimensional scale, created in England in 2006(105), is a telephone questionnaire, composed of two parts: a screening interview consisting of 12 questions to gather data on age and gender, duration of pain, frequency of pain during the previous week, intensity of pain during last pain episode, location of pain and cause of pain; and 44 questions to gather information about demographics, frequency, duration, intensity and impact of pain on work and quality of life. In Fact, it gathers 90 items divided into 5 groups: assessment of inclusion criteria, evaluation of the global pain context, pain evaluation, assessment about pain interference and, finally, demographic aspect. Verbal scales, numerical scales, yes/no answer, free answers and lists with multiple choices are used in this pain scale to assess many pain dimensions.

This scale was studied in only one article in this current review (27). It was not used as a reference. See Table 10 on APPENDIX 5.

Global Pain Scale (GPS)

This 33-items pain scale, created in 2005, assesses 4 pain dimensions with NRS: physical pain (pain intensity), affective effects of pain, specific clinical outcomes (effect of pain on

patients' quality of sleep, comfort, medication consumption etc.) and the degree to which the pain interferes with activities of daily living. These 4 subscales provide a single number between 0 and 100 to describe overall pain and its effects.

This scale was studied in 1 article in this current review(30). It was not used as a reference. See Table 11 on APPENDIX 5.

Cornell Musculoskeletal Discomfort Questionnaire for standing worker (CMDQ fsw)

This 4-item pain scale evaluates 4 pain dimensions with a VRS (the frequency in the past work week, the severity, work interferences and the localization) linked to a pictorial back body, different for male and female, composed by 20 body parts.

This scale was studied in 1 article in this current review (31). It was not used as a reference. See Table 12 on APPENDIX 5.

Nordic Musculoskeletal Questionnaire (NMQ)

This scale, created in 1987, assesses 4 pain dimensions using an illustration of the human body seen from behind: annual and weekly pain prevalence, functional incapacity and search for medical assistance in the last 12 months. Pictorial body is divided in nine parts linked to 4 questions, corresponding to pain dimensions. See Table 13 on APPENDIX 5.

This scale was studied twice in this current review (64,88). It was not used as a reference.

One variant scale was found: the Extended Nordic Musculoskeletal Questionnaire (Ex NMQ) (40). Patients have to answered to 11 questions about their pain. This scale is more precise on pain prevalence and consequences of pain in the previous year.

West Haven Yale Multidimensional Pain Inventory (WHYMPI)

This 52-item scale was created in 1985. It's composed by 3 sections evaluating pain intensity and pain interference with daily activities, work and social life; using a 7-points NRS for each question. This scale was studied in 9 articles (43–45,69,75,79,82,85,95). It was used as reference in 3 articles (30,56,90). See Table 14 on APPENDIX 5.

One variant of the WHYMPI was found in this current review: The Brief screening version of the Multidimensional Pain Inventory (BSv MPI)(41). It includes 34 of the 52 items and explores the same pain dimensions.

The Mainz Pain Staging System (MPSS)

Initially developed in the 2000s in Germany, the Mainz Pain Staging System is a 10-item multidimensional tool evaluating 4 axes: pain persistence (items 1-3), spatial aspects (item 4), drug intake and withdrawal treatments (items 5 and 6) and health care system utilization (items 7-10). The Resulting score classifies patients at three chronicity stages: I: Mild; II: Moderate; III: Severe Chronic Pain. See Table 15 on APPENDIX 5.

This scale was studied once in this current review (19). It was not used as a reference.

The McGill Pain Questionnaire (McGPQ)

The McGill Pain Questionnaire was created in 1975. Classically described as a 78-item tool , this multidimensional pain scale is separated into four parts: Pain Rating Index (PRI) containing 20 subclasses, each containing 2– 6 words finally grouped in 4 pain dimensions (sensory, affective, evaluative, and a miscellaneous category); a 5-point pain intensity scale (present pain intensity [PPI]); a pictorial body to locate the pain and a 3-point verbal rating scale where patients choose the word corresponding to the pattern of their pain. See Table 16 on APPENDIX 5.

This scale was studied in 15 articles in this current review (39,45,47,50,70–72,77,85,89,92,93,96,97,100). It was used as a reference in 5 articles (51,59,75,90,95).

The Short-Form McGill Pain Questionnaire (SF-McGPQ) is the main variant of the McGPQ. It was created in 1987 as a rapid evaluation tool and includes 15 pain descriptors (11 sensory and 4 affective), a VAS and a present pain intensity scale. See Table 17 on APPENDIX 5.

This subscale was studied in 6 articles in this current review (17,31,38,41,68,73). It was used as a reference in 4 articles (8,30,50,63).

The Short-Form McGill Pain Questionnaire 2 (SF McGPQ 2) was created later, with 7 additional items to measure both neuropathic and non-neuropathic pain, so 22 items that patients rate on a 0-10 NRS.

This subscale was studied in 2 articles in this current review (17,32). It was not used as a reference.

d. Summary of multidimensional scales

A summary of different parameters of multidimensional scales is available on table 4.

DISCUSSION

This study was prompted by the need to establish an inventory of different pain scales studied in general population, for the daily exercise of general practitioners. Indeed, very few literature reviews are available about this topic.

35 scales have been found in this current review. They have been classified in two different groups: one-dimensional scales, with 6 main scales and 13 derived scales, and multidimensional scales with 12 main scales and 4 derived scales.

	Number of time quote in an article	Number of time used as a reference	Number of item	Derived from another scale?	Explored dimension	The type of evaluation used
SF-36 BPS	4	3	2	Yes: SF-36 Health Survey	Intensity, Interference with Work	VRS
BPI	5	6	11	No	Localisation, Intensity, Treatment, Interference with Daily activities, Mood and Work	NRS, pictorial body
UB-3-PEG	3	0	3	Yes: BPI	Intensity, Interference with Mood and Daily activities	NRS
CPG	5	1	7	No	Intensity, Temporal aspect, Interference with Daily activities, Social life and Work	NRS
PCP: S	3	0	15	No	Intensity, Treatment, Interference with Mood, Work, Social life	VRS, NRS
STIQ on CP	1	0	90	No	Intensity, Treatment, Pain quality, Localisation, Temporal aspect, Health Care System Utilisation, Interference with Social life, Daily activities, Mood and Work	VRS, NRS, Yes/No, Free answers, list multiple choice
GPS	1	0	33	No	Intensity, Health Care Utilisation, Treatment, Interference with Daily activities, Social life and Work	NRS
CMDQfsw	1	0	4	No	Intensity, Localisation, Temporal aspect, Interference with Work	VRS, pictorial body
NMQ	2	0	5	No	Localisation, Health Care Utilisation, Interference with Work	Yes/No, pictorial body
Ex NMQ	1	0	11	Yes : NMQ	Localisation, Temporal aspect, Treatment, Health Care Utilisation, Interference with Work	Yes/No, pictorial body
WHYMPI	9	3	52	No	Intensity, Interference with Daily activities, Work, Social life and Mood	NRS
BSv MPI	1	0	34	Yes : WHYMPI	Intensity, Interference with Daily activities, Work, Social life and Mood	NRS
MPSS	1	0	10	No	Intensity, Treatment, Localisation, Temporal aspect, Health Care System Utilisation	Free Answers
McGPQ	15	5	78	No	Intensity, Pain quality, Temporal aspect, Factor influencing	VRS, list multiple choice Pictorial body
SF-McGPQ	6	4	15	Yes: McGPQ	Intensity, Pain quality	VRS, VAS +- Pictorial body
SF-McGPQ 2	2	0	22	Yes : SF-McGPQ	Intensity, Pain quality	NRS, VAS

Table 4: Summary of Multidimensional scales parameters (BPI: Brief Pain Inventory, BSy MPI: Brief screening version of the Multidimensional Pain Inventory, CMDQ fsw: Cornell Musculoskeletal Discomfort Questionnaire for standing worker, CPG: Chronic Pain Grade, Ex NMQ: Extended version of the Nordic Musculoskeletal Questionnaire, GPS: Global Pain Scale, McGPQ: McGill Pain Questionnaire, MPSS: The Mainz Pain Staging System, NMQ: Nordic Musculoskeletal Questionnaire, NRS: Numerical Rating Scale, PCP: S: Profile of Chronic Pain: Screen, SF-36 BPS: Short-Form-36 Bodily Pain Subscale, SF-McGPQ: Short-Form McGill Pain Questionnaire, SF-McGPQ 2: Short-Forme McGill Pain Questionnaire 2, STIQ on CP: Structured Telephone Interviews Questionnaire on Chronic Pain, UB-3-PEG: Ultra-Brief 3-item PEG, VAS: Visual Analog Scale, VRS: Verbal Rating Scale, WHYMPI: West Haven Yale Multidimensional Pain Inventory).

In the one-dimensional group, scales were classified by type and subscales. VAS and NRPS were the most studied pain scales. Whether they need or not a graphic support, their principal advantage is to be easy to use. They are also quick to realize. These 2 scales are among the most used scales and often employed to compare other pain scales, as a reference. They mainly analysed one pain dimension: pain intensity. Three pain scales used a graphic support: Pain Drawings, the Wong and Baker Faces Pain Scale and the VAS. This dimension is crucial to locate patients' pain but give few information about pain intensity.

Concerning the multidimensional group, we found 16 scales which were very different by their number of items: from 2 in the SF-36 BPS to 90 in the Structure Telephone Interview Questionnaire on Chronic Pain. Number of explored dimensions varies from 2 in the SF-McGP to 10 in the STIQ on CP. In this current review, the most studied scales were the WHYMPI and the Mc-GPQ. These scales allow refining the evaluation of pain especially concerning chronic pains (interferences with daily activities, with work...).

In this systematic review, a lot of scales evaluating specific populations (children, pregnant women, patients with cancer...) were excluded respecting eligibility criteria to be as general as possible.

There are limitations that should be considered in interpreting these results even if the choice to use the PRISMA method allowed reducing the bias.

First, studies non-published have not been searched. The search was restricted to titles and abstracts of articles because of too many off-topics.

In the first part of the search only Cochrane database was studied. Considered as one of the main medical database with Medline, it's not, however, an exhaustive database. In this current review, despite 1500 screened articles, only 4 could be included with Cochrane database, giving

8 pain scales. It didn't allow us to conclude on the best pain scale, for sake of completeness. The second part of the search allowed to include additional original articles.

Therefore, many pain scales are missing in this current review. If the 2017 study interrogating the Medline database(11) is excluded, only two other literature reviews were found(106,107), making a difficult comparison.

Moreover, there is selection bias. Only one investigator did inclusions of studies despite discussions about eligibility criteria in a research group leading by training professor. The quality assessment was also done by one investigator, with the "Exercer" grid which is not used in the Prisma Statement.

There is also a bias with the quality of articles because they are mostly cross-sectional studies. Only studies written in English were included, limiting the assessment of non-Anglo-Saxon scales.

Finally, no psychometric values were collected, as it will be the aim of a further study.

CONCLUSION

Unidimensional scales are used to evaluate only one parameter, most of the time pain intensity. But many other symptoms such as depression or anxiety are assessed by these scales, with a risk of over simplification of pain affects. Mood, factor influencing pain, daily activities etc, are primordial dimensions in a holistic approach to pain assessment. On this principle, one-dimensional scales seem to be less useful. Moreover, evaluating pain with numbers is it still justified? Can we quote everything with numbers? Developed primarily for clinical research, these scales are often misused by caregivers.

Multidimensional scales seem to be more appropriate to a complete analysis of pain. They have the disadvantage of being long to achieve and they are not much used in daily practice. To

have a better efficiency, pain scales shouldn't take too much time, number of items must be adequate and explored dimensions must be relevant.

Thereby, in this current review, the BPI appears to be the most appropriate scale. A recent systematic review(12) tried to collect reliability data of pain scales available in general population and seemed to correlate this idea.

Finally, this study is incorporated into a larger project to determine the most appropriate pain rating scale for daily exercise in general practice. Psychometric validation can lead to answers about this. A field application will then be needed to confirm this work. Because it is often forgotten in clinical trials, patients 'point of view will be eventually essential.

ABBREVIATIONS LIST

BPI: Brief Pain Inventory

BSv MPI: Brief screening version of the Multidimensional Pain Inventory

CMDQ fsw: Cornell Musculoskeletal Discomfort Questionnaire for standing worker

CPG: Chronic Pain Grade

Ex NMQ: Extended version of the Nordic Musculoskeletal Questionnaire

GP: General Practitioner

GPS: Global Pain Scale

McGPQ: McGill Pain Questionnaire

MeSH: Medical Subject Headings

MPSS: The Mainz Pain Staging System

NMQ: Nordic Musculoskeletal Questionnaire

NRS: Numerical Rating Scale

PCP: S: Profile of Chronic Pain: Screen

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses

SF-36 BPS: Short Form-36 Bodily Pain Subscale

SF-McGPQ: Short Form McGill Pain Questionnaire

SF-McGPQ 2: Short Form McGill Pain Questionnaire 2

STIQ on CP: Structured Telephone Interviews Questionnaire on Chronic Pain

UB-3-PEG: Ultra-Brief 3-item PEG

VRS: Verbal Rating Scale

WHYMPI: West Haven Yale Multidimensional Pain Inventory

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APPENDIX 1: SEARCH EQUATIONS

EQUATION N°1	<p>#1 MeSH descriptor: [Pain Measurement] explode all trees and with qualifier(s): [Instrumentation - IS, Methods - MT, Statistics & numerical data - SN]</p> <p>#2 pain measurement:ti,ab,kw or test, tourniquet pain:ti,ab,kw or nociception test:ti,ab,kw or McGill pain questionnaire:ti,ab,kw or visual analog pain scale:ti,ab,kw (Word variations have been searched)</p> <p>#3 tests, analgesia:ti,ab,kw or test, formalin:ti,ab,kw or questionnaire, McGill pain:ti,ab,kw or scale, McGill pain:ti,ab,kw or pain measurements:ti,ab,kw (Word variations have been searched)</p> <p>#4 tourniquet pain test:ti,ab,kw or analgesia tests:ti,ab,kw or nociception tests:ti,ab,kw or analog pain scale:ti,ab,kw or pain scale, analog:ti,ab,kw (Word variations have been searched)</p> <p>#5 tests, tourniquet pain:ti,ab,kw or McGill pain scale:ti,ab,kw or scale, analog pain:ti,ab,kw or pain questionnaire, McGill:ti,ab,kw or pain scales, analog:ti,ab,kw (Word variations have been searched)</p> <p>#6 tests, nociception:ti,ab,kw or assessment, pain:ti,ab,kw or analog pain scale:ti,ab,kw or scale, analog pain:ti,ab,kw or pain tests, tourniquet:ti,ab,kw (Word variations have been searched)</p> <p>#7 assessments, pain:ti,ab,kw or visual analog pain scale:ti,ab,kw or pain scale, McGill:ti,ab,kw or scales, analog pain:ti,ab,kw or analog pain scales:ti,ab,kw (Word variations have been searched)</p> <p>#8 analog pain scales:ti,ab,kw or scales, analog pain:ti,ab,kw or measurement, pain:ti,ab,kw or pain assessments:ti,ab,kw or pain scales, analog:ti,ab,kw (Word variations have been searched)</p> <p>#9 tourniquet pain tests:ti,ab,kw or tests, formalin:ti,ab,kw or pain assessment:ti,ab,kw or measurements, pain:ti,ab,kw or analgesia test:ti,ab,kw (Word variations have been searched)</p> <p>#10 pain scale, analog:ti,ab,kw or test, analgesia:ti,ab,kw or test, nociception:ti,ab,kw or formalin tests:ti,ab,kw or formalin test:ti,ab,kw (Word variations have been searched)</p> <p>#11 pain test, tourniquet:ti,ab,kw or pain self efficacy:ti,ab,kw or visual analog scale pain:ti,ab,kw or visual analog scale for pain:ti,ab,kw or Dallas pain questionnaire:ti,ab,kw (Word variations have been searched)</p> <p>#12 pain visual analog scale:ti,ab,kw (Word variations have been searched)</p> <p>#13 (#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12)</p> <p>#14 MeSH descriptor: [Reproducibility of Results] explode all trees</p> <p>#15 MeSH descriptor: [Sensitivity and Specificity] explode all trees</p> <p>#16 MeSH descriptor: [Predictive Value of Tests] explode all trees</p> <p>#17 MeSH descriptor: [Psychometrics] explode all trees</p> <p>#18 Youden:ti,ab,kw or Cronbach:ti,ab,kw or Cohen:ti,ab,kw (Word variations have been searched)</p> <p>#19 (#14 or #15 or #16 or #17 or #18)</p> <p>#20 methods:ti,ab,kw or techniques:ti,ab,kw or procedures:ti,ab,kw or methodology:ti,ab,kw (Word variations have been searched)</p> <p>#21 (#13 and #19)</p> <p>#22 #20 and #21</p>
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EQUATION N°2	<p>#1 MeSH descriptor: [Pain Measurement] explode all trees and with qualifier(s): [Instrumentation - IS, Methods - MT, Statistics & numerical data - SN]</p> <p>#2 "pain measurement":ti,ab,kw or "tourniquet pain test":ti,ab,kw or "nociception":ti,ab,kw or "McGill Pain Questionnaire":ti,ab,kw or "Visual Analog Pain Scale":ti,ab,kw (Word variations have been searched)</p> <p>#3 "test":ti,ab,kw and "analgesia":ti,ab,kw or "formalin" (Word variations have been searched)</p> <p>#4 #1 or #2 or #3</p> <p>#5 MeSH descriptor: [Reproducibility of Results] explode all trees</p> <p>#6 MeSH descriptor: [Sensitivity and Specificity] explode all trees</p> <p>#7 MeSH descriptor: [Predictive Value of Tests] explode all trees</p> <p>#8 MeSH descriptor: [Psychometrics] explode all trees</p> <p>#9 "Youden":ti,ab,kw or "Cronbach":ti,ab,kw or "Cohen":ti,ab,kw (Word variations have been searched)</p> <p>#10 #5 or #6 or #7 or #8 or #9</p> <p>#11 methods:ti,ab,kw or techniques:ti,ab,kw or procedures:ti,ab,kw or methodology (Word variations have been searched)</p> <p>#12 #4 and #10</p> <p>#13 #11 and #12</p>
EQUATION N° 3	<p>#1 Pain:ti,ab,kw and (Measurement*:ti,ab,kw or assessment*:ti,ab,kw)</p> <p>#2 Test*:ti,ab,kw or questionnaire*:ti,ab,kw or scale*:ti,ab,kw</p> <p>#3 Tourniquet:ti,ab,kw or nociception:ti,ab,kw or McGill:ti,ab,kw or "visual analog":ti,ab,kw or "analog* pain":ti,ab,kw or analgesia:ti,ab,kw or formalin:ti,ab,kw or Dallas:ti,ab,kw</p> <p>#4 (method*:ti,ab,kw or technique*:ti,ab,kw or procedure*:ti,ab,kw or methodology*:ti,ab,kw)</p> <p>#5 ("Reproducibility of Results":ti,ab,kw or "Sensitivity and Specificity":ti,ab,kw or "Predictive Value of Tests":ti,ab,kw or Psychometrics:ti,ab,kw or Youden:ti,ab,kw or Cronbach:ti,ab,kw or Cohen:ti,ab,kw)</p> <p>#6 #2 and #3</p> <p>#7 #1 or #6</p> <p>#8 #7 and #4 and #5</p>

APPENDIX 2: OFF TOPICS

	Type of Off Topic	Number of the articles	TOTAL
1	Laboratory tests and experimental research (Functional tests, test intensity of muscle palpation, electromyography...)	6,7, 8, 9, 10, 11, 12, 13, 69, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 195, 220, 221, 222, 223, 224, 225, 226, 227, 228,336, 337, 338, 339, 340, 341 ; 459, 460, 461, 462, 463, 464,465, 466, 587, 588, 589,590, 591, 689, 690, 691, 692, 693, 694, 753, 754, 755, 756, 8 20,821, 822, 882, 883, 884, 992, 993, 1036, 1037, 1099, 1135, 1136, 1177, 1178, 1179, 1180, 1181, 1234, 1235, 1265, 1266, 1308, 1329, 1330, 1331, 1356, 1415	88
2	Practices, tests and therapeutic evaluation about pain	14, 16,17,18,19, 20,21,23, 24, 25, 26, 27,28, 29, 30, 31, 32, 34, 91, 92, 93,94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 133, 134, 229 , 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 247, 248, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 362, 363, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 384, 385, 450, 451, 467, 468, 469, 470, 471, 472, 473, 474, 475, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 580, 581, 592, 593, 594, 595, 596, 597, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 940, 941, 942, 943, 944, 945, 946, 947, 948, 950, 951, 952, 953, 954, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1193, 1194, 1195, 1196, 1197, 1198, 1236, 1237, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1267, 1268, 1269, 1270, 1271, 1272, 1273,1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1304, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1390, 1391, 1392, 1400, 1401, 1402, 1403, 1416, 1417, 1418, 1420, 1421, 1428	463
3	Scales about psychologic consequences of pain ; behaviour induced by pain	35, 626	2
4	Evaluation of health care providers' knowledge , practices and belief about pain or pain scales	135, 136, 268, 269, 517, 627, 899, 1364	8
5	Research strategies, algorithms, cost analyzes, statistics model evaluation	36,37, 137, 138, 139, 140, 270, 518, 519, 751, 780, 815, 816, 934, 935, 955, 1111, 1342, 1365, 1370	20
6	Pain risk factors studies, Predictive factors of therapeutic efficacy or of diseases/diagnosis	38,39, 40, 41, 42, 43, 44, 45, 46, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 271, 272, 273, 274,275, 277, 278, 279, 280,281, 282, 283, 284, 285, 286, 289, 290, 291, 292, 293,	132

		294, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 520, 521, 522, 523, 524, 525, 526, 527, 528, 628, 629, 630, 631, 632, 710, 711, 712, 713, 714, 715, 781, 782, 783, 784, 785, 786, 787, 788, 848, 849, 850, 900, 901, 902, 903, 956, 957, 1008, 1009, 1010, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1112, 1151, 1152, 1153, 1199, 1200, 1201, 1202, 1249, 1250, 1251, 1253, 1289, 1290, 1291, 1292, 1343, 1366, 1367, 1384, 1404, 1427	
7	Other Scales : Quality of life scales, behaviour scales, anxiety scales...	47, 48, 50, 52, 53, 54, 55, 56, 57, 58, 59, 60, 70, 159, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 544, 633, 634, 635, 636, 637, 638, 639, 640, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 789, 790, 791, 792, 793, 794, 795, 796, 797, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 904, 905, 906, 907, 908, 909, 910, 911, 912, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 971, 972, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1062, 1063, 1064, 1065, 1066, 1067, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1154, 1155, 1156, 1157, 1158, 1159, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1254, 1255, 1256, 1293, 1294, 1295, 1296, 1297, 1316, 1317, 1344, 1345, 1346, 1347, 1368, 1385, 1393, 1394, 1395, 1405, 1406, 1407, 1409	199
8	No link with pain	61, 62, 63, 64, 65, 66, 67, 68, 181, 182, 183, 184, 185, 186, 187, 188, 189, 1909, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 311, 312, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 436, 437, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 582, 583, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 798, 799, 800, 801, 802, 803, 804, 806, 807, 808, 809, 810, 811, 812, 813, 814, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 913, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1160, 1161, 1162, 1163, 1164, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1298, 1299, 1300, 1301, 1302, 1303, 1318, 1319, 1320, 1321, 1322, 1323, 1348, 1349, 1350, 1351, 1352, 1369, 1386, 1387, 1388, 1396, 1397, 1398, 1410, 1411, 1412, 1413, 1414, 1419, 1422, 1423, 1424, 1425, 1426	365
9	Do not deals with human	989	1
	DUPLICATES	15, 22, 33, 49, 51, 111, 132, 160, 161, 162, 177, 238, 246, 249, 250, 276, 287, 288, 313, 361, 364, 383, 435, 438, 476, 489, 490, 543, 598, 641, 652, 805, 969, 970, 1165, 1192, 1238, 1408	38

APPENDIX 3: INCLUSION GRID

Internet link for the Excel spreadsheet with all results:

<https://1drv.ms/x/s!Atf-MkpOJZbXgh42KxFniq83EkxJ>

APPENDIX 4: “EXERCER” QUALITY GRID

CRITERIA	YES	PARTLY	NO
The research question and / or objectives are clear	3	1	0
The method is suitable for answering research question	3	1	0
Evaluation criteria are clinical	3	1	0
Statistical analysis plan is correct	2	1	0
Results and discussion are consistent with the research question and method	2	1	0
Conclusion is based on the results of this study	2	1	0
Results are relevant for practice, education or care's organization	3	1	0
TOTAL	/18		

Internet Link for the evaluation of each article:

<https://1drv.ms/w/s!Atf-MkpOJZbXgh0AdmOUdenNuRfF>

APPENDIX 5: MULTIDIMENSIONAL SCALES TABLES

Dimension assessed	Item	Response
Pain Intensity	How much Bodily pain have you had during the past 4 weeks?	1 = None, 2 = Very mild, 3 = Mild, 4 = Moderate, 5 = Severe, 6 = Very Severe
	During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?	1 = Not at all, 2 = A little bit, 3 = Moderately, 4 = Quite a bit, 5 = Extremely

Table 5: SF-36 BPS(14)

Dimension assessed	Item	Response
Localisation	Pain drawing	Free response
Pain Intensity	Please rate your pain by circling the one number that best describes your pain at its worst in the last 24 hours	0 = No pain 10 = Pain as bad as you can imagine
	Please rate your pain by circling the one number that best describes your pain at its least in the last 24 hours	“
	Please rate your pain by circling the one number that best describes your pain on the average	“
	Please rate your pain by circling the one number that tells how much pain you have right now	“
Pain Treatments	What treatments or medications are you receiving for your pain	Free response
	In the last 24 hours, how much relief have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received	0 % = No relief 100 % = Complete relief
Daily activity	Circle the one number that describes how, during the past 24 hours, pain has interfered with your general activity	0 = Does not interfere 10 = Completely interferes
	Circle the one number that describes how, during the past 24 hours, pain has interfered with your walking activity	“
	Circle the one number that describes how, during the past 24 hours, pain has interfered with your sleep	“
Mood	Circle the one number that describes how, during the past 24 hours, pain has interfered with your mood	“
	Circle the one number that describes how, during the past 24 hours, pain has interfered with your enjoyment of life	“
Work	Circle the one number that describes how, during the past 24 hours, pain has interfered with your normal work (includes both work outside the home and housework)	“

Table 6: Brief Pain Inventory (14)

Dimension assessed	Item	Response
Pain Intensity	What number best describes your pain on average in the past week	0 = No pain 10 = pain as bad as you can imagine
Mood	What number best describes how, during the past week, pain has interfered with your enjoyment of life?	0 = Does not interfere 10 = Completely interferes
Daily activity	What number best describes how, during the past week, pain has interfered with your general activity?	“

Table 7: Ultra Brief 3-item PEG(14)

Dimension assessed	Item	Response
Pain intensity	How would you rate your pain at the present time?	11-points NRS: 0 = No pain, 10 = Pain as bad as could be
	In the past 6 months, how intense was your worst pain rated?	11-points NRS: 0 = No pain, 10 = Pain as bad as could be
	In the past 6 months, on average, how intense was your pain	11-points NRS: 0 = No pain, 10 = Pain as bad as could be
Work	About how many days in the last 6 months have you been kept from your usual activities (work, school or housework) because of this pain?	0-6 days, 7-14 days, 15-30 days, 31 or more days
	In the past 6 months, how much has this pain change your ability to work (including housework)	11-points NRS: 0 = No Change 10 = Extreme change
Daily activities	In the past six months, how much has this pain interfere d with your daily activities?	11-points NRS: 0 = No interference 10 = Unable to carry on activities
Social life	In the past 6 months, how much has this pain changed your ability to take part in recreational, social and family activities?	11-points NRS: 0 = No Change 10 = Extreme change

Table 8: Chronic Pain Grade (11)

Dimension assessed	Item	Response
Temporal aspect of pain	How often during the past 6 months have you experienced physical pain or discomfort lasting for more than a few minutes? This could be pain from an injury or a chronic problem. It could be pain in your head, neck or back, shoulders, arms or hands, muscles or joints, stomach, feet, legs, or anywhere else in your body.	0 = never, 1 = less than once a month, 2 = once a month, 3 = twice a month, 4 = once a week, 5 = several times every week, 6 = daily
	How often in the past 6 months have you had at least an hour's worth of severe pain. By severe pain, we mean pain that hinders you from accomplishing your daily tasks.	“
Pain intensity	What was your average level of pain on days when you had pain during the past 6 months?	0 = Very little pain, 10 = Unbearable pain
	What is the greatest amount of pain you have had over the past 6 months?	“
Work	How often, in the past 6 months have you not been able to fulfil your usual and expected responsibilities at home, such as chores, repair work, or cleaning because you were in pain.	0 = never, 1 = less than once a month, 2 = once a month, 3 = twice a month, 4 = once a week, 5 = several times every week, 6 = daily
Social life	How often, if ever, in the past 6 months, have you had to give up enjoyable activities, such as hobbies, going to the movies, or fun activities with friends or family because of your pain?	“
	How often, if ever, in the past 6 months, have you not been able to enjoy your relationships with your spouse or other, family, or friends because of your pain?	“
Daily activity	How often, if ever, in the past 6 months, have you not been able to pursue personal goals because of your pain.	“
	How often, if ever, in the past 6 months have you been unable to provide basic care for yourself, such as get out of bed, dress yourself, shower alone, prepare meals, eat without assistance, fix your hair, put on cosmetics, or shave because of your pain?	“
	How often, if ever, in the past 6 months have you been unable to think clearly, solve problems, concentrate or remember accurately because of your pain?	“

Mood	How often over the past 6 months has your pain caused you to feel sad or depressed?	0 = Never, 5 = Extremely often
	How often over the past 6 months has your pain caused you to feel tense, anxious, or jittery?	“
	How often over the past 6 months has your pain caused you to feel angry?	“
	How often over the past 6 months has your pain caused you to feel isolated or lonely?	“
	How often over the past 6 months has your pain reduced your ability to enjoy your life?	“

Table 9 : Profile of chronic pain: screen (26)

Dimension assessed	Item	Response
Inclusion criteria		
	6 questions	agreement, number of adults, age, pain experience, sex, pain duration
Global pain context		
Intensity	Rate of the intensity of the last experienced pain	11-points NRS
Health care System utilisation	Any involvement in medical studies for pain medication?	Yes/No
Localisation	Where is your pain located?	Free answer
Question about diagnosis		
Temporal aspect	Last pain experienced	6-points verbal scale
	Frequency of pain experience	7-points verbal scale
Pain evaluation		
Precision about diagnosis (9 questions)		Yes/No or list with multiples choices
Quality	Words used to describe the pain	Free answer
Temporal aspect	Is the pain constant, on-going but always there or intermittent (comes and goes)?	Constant, Intermittent
Intensity	How to describe the pain tolerance when it was at its worst intensity	4-points verbal scale
	What was the last pain scale scoring on a scale	Number or range
	Does pain increase as a direct result of activity	Yes/No
Work	Did the pain leads to losing job	“
	Did the pain leads to changing job responsibilities	“
	Did the pain leads to changing jobs entirely	“
	How pain interfere with working outside the home	1 = just as able, 2 = less able, 3 = no longer able
	How pain interfere with doing household chores	“
Daily activities	How pain interfere with doing exercising	“
	How pain interfere with ability to participate in lifting	“
	How pain interfere with ability to walk	“
	How pain interfere with ability to sleep	“
	How pain interfere with ability to drive	“
	How pain interfere with maintaining an independent lifestyle	“
	How pain interfere with maintaining relationship with friends and family	“
Social life	How pain interfere with attending social activities	“
	How pain interfere with having sexual relations	“
	With whom do the patient discuss about pain	Free answer
	Is pain discussion comfortable with the doctor	Yes/No

Health care system utilisation	How many doctors have been consulted	Number or range
	How many doctors treated the pain?	“
	Reasons for seeing more than one doctor for pain treatment	Free answer
	Kind of doctors currently seeing for the pain?	Free answer
	Has a pain management specialist ever been consulted?	1 = Yes, 2 = No
	Last doctor visits	Years? Months? Weeks?
	Ever went abroad for treatment?	Yes/No
	For what reasons?	list with multiples choices
	Greatest distance travelled for treatment	Number or range
	Where to hear about new methods for treating pain?	Free answer
Mood	Has depression ever been diagnosed as a result of the pain	Yes/No
	Is the pain currently treated in anyway	“
Treatment	If “NO”: Why not	Free answer
	Have you ever taken prescription medicine for your pain?	Yes/No
	If “NO”: Why not?	Free answer
	Number of different kinds of pain medicine	Number or range
	Is the pain currently treated by prescription pain medicine	Yes/No
	If “NO”: Why not	Free answer
	Did the doctor ever switched the prescription or prescribed more than one medicine	Switched, More than one, Both, Neither
	If “Yes”: Why	Free answer
	What is it the current medicine?	“
	Is it effectiveness?	5-points verbal scale
	Is it sometime inadequate to control the pain?	Yes/No
	Number of different non-prescription oral medication during the past six months	Number or range
	What was it	Free answer
	Is it effectiveness?	5-points verbal scale
	Number of pills taken each day (considering prescription and non-prescription oral medicines)	Number or range
What other methods (apart from medications) were tried?	Free answer	
Was it successful?	4-points verbal scale	
Is the pain adequately controlled?	Yes/No	
Temporal aspect	Duration between first pain experience and adequate control	Years? Months? Weeks?
5 questions about doctor's care		7-points Verbal scale, Free answer, Yes/No, list with multiples choices, 5-points verbal scale

Assessment about Pain interference		
Daily activity	Not possible to function normally	5-points verbal scale
	Makes feel older	“
	Makes feel tired all the time	“
	Pain prevent from thinking and clearly concentrate	“
Work	Employers and colleagues are unsympathetic	“
	Afraid to lose a job	“
Social	Feels like should not discuss the pain	“
	Impression that people’s treatment is different	“
	Not understood by family	“
	Makes feel inadequate as a spouse/partner	“
	Worry about people judgment	“
	Fear that family think about abusing drugs	“
	too much pain to take care about the others	“
	Pain force to rely on the other	“
	Nobody believe in the pain intensity	“
	Could spend a lot of money to relieve the pain	“
Mood	Makes feel Helpless	“
	Want to die because of the pain	“
	Feels alone with pain	“
	Not possible to remember how is it to not have pain	“
Treatment	Pain is not severe enough for taking medicine	“
	Worry about side effects	“
	Prefer that the doctor treat the illness than the pain	“
	Too much other medicine for taking pain medicine	“
	Afraid to be addicted	“
	Feels like there is not enough time to discuss with the doctor	“
	Prefer to take medication for illness than for pain	“
	Always willing to try a new treatment	“
	Doctor does not know how to control the pain	“
	Doctor do not think pain is a problem	“
	Pain is just a part of medical condition	“
	Doctor never ask about the pain	“
Doctor thinks patients just wants drugs	“	
Demographic questions		
7 questions	Marital status, number and age of children, employment status and relation with pain.	

Table 10: Structured Telephone Interviews Questionnaire on Chronic Pain (105)

Dimension assessed	Item	Response
Intensity	The current pain	11-points NRS: 0 = No pain, 10 = Extreme pain
	Best pain (past week)	“
	Worst pain (past week)	“
	Average pain (past week)	“
Mood	Felt less pain (past week)	11-points NRS: 0 = Strongly disagree, 10 = strongly agree
	Felt depressed (past week)	“
	Felt anxious (past week)	“
	Felt afraid (past week)	“
	Felt Hopeless (past week)	“
	Felt Exhausted (past week)	“
	Felt Terrified (past week)	“
	Overall mood improved (past week)	“
	Had more energy (past week)	“
	Daily activities	Had trouble sleeping (past week)
Had trouble feeling comfortable (past week)		“
Currently unable to go to the store		“
Currently unable to exercise		“
Currently unable to bath and dress alone		“
Currently unable to spend time outside		“
Currently unable to walk up on down stairs		“
Currently unable to bend over to pick things up		“
Currently unable to stand as long as wanted		“
Currently unable to walk as long as wanted		“
Treatment	Currently unable to drive	“
	Took fewer medications (past week)	“
Health care system utilisation	Had more control over the pain (past week)	“
	Needed to see the doctor less often (past week)	“
Social life	Was satisfied with medical care (past week)	“
	Was more independent (past week)	“
Work	Currently unable to enjoy friends and family	“
	Currently unable to comfortably enjoy sex	“
Work	Was able to work (past week)	“
	Currently unable to do chores at home	“

Table 11: Global Pain Scale (30)

Dimension assessed	Item	Response
Localisation	Patients have to answer in the line corresponding to the appropriate pain localisations.	20 body regions possible
Temporal aspect of pain	During the last work week, how often did you experience ache, pain or discomfort	Never, 1-2 times last week, 3-4 times last week, Once every day, Several times every day.
Pain intensity	If you experienced ache, pain, discomfort, how uncomfortable was this?	Slightly uncomfortable, Moderately uncomfortable, Very uncomfortable.
Work	If you experienced ache, pain, discomfort, did this interfere with your ability to work?	Not at all, Slightly interfered, Substantially interfered

Table 12: Cornell Musculoskeletal Discomfort Questionnaire for standing worker (31)

Dimension assessed	Item	Response
Section 1: Pain severity (7-points NRS)		
Pain intensity	Rate the level of your pain at the present moment	0 = No pain, 6 = Very intense pain
	On the average, how severe has your pain been during the last week?	0 = No at all severe 6 = Extremely severe
	How much suffering do you experience because of your pain	0 = No suffering 6 = Extreme suffering
Daily activities	In general, how much does your pain problem interfere with your day to day activities?	0 = No interference 6 = Extreme interference
	During the past week how much control do you feel that you have had over your life?	0 = No at all in control 6 = Extremely in control
	During the past week how much do you feel that you've been able to deal with your problems?	0 = Not at all 6 = Extremely well
Work	Since the time you developed a pain problem, how much has your pain changed your ability to work?	0 = No change 6 = Extreme change
	How much has your pain changed the amount of satisfaction or enjoyment you get from work?	0 = No change 6 = Extreme change
	How much has your pain changed your ability to do household chores?	0 = No change 6 = Extreme change
Social life	How much has your pain changed the amount of satisfaction or enjoyment you get from participating in social life and recreational activities?	0 = No change 6 = Extreme change
	How supportive or helpful is your spouse (significant other) to you in relation to your pain	0 = Not at all supportive 6 = Extremely supportive
	How much has your pain changed your ability to participate in recreational and other social activities?	0 = No change 6 = Extreme change
	How much has your pain changed the amount of satisfaction you get from family-related activities?	0 = No change 6 = Extreme change
	How worried is your spouse (significant other) about you in relation to your pain problem?	0 = No at all worried 6 = Extremely worried
	How much has your pain changed your marriage and other family relationships?	0 = No change 6 = Extreme change
	How attentive is your spouse (significant other) to your pain problem	0 = Not at all attentive 6 = Extremely attentive
Mood	How much has your pain changed your friendships with people other than your family?	0 = No change 6 = Extreme change
	Rate your overall mood during the past week	0 = Extremely low mood 6 = Extremely high mood
	During the past week how irritable have you been?	0 = Not at all irritable 6 = Extremely irritable
	During the past week how tense or anxious have you been?	0 = Not at all tense/anxious 6 = Extremely tense/anxious

Section 2: Pain Interference spouse (or significant other) answer when patients are in pain (7-points NRS)			
Social life	Ignores me	0 = Never 6 = Very often	
	Asks me what he/she can do to help	“	
	Reads to me	“	
	Expresses irritation at me	“	
	Takes over my jobs or duties	“	
	Talks to me about something else to take my mind off the pain	“	
	Expresses frustration at me	“	
	Tries to get me to rest	“	
	Tries to involve me in some activity	“	
	Expresses anger at me	“	
	Gets me some pain medications	“	
	Encourages me to work on a hobby	“	
	Gets me something to eat or drink	“	
	Turns on the T.V. to take my mind off my pain	“	
	Section 3: Activity level how often does patients do these activities? (7-points NRS)		
Work	Wash dishes	0 = Never 6 = Very often	
	Mow the lawn	“	
	Work in the garden	“	
	Help with the house cleaning	“	
	Work on the car	“	
	Wash the car	“	
	Do a load of laundry	“	
	Work on a needed house repair	“	
	Daily activities	Go out to eat	“
		Play cards or other games	“
Go grocery shopping		“	
Go to a movie		“	
Prepare a meal		“	
Take a trip		“	
Go to a park or beach		“	
Ssocial life	Take a ride in a car	“	
	Visit friends	“	
	Visit relatives	“	

Table 13: West Have Yale Multidimensional Pain Inventory (43)

Dimension assessed	Item	Response
Temporal aspect of pain	On average, how frequently have you had your main pain during the past 4 weeks?	1 = Pain does not occur on a daily basis or there is daily pain lasting less than a day. If the patient has been pain free during the last 4 weeks "1" should be recorded. 2 = Pain occurs several times per day. Pain intensity most often returns to zero (e.g. "0" on a NRS). There are pain free intervals. 3 = Pain is continuously present, pain intensity does generally not go back to zero. There are only rare moments without pain, e.g. during sleep
	On average, during the past 4 weeks, how long did your main pain last?	1 = Pain lasted for several hours or less. 2 = Pain usually lasted for several days, at most for one week. 3 = Pain usually persisted for more than a week or was continuous
Pain Intensity	Did the intensity of your main pain fluctuate during the past 4 weeks, that is, did your pain change between mild, moderate and severe intensities?	1 = Fluctuation of 2 or more points on a 11-points NRS, two or more times per week 2 = Fluctuation of 2 or more points on a 11-points NRS, less than twice per week. 3 = Pain intensity does not change or hardly changes
	During the past 4 weeks, when you had pain, did it vary in intensity?	1 = Intensity of pain episodes usually varied more than 2 points on a 11-points NRS. Definition of "usually": intensity changed in 50 or more percent of the episodes 2 = Intensity of pain episodes rarely varied 2 points on a 11-points NRS. Definition of "rarely": intensity changed in less than 50% of the pain episodes 3 = Pain intensity hardly or never changed.
Pain localisation	In which body areas did you suffer pain during the past 4 weeks? How many kinds of pains could you discriminate during the past 4 weeks?)	1 = Patient complains about one pain in one or more body areas, he or she feels, however, these pain areas belong together. 2 = Patient complains about 2 definable pains located in one or more areas of the body. 3 = Patient complains about more than two definable pains or his pain areas covers more than 50% of his body surface.
Pain Treatments	Did you take any drugs for your pain in the last 4 weeks?	1 = No drugs or group I-drug-intake on less than 15 days in the last 4 weeks 2 = Up to maximally 2 drugs of group I on more than 15 days in the last 4 weeks. 3 = More than 2 drugs of group I or one or more drugs of group II or III on at least 15 days in the last 4 weeks.

Health Care System Utilization	Have you ever been withdrawn from a drug which you took for pain, or have you attempted to reduce the dose of such a drug?	1 = No drug withdrawal treatment or significant dose reduction in the past history. 2 = One account of drug withdrawal or one attempt of dose reduction in the past history. 3 = Two or more drug withdrawals or several dose reduction attempts in the past history.
	Have you ever chosen another physician because of previous unsuccessful pain treatment?	1 = No change of personal, pain managing physician 2 = Maximum three changes of personal, pain managing physician 3 = More than three changes of personal, pain managing physician
	Have you ever had pain treatment as an inpatient?	1 = No or one pain related hospitalization (for diagnosis and/or treatment) 2 = Two to three pain related hospitalization
	Have you ever been operated on because of your pain(s)?	1 = No or one pain related surgical procedure 2 = Two to three pain related surgical procedures 3 = More than three pain related surgical procedures
	Have you ever had pain treatments in a rehabilitation or pain center?	1 = No pain related stay in a rehabilitation or pain center 2 = One or two pain related stays in a rehabilitation or pain center 3 = More than two pain related stays in a rehabilitation or pain center

Table 14: Mainz Pain Staging System (11)

Dimension assessed	Item	Response
Pain Quality	Temporal	Flickering = 1, quivering = 2, pulsing = 3, throbbing = 4, beating = 5, pounding = 6
	Spatial	jumping = 1, flashing = 2, shooting = 3
	Punctate pressure	Pricking = 1, boring = 2, drilling = 3, stabbing = 4, lacerating = 5
	Incisive pressure	sharp = 1, cutting = 2, lacerating = 3
	Constrictive pressure	pinching = 1, pressing = 2, gnawing = 3, cramping = 4, crushing = 5
	Traction pressure	tugging = 1, pulling = 2, wrenching = 3
	Thermal	hot = 1, boring = 2, scalding = 3, searing = 4
	Brightness	tingling = 1, itchy = 2, smarting = 3, stinging = 4
	Dullness	dull = 1, sore = 2, hurting = 3, aching = 4, heavy = 3
	Sensory miscellaneous	tender = 1, taut = 2, rasping = 3, splitting = 4
	Tension	tiring = 1, exhausting = 2
	Autonomic	sickening = 1, suffocating = 2
	Fear	fearful = 1, frightful = 2, terrifying = 3
	Punishment	punishing = 1, gruelling = 2, cruel = 3, vicious = 4, killing = 5
	Affective-evaluative-sensory: miscellaneous	wretched = 1, blinding = 2
	Evaluative	annoying = 1, troublesome = 2, miserable = 3, intense = 4, unbearable = 5
	Sensory: miscellaneous	spreading = 1, radiating = 2, penetrating = 3, piercing = 4
	Sensory: miscellaneous	tight = 1, numb = 2, drawing = 3, squeezing = 4, tearing = 5
	Sensory	cool = 1, cold = 2, freezing = 3
	Affective-evaluative: miscellaneous	nagging = 1, nauseating = 2, agonizing = 3, dreadful = 4, torturing = 5
Temporal aspect of pain	Which word or words would you use to describe the pattern of your pain?	Continuous steady constant = 1 rhythmic periodic intermittent = 2 brief momentary transient = 3

Factor influencing pain	Do the following items increase or decrease your pain?	Liquor, stimulants such as coffee, eating, heat, cold, damp, weather changes, massage or use of a vibrator, pressure, no movement, movement, sleep or rest, lying down, distraction (TV reading etc.), urination or defecation, tension, bright lights, loud noises, going to work, intercourse, mild exercise, fatigue
	Which word describes your pain right now?	Mild = 1, discomforting = 2, distressing = 3, horrible = 4, excruciating = 5
Pain Intensity	Which word describes it at its worst?	..
	Which word describes it when it is least?	..
	Which word describes the worst toothache you ever had?	“
	Which word describes the worst headache you ever had?	“
	Which word describes the worst stomach ache you ever had?	“

Table 15: McGill Pain Questionnaire (11)

Dimension assessed	Item	Response
Quality pain	Throbbing	0 = None, 1 = Mild, 2 = Moderate, 3 = Severe
	Shooting	“
	Stabbing	“
	Sharp	“
	Cramping	“
	Gnawing	“
	Hot-burning	“
	Aching	“
	Heavy	“
	Tender	“
	Splitting	“
	Tiring-Exhausting	“
	Sickening	“
	Fearful	“
Punishing-Cruel	“	
Pain intensity	Visual Analog scale	Left end-point = No pain Right end-point = Worst possible pain
	Present Pain Intensity	0 = No Pain, 1 = Mild, 2 = Discomforting, 3 = Distressing, 4 = Horrible, 5 = Excruciating

Table 16: Short-Form McGill Pain Questionnaire(11)

COCHET (Laurent) – What pain scales assessment are usable in general population? A systematic literature review of Cochrane library according to the PRISMA statement
Th. : Méd. : Brest 2018

ABSTRACT:

Background: Pain is one of the most common symptom reported in general practice. For this purpose, one-dimensional and multidimensional pain scales have been developed to assess acute or chronic pain. There is no gold standard in pain assessment in general practice. This study aimed to list all pain scales studied for the general population.

Method: A systematic review questioning Cochrane database, according to the PRISMA protocol, was conducted until February 2018. Only English articles assessing pain scales in general population were included. The bibliography of selected studies and recent systematics reviews had been examined to include additional articles in a second search.

Results: On 1431 results found on Cochrane, 4 relevant articles were included. With the second search, 203 additional articles were detected and 84 were added. Finally, 88 articles were selected and 35 pain scales were found: 6 unidimensional-scales with 13 variants and 12 multidimensional scales with 4 variants.

Discussion: Pain scales were different by explored dimensions and the number of item. Some of them are not studied in this current review by a lack of articles available on the database responding to eligibility criteria. Reliability data of available pain assessment scales were recently collected in a systematic review. It will be necessary to consider external validity data in further studies and to choose which pain scale is the most appropriate for a daily practice.

KEYWORDS:

PAIN MEASUREMENT ;
PAIN SCALE ;
GENERAL POPULATION ;
PRIMARY CARE

JURY :

Président :	<u>M. Le Professeur Jean-Yves Le Reste</u>
Membres du Jury :	M. le Dr Patrice Nabbe
	M. le Dr Chiron Benoît
	M. le Dr Elouan Péron

DATE DE SOUTENANCE :

Jeudi 14 Juin 2018

ADRESSE DE L'AUTEUR :