Prevalence of chronic pain in Brazil: systematic review

Prevalência de dor crônica no Brasil: revisão sistemática

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ABSTRACT

BACKGROUND AND OBJECTIVES: Chronic pain is considered a worldwide public health problem, can lead to physical and emotional stress, in addition to high financial and social costs for the population. The aim of this study was to produce a systematic review to identify the prevalence of chronic pain in Brazil, considering its geographical regions and mechanisms subclassifications by the International Association for the Study of Pain (IASP).

CONTENTS: A systematic review was carried out on the following databases: Scielo, Pubmed, *Periódicos* Capes, Science Direct and Virtual Health Library. 35 studies that investigated the prevalence of chronic pain in Brazil were included. The prevalence ranged from 23.02 to 76.17%, presenting a national average of 45.33% between studies, affecting more women. The Brazilian region with the highest prevalence among the included studies was the Midwest region (56.25%), however the region with the most studies and the largest population analyzed was the Southeast region (42.2%). Regarding the classifications of IASP mechanisms, possibly nociceptive pain had a prevalence of 36,70%, whereas neuropathic pain was 14,5% and nociplastic pain 12,5%.

CONCLUSION: The present study observed a high prevalence of chronic pain in Brazil, being the majority in women. Regarding chronic pain mechanisms, the possibly nociceptive predominance was the most prevalent. As for the national geographic region, the highlight of the highest prevalence of chronic pain was for the Midwest region, however the region with the most studies and the largest population analyzed was the Southeast region.

Keywords: Chronic pain, Collective health, Prevalence.

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RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor crônica é considerada um problema de saúde pública mundial, pode levar ao estresse físico e emocional, além de altos custos financeiros e sociais para a população. O objetivo deste estudo foi produzir uma revisão sistemática para identificar a prevalência da dor crônica no Brasil, considerando suas regiões geográficas e subclassificações de mecanismos pela *International Association for the Study of Pain* (IASP).

CONTEÚDO: Foi realizada uma revisão sistemática nas seguintes bases de dados: Scielo, Pubmed, Periódicos Capes, *Science Direct* e Biblioteca Virtual em Saúde. Foram incluídos 35 estudos que investigavam a prevalência de dor crônica no Brasil. A prevalência variou de 23,02 a 76,17%, apresentando média nacional de 45,59% entre os estudos, afetando mais o sexo feminino. A região do Brasil com maior prevalência dentre os estudos incluídos foi a região centro-oeste (56,25%), porém a região com mais estudos e maior população analisada foi a região sudeste (42,2%). Quanto às classificações de mecanismos da IASP, a dor possivelmente nociceptiva obteve prevalência de 36,70%, já a neuropática foi de 14,5% e a dor nociplástica de 12,5%.

CONCLUSÃO: O presente estudo identificou alta prevalência de dor crônica no Brasil, maior em mulheres. Em relação aos seus mecanismos, a dor de predomínio possivelmente nociceptivo foi a mais prevalente. Quanto a região geográfica nacional, o destaque de maior prevalência foi para a região Centro-Oeste, porém a região com mais estudos e maior população analisada foi a região Sudeste.

Descritores: Dor crônica, Prevalência, Saúde coletiva.

INTRODUCTION

The definition of pain revised by the International Association for the Study of Pain (IASP) presents pain as ''an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage"[1]. As for the temporal sub-classification, it can be acute and chronic, chronic pain (CP) being that which persists after three months beyond the usual time of healing of an injury or is associated with chronic pathological processes that cause continuous or recurrent pain[2]. For non-oncologic musculoskeletal pain, three months is the most convenient dividing point between acute and chronic pain, but for research purposes, six months is also used often[3].

Moreover, CP is characterized as a disease by the ICD 11 (International Classification of Diseases) and classified as primary, due to the existence of secondary chronic pains (visceral, neuropathic, musculoskeletal, cancer-related, post-surgical / post-traumatic, or headache / orofacial)[4]. Regarding the biological mechanisms accepted by the IASP, CP can be classified as nociceptive, nociplastic, and neuropathic[5]. In Brazil, it's considered a public health problem[6], and its prevalence - the number of people with the disease at a given time - needs to be constantly investigated[7]. Approximately 60 million people suffer from CP, corresponding to about 10% of the world population[8].

CP may be related to more physical and emotional stress, besides high financial and social costs for the population. CP also presents more prevalence among women with ages between 45 and 66 years old[9,10]. A previous Brazilian study found the need to further identify the most prevalent body region associate with CP, highlighting the dorsal/lumbar region as the most relevant[11], with high treatment costs, higher number of medical leaves, and individual suffering[12].

Although CP has already been recognized as a worldwide problem, there are still several gaps to be filled on this subject and its impacts on the population. Regarding Brazil, few studies intend to quantify the prevalence of CP respecting the differences between geographic regions. Furthermore, studies that allow a view of CP related to the predominant mechanisms can direct future strategic actions for these conditions.

The objective of the present study was to produce a systematic review to identify the prevalence of chronic pain in Brazil, considering its geographic regions and sub-classifications of mechanisms by the IASP.

CONTENTS

A systematic review carried out according to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, which can be accessed at: rev://www.prisma-statement.org/.

Articles with the following features were included: (1) cross-sectional type studies; (2) in English, Spanish and Portuguese languages; (3) conducted in Brazil; (4) that investigated the prevalence of chronic pain, defined in the present study as: persistent or continuous pain lasting more than 3 months - the predominant pain mechanisms were defined as: possibly nociplastic when related to Fibromyalgia and irritable bowel syndrome, neuropathic identified by the Douleur Neuropathique 4 (DN4) and nociceptive through the exclusion of the other already mentioned pain subtypes; (5) that used a collection questionnaire, either proprietary or validated, with or without the use of clinical examination to identify the individual with chronic pain or characterize its biological mechanisms; (6) articles that presented chronic pain criteria, according to the IASP, to reference the delimitation of their sample, either in the manuscript or in the collection instrument; (7) studies with populations formed by children, adolescents, adults or elderly individuals above 60 years old. Longitudinal studies, clinical trials, doctoral or master's theses, course completion works, and those that did not fit the inclusion requirements were excluded.

Search strategy

The search was conducted through the Pubmed, *Periódicos* Capes, Virtual Health Library, Scielo and Science Direct (journal repository) databases. The words used for the search were ("chronic pain" AND prevalence AND Brazil), (*"dor crônica"* AND *prevalência* AND *Brasil*), (*"dolor crónico"* AND *prevalência* AND *Brasil*), the search was conducted between the months of April and August 2020.

Data collection and analysis

At first, the descriptors were put into the databases with a result of 4.825 articles in total (Table 1). The data screening was carried out in stages: title, duplicates identification, abstracts and full text reading, taking into account the inclusion and exclusion criteria. The final result consisted of: 35 articles of chronic pain prevalence survey, being 23 studies in varied populations, 9 articles with possible characteristics of nociceptive pain, 1 study on neuropathic pain and 2 articles on nociplastic pain. All the information was stored in Microsoft Excel spreadsheets. Figure 1 shows the data flowchart of the extraction process of studies included.

Data extraction

Two reviewers performed independently the search and initial selection in order to identify the titles and abstracts of studies that were potentially relevant in each database. If at least one reviewer considered the reference eligible, the article was fully analyzed. In case of disagreement, a third reviewer was consulted, and a decision was reached. If necessary, the authors were contacted by e-mail to provide further information about their studies. The reviewers extracted variables from the articles that were divided into: primary outcomes (PO) - prevalence of chronic pain; and secondary outcomes (SO) - the division of the articles according to the predominant neurophysiological mechanisms according to the IASP definitions[3].

Table 1. List of descriptors used and quantity of files found in the databases

Descriptors	Scielo	Pubmed	Science Direct	*Periódico* Capes	Virtual Health Library
"dor crônica" AND *prevalência* AND *Brasil*	39	12	684	106	103
"chronic pain" AND prevalence AND Brazil	39	1754	482	1324	154
"dolor crónico" AND *prevalência* AND *Brasil*	15	1	27	16	69
Total	4825				

Source: Elaborated by the authors.

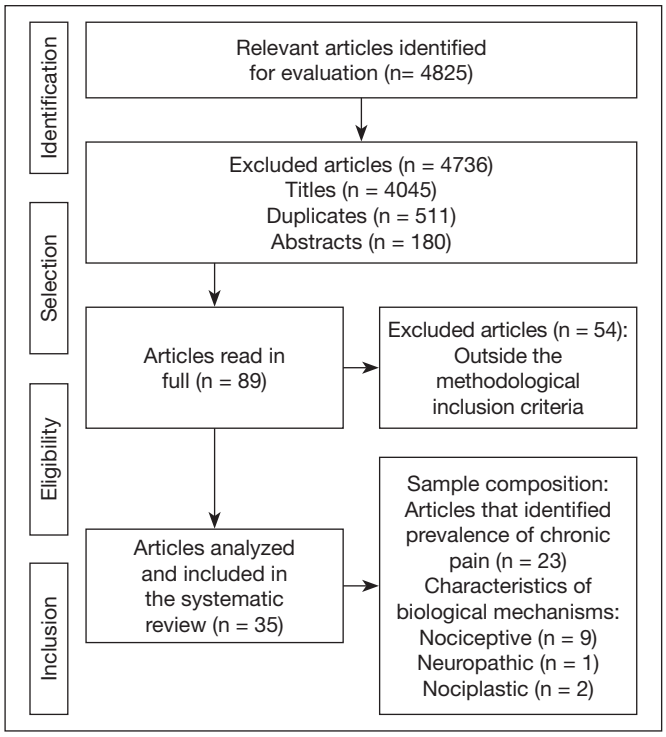

Figure 1. Search strategy and study selection flowchart

Risk of bias analysis

The risk of bias evaluation was performed by two independent examiners using the instrument proposed in the study[13]. This is a 10-points instrument with the objective of evaluating prevalence studies, analyzing aspects of the articles, and correlating external and internal validity. Subsequently, the risk is classified as low, moderate, or high.

The final classification of each article, which determines the methodological quality, was based on the study[14], being composed as follows: low risk when they met at least nine of the criteria in the table; medium or moderate risk of bias when seven or eight of the criteria were found in the studies; and high risk of bias for those that met less than seven of the presented criteria.

Statistical analysis

The studies were grouped according to the country's regions, after that, the prevalence data were analyzed for normality by the Shapiro-Wilk test, and then the data were analyzed by T-test, or Wilcoxon test, for single sample in Graphpad Prism 9.0 statistical software to determine the mean prevalence and the 95% Confidence Interval (95% CI).

RESULTS

Of the 35 cross-sectional studies included in this review, ten were carried out in the state of São Paulo, two in Rio Grande do Sul, two in Goiás, five in Maranhão, three in Minas Gerais, one in Bahia, four in Paraná, three in Rio de Janeiro, one in Piauí, one in Santa Catarina, and three covered the whole Brazilian territory (Figure 2). The total number of individuals who participated in the studies was 122.060 people with different chronic pain conditions, with the sample size of the articles ranging from 23 to 62.982 individuals. The mean age or age frequency of the participants presented in the studies ranged from 15 to 80 years. The region of Brazil (Table 2) with the highest prevalence among the included studies was the Midwestern region (56.25%).

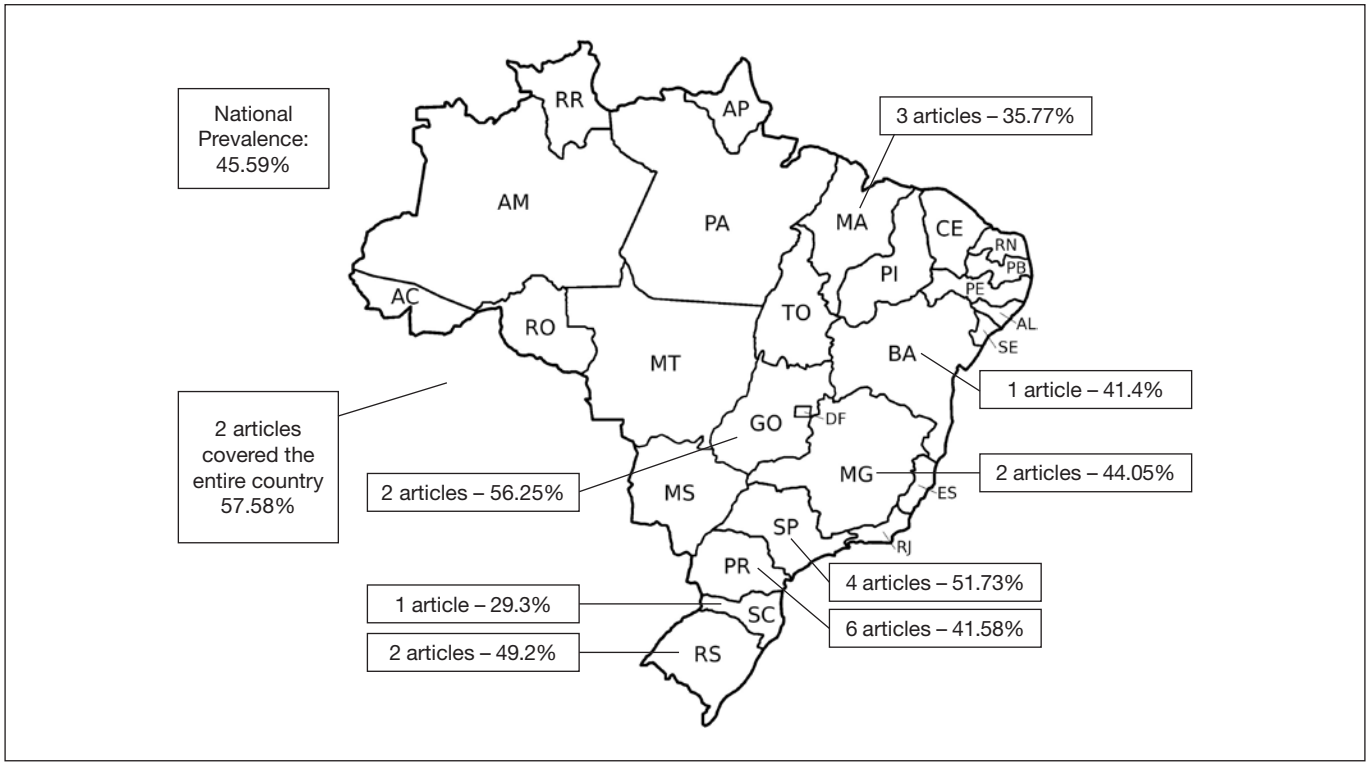

Figure 2. National and fractional prevalence of chronic pain according to federal states

Table 2. Chronic pain prevalence according to geographic region (95% CI mean)

Country's region	Mean prevalence	95% CI
Northeast[b]	41.70	23.02 to 42.30
Midwest[c]	56.25	12.41 to 100.1
Southeast[a]	42.2	30.05 to 54.34
South[a]	46.70	36.07 to 57.34
North	-	-
Total[a]	45.59	39.44 to 51.74

CI = Confidence Interval; a = one-sample t-test; b = Wilcoxon test; c = one-sample t-test, however, only 2 studies were included.

Chronic pain criteria

The chronic pain criteria, according to the definition in place before the IASP's update, were informed in all the 35 articles, be it in the manuscript or in the method of investigation through the questionnaires. 13 articles presented criteria for the presence of continuous or recurrent pain lasting 3 months or more, while 22 studies chose the period equal to or greater than 6 months. Of these, only four articles added that pain, to be chronic, is also that which persists after the normal recovery time.

Composition of the studies' sample

Regarding the research sample, no article covering children was identified and included; however, one article covering adolescents was included. In addition to that, were included: five studies exclusively with adults; 10 papers with an exclusive sample of elderly (over 60 years); 13 studies involving adults and elderly; three research involving adolescents, adults, and elderly; and three studies with adolescents and adults.

Origin of collected data

The places chosen for the collections were community settings such as schools, universities, homes, and others, as well as locations that offer health services, hospitals, specialized pain centers, or *Unidades Básicas de Saúde* (UBS - basic health units). Of the total of 35 surveys, 20 were carried out in the interviewees' homes, 9 in public environments and 6 in clinics, hospitals or UBS.

Gender

Three studies used 100% female individuals in their sample and one study 100% males. 28 articles included both females and males, with females being more prevalent in the samples of 26 works. Only one study presented a male predominance, and one study presented in its sample 50% of each sex. Three studies did not inform the majority gender of their sample, although, of these, only one article did not inform the prevalent gender affected by CP, and the other two showed a predominance of females. The presence of CP was more prevalent in females, presenting an average of 71.49% of involvement among the eligible studies (Table 3), moreover, taking into consideration all the included articles, women were also more affected (70.58%).

Instruments

The identification of CP was performed through certain instruments, and 20 articles used their own questionnaire, 1 study used the Health, Well-Being, and Aging (SABE) questionnaire, 1 study used the modified SABE questionnaire and one used the Numeric Rating Scale (NRS). In the characterization of studies with nociceptive pain, 5 articles used their own questionnaire to survey chronic low back pain, musculoskeletal, pelvic, neck and head, face and neck pain, one used the *Pesquisa Nacional de Saúde* (PNS - National Health Survey) for spinal pain, 3 articles used the Nordic questionnaire to assess low back pain and neck pain. As for neuropathic pain, the included article used *Douleur Neuropathique* 4 (DN4) questionnaire and, finally, for classification of nociplastic pain, the Fibromyalgia Impact Questionnaire (FIQ) was used to identify the prevalence of fibromyalgia and a questionnaire created by the authors to identify people with irritable bowel syndrome and chronic generalized pain.

Prevalence of chronic pain

In Brazil, the prevalence of chronic pain in the collected studies was diverse, ranging from 23.02% in a study conducted in Maranhão, to 76.17% in an online study conducted nationwide. However, overall, and nonspecifically, the national prevalence of CP was 45.59% for all included studies (Table 2). One of the most notable points is that in adults residing in the city of São Paulo, the percentage of the population with CP, on average, was 31%, while in adults residing in the city of São Luís it was 42.3% (Table 3).

After the end results, studies that met the classification criteria as to the IASP predominant pain mechanisms were identified and grouped in Table 4. In the studies that declared to have included pains of possibly nociceptive predominance (Table 4), the nonspecific prevalence of the findings was 29.5% and a high variation of results was observed among the articles, especially those related to chronic low back pain (among the pains inserted as nociceptive), presenting a minimum value of 10.7% in a study with adolescents in the city of Caracol, in the state of Piauí, and reaching 96.8% of chronic low back pain in patients diagnosed with Parkinson's disease in the outpatient clinic of a hospital in Belo Horizonte.

As for the prevalence of neuropathic pain, the result was 14.5% in patients admitted to hospitals in the urban area of Santo André/SP. While for the characteristics of nociplastic pain, a prevalence of 5.5% of Fibromyalgia was presented in relation to the population of elderly residents in the western region of São Paulo, as well as 19.5% of prevalence of irritable bowel syndrome in women with chronic pelvic pain, with a mean prevalence of 12.5% among the studies (Table 4).

Location of pain

The most prevalent location for CP was the lumbar region, with 41.96% of overall prevalence, considering all types of pain investigated, followed by lower limbs, head, joints, and upper limbs. There was also one study that presented groupings formed of lower back, sacrum, and coccyx, as well as head, face, and mouth. Chronic low back pain was prevalent in 35.33% if only the articles of general aspects in table 4 are conside-

Table 3. Chronic pain prevalence rate and its biological features in the Brazilian population

GENERAL										
Authors	Types of collection	Collection instrument	Sample size (n)	Sex	Population	Mean age or frequency of age (years)	Chronic pain criteria	PO: prevalence	SO: location of highest prevalent pain	SO: higher prevalence among sexes
NORTHEAST REGION										
Cordeiro et al.[15]	Interview	Authors' questionnaire	2341	64.59% Female	Residents and users of basic health care in the municipality of Buriticupu - MA	30	Persisting for longer than a reasonable time for a possible cure, for more than three months, continuous or recurrent	23.02%	Musculoskeletal pain 46.30%	70.92% Female
Sá et al.[16]	Home interview	Authors' questionnaire	2297	55.4% Female	Adult residents of 34 watersheds in Salvador - BA	40.9	Duration of six months or more	41.4%	Lumbar 16.3%	62% Female
de Moraes Vieira et al.[17]	Home interview	Authors' questionnaire, DN4	1597	66.4% Female	Adult residents of São Luís – MA	39.5	Persistent for more than six months	42%	Head 36%	77.5% Female
Vieira et al.[18]	Home interview	Authors' questionnaire	1597	66.4% Female	Adult residents of São Luís, MA	37.6	Duration of six months or more	42.3%	Women - head 40.46% Men - lumbar 39.47%	77.5% Female
MIDWESTERN REGION										
Silva et al.[19]	Interview	Authors' questionnaire, McGill, Numeric Scale	211	Not mentioned	Nursing students of the Federal University of Goiás	21.1	Duration of six months or more in the same location	59.7%	Head 38.1%	97.6% Female
Pereira et al.[20]	Home interview	Authors' questionnaire, MMSE	872	62.3% Female	Elderly residents in the urban area of Goiânia - GO	60-69	Duration of six months or more	52.8%	Lower limbs 34.5%	60.4% Female
SOUTHEAST REGION										
Dellaroza et al.[21]	Home interview	Authors' questionnaire, MMSE, QPAF	1271	59.6% Female	Elderly residents in São Paulo of the SABE project	69.5	Duration of six months or more	29.7%	Lumbar 25.4%	Not mentioned
Barbosa et al.[22]	Interview	Authors' questionnaire	124	50.8% Female	Institutionalized elderly in Uberaba - MG	70-80	Continuous or recurrent, intensity from low to intense and duration of more than six months	58.1%	Lower limbs 31.9%	59.7% Female
Maia Costa Cabral et al.[23]	Home interview	Authors' questionnaire, CPG, HADS, EQ-5D	826	69% Female	Residents of downtown São Paulo - SP	51.4	Persisting over the normal time of healing, with duration of three months or more	42%	Lumbar 40.1%	77.5% Female
Silva and Dutra[24]	Interview	Authors' questionnaire, VAS, JCQ	23	100% Female	Teachers of two city schools of Serrana - SP	42	Duration of more than three months	69.6%	Lumbar 30.43%	Does not apply
Pereira et al.[25]	Home interview	Authors' questionnaire, VAS	5037	53% Female	Adult residents of São Paulo - SP	18-34	Duration of six months or more	31%	Joints 31.3%	57.5% Female
Silva et al.[26]	Interview	Authors' questionnaire, McGill	395	64,05% Female	Students enrolled in the Taubaté School of Medicine - SP	21-25	Persisting over the normal time of tissue healing, with duration of more than six months	35.69%	Lumbar. sacrum and coccyx 23.13%	73.8% Female
Torres et al.[27]	Home interview	Authors' questionnaire	383	71% Female	Elderly, above 65 years old, living in Belo Horizonte.	75.6	An episode of persistent pain that lasts for more than six months	30%	Not mentioned	Not mentioned

Continue...

Table 3. Chronic pain prevalence rate and its biological features in the Brazilian population – continuation

GENERAL										
Authors	Types of collection	Collection instrument	Sample size (n)	Sex	Population	Mean age or frequency of age (years)	Chronic pain criteria	PO: prevalence	SO: location of highest prevalent pain	SO: higher prevalence among sexes
MIDWESTERN REGION										
Souza, Hafele and Siqueira[28]	Interview	Authors' questionnaire, IPAQ	540	72.8% Female	Adults aged 18 years or older, users of basic health units in the urban area of Pelotas - SP	48	May last three months or more	41.5%	Lumbar 28.6%	79.9% Female
SOUTHERN REGION										
Kreling, Cruz and Pimenta[29]	Interviewee's preferred location	Authors' questionnaire	505	54.1% Female	Servers of the State University of Londrina - PR	30-40	Duration of six months or more	61.4%	Head, face and mouth 26.7%	69.2% Female
Dellaroza, Pimenta and Matsuo[30]	Home interview	Authors' questionnaire, MMSE, Full Cup Test	451	64.7% Male	Elderly municipal workers of Londrina - PR	60-75	Duration of six months or more	51.4%	Dorsal Region 21.7%	60.77% Male
Dellaroza et al.[31]	Home interview	Authors' questionnaire, Blessed scale, Yesavage's Geriatric Depression Scale	172	58.7% Female	Elderly residents in the coverage area of the Basic Health Unit of Conjunto Cabo Frio, Londrina	60-69	Duration of six months or more	62.21%	Lower limbs 31.40%	65.4% Female
dos Santos et al.[32]	Home interview	Authors' questionnaire, IPAQ	1656	62.5% Female	Elderly residents of Florianópolis - SC	60-69	Duration of six months or more, with continuous or recurrent features	29.3%	Not mentioned	78.7% Female
Lini et al.[33]	Home interview	SABE questionnaire	416	56.7% Female	Elderly residents of a city in southern Brazil	69	Presence of pain for more than three months, continuous, or episodes of pain at least once a month	54.7%	Lower limbs 82.5%	64.8% Female
Rodrigues et al.[34]	Home interview	SABE questionnaire (adapted)	158	100% Male	Elderly residents of Coxilha - RS	68.7	Persistent or recurrent for a period of three months or more	43.7%	Lumbar 67.4%	Does not apply
Santos, Madeira and Longen[35]	Interview	Authors' questionnaire	943	68.3% Female	Teachers of basic and high school of a Northern town in the state of Londrina	23-36	Duration of six months or more	31.9%	Not mentioned	73.8% Female
NATIONAL TERRITORY										
de Souza et al.[36]	Interview	Questionnaire for the investigation of the prevalence of pain in Latin America, NRS	723	52% Female	Adult residents of the states and federal district of Brazil	38	Persistent for more than six months	39%	Upper limbs 22%	56% Female
Carvalho et al.[37]	Interview	Authors' questionnaire (online)	27345	83% Female	Adult residents of Brazil	>65	Persistent or recurrent for a period of more than three months	76.17%	Lumbar 35%	84.60% Female

VAS = Visual Analog Scale; JCQ = Job Content Questionnaire; SABE = *Saúde, Bem-Estar e Envelhecimento*; NRS = Numeric Rating Scale;

MMSE = Mini-Mental State Exam; RDC/TMD = Research Diagnostic Criteria for Temporomandibular Disorders; DN4 = *Douleur Neuropathique;*

IPAQ = International Physical Activity Questionnaires. HADS = Hospital Anxiety and Depression Scale; CPG = Chronic Pain Grade;

EQ-5D = EuroQol 5 Dimensions; QPAF = Pfeffer Functional Activities Questionnaire; PO = Primary Outcome; SO = Secondary Outcome.

red, and 52.58% only in articles about the possibly nociceptive characteristics. Seven studies did not report the predominant location of pain.

Risk of bias assessment

Among the studies included in this review and analyzed methodologically, the scores ranged from 4 to 9 points out of 10 possible points. Regarding the final classification, 8 studies were classified with high risk of bias and 27 articles with moderate risk of bias. In the distribution of the proposed instrument's points, the result presented the highest risk of bias in the first two points of external validity. The target population as a representation of the Brazilian population and the sampling system obtained 32 articles with high risk of bias, random selection with nine, and non-response bias obtained eight studies also classified with high risk.

Regarding the internal validity, the item of direct collection of interviewees did not present a high risk, although six studies presented moderate risk. On the other hand, the case definition and collection method criteria presented two studies with high risk of bias. The parameters of interest showed high risk in five studies. Only the instruments used and duration of prevalence criteria did not present a high or moderate risk of bias. The assessment, in the overall classification, resulted in 27 articles with moderate risk of bias and 8 studies with high risk of bias (Figure 3).

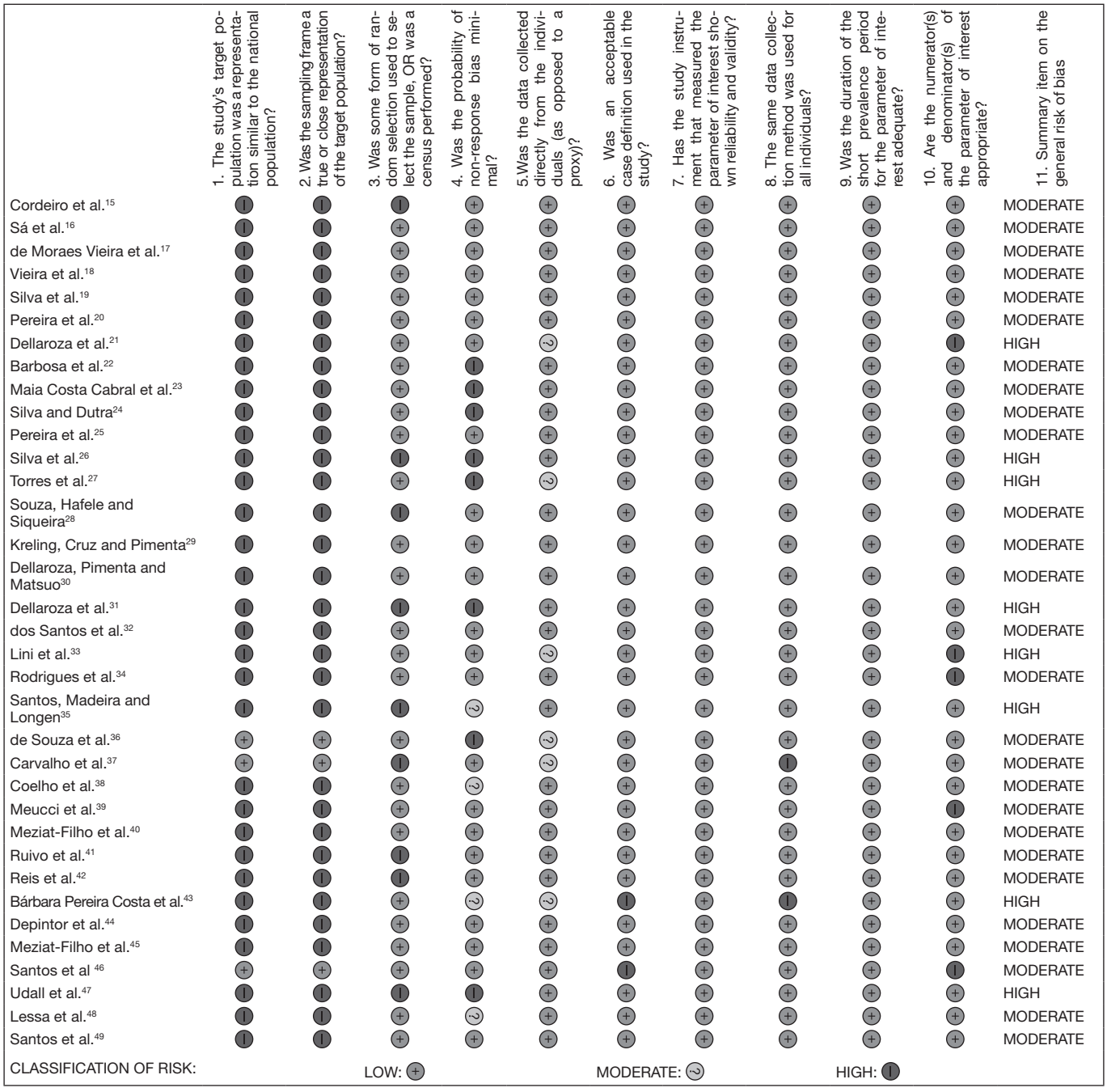

Figure 3. Risk of bias assessment of the included articles

Table 4. Rates of nociceptive, neuropathic and nociplastic chronic pain in the Brazilian population

Authors	Types of collection	Collection instrument	Sample size (n)	Sex	Population	Mean age or frequency of age (years)	Chronic pain criteria	PO: Prevalence	SO: location of highest prevalent pain	SO: higher prevalence among sexes
Possibly nociceptive classification										
NORTHEAST REGION										
Coelho et al.[38]	Home interview	Author's questionnaire, VAS, PHQ-4	1470	100% Female	Women (14 to 60 years old) that use SUS (Brazil's public health system) in the urban area of São Luís - MA	32.7-34.6	Duration of six months or more	Chronic pelvic pain 19%	Does not apply	Does not apply
Meucci et al.[39]	Home interview	Author's questionnaire, Nordic questionnaire (modified)	1112	53,3% Female	Adolescents from Caracol - PI	15-17	Continuous for more than three months	Chronic lumbar pain 10,7%	Does not apply	Not mentioned
SOUTHEAST REGION										
Meziat-Filho et al.[40]	Interview	Author's questionnaire, Nordic questionnaire	1102	53,3% Female	Students of a state school of Rio de Janeiro – RJ.	16.8	Pain for more than three months	Chronic lumbar pain 18,2%	Does not apply	63,5% Female
Ruivo et al.[41]	Interview	Author's questionnaire, *Orofacial Pain Questionnaire* and WHO-QOL-BREF	400	50% Female	Adult residents of Piracicaba, São Paulo.	34.7	Duration of more than six months	Head, face and neck 50%	Head 36%	Not mentioned
Reis, et al.[42]	Interview	Author's questionnaire, QBPDS	72	Not mentioned	Jiu-jitsu practitioners in training spots of Rio de Janeiro – RJ.	26.7	Duration of six months or more	Chronic lumbar pain 80,6%	Does not apply	Not mentioned
Maria Costa Cabral et al.[43]	Home or telephone interview	Author's questionnaire	383	71% Female	Elderly residents of Belo Horizonte - MG	75.6	Pain in the last six months for at least 30 consecutive days	Chronic musculoskeletal pain 30%	Not mentioned	81,7% Female
Depintor et al.[44]	Home interview	Author's questionnaire	826	69% Female	Residents of the Midwest region of the city of São Paulo - SP	51.4	Persists after normal tissue healing time, lasting longer than three months	Chronic spinal pain 22%	Lumbar 56,6%	80,8% Female
Meziat-Filho et al.[45]	Interview	Author's questionnaire, Nordic questionnaire	1102	53,3% Female	Students of a state school of Rio de Janeiro – RJ.	16.8	Pain for more than three months	Chronic neck pain 16%	Does not apply	60,8% Female
NATIONAL TERRITORY										
Santos et al.[46]	Home interview	PNS	62986	Not mentioned	Adult residents of Brazil	60-64	Duration of six months or more	Chronic spinal pain 19%	Not mentioned	20,08% Female
NEUROPATHIC CHARACTERIZATION										
SOUTHEAST REGION										
Udall et al.[47]	Interview	Author's questionnaire, EQ-5D, DN4, BPI, WPAI-SHP	2118	75,4% Female	Chronic pain patients in one of the urban general hospitals of Santo André - SP	50.1	Greater than or equal to three months in the last 12 months	Chronic pain 85,5% Neuropathic 14,5%	Not mentioned	80,5% Female
NOCIPLASTIC CHARACTERIZATION										
NORTHEAST REGION										
Lessa et al.[48]	Home interview	Author's questionnaire; Rome III11 criteria	246	100% Female	Women residents of São Luís – MA with chronic pelvic pain.	30-40	Duration of six months or more	Irritable Bowel Syndromes 19,5%	Does not apply	Does not apply
SOUTHEAST REGION										
Santos et al.[49]	Interview	Author's questionnaire, FIQ	361	64% Female	Elderly (65 years or older) who live in the western region of São Paulo	73.3	Pain for more than three months	Fibromyalgia 5,5% Chronic generalized pain 14,1%	Not mentioned	Fibromyalgia 100% Female Chronic widespread pain 90,2% Female

MMSE = Mini-Mental Status Examination; UPDRS = Unified Parkinson's Disease Rating Scale; BDI = Beck Depression Inventory; RMDQ = Roland Morris Disability Questionnaire; PDQ-39 = 39-item Parkinson's Disease Questionnaire; VAS = Visual Analog Scale; PHQ-4 = Patient Health Questionnaire; PNS = *Pesquisa Nacional de Saúde*; QBPDS = Quebec Back Pain Disability Scale; EQ-5D = EuroQol 5 Dimensions; DN4 = *Douleur Neuropathique 4;* BPI = Brief Pain Inventory; WPAI-SHP = Specific Health Problem v2.0; FIQ = Fibromyalgia Impact Questionnaire; PO = Primary Outcome; SO = Secondary Outcome.

DISCUSSION

The synthesis of the prevalence studies included in the present review, mainly collected in health care units specialized or not in pain, showed an expressive prevalence of CP, mainly in women and the elderly, as well as the predominant location of pain in the lumbar spine. There was a significant amount of studies that covered different areas of the body. As for the geographic region, there was a higher prevalence of CP in the Midwest region of Brazil, while the Northern region still lacked studies exclusively of its own and could not have its prevalence quantified based on regional studies. Furthermore, the most reported pain mechanism among the reviewed studies is possibly the nociceptive.

A high prevalence of CP in the Brazilian population was evidenced. The same data is also high in developed countries such as Japan (39.3%)[50], China (Hong Kong - 34.9%)[51], and the United States (30.7%)[52], or developing countries such as Iran (38.9%)[53]. This fact can infer that the presence of CP is not directly associated with the economic context of each nation. Regarding gender, CP in Brazil predominated in females[15-20,22,23,25-29,31-33,35-37,40,43-47,49], as well as in studies from other countries[50,52-56].

Moreover, a large portion of the samples was composed of adults and elderly individuals, with CP being more prevalent among the elderly. This increase in age has already been identified as a factor strongly associated with a higher prevalence of CP[18], a fact reinforced by the studies included in the present review[20,24,32,35-37]. The location chosen to collect the sample is also a determining factor for the prevalence of CP, and this was observed in the present study, since the data collected at the interviewees' homes showed a lower prevalence of chronic pain[16-18,21,23,25,27] than that of studies from online data collection[37], or specialized health centers[22].

Regarding the anatomical location of CP, low back pain was found to be the main region, both in online studies[37] and in home interviews[21,23,34], and its quantity was considered high in adult and adolescent populations[14]. The present review reinforces this conclusion since a high prevalence of CP in the lumbar region was also found among studies with Brazilians. A previous study by the Global Burden of Diseases (GBD)[57] stated that, in fact, the estimated prevalence should increase and the present study's data show that these patients seek treatment in clinical centers[37], which highlights the importance of training health professionals and the search for preventive measures, such as encouraging the practice of physical activity[58].

As for the two studies of national coverage, one was conducted through a telephone interview with the general population of all states and the Federal District, identifying the South region[36] as the one with the highest prevalence. The second national study[37], via a questionnaire (survey) applied using the world wide web, obtained the Southeast region as the one with the highest prevalence of CP, however, in this study, pain treatment centers were prioritized as a response environment. The data collection in health care units directly influences the prevalence rate found, since the majority of the volunteers sought this place for some health problem, while the community samples include proportionally more people without pain, for example. As for the regional studies analyzed, the highest Brazilian prevalence published was in the Midwestern region, where the studies found were carried out through home interviews[20] with residents of the urban area of Goiânia and at the Federal University of Goiás with nursing students[19].

The methodological quality of the studies performed in Brazilian populations presents some limitations, since only two of the evaluated criteria did not present high risk in the studies: collection instruments and duration of prevalence. This can be explained by the self-report being the best way to evaluate pain and by the existence of a definition of chronic pain made by the IASP[3]. It's noteworthy that, among the sample collected, only three studies achieved a national representativeness in their target population and sampling[36,37,46], since the other articles brought a specific population delimitation. The form of collection was convenient in nine studies[15,26,28,31,35,37,41,42,47], favoring agility in gathering the desired number of sample, but hindering a broader view of adverse characteristics. Eight studies had a high non-response bias, failing to reach the stipulated sample[22-24,26,27,31,36,47].

The data collection method is very important for the reliability of information, so six studies were classified with moderate risk[21,27,33,36,37,43] due to the telephone interview, since the face-to-face interview may be more reliable in capturing data from the individuals. In addition, the method of collection should ideally be performed in the same way for all individuals in the survey, which did not happen in two studies[37,43]. Overall, the articles that were carried out with the objective of quantifying the prevalence of chronic pain in Brazil have, according to this review, a moderate risk of bias[15-20,22-25,28-30,32,34,36-42,44-48,49].

This review sough to evaluate the prevalence of mainly nociceptive musculoskeletal pain through the exclusion of studies of prevalence of clearly neuropathic pain[47], such as cervical and lumbar radiculopathies, and conditions that are known to develop signs of nociplasty[48,49], such as fibromyalgia. Nevertheless, the update of the definition of pain mechanisms proposed by the IASP was only carried out in 2017[5] and many studies included in the present review date their publication and conduction from times before that publication, therefore, it cannot be stated with full certainty that the prevalence reported is only of musculoskeletal pain of nociceptive predominance.

Study's strengths and limitations

This study was the largest systematic review of pain prevalence in Brazil and for the first time these data were observed in sub-classifications through mechanisms described by the IASP. Moreover, the study was conducted with evidence quality analysis, in order to better guide future decisions, considering that most of the articles included presented high or moderate quality of evidence. Regarding the study's limitations, the lack of prior registration of the research protocol in the International Prospective Register of Systematic Reviews should be reported. Another relevant limiting point is in relation to the standardization of the time of pain presence for the consideration of CP in the included articles, since some articles presented a time of three months[15,23,24,28,33,34,39,40,44,45,47,49] and others a period of six months[16-22,25-27,29-32,35-38,41,42,43,45,46,48].

In some articles, the origin of the samples were from treatment centers[15,22,37], hospitals[47] and institutions[19,24,26,29,35], with

a public already affected by comorbidities accompanied by pain[47-49]. These places may have been chosen probably because it was easy to reach the target sample, however, they can influence the results. As for the prevalence of CP by sex, when there was female prevalence, there was also a predominant sample of women[15-18,20,22,23,25-29,31-33,35-,40,43-45,47,49], this fact needs to be better investigated, although it's in agreement with international data[50,52-56].

Future implications

This article's contribution is to indicate the profile of individuals with chronic pain in Brazil, aiding in clinical research and activities, directing the attention to a more determined public. However, it's necessary to reinforce the need for more studies, especially for the North region states, which still do not present specific articles with prevalence related to CP. The present study also observes the need for public and private actions for the concerned population, reinforcing the high prevalence of CP and its high impact on the Brazilian population.

CONCLUSION

Based on evidence with moderate and high risk of bias, the result of a high prevalence of chronic pain in Brazil was found in the articles (45,59%), being present mainly in adult and elderly women. The most affected location was the lumbar region. The possibly nociceptive mechanism was the most prevalent. As for the national geographic region, the highlight of highest prevalence of CP was in the Midwestern region. The region with more studies and the largest evaluated population was the Southeast.

AUTHORS' CONTRIBUTIONS

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