

Research Methodology: Women's Chronic Pain and Prescription Opioid Use Project

Introduction

The Women's Chronic Pain and Prescription Opioid Project is a two-year project led by the Centre of Excellence for Women's Health and funded by Health Canada. The goal of the project is to create sex, gender, equity, and trauma-informed resources for health and social service providers that reflect women's lived and living experiences with chronic pain and prescription opioids.

Project activities include a scoping review, literature reviews, qualitative interviews, and consultations with policymakers, health and social service providers, researchers, and women with lived and living experience. The results of these activities have been translated into information sheets, packages, and educational guides available on the [Centre of Excellence for Women's Health](#) website. Below we briefly outline the scoping and literature review methodologies and provide the reference list of all included studies.

Scoping Review

A scoping review was conducted in April 2022 guided by the question:

1. *What are women's experiences with prescribed opioids for chronic pain?*

Four electronic databases, Medline, CINALH, PsycInfo, and Scopus, were searched using keywords inclusive of opioids, views and experiences, and chronic pain conditions. The search produced 5,943 returns and once duplicates were removed, there were 4,357 unique returns included for screening. All screening was completed using [Covidence](#) Systematic Review Software from Veritas Health Innovation, Melbourne, Australia. Articles published between 2012 and 2022 were included, if they included women or female's views, perspectives, perceptions, beliefs, and experiences with prescribed opioids for a chronic pain prescription. Throughout the screening process, we sought experiences such as misuse, barriers, drawbacks, benefits, side effects, tapering, health effects, dependence, and efficacy of opioids for chronic pain conditions. 49 studies were included in the final review.

Literature Reviews

Two literature reviews were conducted in July 2023 guided by the questions:

1. *What are the sex and gender factors affecting chronic pain?*
2. *How do sex and gender factors impact the efficacy of chronic pain interventions?*

To answer the first question, six databases, MEDLINE, Embase, PsycInfo, International Pharmaceutical Abstracts, Cochrane Database of Systematic Reviews, and Scopus were searched using keywords and MeSH terms inclusive of sex and gender factors and chronic pain. The search produced 1,489 returns and once duplicates were removed, there were 1,475 unique returns included for screening. All screening was completed using Covidence. Articles published between 2013 and 2023 were included if they had a focus on pain and sex and/or gender related factors. 32 studies were included in the final review.

To answer the second question, six databases, MEDLINE, Embase, PsycInfo, International Pharmaceutical Abstracts, Cochrane Library, and Scopus were searched using MeSH terms and keywords related to three main topics: sex and gender factors, chronic pain, and pain management interventions and options. The search produced 2,389 returns and once duplicates were removed, there were 1,861 unique returns included for screening. All screening was completed using Covidence. Articles published between 2013 and 2023 were included if they reported on women's sex and/or gender disaggregated outcomes from a wide range of pain management interventions. 38 studies were included in the final review.

Full Reference List

SCOPING REVIEW

- Ait-Daoud, N., Blevins, D., Khanna, S., Sharma, S., Holstege, C. P., & Amin, P. (2019). Women and Addiction: An Update. *Med Clin North Am*, *103*(4), 699-711. doi:10.1016/j.mcna.2019.03.002
- Allen, C., Murphy, A., Kiselbach, S., VandenBerg, S., & Wiebe, E. (2015). Exploring the experience of chronic pain among female Survival Sex Workers: a qualitative study. *BMC Family Practice*, *16*, 1-8.
- Allen, C., Murphy, A., Kiselbach, S., VandenBerg, S., & Wiebe, E. (2015). Exploring the experience of chronic pain among female Survival Sex Workers: a qualitative study. *BMC Family Practice*, *16*, 1-8.
- Arksey, H., & O'malley, L. (2005). Scoping studies: towards a methodological framework. *International journal of social research methodology*, *8*(1), 19-32.
- As-Sanie, S., Soliman, A., Evans, K., Erpelding, N., Lanier, R., & Katz, N. (2020). Healthcare utilization and cost burden among women with endometriosis by opioid prescription status in the first year after diagnosis: a retrospective claims database analysis. *Journal of Medical Economics*, *23*(4), 371-377.
- As-Sanie, S., Soliman, A. M., Evans, K., Erpelding, N., Lanier, R. K., & Katz, N. P. (2021). Short-acting and long-acting opioids utilization among women diagnosed with endometriosis in the United States: a population-based claims study. *Journal of Minimally Invasive Gynecology*, *28*(2), 297-306. e292.
- As-Sanie, S., Till, S. R., Mowers, E. L., Lim, C. S., Skinner, B. D., Fritsch, L., . . . Brummett, C. M. (2017). Opioid prescribing patterns, patient use, and postoperative pain after hysterectomy for benign indications. *Obstetrics & Gynecology*, *130*(6), 1261-1268.
- Braden, J. B., Young, A., Sullivan, M. D., Walitt, B., LaCroix, A. Z., & Martin, L. (2012). Predictors of change in pain and physical functioning among post-menopausal women with recurrent pain conditions in the women's health initiative observational cohort. *The Journal of Pain*, *13*(1), 64-72.
- Castillo, A. I. M. (2021). *"It Just Stopped": Veterans' Experiences of Opioid Discontinuation*. University of Arkansas for Medical Sciences.
- Chang, F., & Ibrahim, S. (2017). Perceptions of community-dwelling patients and their physicians on OxyContin® discontinuation and the impact on chronic pain management. *Pain Research and Management*, 2017.
- Cherrier, M. M., Shen, D. D., Shireman, L., Saxon, A. J., Simpson, T., Men, A., . . . Terman, G. W. (2021). Elevated customary alcohol consumption attenuates opioid effects. *Pharmacology Biochemistry and Behavior*, *211*, 173295.
- Chiuvé, S. E., Kilpatrick, R. D., Hornstein, M. D., Petruski-Ivleva, N., Wegrzyn, L. R., Dabrowski, E. C., . . . Bateman, B. T. (2021). Chronic opioid use and complication risks in women with endometriosis: a cohort study in US administrative claims. *Pharmacoepidemiology and drug safety*, *30*(6), 787-796.
- Cichowski, S. B., Rogers, R. G., Komesu, Y., Murata, E., Qualls, C., Murata, A., & Murata, G. (2018). A 10-yr analysis of chronic pelvic pain and chronic opioid therapy in the women veteran population. *Military medicine*, *183*(11-12), e635-e640.
- Dailey, D. L., Vance, C. G., Chimenti, R., Rakel, B. A., Zimmerman, M. B., Williams, J. M., . . . Crofford, L. J. (2022). The Influence of opioids on transcutaneous electrical nerve stimulation effects in women with fibromyalgia. *The Journal of Pain*, *23*(7), 1268-1281.
- Dassieu, L., Heino, A., Develay, É., Kaboré, J.-L., Pagé, M. G., Hudspith, M., . . . Choinière, M. (2021). Conversations about opioids: impact of the opioid overdose epidemic on social interactions for people who live with chronic pain. *Qualitative Health Research*, *31*(9), 1657-1669.
- Dassieu, L., Heino, A., Develay, É., Kaboré, J.-L., Pagé, M. G., Moor, G., . . . Choinière, M. (2021). "They think you're trying to get the drug": Qualitative investigation of chronic pain patients' health care experiences during the opioid overdose epidemic in Canada. *Canadian journal of pain*, *5*(1), 66-80.
- Dassieu, L., Kaboré, J.-L., Choinière, M., Arruda, N., & Roy, É. (2019). Chronic pain management among people who use drugs: A health policy challenge in the context of the opioid crisis. *International Journal of Drug Policy*, *71*, 150-156.
- Dassieu, L., Kabore, J.-L., Choinière, M., Arruda, N., & Roy, E. (2019). Understanding the link between substance use and chronic pain: A qualitative study among people who use illicit drugs in Montreal, Canada. *Drug and alcohol dependence*, *202*, 50-55.
- De Sola, H., Maquibar, A., Failde, I., Salazar, A., & Goicolea, I. (2020). Living with opioids: a qualitative study with patients with chronic low back pain. *Health Expectations*, *23*(5), 1118-1128.

- Estes, S. J., Soliman, A. M., Zivkovic, M., Chopra, D., & Zhu, X. (2020). Healthcare resource use and costs associated with opioid initiation among patients with newly diagnosed endometriosis with commercial insurance in the USA. *Advances in Therapy*, *37*, 2777-2791.
- Estes, S. J., Soliman, A. M., Zivkovic, M., Chopra, D., & Zhu, X. (2020). The impact of high-risk and chronic opioid use among commercially insured endometriosis patients on health care resource utilization and costs in the United States. *Women's Health*, *16*, 1745506520965898.
- Frank, J. W., Levy, C., Matlock, D. D., Calcaterra, S. L., Mueller, S. R., Koester, S., & Binswanger, I. A. (2016). Patients' perspectives on tapering of chronic opioid therapy: a qualitative study. *Pain medicine*, *17*(10), 1838-1847.
- Garland, E. L., Reese, S. E., Bedford, C. E., & Baker, A. K. (2019). Adverse childhood experiences predict autonomic indices of emotion dysregulation and negative emotional cue-elicited craving among female opioid-treated chronic pain patients. *Development and Psychopathology*, *31*(3), 1101-1110.
- Goetz, T. G., Becker, J. B., & Mazure, C. M. (2021). Women, opioid use and addiction.
- Hachey, L. M., Gregg, J. A., Pavlik-Maus, T. L., & Jones, J. S. (2017). Health implications and management of women with opioid use disorder. *Journal of Nursing Education and Practice*, *7*(8), 57-62.
- Hadlandsmyth, K., Stewart, K. R., Paez, M. B., Steffen, M., Meth, M., Reisinger, H. S., & Mosher, H. J. (2019). Patient perspectives on opioids: Views of inpatient veterans with chronic pain. *Pain medicine*, *20*(6), 1141-1147.
- Hoffman, K. A., Ponce Terashima, J., McCarty, D., & Muench, J. (2017). Toward a Patient Registry for Cannabis Use: An Exploratory Study of Patient Use in an Outpatient Health-Care Clinic in Oregon. *World medical & health policy*, *9*(3), 307-317.
- Huhn, A. S., Tompkins, D. A., Campbell, C. M., & Dunn, K. E. (2019). Individuals with chronic pain who misuse prescription opioids report sex-based differences in pain and opioid withdrawal. *Pain medicine*, *20*(10), 1942-1947.
- Kim, C. H., Garcia, R., Stover, J., Ritchie, K., Whealton, T., & Ata, M. A. (2014). Androgen deficiency in long-term intrathecal opioid administration. *Pain Physician*, *17*(4), E543.
- Kinnaird, E., Kimergård, A., Jennings, S., Drummond, C., & Deluca, P. (2019). From pain treatment to opioid dependence: a qualitative study of the environmental influence on codeine use in UK adults. *BMJ open*, *9*(4), e025331.
- LeResche, L., Saunders, K., Dublin, S., Thielke, S., Merrill, J. O., Shortreed, S. M., . . . Von Korff, M. R. (2015). Sex and age differences in global pain status among patients using opioids long term for chronic noncancer pain. *Journal of women's health*, *24*(8), 629-635.
- Ljungvall, H., Rhodin, A., Wagner, S., Zetterberg, H., & Åsenlöf, P. (2020). "My life is under control with these medications": an interpretative phenomenological analysis of managing chronic pain with opioids. *BMC musculoskeletal disorders*, *21*, 1-14.
- Manubay, J., Davidson, J., Vosburg, S., Jones, J., Comer, S., & Sullivan, M. Sex differences among opioid-abusing patients with chronic pain in a clinical trial. *J Addict Med*. 2015; 9(1): 46-52. DOI: 10.1097. ADM, 86.
- Margarit, C., Ballester, P., Maria-del-Mar, I., Roca, R., Gomez, L., Planelles, B., . . . Peiro, A. M. (2019). OPRM1 gene interaction with sleep in chronic pain patients treated with opioids. *Pain Physician*, *22*(1), 97.
- Martucci, K. T., MacNiven, K. H., Borg, N., Knutson, B., & Mackey, S. C. (2019). Apparent effects of opioid use on neural responses to reward in chronic pain. *Scientific reports*, *9*(1), 9633.
- McCrorie, C., Closs, S. J., House, A., Petty, D., Ziegler, L., Glidewell, L., . . . Foy, R. (2015). Understanding long-term opioid prescribing for non-cancer pain in primary care: a qualitative study. *BMC Family Practice*, *16*, 1-9.
- Menzies, V., Thacker, L. R., Mayer, S. D., Young, A. M., Evans, S., & Barstow, L. (2017). Polypharmacy, opioid use, and fibromyalgia: a secondary analysis of clinical trial data. *Biological Research For Nursing*, *19*(1), 97-105.
- Paterson, C., Ledgerwood, K., Arnold, C., Hogg, M., Xue, C., & Zheng, Z. (2016). Resisting prescribed opioids: a qualitative study of decision making in patients taking opioids for chronic noncancer pain. *Pain medicine*, *17*(4), 717-727.
- Ritchie, C. S., Garrett, S. B., Thompson, N., & Miaskowski, C. (2020). Unintended consequences of opioid regulations in older adults with multiple chronic conditions. *The Gerontologist*, *60*(7), 1343-1352.
- Sheehy, K. A., Finkel, J. C., Darbari, D. S., Guerrero, M. F., & Quezado, Z. M. (2015). Dexmedetomidine as an Adjuvant to Analgesic Strategy During Vaso-Occlusive Episodes in Adolescents with Sickle-Cell Disease. *Pain Practice*, *15*(8), E90-E97.
- St. Marie, B. (2014). Health care experiences when pain and substance use disorder coexist: "just because I'm an addict doesn't mean I don't have pain". *Pain medicine*, *15*(12), 2075-2086.

- Swenson, C. W., Kelley, A. S., Fenner, D. E., & Berger, M. B. (2016). Outpatient narcotic use after minimally invasive urogynecologic surgery. *Urogynecology*, 22(5), 377-381.
- VanDenKerkhof, E. G., Hopman, W. M., Goldstein, D. H., Wilson, R. A., Towheed, T. E., Lam, M., . . . Medd, J. D. (2012). Impact of perioperative pain intensity, pain qualities, and opioid use on chronic pain after surgery: a prospective cohort study. *Regional Anesthesia & Pain Medicine*, 37(1), 19-27.
- Vowles, K. E., Witkiewitz, K., Pielech, M., Edwards, K. A., McEntee, M. L., Bailey, R. W., . . . Sullivan, M. D. (2018). Alcohol and opioid use in chronic pain: A cross-sectional examination of differences in functioning based on misuse status. *The Journal of Pain*, 19(10), 1181-1188.
- Weimer, M. B., Macey, T. A., Nicolaidis, C., Dobscha, S. K., Duckart, J. P., & Morasco, B. J. (2013). Sex differences in the medical care of VA patients with chronic non-cancer pain. *Pain medicine*, 14(12), 1839-1847.
- Wersocki, E., Bedson, J., Chen, Y., LeResche, L., & Dunn, K. M. (2017). Comprehensive systematic review of long-term opioids in women with chronic noncancer pain and associated reproductive dysfunction (hypothalamic-pituitary-gonadal axis disruption). *Pain*, 158(1), 8-16.
- Young-Wolff, K. C., Klebaner, D., Weisner, C., Von Korff, M., & Campbell, C. I. (2017). Smoking status and opioid-related problems and concerns among men and women on chronic opioid therapy. *The Clinical journal of pain*, 33(8), 730-737.

LITERATURE REVIEW QUESTION #1

- Adeyemo, M. A., Spiegel, B. M. R., & Chang, L. (2010). Meta-analysis: do irritable bowel syndrome symptoms vary between men and women? *Alimentary pharmacology & therapeutics*, 32(6), 738-755. doi:https://dx.doi.org/10.1111/j.1365-2036.2010.04409.x
- Al-Hassany, L., Haas, J., Piccininni, M., Kurth, T., Maassen Van Den Brink, A., & Rohmann, J. L. (2020). Giving Researchers a Headache - Sex and Gender Differences in Migraine. *Frontiers in Neurology*, 11((Al-Hassany, Maassen Van Den Brink) Division of Vascular Medicine and Pharmacology, Department of Internal Medicine, Erasmus MC University Medical Center, Rotterdam, Netherlands(Haas, Piccininni, Kurth, Rohmann) Institute of Public Health, Charite - Unive), 549038. doi:https://dx.doi.org/10.3389/fneur.2020.549038
- Al-Karagholi, M. A.-M., Kalatharan, V., Ghanizada, H., Dussor, G., & Ashina, M. (2023). Prolactin in headache and migraine: A systematic review of preclinical studies. *Headache*, 63(5), 577-584. doi:https://dx.doi.org/10.1111/head.14412
- Andersen, S., Petersen, M. W., Svendsen, A. S., & Gazerani, P. (2015). Pressure pain thresholds assessed over temporalis, masseter, and frontalis muscles in healthy individuals, patients with tension-type headache, and those with migraine—a systematic review. *Pain*, 156(8), 1409-1423. doi:https://dx.doi.org/10.1097/j.pain.0000000000000219
- Barnish, M., Morgan, H. M., & Barnish, J. (2017). The 2016 HIGH Heels: Health effects And psychosexual Benefits (HIGH HABITS) study: systematic review of reviews and additional primary studies. *BMC public health*, 18(1), 37. doi:https://dx.doi.org/10.1186/s12889-017-4573-4
- Barrington, D. J., Robinson, H. J., Wilson, E., & Hennegan, J. (2021). Experiences of menstruation in high income countries: A systematic review, qualitative evidence synthesis and comparison to low and middle-income countries. *PLoS ONE*, 16(July), e0255001. doi:https://dx.doi.org/10.1371/journal.pone.0255001
- Boiko, O., Barrio-Martinez, S., Priede, A., Ventura, L., Gómez-Carazo, N., Hernández-Abellá, A., . . . González-Blanch, C. (2021). Analysis of the PHQ-15 by individual items: A systematic review and meta-analysis. *Ansiedad y Estrés*, 28(1), 62-73. doi:10.5093/anyes2022a7
- Brown, D., Schenk, S., Genent, D., Zernikow, B., & Wager, J. (2021). A scoping review of chronic pain in emerging adults. *Pain Reports*, 6(1), E920. doi:10.1097/PR9.0000000000000920
- Castien, R. F., van der Wouden, J. C., & De Hertogh, W. (2018). Pressure pain thresholds over the cranio-cervical region in headache: a systematic review and meta-analysis. *Journal of Headache and Pain*, 19(1), 9. doi:https://dx.doi.org/10.1186/s10194-018-0833-7
- Chai, N. C., Peterlin, B. L., & Calhoun, A. H. (2014). Migraine and estrogen. *Current Opinion in Neurology*, 27(3), 315-324. doi:https://dx.doi.org/10.1097/WCO.0000000000000091
- Choquet, H., Yin, J., Jacobson, A. S., Horton, B. H., Hoffmann, T. J., Jorgenson, E., . . . Pressman, A. R. (2021). New and sex-specific migraine susceptibility loci identified from a multiethnic genome-wide meta-analysis. *Communications biology*, 4(1), 864. doi:https://dx.doi.org/10.1038/s42003-021-02356-y

- Conversano, C., Ciacchini, R., Orru, G., Bazzichi, M. L., Gemignani, A., & Miniati, M. (2021). Gender differences on psychological factors in fibromyalgia: a systematic review on the male experience. *Clinical and experimental rheumatology*, 39 Suppl 130(3), 174–185. doi:<https://dx.doi.org/10.55563/clinexprheumatol/73g6np>
- Cote, D., & Coutu, M.-F. (2010). A critical review of gender issues in understanding prolonged disability related to musculoskeletal pain: how are they relevant to rehabilitation? *Disability and rehabilitation*, 32(2), 87–102.
- Delaruelle, Z., Ivanova, T. A., Khan, S., Negro, A., Ornello, R., Raffaelli, B., . . . Reuter, U. (2018). Male and female sex hormones in primary headaches. *Journal of Headache and Pain*, 19(1), 117. doi:<https://dx.doi.org/10.1186/s10194-018-0922-7>
- Facchin, F., Buggio, L., Dridi, D., Barbara, G., & Vercellini, P. (2021). The Subjective Experience of Dyspareunia in Women with Endometriosis: A Systematic Review with Narrative Synthesis of Qualitative Research. *International Journal of Environmental Research and Public Health*, 18(22). doi:<https://dx.doi.org/10.3390/ijerph182212112>
- Fernandez-de-las-Penas, C., Navarro-Santana, M. J., Curiel-Montero, F., Plaza-Manzano, G., Alburquerque-Sendin, F., & Rodrigues-de-Souza, D. P. (2022). Localized and widespread pressure pain hypersensitivity in patients with episodic or chronic migraine: A systematic review and meta-analysis. *Cephalalgia*, 42(9), 966–980. doi:<https://dx.doi.org/10.1177/03331024221084217>
- Huguet, A., Tougas, M. E., Hayden, J., McGrath, P. J., Chambers, C. T., Stinson, J. N., & Wozney, L. (2016). Systematic Review of Childhood and Adolescent Risk and Prognostic Factors for Recurrent Headaches. *Journal of Pain*, 17(8), 855–873.e858. doi:<https://dx.doi.org/10.1016/j.jpain.2016.03.010>
- Hunt, K., Adamson, J., Hewitt, C., & Nazareth, I. (2011). Do women consult more than men? A review of gender and consultation for back pain and headache. *Journal of health services research & policy*, 16(2), 108–117. doi:<https://dx.doi.org/10.1258/jhsrp.2010.009131>
- Kahere, M., Hlongwa, M., & Ginindza, T. G. (2022). A Scoping Review on the Epidemiology of Chronic Low Back Pain among Adults in Sub-Saharan Africa. *International Journal of Environmental Research and Public Health*, 19(5), 2964. doi:<https://dx.doi.org/10.3390/ijerph19052964>
- Levine, D., & Horesh, D. (2020). Suicidality in Fibromyalgia: A Systematic Review of the Literature. *Frontiers in Psychiatry*, 11((Levine) Department of Psychology, New York University, New York, NY, United States(Levine) Department of Psychiatry, Massachusetts General Hospital, Boston, MA, United States(Horesh) Department of Psychology, Bar-Ilan University, Ramat Gan, Israel(Horesh), 535368. doi:<https://dx.doi.org/10.3389/fpsy.2020.535368>
- Ma, T., Li, Z.-Y., Yu, Y., Yang, Y., Ni, M.-H., Xie, H., . . . Yan, L.-F. (2022). Gray Matter Abnormalities in Patients with Complex Regional Pain Syndrome: A Systematic Review and Meta-Analysis of Voxel-Based Morphometry Studies. *Brain sciences*, 12(8). doi:<https://dx.doi.org/10.3390/brainsci12081115>
- Ricoy-Cano, A. J., Cortes-Perez, I., Del Carmen Martin-Cano, M., & De La Fuente-Robles, Y. M. (2022). Impact of Fibromyalgia Syndrome on Female Sexual Function: A Systematic Review with Meta-analysis. *Journal of Clinical Rheumatology*, 28(2), 574–582. doi:<https://dx.doi.org/10.1097/RHU.0000000000001758>
- Rummens, S., Robben, E., De Groef, A., Van Wambeke, P., Janssens, L., Brumagne, S., . . . Peers, K. (2020). Factors Associated With the Ultrasound Characteristics of the Lumbar Multifidus: A Systematic Review. *PM & R : the journal of injury, function, and rehabilitation*, 12(1), 82–100. doi:<https://dx.doi.org/10.1002/pmrj.12212>
- Sabo, M. C., Fratila, T. D., Bogariu, A. M., & Dumitrascu, D. L. (2021). Sex-gender differences in irritable bowel syndrome. *European Journal of Clinical Investigation*, 51(SUPPL 1), 136–137. doi:<https://dx.doi.org/10.1111/eci.13567>
- Schulte, K. J., & Mayrovitz, H. N. (2023). Myocardial Infarction Signs and Symptoms: Females vs. Males. *Cureus*, 15(4), e37522. doi:<https://dx.doi.org/10.7759/cureus.37522>
- Shallcross, R., Dickson, J. M., Nunns, D., Mackenzie, C., & Kiemle, G. (2018). Women's Subjective Experiences of Living with Vulvodynia: A Systematic Review and Meta-Ethnography. *Archives of sexual behavior*, 47(3), 577–595. doi:<https://dx.doi.org/10.1007/s10508-017-1026-1>
- Shen, B. Q., Sankaranarayanan, I., Price, T. J., & Tavares-Ferreira, D. (2023). Sex-differences in prostaglandin signaling: a semi-systematic review and characterization of PTGDS expression in human sensory neurons. *Scientific reports*, 13(1), 4670. doi:<https://dx.doi.org/10.1038/s41598-023-31603-x>
- Souza, P. P., Romao, A. S., Rosa-e-Silva, J. C., Reis, F. C. d., Nogueira, A. A., & Poli-Neto, O. B. (2011). Qualitative research as the basis for a biopsychosocial approach to women with chronic pelvic pain. *Journal of psychosomatic obstetrics and gynaecology*, 32(4), 165–172. doi:<https://dx.doi.org/10.3109/0167482X.2011.607523>

- Tschon, M., Contartese, D., Pagani, S., Borsari, V., & Fini, M. (2021). Gender and sex are key determinants in osteoarthritis not only confounding variables. A systematic review of clinical data. *Journal of Clinical Medicine*, *10*(14), 3178. doi:<https://dx.doi.org/10.3390/jcm10143178>
- Úbeda-D'ocasár, E., Gallego-Sendarrubias, G. M., Guodemar-Pérez, J., & Hervás-Pérez, J. P. (2020). Differences between Men and Women with Fibromyalgia. *Physikalische Medizin Rehabilitationsmedizin Kurortmedizin*, *30*(5), 272-282. doi:10.1055/a-1089-8152
- Wang, Z., Yuan, M., Xiao, J., Chen, L., Guo, X., Dou, Y., . . . Zhou, B. (2022). Gray Matter Abnormalities in Patients with Chronic Primary Pain: A Coordinate-Based Meta-Analysis. *Pain physician*, *25*(1), 1-13.
- Yousaf, M. S., Alam, M. A., Qadeer, M., Ahmad, F., Riaz, R. H., & Riaz, S. H. (2021). Risk factors in burning mouth syndrome among older adults. *Pakistan Journal of Medical and Health Sciences*, *15*(8), 2060-2063. doi:<https://dx.doi.org/10.53350/pjmhs211582060>

LITERATURE REVIEW QUESTION #2

- Aboussouan, A. B., Mandell, D., Johnson, J., Thompson, N., & Huffman, K. L. (2021). An interdisciplinary chronic pain rehabilitation program effectively treats impairment in sexual function, depression, alexithymia, and pain in women with chronic pelvic pain. *Journal of psychosomatic obstetrics and gynaecology*, *42*(4), 261-271. doi:<https://dx.doi.org/10.1080/0167482X.2020.1735341>
- Acker, H., Schmidt-Rathjens, C., Acker, Fandrey, J., & Ehleben, W. (2015). Acupuncture-brain interactions as hypothesized by mood scale recordings. *Medical Hypotheses*, *85*(3), 371-379. doi:<https://dx.doi.org/10.1016/j.mehy.2015.05.013>
- Agius, A. M., Jones, N. S., & Muscat, R. (2013). Serial blood serotonin levels in a randomized controlled trial comparing the efficacy of low-dose amitriptyline, amitriptyline with pindolol and surrogate placebo in patients with chronic tension-type facial pain. *Rhinology*, *51*(3), 236-242. doi:10.4193/rhin13.019
- Ahlstrand, I., Thyberg, I., Falkmer, T., Dahlstrom, O., & Bjork, M. (2015). Pain and activity limitations in women and men with contemporary treated early RA compared to 10 years ago: the Swedish TIRA project. *Scandinavian journal of rheumatology*, *44*(4), 259-264. doi:<https://dx.doi.org/10.3109/03009742.2014.997285>
- Anderson, R. U., Wise, D., Sawyer, T., Nathanson, B. H., & Nevin Smith, J. (2016). Equal Improvement in Men and Women in the Treatment of Urologic Chronic Pelvic Pain Syndrome Using a Multi-modal Protocol with an Internal Myofascial Trigger Point Wand. *Applied psychophysiology and biofeedback*, *41*(2), 215-224. doi:<https://dx.doi.org/10.1007/s10484-015-9325-6>
- Arentz, S., Smith, C., Redmond, R., Abbott, J., & Armour, M. (2021). A cross-sectional study of traditional Chinese medicine practitioner's knowledge, treatment strategies and integration of practice of chronic pelvic pain in women. *BMC Complementary Medicine and Therapies*. doi:10.1186/s12906-021-03355-6
- Barrachina, J., Margarit, C., Muriel, J., Lopez-Gil, V., Lopez-Gil, S., Ballester, P., . . . Peiro, A. M. (2022). Sex Differences in Oxycodone/Naloxone vs. Tapentadol in Chronic Non-Cancer Pain: An Observational Real-World Study. *Biomedicines*, *10*(10). doi:<https://dx.doi.org/10.3390/biomedicines10102468>
- Boerner, K. E., Eccleston, C., Chambers, C. T., & Keogh, E. (2017). Sex differences in the efficacy of psychological therapies for the management of chronic and recurrent pain in children and adolescents: A systematic review and meta-Analysis. *Pain*, *158*(4), 569-582. doi:<https://dx.doi.org/10.1097/j.pain.0000000000000803>
- Brotto, L. A., Basson, R., Smith, K. B., Driscoll, M., & Sadownik, L. (2015). Mindfulness-based group therapy for women with provoked vestibulodynia. *Mindfulness*, *6*(3), 417-432. doi:<https://dx.doi.org/10.1007/s12671-013-0273-z>
- Brotto, L. A., Bergeron, S., Zdaniuk, B., & Basson, R. (2020). Mindfulness and cognitive behavior therapy for provoked vestibulodynia: Mediators of treatment outcome and long-term effects. *Journal of consulting and clinical psychology*, *88*(1), 48-64. doi:<https://dx.doi.org/10.1037/ccp0000473>
- Brotto, L. A., Yong, P., Smith, K. B., & Sadownik, L. A. (2015). Impact of a multidisciplinary vulvodynia program on sexual functioning and dyspareunia. *The Journal of Sexual Medicine*, *12*(1), 238-247. doi:<https://dx.doi.org/10.1111/jsm.12718>
- Brotto, L. A., Zdaniuk, B., Rietchel, L., Basson, R., & Bergeron, S. (2020). Moderators of Improvement From Mindfulness-Based vs Traditional Cognitive Behavioral Therapy for the Treatment of Provoked Vestibulodynia. *The Journal of Sexual Medicine*, *17*(11), 2247-2259. doi:<https://dx.doi.org/10.1016/j.jsxm.2020.07.080>

- Castro, S., Acute, nchez, A. M., Aguilar, F., ndiz, M. E., Matar, . . . as, C. (2014). Short-term effects of a manual therapy protocol on pain, physical function, quality of sleep, depressive symptoms, and pressure sensitivity in women and men with fibromyalgia syndrome: a randomized controlled trial. *Clinical Journal of Pain*, *30*(7), 589. doi:<https://doi.org/10.1097/AJP.0000000000000008>
- Conic, R. R. Z., Caylor, J., Cui, C. L., Reyes, Z., Nelson, E., Yin, S., & Lerman, I. (2022). Sex-specific differences in the efficacy of traditional low frequency versus high frequency spinal cord stimulation for chronic pain. *Bioelectronic medicine*, *8*(1), 8. doi:<https://dx.doi.org/10.1186/s42234-022-00090-2>
- Davis, S. N. P., Bergeron, S., Binik, Y. M., & Lambert, B. (2013). Women with Provoked Vestibulodynia Experience Clinically Significant Reductions in Pain Regardless of Treatment: Results from a 2-Year Follow-Up Study. *Journal of Sexual Medicine*, *10*(12), 3080-3087. doi:<https://dx.doi.org/10.1111/jsm.12309>
- Desjardins, E. L., Brooks, B., Leishear, K., Aronson, R., Howell, M., & Shrikhande, A. A. (2020). A novel, non-opioid treatment protocol for women with chronic pelvic pain syndrome. *PM and R*. doi:10.1002/pmrj.12519
- Driscoll, M. A., Knobf, M. T., Higgins, D. M., Heapy, A., Lee, A., & Haskell, S. (2018). Patient Experiences Navigating Chronic Pain Management in an Integrated Health Care System: A Qualitative Investigation of Women and Men. *Pain medicine (Malden, Mass.)*, *19*(suppl_1), S19-S29. doi:<https://dx.doi.org/10.1093/pm/pny139>
- Dubinskaya, A., Horwitz, R., Scott, V., Anger, J., & Eilber, K. (2023). Is it time for doctors to Rx vibrators? A systematic review of pelvic floor outcomes. *Sexual Medicine Reviews*, *11*(1), 15-22. doi:<https://dx.doi.org/10.1093/sxmrev/qeac008>
- Franconi, F., Finocchi, C., Allais, G., Omboni, S., Tullo, V., Campesi, I., . . . Bussone, G. (2014). Gender and triptan efficacy: A pooled analysis of three double-blind, randomized, crossover, multicenter, Italian studies comparing frovatriptan vs. other triptans. *Neurological Sciences*, *35*(SUPPL. 1), S99-S105. doi:<https://dx.doi.org/10.1007/s10072-014-1750-4>
- Giudice, L. C., As-Sanie, S., Arjona Ferreira, J. C., Becker, C. M., Abrao, M. S., Lessey, B. A., . . . Johnson, N. P. (2022). Once daily oral relugolix combination therapy versus placebo in patients with endometriosis-associated pain: two replicate phase 3, randomised, double-blind, studies (SPIRIT 1 and 2). *Lancet*. doi:10.1016/S0140-6736(22)00622-5
- Hasegawa, M., Yamazaki, S., Kimura, M., Nakano, K., & Yasumura, S. (2013). Community-based exercise program reduces chronic knee pain in elderly Japanese women at high risk of requiring long-term care: A non-randomized controlled trial. *Geriatrics & Gerontology International*, *13*(1), 167-174. doi:<https://dx.doi.org/10.1111/j.1447-0594.2012.00879.x>
- Ilgen, M. A., Coughlin, L. N., Bohnert, A. S. B., Chermack, S., Price, A., Kim, H. M., . . . Blow, F. C. (2020). Efficacy of a Psychosocial Pain Management Intervention for Men and Women With Substance Use Disorders and Chronic Pain: A Randomized Clinical Trial. *JAMA psychiatry*, *77*(12), 1225-1234. doi:<https://dx.doi.org/10.1001/jamapsychiatry.2020.2369>
- Kang, S.-K., Lee, Y.-H., Park, H., Ro, J. Y., & Auh, Q. S. (2018). Effects of intramuscular morphine in men and women with temporomandibular disorder with myofascial pain. *Oral diseases*, *24*(8), 1591-1598. doi:<https://dx.doi.org/10.1111/odi.12919>
- Lami, M. J., Martinez, M. P., Sanchez, A. I., Miro, E., Diener, F. N., Prados, G., & Guzman, M. A. (2016). Gender Differences in Patients with Fibromyalgia Undergoing Cognitive-Behavioral Therapy for Insomnia: Preliminary Data. *Pain practice : the official journal of World Institute of Pain*, *16*(2), E23-34. doi:<https://dx.doi.org/10.1111/papr.12411>
- Leo, R. J. (2013). A systematic review of the utility of anticonvulsant pharmacotherapy in the treatment of vulvodynia pain. *Journal of Sexual Medicine*. doi:10.1111/jsm.12200
- Linda, S., Gunilla, S., Ann-Charlotte, K., & Britt-Marie, S. (2022). SEX AND AGE GROUP FOCUS ON OUTCOMES AFTER MULTIMODAL REHABILITATION FOR PATIENTS WITH CHRONIC PAIN IN NORTHERN SWEDEN. *Journal of Rehabilitation Medicine*, *54*. doi:10.2340/jrm.v54.2336
- Lutfi, M., Dalleck, L. C., Drummond, C., Drummond, M., Paparella, L., Keith, C. E., . . . Ramos, J. S. (2023). A Single Session of a Digital Health Tool-Delivered Exercise Intervention May Provide Immediate Relief from Pelvic Pain in Women with Endometriosis: A Pilot Randomized Controlled Study. *International Journal of Environmental Research and Public Health*. doi:10.3390/ijerph20031665
- Murphy, J. L., Phillips, K. M., & Rafie, S. (2016). Sex differences between Veterans participating in interdisciplinary chronic pain rehabilitation. *Journal of rehabilitation research and development*, *53*(1), 83-94. doi:<https://dx.doi.org/10.1682/JRRD.2014.10.0250>

- Myhr, A., & Augestad, L. B. (2013). Chronic pain patients—effects on mental health and pain after a 57-week multidisciplinary rehabilitation program. *Pain management nursing : official journal of the American Society of Pain Management Nurses*, 14(2), 74–84. doi:<https://dx.doi.org/10.1016/j.pmn.2010.09.005>
- Nicosia, F. M., Gibson, C. J., Purcell, N., Zamora, K., Tighe, J., & Seal, K. H. (2021). Women Veterans' Experiences with Integrated, Biopsychosocial Pain Care: A Qualitative Study. *Pain medicine (Malden, Mass.)*, 22(9), 1954–1961. doi:<https://dx.doi.org/10.1093/pm/pnaa481>
- Ornello, R., Ahmed, F., Negro, A., Miscio, A. M., Santoro, A., Alpuente, A., . . . Sacco, S. (2021). Is There a Gender Difference in the Response to onabotulinumtoxinA in Chronic Migraine? Insights from a Real-Life European Multicenter Study on 2879 Patients. *Pain and Therapy*, 10(2), 1605–1618. doi:<https://dx.doi.org/10.1007/s40122-021-00328-y>
- Racine, M., Sole, E., Sanchez-Rodriguez, E., Tome-Pires, C., Roy, R., Jensen, M. P., . . . Cane, D. (2020). An Evaluation of Sex Differences in Patients With Chronic Pain Undergoing an Interdisciplinary Pain Treatment Program. *Pain practice : the official journal of World Institute of Pain*, 20(1), 62–74. doi:<https://dx.doi.org/10.1111/papr.12827>
- Rini, C., Porter, L. S., Somers, T. J., McKee, D. C., DeVellis, R. F., Smith, M., . . . Keefe, F. J. (2015). Automated Internet-based pain coping skills training to manage osteoarthritis pain: A randomized controlled trial. *Pain*, 156(5), 837–848. doi:<https://dx.doi.org/10.1097/j.pain.0000000000000121>
- Schlaeger, J. M., Pauls, H. A., Powell-Roach, K. L., Thornton, P. D., Hartmann, D., Suarez, M. L., . . . Patil, C. L. (2019). Vulvodynia, “A Really Great Torturer”: A Mixed Methods Pilot Study Examining Pain Experiences and Drug/Non-drug Pain Relief Strategies. *The Journal of Sexual Medicine*. doi:10.1016/j.jsxm.2019.05.004
- Sinclair, J., Smith, C. A., Abbott, J., Chalmers, K. J., Pate, D. W., & Armour, M. (2020). Cannabis Use, a Self-Management Strategy Among Australian Women With Endometriosis: Results From A National Online Survey. *Journal of Obstetrics and Gynaecology Canada*. doi:10.1016/j.jogc.2019.08.033
- Vallinga, M. S., Spoelstra, S. K., Hemel, I. L. M., van de Wiel, H. B. M., & Weijmar Schultz, W. C. M. (2015). Transcutaneous electrical nerve stimulation as an additional treatment for women suffering from therapy-resistant provoked vestibulodynia: a feasibility study. *The Journal of Sexual Medicine*, 12(1), 228–237. doi:<https://dx.doi.org/10.1111/jsm.12740>
- Vining, R., Onifer, S. M., Twist, E., Ziegler, A. M., Corber, L., & Long, C. R. (2022). Thoracolumbar fascia mobility and chronic low back pain: Phase 2 of a pilot and feasibility study including multimodal chiropractic care. *Chiropractic and Manual Therapies*, 30(1), 46. doi:<https://dx.doi.org/10.1186/s12998-022-00455-z>
- Yang, E. C., Koenig, N. A., Gong, M., Brotto, L. A., Barr, A. M., Lee, T., . . . Geoffrion, R. (2022). Cannabis use preferences in women with myofascial pelvic pain: A survey. *International Urogynecology Journal*. doi:10.1007/s00192-022-05079-8

OTHER

In addition to what was found through the scoping and literature reviews, the following resources and references were included in knowledge products that highlighted the prevalence of specific chronic pain conditions among women and females.

- Alberta Health Services. (2020). *Fibromyalgia: Living with Fibromyalgia*. <https://myhealth.alberta.ca/Alberta/Pages/living-with-fibromyalgia.aspx>.
- BC Women's Hospital & Health Centre. (n.d.). *Pelvic Pain/Endometriosis: Health info & resources for patients*. <http://www.bcwomens.ca/health-info/sexual-reproductive-health/pelvic-pain-endometriosis#Endometriosis>.
- Bergeron, S. R., Barbara, D., Wesselmann, U., & Bohm-Starke, N. (2020). *Vulvodynia*. *Nature Reviews Disease Primers*, 6(36). <https://doi.org/10.1038/s41572-020-0164-2>.
- EndoAct Canada. (n.d.). *Endometriosis Awareness in Canada: Introduction*. (n.d.). <https://endoact.ca/>.
- Fedorak, R. N., Vanner, S. J., Paterson, W. G., & Bridges, R. J. (2012). Canadian Digestive Health Foundation Public Impact Series 3: irritable bowel syndrome in Canada. Incidence, prevalence, and direct and indirect economic impact. *Canadian Journal of Gastroenterology*, 26(5), 252–256. <https://doi.org/10.1155/2012/861478>.
- Fitzcharles, M. A. (2017). *What is Fibromyalgia?* *Arthritis Society Canada*. [https://arthritis.ca/about-arthritis/arthritis-types-\(a-z\)/types/fibromyalgia](https://arthritis.ca/about-arthritis/arthritis-types-(a-z)/types/fibromyalgia).

- Health Canada. (2008). *It's Your Health: Seniors and Aging - Osteoarthritis*. https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/hl-vs/alt_formats/pacrb-dgapcr/pdf/iyh-vsv/diseases-maladies/seniors-aines-ost-art-eng.pdf.
- Heitkemper, M. M., & Jarett, M. (2021). *IBS in women*. The International Foundation for Gastrointestinal Disorders. <https://aboutibs.org/what-is-ibs/ibs-in-women/>.
- International Association for the Study of Pain. (2007). *Differences in Pain Between Men and Women*. https://www.iasp-pain.org/wp-content/uploads/2022/10/PainDifferences-English_References.pdf.
- Kuriya, B. (2023). *What is Rheumatoid Arthritis?* Arthritis Society Canada. [https://arthritis.ca/about-arthritis/arthritis-types-\(a-z\)/types/rheumatoid-arthritis](https://arthritis.ca/about-arthritis/arthritis-types-(a-z)/types/rheumatoid-arthritis).
- Meana, M., Cho, R., & DesMeules, M. (2004). Chronic Pain: The Extra Burden on Canadian Women. *BMC Women's Health*, 4(Suppl 1), S17-S17. <https://doi.org/10.1186/1472-6874-4-S1-S17>.
- Public Health Agency of Canada (2020). *Rheumatoid Arthritis in Canada*. <https://www.canada.ca/en/public-health/services/publications/diseases-conditions/rheumatoid-arthritis.html>.

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