The association between violence against women and chronic pain: A systematic review and meta-analysis

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Abstract

Violence against women is still a recurring phenomenon that involves at least 35% of women worldwide. Violence can be sexual, physical, and/or psychological, perpetrated by the partner, another family member, or a stranger. Violence is a public health problem because its consequences include higher morbidity, higher mortality, and short and long-term physical and psychological health diseases. Most studies prove an association between any type of violence and some chronic pain diagnoses but no one has done a complete collection of this evidence. This systematic review and meta-analysis aimed to evaluate whether this association is statistically significant, including the largest number of studies. Through the inclusion of 37 articles, the association has been demonstrated. Compared with no history of violence, women who did experience violence showed increased odds of developing chronic pain. The impact of violence was significant also on fibromyalgia separately, but not on pelvic pain.

Systematic review registration: PROSPERO CRD42023425477

Background

Violence against women violates human rights and is a public health matter [1]. Violence can occur as interpersonal violence, domestic abuse, or intimate partner violence, which refers to all types of this: sexual, physical, and/or psychological.

The objective is to control women's lives, destroying any form of independence, self-determination, and personal development, and affecting their psychological health.

The United Nations [2] defines violence against women as "any act gender-based violence that results in or is likely to result in, physical, sexual or mental harm or suffering to women, including threats to such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life".

Despite the contrast and prevention policies the rate of the phenomenon is high, a recent observational study referred that about 51.7% of women in the European Union have been victims of violence in their lifetime [3], and at least 35% of women worldwide [4].

Among all forms of violence against women, intimate partner violence (IPV) is the most prevalent, most commonly, most difficult to detect, and most difficult to study [5]. IPV has been defined, by the Centers for Disease Control and Prevention (CDC), as violence that includes physical violence, sexual violence, stalking, and psychological aggression perpetrated by a current or former intimate partner [6].
In the last decade, the prevalence of the literature focused on this, but many aspects still need to be explored.

Abuse survivors suffer various consequences that range from higher morbidity and mortality and short and long-term physical and psychological health problems [7].

Victimized women have higher rates of depression, post-traumatic stress disorder (PTSD), anxiety, alcoholism, and suicidal tendencies [8-10].

Apart from the psychological consequences, violence can result in chronic health problems and somatic complaints that cause pain [11-14].

Most studies focus on pelvic/vaginal pain [15], fibromyalgia [16], irritable bowel syndrome/bowel symptoms [17], abdominal pain [18], temporomandibular pain [19], breast pain [20], migraine/headache [21], back pain [22], and neck pain [23], which tend to become chronic as well as the pain derived from them.

Often, these problems were studied individually, one health condition and one violence type. For example, studies and systematic reviews about the association between sexual trauma and pelvic pain [24-25], or psychological trauma and fibromyalgia [26-27].

Other studies and systematic reviews evaluated the association between adverse childhood experience (ACE) and chronic pain [28-29], or PTSD and physical health consequences [30-31].

There are also longitudinal studies in which abused women are monitored over time concerning their health [32-34].

Most of these studies show a positive association between any kind of violence and all chronic conditions, with a significant difference between the group of abused women and the group of not-abused women [35-41].

Studies on gender violence began many years ago, and are still present in recent years creating a large database in which experts and researchers can find any information to orient their study or clinical practices. With so much data available it's necessary to group and systematize them into various evidence collections. In particular, data regarding abused women's health can direct the health policies and guidelines, but also can help the healthcare professionals in their clinical work and can better direct women towards proper treatment. Unfortunately, there aren't reviews in this regard that consider chronic pain as a general concept.

Objectives

This systematic review and meta-analysis aim to contribute to the systematization of the literature on the association between violence against women and chronic pain, considering all types of abuse verified only in adulthood, and the major chronic pain diagnoses found in the literature.

The final objective is to increase the knowledge about this condition because no one has done this complete collection before considering it as a wide-ranging phenomenon.

Materials & methods

This search protocol was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines [42], according to the PECOS (Population, Exposure, Comparison, Outcome, Study Design) guidelines.

Search strategy

The research was conducted on the online electronic databases of PubMed, Scopus, and Web of Science from October 2022 to May 2023, and carried out a manual review of references. The protocol has been registered at the International Prospective Register of Systematic Reviews (PROSPERO; registration number CRD42023425477).

The search strategy relating to the association between violence against women and chronic pain was: (“intimate partner violence” OR “interpersonal violence” OR “partner abuse” OR “domestic violence”) AND ((pain)). The keywords have been chosen after a preliminary search of the literature thanks to which it was possible to identify the most used and relevant terms.

There were no period restrictions on the search to increase the yield of studies, though the language was restricted to studies published in English or Italian.

Authors were also contacted via email where there was insufficient data, and references from included studies were manually scanned for further sources as per published recommendations [43-45].

Criteria for Selection of Studies

It included studies on human females of at least 18 years old with and without a history of adulthood abuse identified through published observational study designs (cohort, case-control, and cross-sectional studies). For the definition of abuse, it was adopted an inclusive approach with a composite of sexual, physical, and psychological violence. Definitions of chronic pain varied between studies and it also adopted an inclusive approach. In general, it’s whatever typology of pain or discomfort in the involved area which tends to persist for at least 3 of the past 6 months. Pain signs and symptoms considered were pelvic pain, fibromyalgia, bowel pain, abdominal pain, temporomandibular pain, breast pain, migraine/headache, back pain, and neck pain. Exclusion criteria included male subjects, minor subjects, childhood abuse, studies without a control group, and studies published in non-English or Italian languages. Lastly, systematic reviews, meta-analyses, commentaries, dissertations, thesis, editorials, and conference deeds were excluded but their references were examined to find other studies not retrieved between the search strategy.

Study Selection and data extraction

Studies were selected in a three-stage process. All citations identified from initial searching were imported into Zotero Software, where duplicate citations were removed, after which two reviewers (AU & CR) independently scrutinized all article titles remaining from the original search. After this, the same two reviewers independently analyzed all article abstracts remaining from the second removal. In case of

disagreement, the references were discussed until an agreement was reached, and an independent third reviewer (FF) was consulted. In case of unclear abstract, the reference was included in the next stage (full-text screening) to confirm the information given in the full text. For studies assessed for eligibility full manuscripts were obtained, and two reviewers (AU & CR) carried out an independent full-text review of all English/Italian language articles. Disagreements regarding inclusion or exclusion criteria were resolved by consensus, or through consultation of an independent third reviewer (FF). Two reviewers (AU & CR) carried out independent data extraction, where extractable data was missing, authors were contacted by email. It used outcome data and exposure to abuse to construct a table for the appropriate analyses.

Assessment of study quality

Quality assessment was conducted through existing checklists [46]. Quality was defined as the confidence that bias in the estimation of the effect of abuse on pain symptom outcomes was minimized through appropriate study design methods and analysis. Two independent authors (AU & CR) assessed the quality of the retrieved articles to identify any potential source of bias using predetermined and validated criteria from The Johanna Briggs Institute appraisal checklists for cross-sectional, case-control, and cohort studies [46]. Appraisal criteria are made of comparability and appropriateness of cases and controls, description of subjects and setting, reliable and valid measurement of exposure, appropriateness of inclusion criteria, identification of confounding factors and whether strategies were implemented to deal with these factors, valid and reliable assessment of outcomes, exposure time, appropriateness of follow-up and whether strategies were implemented to deal whit uncomplete follow-up, and appropriateness of statistical analyses used. A high-quality study achieved the following criteria: cross-sectional studies met at least 5/8 criteria, cohort studies fulfilled at least 6/11, and case-control studies met at least 6/10 of the criteria. Low-quality studies were excluded. Cohort studies satisfy 7/11 criteria, 2 case-control studies satisfy 6/10 criteria, 2 of them satisfy 8/10 criteria, 2 of them satisfy 7/10 criteria, and the last one satisfy 10/10 criteria, 10 cross-sectional studies satisfy 6/8 criteria, 14 of them satisfy 5/8 criteria, and the last one satisfies 8/8 criteria.

Statistical analysis

Statistical analyses were performed using CMA v4. Since the prevalence of chronic pain could be affected by the characteristics of the populations included, and considering the heterogeneity of the symptoms defining this health problem, random-effect models were used in this study [47]. The effect size was assessed in the odds ratio of having chronic pain and being a victim of violence. The results of three meta-analyses were evaluated: chronic pain in general, pelvic pain, and fibromyalgia. The effect sizes were estimated by the odds ratios' 95% confidence interval. Forest plots were generated, and heterogeneity analysis of the effect sizes was performed by calculating Higgins's I^2 statistic [48] and Cochrane's Q index [49]. Cochrane's Q p value <0.1 and an I^2>40% were considered markers of heterogeneity.

Publication bias was explored through the inspection of the funnel plot and the Egger test [50]. The funnel plot appears asymmetrical if publication bias is detected, while a non-statistically significant result

of the t-value of Egger's regression intercept allows us to discard publication bias. The level of significance was set at $p<0.05$.

Results

Literature Identification, study characteristics, and Quality

The search protocol identified 1392 publications from online databases. 578 were removed as they were duplicate publications. The remaining 814 studies were screened against title and abstract criteria, after which a further 725 were excluded. Of the 89 studies selected for full-text review, 52 were excluded, 4 were written in unknown languages, 19 were due to lack of a control group, 10 focused on childhood abuse, 3 were review, and 16 were due to lack of some important data. After the quality assessment was carried out 37 studies [12, 20, 51-85]. See the flow diagram in Fig. 1.

[INSERT HERE FIGURE 1]

The years of the study range from 1994 to 2021, 26 studies are cross-sectional, 7 are case-control, and 4 are cohort studies. 56.7% of the studies are from the USA, 10.8% are from the UK, 5.4% are from Spain and Australia respectively, and 21.5% are from other countries. The sample size ranges from 50 to 92735, its age ranges from 18 to 65, and all the adult abuse types are represented. 56.7% of the studies evaluated general chronic pain, 18.9% evaluated fibromyalgia, and 24.3% evaluated pelvic pain. 78.3% of the studies evaluated intra-family violence (perpetrated by partners or other family members), and 21.6% evaluated extra-family violence (all types of this). Table 1 summarizes the characteristic of included studies.

[INSERT HERE TABLE 1]

Meta-analysis results

Fig. 2 shows the results of the random effects meta-analysis about the association between violence and chronic pain. Compared with no history of violence, women who did experience violence showed an increased odds of developing chronic pain (OR 2.08; 95% CI, 1.80-2.41; p=0.00). Significant heterogeneity was found [I^2 = 85.86, $Q_{(36)}$ = 254.56, p < 0.000], and the existence of publication bias was proved by the Funnel plot (7 out of 37 studies were located on the right side out of the plot) (Fig. 3) and by the significance of the Egger test on regression intercept [β = 1.676, SE = 0.589, $t_{(35)}$ = 2.844, p < 0.007].

[INSERT HERE FIGURE 2]

[INSERT HERE FIGURE 3]

The pool of studies that investigated pelvic pain showed a not significant effect size of the overall odds ratio (OR 0.570; 95% CI, 0.25-1.29; p=0.178). The forest plot with mean effect sizes is provided in Fig. 4. Significant heterogeneity was found [I^2 = 96.040, $Q_{(8)}$ = 2020.011, p < 0.000], but no publication bias was

detected according to the Funnel plot and the Egger test of intercept (Fig. 5) [β = -3.657, SE = 3.284, $t_{(7)}$ = 1.114, p < 0.302].

[INSERT HERE FIGURE 4]

[INSERT HERE FIGURE 5]

The impact of violence on fibromyalgia was significant (Fig. 6): the overall odds ratio effect size was 1.684 (95% CI: 1.44-1.98) with a p<0.000. The forest plot highlighted a high level of homogeneity among the studies' results [I^2 = 0.000, $Q_{(86}$ = 3.070, p < 0.800], together with the lack of publication bias: all the studies were located inside the Funnel (Fig. 7) and the Egger test of the intercept was not significant [β = 0.913, SE = 0.522, $t_{(5)}$ = 1.748, p < 0.141].

[INSERT HERE FIGURE 6]

[INSERT HERE FIGURE 7]

Discussion

In this review, we evaluated 37 studies on women both with and without a history of sexual, physical, and emotional abuse perpetrated by a partner, a family member, or a stranger. Results found strong and consistent associations between violence and the presence of chronic pain conditions. Our findings are consistent with reports that women experiencing violence have adverse health outcomes [15-18], and with other systematic reviews that associate some pain symptoms/syndromes with some type of adult or childhood abuse [27-29, 31]. Healthcare workers dealing with chronic pain could treat this type of woman without knowing it, and anti-violence workers should know that their patients could develop pain symptoms that tend to become chronic. Without this professional integration, the treatment of these women will never be completed and effective. Even the health policies, guidelines, and prevention practices should take this into account to direct victims to a bio-psycho-social individualized path. The exit from violence must pass not only through the elimination of the problem but also through the resolution of short and long-term health consequences. Unfortunately, the etiology of these conditions isn't clear. According to the bio-psycho-social model [86], we may suppose many different factors that contribute to the onset of pain symptoms in violence victims, in fact, this condition is often associated with mental health problems, such as anxiety or depression [8-10], and social problems, such as lack of social support, but for each woman the three types of factors have different importance. Furthermore, the cause-effect relationship between violence and pain hasn't yet been fully clarified; in some cases, violence is a risk factor, and in others is a consequence. It's difficult to establish which of the two is decisive for the onset of the other. At the moment it is only possible to show that the association between violence exposure and chronic pain exists and that it's statistically significant.

This review represents the most systematized evidence collection between violence and chronic pain, including some diagnoses not yet considered by previous reviews, and can also evaluate the two

subcategories of pelvic pain and fibromyalgia. Unfortunately, the results of the subcategories are less consistent than the general results. This may be due to the few included studies for each category. When the diagnostic categories are combined the achieved results are significant; to obtain the same effects from subcategories it could be necessary to increase the number of studies that have evaluated them.

We adopted an inclusive approach to our extensive literature search to combine all relevant and recent evidence in one review and increase the study's quality.

Limitations and potential bias

Our study has some limitations. First of all, some aspects, such as the etiology and the cause-effect relationship, are not yet clear in the literature. Moreover, there isn't total agreement on the specific painful diagnosis that can be studied together. In addition, the number of eligible studies was greater than the final number of included ones. Unfortunately, some important data was missing in the published version of these articles. Each first author was contacted by e-mail to gain missing data but no attempt was successful. Furthermore, the grey literature wasn't considered.

Publication bias could have been a problem; therefore, they have been investigated.

There is a need for future research to better investigate this specific subcategory.

Despite the limitations, this review represents the first to examine the association between violence against women, in all its forms, and chronic pain, in most of its representations.

Conclusion

Gender violence is an underestimated public health problem but its consequences have serious short and long-term psychological and physical effects.

This review with meta-analysis shows strong associations between an adult history of violent victimization and chronic pain. This evidence should guide future studies on this type of association and be useful from a clinical point of view, not just a research one. Considering that many women don't refer their violence, each healthcare professional working with chronic pain or in the emergency room should be careful and be prepared for these situations. Furthermore, the same attention should be paid by the health system in general, and by the institution to provide the correct path for these women.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Availability of data and materials

All data generated and analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

AU and CR have been involved in conceptualization, formal analysis, methodology, data extraction, and data curation. FF has participated in data curation, formal analysis, and methodology software. GG and AC have participated in conceptualization, and manuscript writing. All authors read and approved the final manuscript.

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Not applicable

References

1. Ellsberg M. Violence against women and the millennium development goals: facilitating women's access to support. *International Journal of Gynaecology and Obstetrics.* 2006; 94(3):325-32.
2. United Nations. Declaration on the elimination of Violence Against Women. 1993. https://digitallibrary.un.org/record/179739.
3. Barbier A, Chariot P, Lefevre T. Intimate partner violence against ever-partnered women in Europe: prevalence and associated factors-results from the violence against women EU-wide survey. *Front. Public Health.* 2022; 10:1033465
4. World Health Organization. World report on violence and health. 2002. https://www.who.int/publications/i/item/9241545615.
5. Garcia-Moreno C, Jansen HA, Ellsberg M, Heise L, Watts CH. Prevalence of intimate partner violence: findings from the WHO multi-country study on women's health and domestic violence. *Lancet.* 2006; 368(9543):1260-69.
6. CDC. Centers for Disease Control and Prevention Fast Facts: Preventing Intimate Partner Violence. 2021. https://www.cdc.gov/violenceprevention/intimatepartnerviolence/fastfact.html.

7. Cirici AR, Soler AR, Cobo J, Soldevilla AJM. Psychological consequences and daily life adjustment for victims of intimate partner violence. *Int. J. Psychiatry Med.* 2023; 58, 6-19.
8. Plichta S. The effects of woman abuse on health care utilization and health status: a literature review. *Women Health Issues.* 1992; 2(3):154-63.
9. Scholle SH, Rost KM, Golding JM. Physical abuse among depressed women. *Journal of General Internal Medicine.* 1998; 13(9):607-13.
10. Stewart DE & Vigod SN. Update on mental health aspect of intimate partner violence. *Med. Clin. N. Am.* 2019; 103(4):735-49.
11. Koss MP, Koss PG, Woodruff WJ. Deleterious effects of criminal victimization on women's health and medical utilization. *Arch. Intern. Med.* 1991; 151(2):342-47.
12. Pikarinen U, Saisto T, Schei B, Swahnberg K, Halmesmaki E. Experiences of physical and sexual abuse and their implications for current health. *Obstetrics & Gynecology.* 2007; 109(5):1116-22.
13. Goldblatt H. & Granot M. Domestic violence among Druze women in Israel as reflected by health status and somatization level. *Women & Health.* 2008; 42(3):19-36.
14. Onur OS, Cesur E, Donmezler FG, Aydin FY, Vural M, Guru M. Evaluation of partner violence in female patients with fibromyalgia syndrome. *Med J Bakirkoy.* 2020; 16(2):190-96.
15. As-Sanie S, Clevenger LA, Geisser ME, Williams DA, Roth RS. History of abuse and its relationship to pain experience and depression in women with chronic pelvic pain. *Am J Obstet Gynecol.* 2014; 210(317):1-8.
16. Gunduz N, Erzican E, Polat A. (2019). The relationship of intimate partner violence with psychiatric disorders and severity of pain among female patients with fibromyalgia. *Arch Rheumatol.* 2019; 34(3):245-252.
17. Ringel Y, Whitehead WE, Toner BB, Diamant NE, Hu Y, Jia H, et al. Sexual and physical abuse are not associated with rectal hypersensitivity in patients with irritable bowel syndrome. *Gut.* 2004; 53(6):838-42.
18. Bo M, Canavese A, Magnano L, Rondana A, Castagna P, Gino S. (2020). Violence against pregnant women in the experience of the rape centre of Turin: clinical and forensic evaluation. *J Forensic Leg Med.* 2020; 76:102071.
19. Progiante PS, Ficht DM, Lemos MS, Grossi PK, Grossi ML. Prevalence of temporomandibular disorders and orofacial pain in battered women in Brazilian shelters. *Revista Odonto Ciencia.* 2011; 26(3):227-31.
20. Johnson KM, Bradley KA, Bush K, Gardella C, Dobie JC, Laya MB. Frequency of mastalgia among women veterans. *Journal of General Internal Medicine.* 2006; 21:S70-S75.
21. Cripe SM, Sanchez SE, Gelaye B, Sanchez E, Williams MA. Association between intimate partner violence, migraine and probable migraine. *Headache.* 2011; 51(2):208-19.
22. Vives-Cases C, Ruiz-Cantero MT, Escriba-Aguir V, Miralles JJ. The effect of intimate partner violence and other forms of violence against women on health. *J Public Health (Oxf).* 2011; 33(1):15-21.

23. Shields LB, Corey TS, Weakley-Jones B, Stewart D. Living victims of strangulation: a 10-year review of cases in a metropolitan community. *Am J Forensic Med Pathol.* 2010; 31(4):320-25.
24. Ross WT, Snyder B, Stuckey H, Ross IR, McCall-Hosenfeld J, Harkins GJ, et al. Gynaecological care of women with chronic pelvic pain: patient perspectives and care preferences. *BJOG.* 2022; 00:1-9.
25. Coker AL. Does physical intimate partner violence affect sexual health? A systematic review. *Trauma Violence Abuse.* 2007; 8(2):149-77.
26. Gardoki-Souto I, Redolar-Ripoll D, Fontana M, Hogg B, Castro MJ., Blanch JM, et al. Prevalence and characterization of psychological trauma in patients with fibromyalgia: a cross-sectional study. *Pain Res Manag.* 2022; 2114451.
27. Afari N, Ahumada SM, Wright LJ, Mostoufi S, Golnari G, Reis V, et al. Psychological trauma and functional somatic syndromes: a systematic review and meta-analysis. *Psychosom Med.* 2014; 76(1):2-11.
28. Palsdottir VH, Jonsdottir T, Oskarsson GK. Adult chronic pain in relation to psychological trauma in childhood. *Laeknabladid.* 2023; 109(2):67-73.
29. Bussieres A, Hartvigsen J, Ferreira ML, Ferreira PH, Hancock MJ, Stone LS, et al. Adverse childhood experience and adult persistent pain and disability: protocol for a systematic review and meta-analysis. *Syst Rev.* 2020; 9(1):215.
30. Li DJ, Chen MH, Bai YM, Tsai SJ, Cheng CM, Su TP, et al. Parental post-traumatic stress disorder and increased risk of chronic pain conditions and major psychiatric disorders in their offspring. *Gen Hosp Psychiatry.* 2022; 79:152-57.
31. Pacella ML, Hruska B, Delahanty DL. The physical health consequences of PTSD and PTSD symptoms: a meta-analytic review. *J Anxiety Disord.* 2013; 27(1):33-46.
32. Loxton D, Dolja-Gore X, Anderson AE, Townsend N. Intimate partner violence adversely impacts health over 16 years and across generations: a longitudinal cohort study. *PLoS One.* 2017; 12(6):e0178138.
33. Morris MC, Bailey B, Ruiz E. Pain in the acute aftermath of stalking: associations with posttraumatic stress symptoms, depressive symptoms, and posttraumatic cognitions. *Violence Against Women.* 2020; 26(11):1343-61.
34. Lannon E, Sanchez-Saez F, Bailey B, Hellman N, Kinney, K, Williams A, et al. Predicting pain among female survivors of recent interpersonal violence: a proof-of-concept machine-learning approach. *PLoS One.* 2021; e0255277.
35. Fisher BS & Regan SL. The extent and frequency of abuse in the lives of older women and their relationship with health outcomes. *The Gerontologist.* 2006; 46(2):200-09.
36. Hu JC, Link CL, McNaughton-Collins M, Barry MJ, McKinlay JB. The association of abuse and symptoms suggestive of chronic prostatitis/chronic pelvic pain syndrome: results from the Boston area community health survey. *J Gen Intern Med.* 2007; 22(11):1532-37.
37. Peters KM, Kalinowski SE, Carrico DJ, Ibrahim, IA, Diokno AC. Fact or fiction-is abuse prevalent in patients with interstitial cystitis? Results from a community survey and clinic population. *The*

Journal of Urology. 2007; 178(3):891-95.

38. Saito A, Creedy D, Cooke M, Chaboyer W. Effect of intimate partner violence on antenatal functional health status of childbearing women in northeastern Thailand. *Health Care for Women International.* 2013; 34(9):757-74.
39. Friborg O, Emaus N, Rosenvinge JH, Bilden U, Olsen JA, Pettersen G. Violence affects physical and mental health differently: the general population based Tromso study. *PLoS One.* 2015; 10(8):e0136588.
40. Gibson C, Lisha NE, Walter LC, Huang AJ. Interpersonal trauma and aging-related genitourinary dysfunction in a national sample of older women. *Am J Obstet Gynecol.* 2019; 220(94):1-7.
41. Riedl D, Beck T, Exenberger S, Daniels J, Dejaco D, Unterberger I, et al. Violence from childhood to adulthood: the influence of child victimization and domestic violence on physical health in later life. *Journal of Psychosomatic Research.* 2019; 116:68-74.
42. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ.* 2021; 372:71.
43. Higgins JPT & Green S. Cochrane handbook for systematic reviews of interventions version 5.1.0. *The Cochrane Collaboration.* 2011; www.cochranehandbook.org.
44. Horsley S, Dingwall O, Sampson M. Checking reference lists to find additional studies for systematic reviews. *Cochrane Database Syst Rev.* 2011; 8:MR000026.
45. Beynon R, Leeflang MMG, McDonald S, Eisinga A, Mitchell RL, Whiting P, et al. Search strategies to identify diagnostic accuracy studies in MEDLINE and EMBASE. *Cochrane Database Syst Rev.* 2013; 9:MR000022.
46. Moola S, Munn Z, Tufanaru C, Aromataris E, Sears K, Sfetc R. Systematic reviews of etiology and risk. In: Aromataris E, Munn Z (Editors). *JBI Manual for Evidence Synthesis.* JBI, 2020. https://synthesismanual.jbi.global.
47. Borenstein M, Hedges LV, Higgins JPT, Rothstein HR. A basic introduction to fixed-effect and random-effects models for meta-analysis. *Research Synthesis Methods*. 2010; 1(2):97-111.
48. Higgins JP & Thompson SG. Quantifying heterogeneity in a meta-analysis. *Stat Med.* 2002; 21(11):1539-58.
49. Hedges LV. Distribution theory for Glass's estimator of effect size and related estimators. *J Educ Stat.* 1981; 6(2):107-28.
50. Borenstein M, Hedges LV, Higgins PT, Rothstein HR. Introduction to meta-analysis. Chichester: John Wiley & Sons. 2009.
51. Talley NJ, Fett SL, Zinsmeister AR, Melton J. Gastrointestinal tract symptoms and self-reported abuse: a population-based study. *Gastroenterology.* 1994; 107(4):1040-49.
52. Boisset-Pioro MH, Esdaile JM, Fitzcharles MA. Sexual and physical abuse in women with fibromyalgia syndrome. *Arthritis Rheum.* 1995; 38(2):235-41.

53. Taylor ML, Trotter DR, Csuka ME. The prevalence of sexual abuse in women with fibromyalgia. *Arthritis Rheum.* 1995; 38(2):229-34.
54. Letourneau EJ, Holmes M, Chasedunn-Roark MD. Gynecologic health consequences to victims of interpersonal violence. *Women's Health Issues.* 1999; 9(2):115-20.
55. Coker AL, Smith PH, Bethea L, King MR, McKeown RE. Physical health consequences of physical and psychological intimate partner violence. *Arch Fam Med.* 2000; 9(5):451-57.
56. Dienemann J, Boyle E, Baker D, Resnick W, Wiederhorn N, Campbell J. Intimate partner abuse among women diagnosed with depression. *Issues in Mental Health Nursing.* 2000; 21(5):499-513.
57. Lown EA & Vega WA. Intimate partner violence and health: self-assessed health, chronic health, and somatic symptoms among mexican american women. *Psychosomatic Medicine.* 2001; 63(3):352-60.
58. Weinbaum Z, Stratton TL, Chavez G, Motylewski-Link C, Barrera N, Courtney JG. Female victims of intimate partner physical domestic violence (IPV-DV), California 1998. *Am J Prev Med.* 2001; 21(4):313-9.
59. Campbell J, Jones AS, Dienemann J, Kub J, Schollenberger J, O'Campo P, et al. Intimate partner violence and physical health consequences. *Arch Intern Med.* 2002; 162(10):1157-63.
60. Kramer A, Darcy L, George M. Prevalence of intimate partner violence and health implications for women using emergency departments and primary care clinics. *Women's Health Issues.* 2004; 14(1):19-29.
61. John R, Johnson JK, Kukreja S, Found M, Lindow SW. Domestic violence: prevalence and association with gynecological symptoms. *BJOG: an International Journal of Obstetrics and Gynaecology.* 2004; 111(10):1128-32.
62. Castro I, Barrantes F, Tuna M, Cabrera G, Garcia C, Recinos M, et al. Prevalence of abuse in fibromyalgia and other rheumatic disorders at a specialized clinic in rheumatic diseases in Guatemala City. *Journal of Clinical Rheumatology.* 2005; 11(3):140-45.
63. Coker AL, Smith PH, Fadden MK. Intimate partner violence and disabilities among women attending family practice clinics. *Journal of Women's Health.* 2005; 14(9):829-38.
64. Salam A, Alim A, Noguchi T. Spousal abuse against women and its consequences on reproductive health: a study in the urban slums in Bangladesh. *Mental and Child Health Journal.* 2006; 10(1):83-94.
65. Plante AF & Kamm MA. Life events in patients with vulvodynia. *BJOG.* 2008; 115(4):509-14.
66. Ellsberg M, Jansen HAFM, Heise L, Watts CH, Garcia-Moreno C, WHO multi-country study on women's health and domestic violence against women study team. Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: an observational study. *Lancet.* 2008; 371(9619):1165-72.
67. Kendall-Tackett K, Marshall R, Ness K. Chronic pain syndromes and violence against women. *Women & Therapy.* 2008; 26(1-2):45-56.

68. Bonomi AE, Anderson ML, Reid RJ, Rivara FP, Carrell D, Thompson RS. Medical and psychosocial diagnoses in women with a history of intimate partner violence. *Arch Intern Med.* 2009; 169(18):1692-95.
69. Ruiz-Perez I, Plazaola-Castano J, Caliz-Caliz R, Rodriguez-Calvo I, Garcia-Sanchez A, Ferrer-Gonzalez MA, et al. Risk factors for fibromyalgia: the role of violence against women. *Clin Rheumatol.* 2009; 28:777-86.
70. Vung ND, Ostergren P, Krantz G. Intimate partner violence against women, health effects and health care seeking in rural Vietnam. *European Journal of Public Health.* 2009; 19(2):178-82.
71. Becker-Dreps S, Morgan D, Pena R, Cortes L, Martin CF, Valladares E. Association between intimate partner violence and irritable bowel syndrome: a population-based study in Nicaragua. *Violence Against Women.* 2010; 16(7):832-45.
72. Vives-Cases C, Ruiz-Cantero MT, Escriba-Aguir V, Miralles JJ. The effect of intimate partner violence and other forms of violence against women on health. *J Public Health (Oxf).* 2011; 33(1):15-21.
73. Prosman G, Lo Fo Wong SH, Bulte E, Lagro-Janssen ALM. Healthcare utilization by abused women: a case-control study. *The European Journal of General Practice.* 2012; 18(2):107-13.
74. Eldoseri HM, Tufts KA, Zhang Q, Fisch JN. Adverse health effect of spousal violence among women attending Saudi Arabian primary health-care clinics. *Eastern Mediterranean Health Journal.* 2014; 20(11):717-25.
75. Al-Modallal H. Effect of intimate partner violence on health of women of Palestinian origin. *International Nursing Review.* 2016; 63:259-66.
76. Halpern L, Cho R, Rogers J, Padron V, Isaza S, Southerland J, et al. The impact of intimate partner violence exposure on orofacial and stress-related health consequences in female patients. *Violence and Gender.* 2016; 3(4):181-88.
77. Lacey KK & Mouzon DM. Severe physical intimate partner violence and the mental and physical health of U.S. Caribbean black women. *Journal of Women's Health.* 2016; doi:10.1089/jwh.2015.5293.
78. Ford JD, Grasso DJ, Jones S, Works T, Andemariam B. Interpersonal violence exposure and chronic pain in adult sickle cell. *Journal of Interpersonal Violence.* 2017; 35(3-4):924-42.
79. Iverson KM, Sayer NA, Meterko M, Stolzmann K, Suri P, Gormley K, et al. Intimate partner violence among female OEF/OIF/OND veterans who were evaluated for traumatic brain injury in the veterans health administration: a preliminary investigation. *Journal of Interpersonal Violence.* 2017; 35(13-14):2422-45.
80. Campbell JC, Anderson JC, McFadgion A, Gill J, Zink E, Patch M, et al. The effects of intimate partner violence and probable traumatic brain injury on central nervous system symptoms. *Journal of Women's Health.* 2018; 27(6):761-67.
81. Chandan J, Thomas T, Bradbury-Jones C, Taylor J, Bandyopadhyay S, Nirantharakumar K. Intimate partner violence and temporomandibular joint disorder. *Journal of Dentistry.* 2019; 82:98-100.

82. Craner JR, Lake ES, Bancroft KE, Hanson KM. Partner abuse among treatment-seeking individuals with chronic pain: prevalence, characteristics, and association with pain-related outcomes. *Pain Medicine.* 2020; 21(11):2789-98.
83. FitzPatrick KM, Brown S, Hegarty K, Mensah F, Gartland D. Physical and emotional intimate partner violence and women's health in the first year after childhbirth: an Australian pregnancy cohort study. *Journal of Interpersonal Violence.* 2020; doi:10.1177/0886260520934426.
84. Chandan JS, Thomas T, Raza K, Bradbury-Jones C, Taylor J, Bandyopadhyay S, et al. Intimate partner violence and the risk of developing fibromyalgia and chronic fatigue syndrome. *Journal of Interpersonal Violence.* 2021; 36(21-22):NP12279-98.
85. Trivedi M, Dumkrieger G, Chong CD, Dodick DW, Schwedt TJ. Impact of abuse on migraine-related sensory hypersensitivity symptoms: results from the American registry for migraine research. *Headache.* 2021; 61(5):740-54.
86. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science.* 1977; 196(4286):129-36.

Table

Table 1. Characteristics of the included studies.

Authors	Controls	Cases	Study design	Type of violence	Type of pain
Talley et al. (1994) Australia	111 30-49 y/o 35 with pain	89 30-49 y/o 45 with pain	Cross-sectional study	Spousal violence	General chronic pain
Boisset-Pioro et al. (1995) Canada	132 51.2 y/o 39 with pain and fibromyalgia	112 49.3 y/o 44 with pain and fibromyalgia	Case-control study	Sexual and physical abuse	Fibromyalgia and general chronic pain
Taylor et al. (1995) USA	47 49.5 y/o 11 with pain 20 with fibromyalgia	35 44.58 y/o 17 with pain 20 with fibromyalgia	Case-control study	Sexual and physical abuse	Fibromyalgia and general chronic pain
Letourneau et al. (1999) USA	151 33 y/o 37 with pain	40 33 y/o 17 with pain	Cross-sectional study	Sexual, physical and emotional abuse	General chronic pain
Coker et al. (2000) USA	532 18-65 y/o 118 with pain 50 with pelvic pain	620 18-65 y/o 235 with pain 107 with pelvic pain	Cross-sectional study	Intimate Partner Violence	Pelvic pain and general chronic pain
Dienemann et al. (2000) USA	30 25-45 y/o 8 with pain	47 25-45 y/o 21 with pain	Cross-sectional study	Domestic violence	General chronic pain
Lown & Vega (2001) USA	1057 32 y/o 6 with pain	126 32 y/o 13 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Weinbaum et al. (2001) USA	2776 18-65 y/o	207 18-65 y/o	Cross-sectional study	Intimate Partner Violence	General chronic pain

	571 with pain	73 with pain			
Campbell et al. (2002) USA	1000 21-56 y/o 252 with pain 86 with pelvic pain	980 21-56 y/o 389 with pain 169 with pelvic pain	Case-control study	Intimate Partner Violence	Pelvic pain and general chronic pain
Kramer et al. (2004) USA	718 18-65 y/o 167 with pain	550 18-65 y/o 291 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
John et al. (2004) UK	649 20-60 y/o 86 with pain	171 20-60 y/o 36 with pain	Cross-sectional study	Physical domestic violence	General chronic pain
Castro et al. (2005) USA - Guatemala	257 44.5 y/o 67 with pain 30 with fibromyalgia	117 44.5 y/o 62 with pain 28 with fibromyalgia	Case-control study	Physical, verbal and sexual abuse	Fibromyalgia and general chronic pain
Coker et al. (2005) USA	530 18-65 y/o 21 with pain	624 18-65 y/o 60 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Johnson et al. (2006) USA	786 47 y/o 269 with pain	433 47 y/o 164 with pain	Cross-sectional study	Domestic violence	General chronic pain
Salam et al. (2006) Bangladesh - Japan	132 25.4 y/o 48 with pain 31 with pelvic pain	364 25.4 y/o 189 with pain 128 with pelvic pain	Cross-sectional study	Spousal violence	Pelvic pain and general chronic pain
Pikarinen et al. (2007)	402	289	Cross-sectional	Physical and sexual abuse	General chronic pain

Finland	42.5 y/o 79 with pain	42.5 y/o 92 with pain	study		
Plante & Kamm (2008) France - UK	56 40 y/o 10 with pain and pelvic pain	110 34 y/o 68 with pain and pelvic pain	Cohort study	Sexual and physical assault, intra-family violence	Pelvic pain and general chronic pain
Ellsberg et al. (2008) Switzerland - USA - UK	10299 18-50 y/o 2165 with pain	9218 18-50 y/o 2856 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Kendall-Tackett et al. (2008) USA	53 47 y/o 21 with pain	57 47 y/o 30 with pain	Cross-sectional study	Domestic abuse	General chronic pain
Bonomi et al. (2009) USA	1686 18-64 y/o 340 with pain 128 with pelvic pain	242 18-64 y/o 76 with pain 29 with pelvic pain	Cross-sectional study	Physical and sexual abuse	Pelvic pain and general chronic pain
Ruiz-Perez et al. (2009) Spain	306 40.7 y/o 139 with pain and fibromyalgia	268 47.76 y/o 148 with pain and fibromyalgia	Case-control study	Physical, sexual and emotional abuse	Fibromyalgia and general chronic pain
Vung et al. (2009) Vietnam - Sweden	802 18-60 y/o 81 with pain	81 18-60 y/o 24 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Becker-Dreps et al. (2010) USA - Nicaragua	776 37 y/o 104 with pain	186 37 y/o 47 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Vives-Cases et al. (2010) Spain	12707 18-50 y/o	278 18-50 y/o	Cross-sectional study	Intimate Partner Violence	General chronic pain

	3069 with pain	109 with pain			
Prosman et al. (2012) Netherland	50 19-60 y/o 19 with pain 15 with pelvic pain	50 19-60 y/o 22 with pain 28 with pelvic pain	Case-control study	Intimate Partner Violence	Pelvic pain and general chronic pain
Eldoseri et al. (2014) UK	111 18-65 y/o 35 with pain	89 18-65 y/o 45 with pain	Cross-sectional study	Spousal violence	General chronic pain
Al-Modallal (2016) Jordan	87 32.7 y/o 57 with pain 42 with fibromyalgia	151 32.7 y/o 120 with pain 99 with fibromyalgia	Cross-sectional study	Intimate Partner Violence	Fibromyalgia and general chronic pain
Halpern et al. (2016) USA	30 18-64 y/o 18 with pain 0 with pelvic pain	34 18-64 y/o 26 with pain 3 with pelvic pain	Cross-sectional study	Intimate Partner Violence	Pelvic pain and general chronic pain
Lacey & Mouzon (2016) USA	836 18-65 y/o 129 with pain	113 18-65 y/o 30 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Ford et al. (2017) USA	16 24.9 y/o 4 with pain	34 34.9 y/o 24 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Iverson et al. (2017) USA	47 39.8 y/o 12 with pain	80 36 y/o 36 with pain	Cross-sectional study	Intimate Partner Violence	General chronic pain
Campbell et al. (2018) USA	356 27 y/o	534 27 y/o	Case-control study	Intimate Partner Violence	General chronic pain

	311 with pain	476 with pain			
Chandan et al. (2019) UK	74188 36.9 y/o 1507 with pain	18547 36.9 y/o 343 with pain	Cohort study	Intimate Partner Violence	General chronic pain
Craner et al. (2020) USA	48 46.87 y/o 1 with pain 6 with fibromyalgia 4 with pelvic pain	60 45 y/o 11 with pain 15 with fibromyalgia 0 with pelvic pain	Cross-sectional study	Intimate Partner Violence	Fibromyalgia, pelvic pain and general chronic pain
FitzPatrick et al. (2020) Australia	1112 31 y/o 563 with pain 284 with pelvic pain	234 31 y/o 139 with pain 79 with pelvic pain	Cohort study	Intimate Partner Violence	Pelvic pain and general chronic pain
Chandan et al. (2021) UK	74188 36.9 y/o 53 with pain 239 with fibromyalgia	18547 36.9 y/o 19 with pain 97 with fibromyalgia	Cohort study	Intimate Partner Violence	Fibromyalgia and general chronic pain
Trivedi et al. (2021) USA	366 47.7 y/o 64 with pain	222 45.9 y/o 67 with pain	Cross-sectional study	Physical, sexual and emotional abuse	General chronic pain

Figures

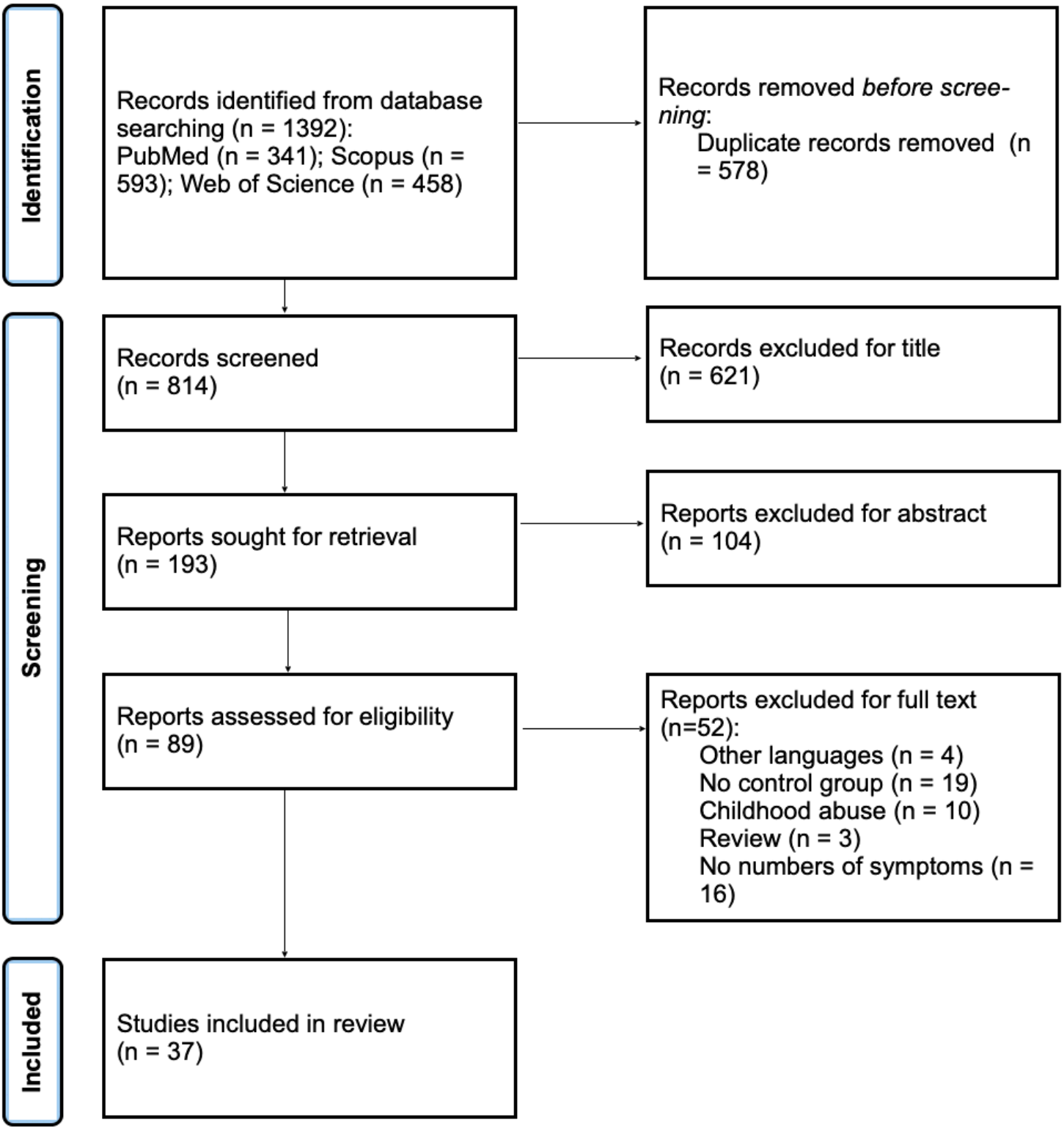

Figure 1

Prisma flowchart [42].

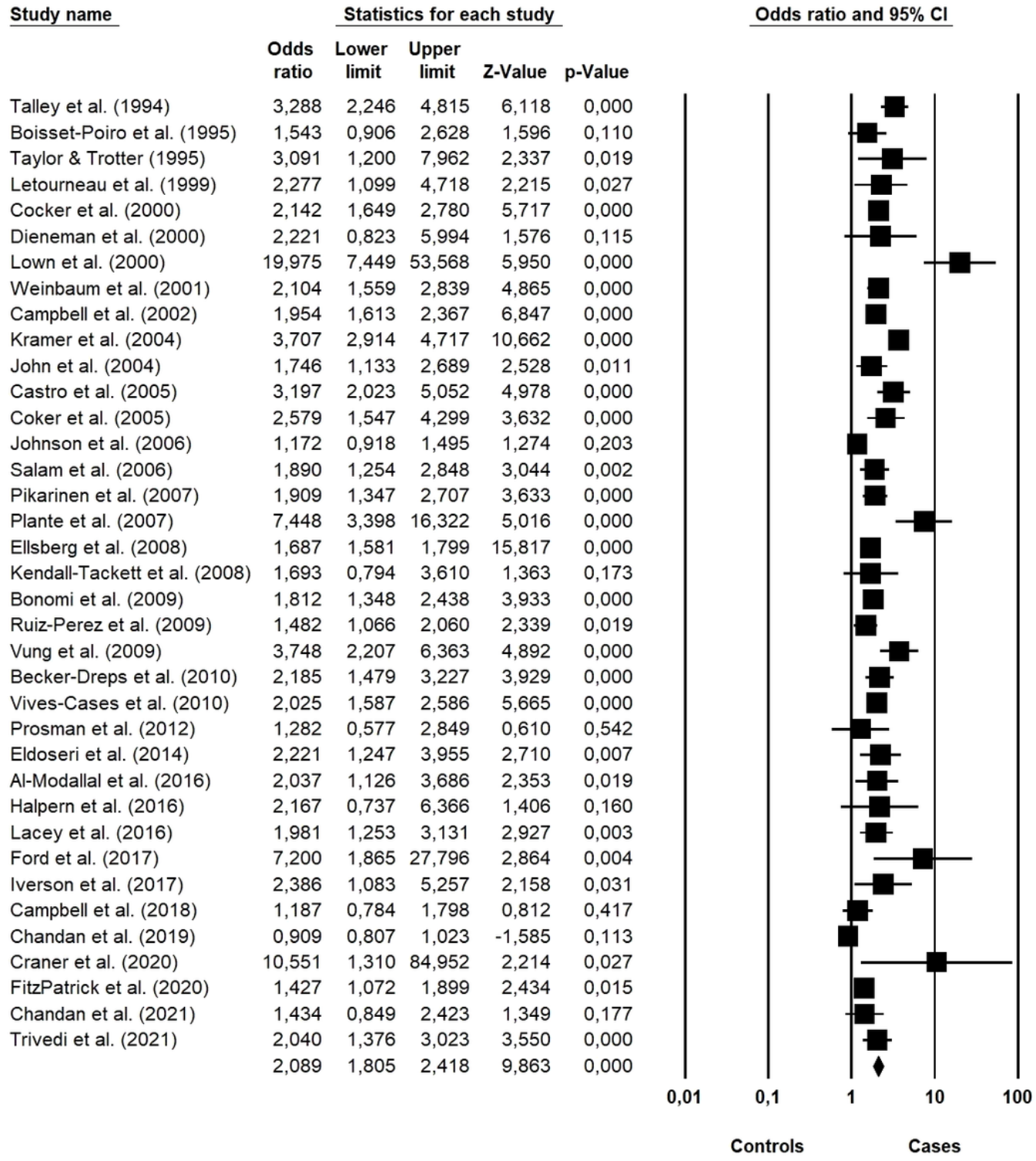

Figure 2

Forest plot showing the meta-analysis results about chronic pain in general.

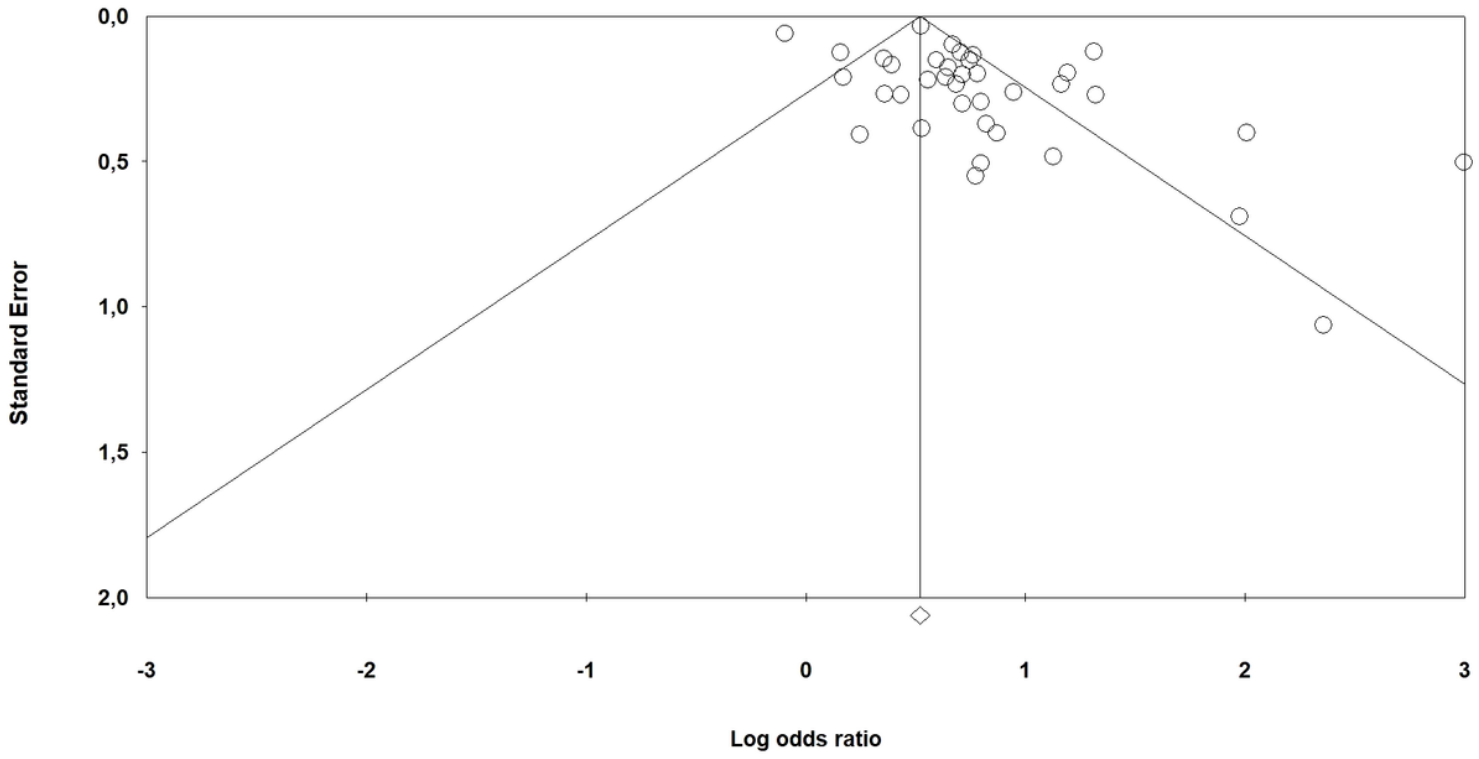

Figure 3

Funnel plot of chronic pain in general.

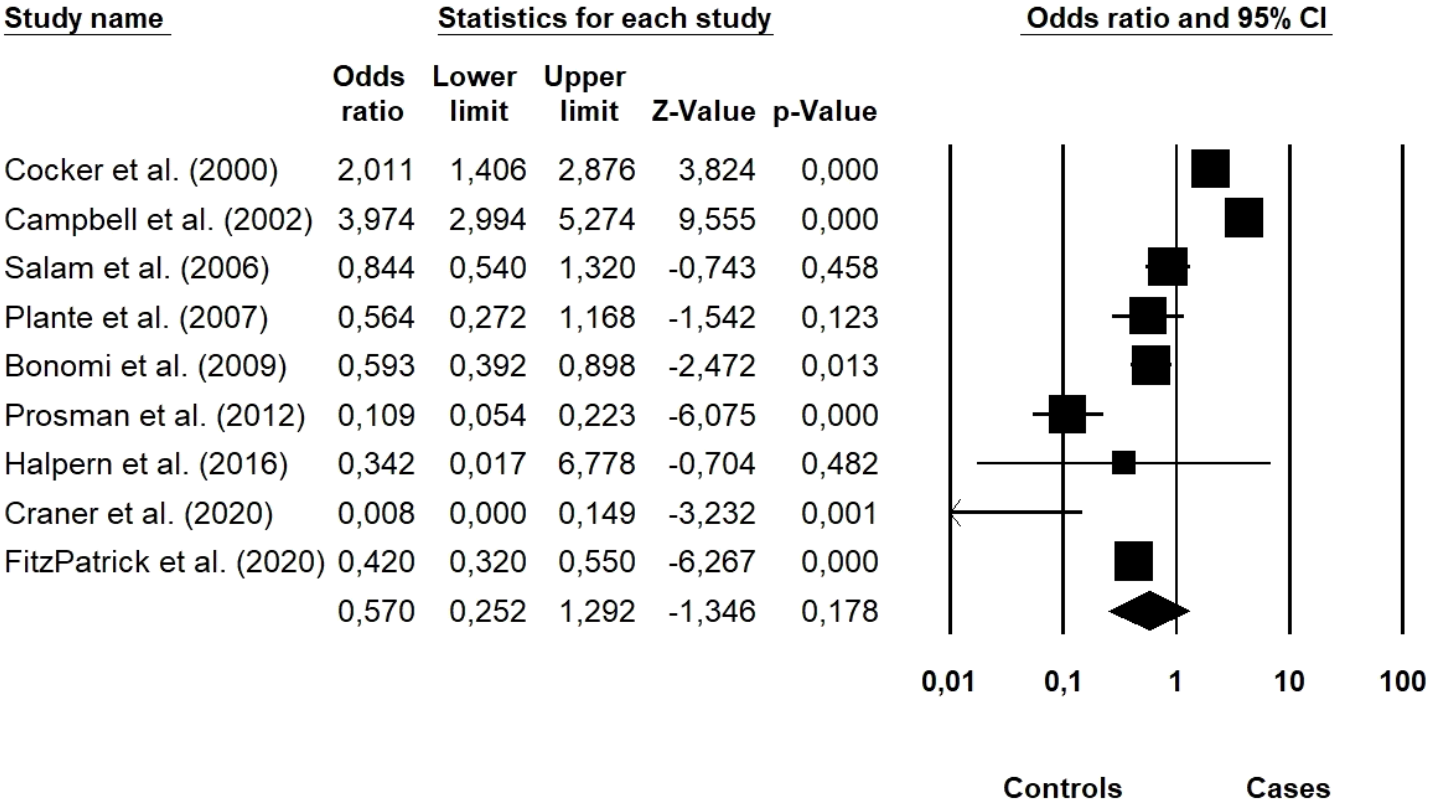

Figure 4

Forest plot of the meta-analysis results about pelvic pain.

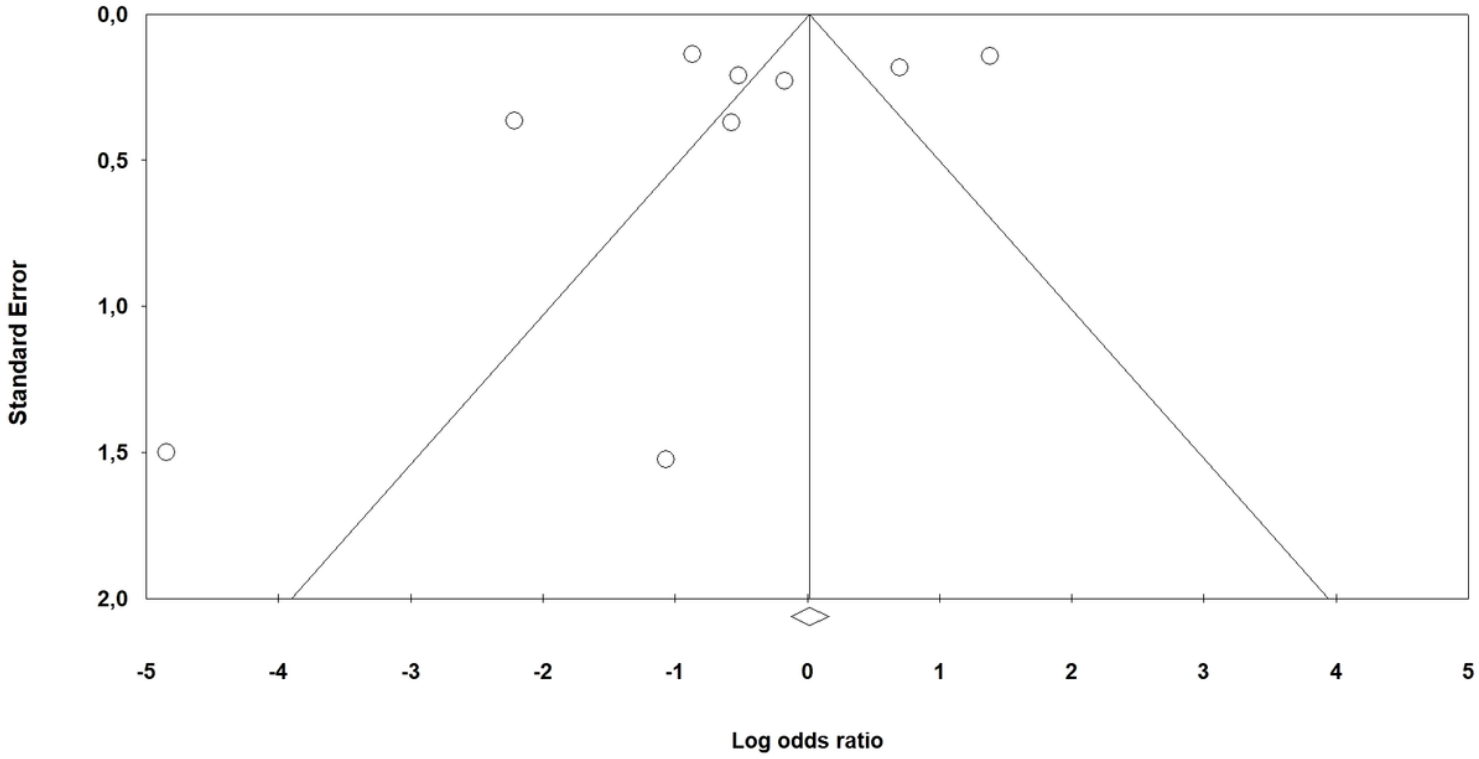

Figure 5

Pelvic pain Funnel plot.

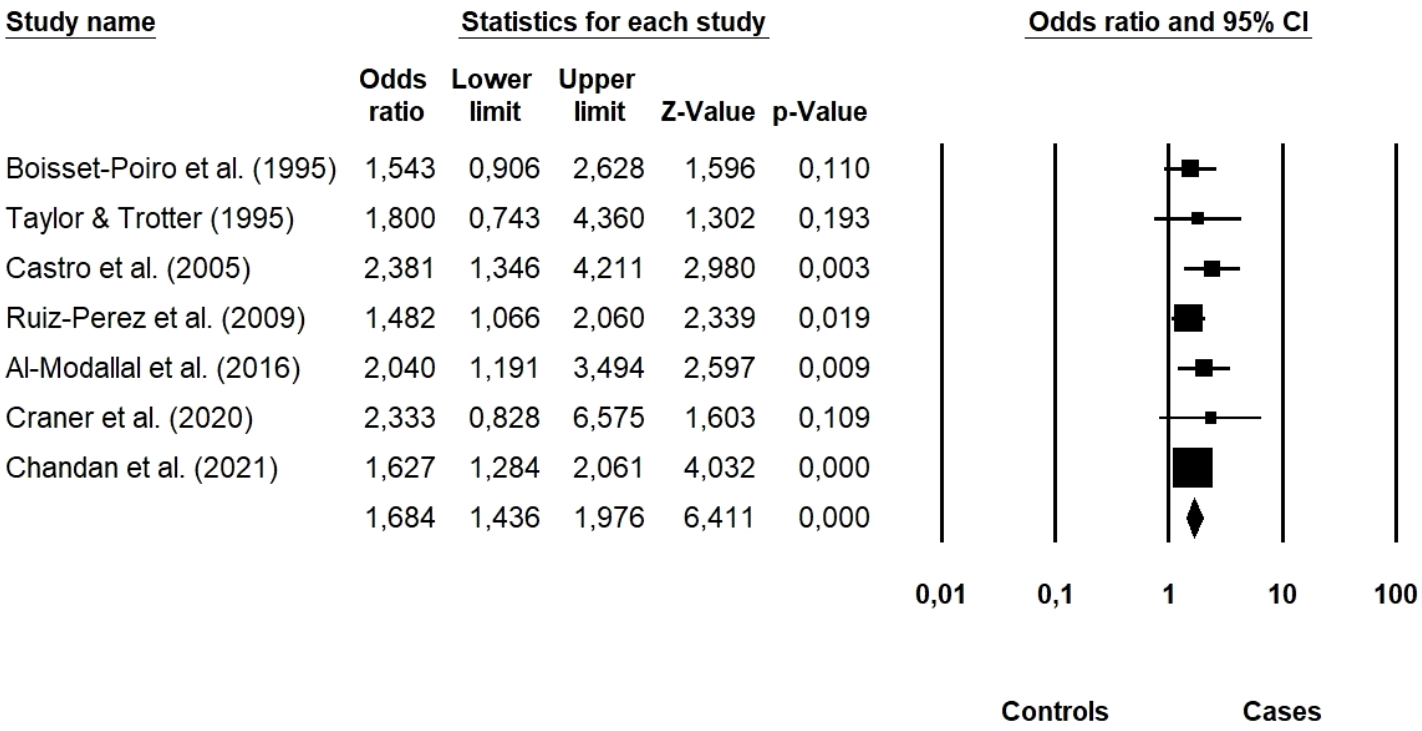

Figure 6

Forest plot of the meta-analysis results about fibromyalgia.

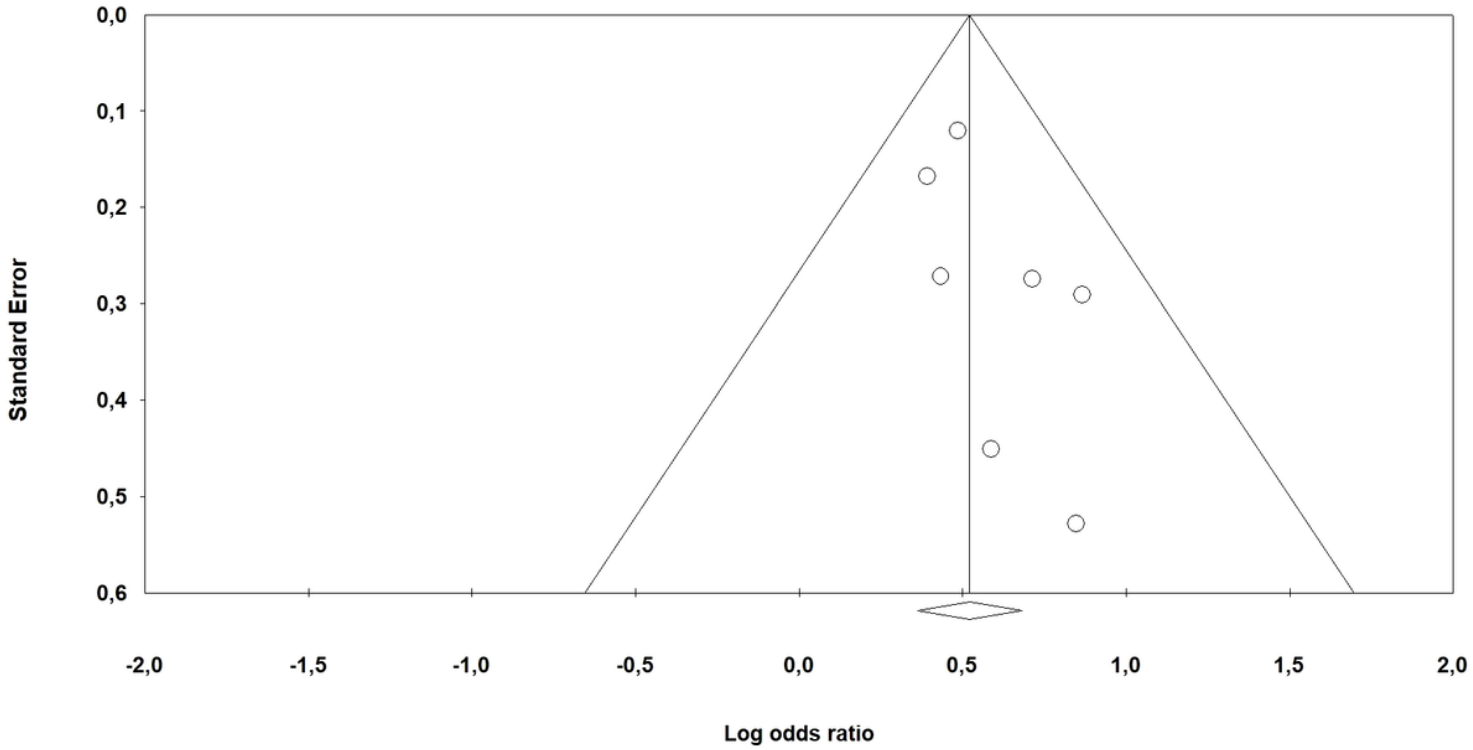

Figure 7

Fibromyalgia funnel plot.