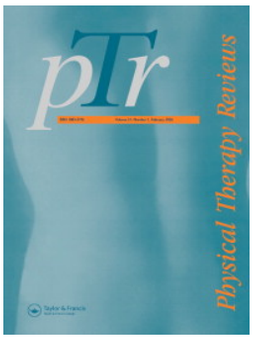

Physical Therapy Reviews

ISSN: 1083-3196 (Print) 1743-288X (Online) Journal homepage: www.tandfonline.com/journals/yptr20

Female-specific factors in chronic neck and back pain: a scoping review of clinical practice guidelines and clinical guidance documents

Lauren Haworth, Aaisha Sawlani & Anastasia Topalidou

To cite this article: Lauren Haworth, Aaisha Sawlani & Anastasia Topalidou (26 Feb 2026): Female-specific factors in chronic neck and back pain: a scoping review of clinical practice guidelines and clinical guidance documents, Physical Therapy Reviews, DOI: 10.1080/10833196.2026.2631349

To link to this article: https://doi.org/10.1080/10833196.2026.2631349

PHYSICAL THERAPY REVIEWS
https://doi.org/10.1080/10833196.2026.2631349

Taylor & Francis
Taylor & Francis Group

Female-specific factors in chronic neck and back pain: a scoping review of clinical practice guidelines and clinical guidance documents

Lauren Haworth[a], Aaisha Sawlani[a] and Anastasia Topalidou[b]

[a]Allied Health Research Unit, University of Lancashire, United Kingdom; [b]School of Nursing and Midwifery, University of Lancashire, United Kingdom

ABSTRACT

Introduction: Females are disproportionally affected by chronic neck and back pain, but whether Clinical Practice Guidelines (CPGs) and Clinical Guidance Documents (CGDs) consider female-specific factors is unknown. This study aimed to identify the CPGs and CGDs that address female-specific factors in chronic neck and back pain, pinpointing any gaps that need addressing to optimise female-specific healthcare.

Methods: A scoping review was conducted following Arksey and O'Malley's methodological framework and PRISMA diagram, searching three electronic databases and five grey literature registries. Content, documentary and thematic analyses were performed.

Results: None of the nine included records mentioned 'female' or 'sex,' four mentioned 'woman'/'women,' and one mentioned 'gender.' Three themes emerged: use of sex-related epidemiological context in guideline framing; patient-centred but not sex-considered approaches to healthcare; women's health and reproductive health considerations.

Discussion: While patient-centred approaches to pain management are encouraged, sex-specific factors remain overlooked when managing general health conditions, risking sub-optimal care and outcomes.

ARTICLE HISTORY
Received 8 April 2025
Accepted 6 February 2026

KEYWORDS
Neck pain; back pain; clinical practice guidelines; sex differences; gender differences

1. Introduction

Chronic pain, defined as pain persisting for more than 3 months, affects a significant proportion of adults in the United Kingdom (UK), with estimates ranging from one-third to one-half of the population [1,2]. Low back pain (LBP) is the leading cause of years lived with disability (YLD) globally and in the UK, affecting both sexes across all age groups [3]. Approximately 619 million people worldwide experience LBP annually, with females disproportionately affected (9,300 cases per 100,000 females, compared to 5,520 per 100,000 males) [4]. Neck pain is also a major contributor to YLD, affecting an estimated 203 million people globally each year [3,5,6], with higher prevalence in females (2,890 versus 2,000 cases per 100,000) [6].

Given these disparities, understanding the biological and social factors contributing to sex differences in musculoskeletal (MSK) pain is essential for developing equitable person-centred care [7,8]. For clarity, *sex* refers to biological characteristics, such as chromosomal makeup, hormone levels, genetic factors, and anatomical structure [9], whilst *gender* refers to socially constructed roles and identities [7,9]. Biological sex differences, including skeletal morphology, hormonal regulations, and reproductive anatomy, may influence MSK pain development and experience [10–12]. For instance, skeletal differences such as a wider pelvis in females can alter biomechanics and posture, potentially affecting how stress and strain are distributed across the spine [13,14]. Additionally, hormonal fluctuations, particularly oestrogen and progesterone, which vary throughout the menstrual cycle and life stages, like pregnancy and menopause, may impact pain perception and sensitivity [15–17]. Thus, these sex-related factors can result in differences in how neck and back pain develop and are experienced by females.

Intersex individuals, who possess biological characteristics that do not fit typical definitions of male or female, are often excluded from these binary categories, and their specific needs must also be considered in clinical guidelines [7,18]. Despite the importance of accounting for sex diversity, much of current research and healthcare practice continues to overlook these nuances [19]. Current healthcare frameworks often fail to sufficiently consider the unique needs of diverse populations, including intersex individuals, leading to significant disparities

CONTACT Lauren Haworth LHaworth6@lancashire.ac.uk Allied Health Research Unit, University of Lancashire, United Kingdom.

in healthcare [19]. This highlights the need for clinical frameworks that acknowledge sex-related factors in MSK pain management.

Policy developments in the UK further emphasise this need. The NHS 'Universal Personalised Care' model advocates for care tailored to patients' preferences, needs, and values [20], yet it remains unclear to what extent sex-specific factors are incorporated when managing chronic conditions, such as neck and back pain. The Women's Health Strategy for England [21] explicitly calls for addressing health inequalities and moving away from a '*male-as-default*' approach, noting that historical research and education have often centred on male populations [7,22,23]. This may contribute to gaps in understanding how chronic MSK pain affects females differently and how care should be tailored accordingly. This male-centric bias could result in less effective treatment and management of these conditions in females. The Women's Health Strategy aims to provide better information, education, and resources to ensure that healthcare professionals are equipped to deliver sex-sensitive, person-centred care [21]. This highlights the urgent need to assess current clinical guidance to determine whether they adequately consider sex-specific factors in the management of general health conditions, like neck and back pain.

MSK neck and back pain represent a core area of physiotherapy practice, with physiotherapists acting as primary providers of non-surgical assessment, rehabilitation, exercise-based interventions, pain education, and self-management support across UK healthcare settings. Although physiotherapy interventions form a central component of care, clinical practice is shaped by broader multidisciplinary clinical practice guidelines (particularly those issued by National Institute for Health and Care Excellence [NICE] and Scottish Intercollegiate Guidelines Network [SIGN]) which define referral pathways, models of care, treatment sequencing, and the framing of 'individualised' management within MSK services.

Therefore, this study undertakes a documentary analysis of UK-based Clinical Practice Guidelines (CPGs) and Clinical Guidance Documents (CGDs) for chronic neck and back pain, aiming to identify whether female-specific factors are included, examine how these factors are conceptualised, and identify gaps that may affect the management of neck and back pain in female patients.

This review adopts a scoping methodology to map the full landscape of UK clinical guidance influencing non-surgical neck and back pain management, rather than restricting inclusion to physiotherapy-exclusive documents. This approach reflects the reality of physiotherapy practice, which is embedded within multidisciplinary care pathways and policy frameworks. Accordingly, guidelines containing pharmacological or multidisciplinary recommendations are included where they inform the context within which physiotherapy is delivered, even when physiotherapists are not the prescribers. The purpose of this review is not to evaluate the effectiveness of specific physiotherapy techniques, but to examine whether sex-related considerations are acknowledged, operationalised, or explicitly justified within the clinical guidance governing MSK pain care, and to consider the implications for rehabilitation and physiotherapy practice.

2. Methods

This study used a scoping review design, allowing the researchers to explore the key concepts related to the research aim [24]. This design is flexible, iterative, and suited for broad research questions [25]. It is commonly used to both identify research gaps and map the existing knowledge in the field, making it a suitable approach for the aim of this study.

The methodology followed Arksey and O'Malley's framework [26]. The review was reported using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) extension for Scoping Reviews (PRISMA-ScR) guidelines, and the PRISMA 2020 flow diagram [27,28] was followed for the reporting of included and excluded studies. Prior to the screening stage, the scoping review protocol (10.17605/OSF.IO/D5RFJ) was registered on the Open Science Framework (OSF) to promote transparency and reduce bias [29]. The Population, Exposure, Outcome (PEO) framework for qualitative research was used to define the research question (Table 1).

2.1. Search strategy

A comprehensive literature search was conducted to identify all relevant records, utilising a combination of academic databases and grey literature sources. The databases used were MEDLINE and Epub ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily (*via* Ovid), Embase (*via* Ovid) and CINAHL Ultimate (*via* EBSCOhost). Guided by the Grey Matters resource [30], grey literature sources included Healthcare Improvement Scotland (HIS), National Institute for Health and Care Excellence (NICE), National Institute for Health Research (NIHR) and UK Department of Health and National Health Service (NHS) websites. The selected databases and grey literature sources were deemed the most relevant and

Table 1. PEO framework.

Population	**Adults with chronic neck or back pain** For the purpose of this scoping review the following definitions are used: • Chronic pain: pain persisting for more than 3 months [1,2]. • Neck and back pain: painful symptoms, including stiffness and discomfort, spanning the cervical, thoracic and lumbar spine regions. This includes any pain from the cervical region to the posterior aspect of the acromion process at the shoulder but excludes radiating pain down the arm, headaches/migraines or cranial neuropathy-related pain.
Exposure	**Experience of chronic neck or back pain.**
Outcome	**The inclusion of female-specific considerations within the CPGs and CGDs** This included the types of **female-specific factors** (e.g biological, psychological, social) and **female-specific recommendations** (e.g pharmacological intervention, lifestyle advice, patient education) outlined within each CPG/CGD, with a specific focus on non-surgical approaches.

suitable for addressing the objectives of this scoping review. International guideline repositories were not searched, as the review was intentionally restricted to UK-produced guidance.

With support from a subject librarian, one author (AS) conducted the literature search on May 29th and 30th 2024. A broad search strategy was developed by the research team to capture all relevant records. The search aimed to retrieve records combining key words such as *'chronic,' 'neck,' 'back,' 'shoulder,' 'cervical,' 'thoracic,' 'lumbar,' 'spine,' 'pain,'* and *'clinical practice guideline.'* The search was limited to sources in English. The search strings used for the database search are provided in Appendix 1.

Grey literature searches were conducted using site-specific approaches appropriate to each source. On NICE and HIS websites, internal search functions were used with key terms including '*neck pain*,' '*back pain*,' '*low back pain*,' '*musculoskeletal pain*,' and '*chronic pain*,' and results were filtered to guidance and guideline documents where available. NHS and Department of Health websites were searched using internal search tools and manual navigation of policy and guidance sections. All potentially relevant documents were screened against the inclusion criteria.

2.2. Inclusion criteria

Only existing UK-based CPGs or CGDs were eligible for inclusion in this scoping review. Including both CPGs and CGDs is essential to achieving a comprehensive understanding of female-specific considerations in chronic neck and back pain management. CPGs offer systematically developed, evidence-based recommendations, providing a clear benchmark of the current best practices in clinical settings [31]. They allow for an assessment of established care standards and the identification of any existing gaps in addressing female-specific issues. On the other hand, CGDs often present broader consensus-based recommendations that may highlight emerging trends and practices not yet fully integrated into formal guidelines. This dual inclusion guarantees that no relevant guidelines are missed, ensuring a comprehensive assessment of documents with potential recommendations for neck and back pain management.

The records had to focus specifically on the non-surgical management of chronic neck and/or back pain. Any records that were not a CPG or CGD, not UK-based, or did not mention non-surgical management of chronic neck and/or back pain were excluded. Any records relating only to acute, sub-acute, or surgical pain management were excluded. All publication years were considered, with only the most up-to-date version of each CPG or CGD initially included. Upon identifying female-specific considerations in a record, the research team traced previous versions to determine when these factors were first introduced. Differences between the earliest and most recent versions were then compared. Due to the nature of this review, which aimed to comprehensively identify relevant records, no formal quality appraisal was performed, and records were not excluded on this basis. However, publicly available information on guideline development processes (e.g. scope definition, evidence synthesis approaches, and stakeholder involvement) was considered to provide contextual interpretation of findings. Records that were not available in full text were excluded.

2.3. Screening and charting

Records identified during the searches were first imported into EndNote (version 21, Clarivate Analytics, Philadelphia, PA) for automated de-duplication. The updated list of records was then imported into Rayyan® (https://www.rayyan.ai/) for a second round of automated de-duplication prior to screening. A two-step screening process was conducted by two independent reviewers (AS and LH). In the first step, the titles and abstracts of all records from the literature search were screened according to the inclusion and exclusion criteria. Any disagreements between reviewers resulted in the article being included for full-text review. In the second step, all included records were retrieved for full text and screened again by the same two reviewers (AS and LH), who were blinded to each other's decisions throughout the process. Any

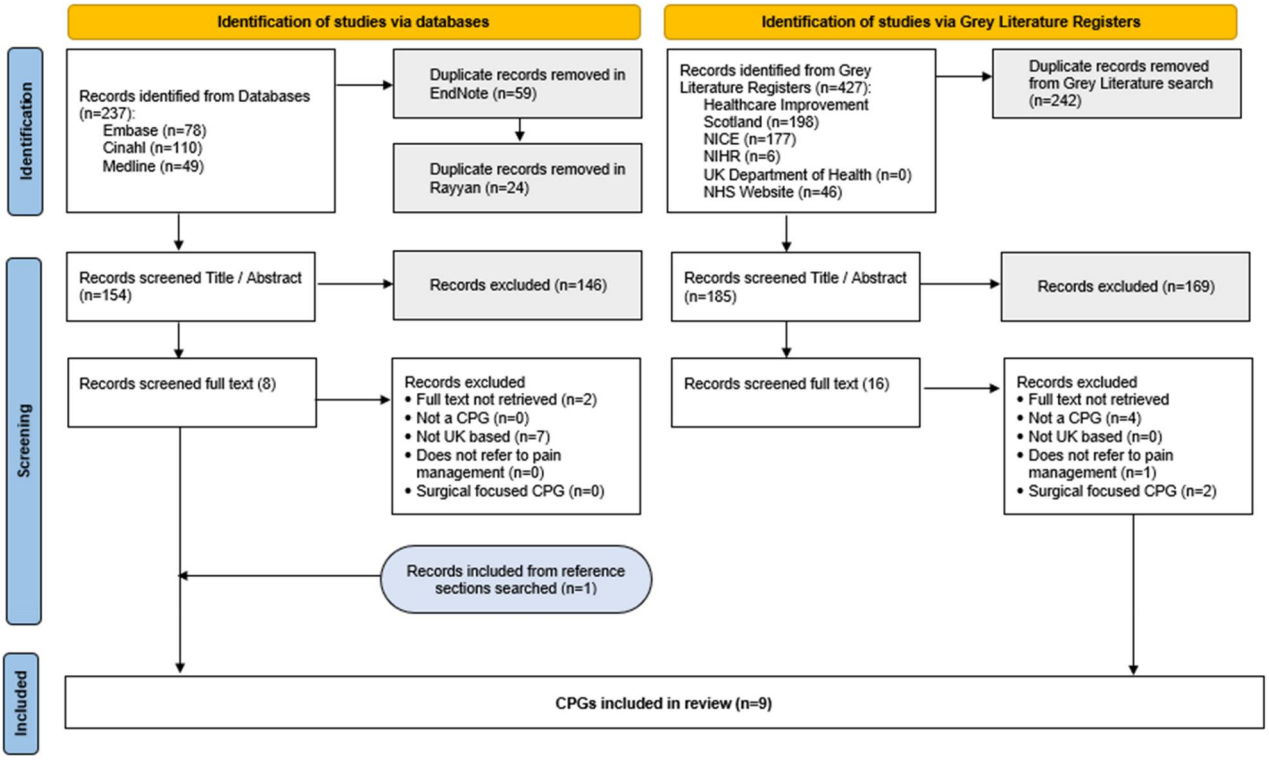

Figure 1. PRISMA flow diagram [27].

disagreements during the full text screening were resolved through discussion, with a third reviewer (AT) consulted where necessary. Finally, the reference lists of all records included after full-text screening were checked to identify any additional eligible records.

All included studies were charted using Microsoft Excel and data was extracted using the following categories: (1) Publication information: title, organisation, year of first publication/updates, location; (2) Population group characteristics; (3) Any female-specific factors contained in the publication: epidemiological, biological, psychological, social; (4) Any female-specific recommendations contained in the publication: assessment, pharmacological intervention, lifestyle advice, patient education; (5) Recommendations for research; (6) Limitations as declared by the author. The data extraction table is available, in full, in Appendix 2.

2.4. Data synthesis process

A content analysis was performed to systematically analyse and interpret the included records [32]. The presence of specific keywords was quantified: *'female', 'woman', 'women', 'male', 'man', 'men', 'people('s)', 'person(s/'s)', 'individual(s/'s)', 'gender,'* and *'sex'*. The terms '*female*' and '*woman/women*' were chosen to determine how frequently female-specific factors were mentioned. '*Male*' and '*man/men*' were also searched for to compare how male-specific factors were considered in relation to female-specific factors. '*People('s)/person(s/'s)/individual(s/'s)*' were included to assess whether populations were referred to in a gender-neutral manner or differentiated by sex or gender. The terms '*gender*' and '*sex*' were included to identify whether the distinction between these terms was acknowledged.

For records that included mentions of *'female,'* thematic analysis (within documentary analysis) was conducted to explore how and when female-specific factors were incorporated, identifying any underlying themes and patterns [33,34]. As CPGs are documentary outputs rather than empirical studies, thematic analysis was conducted across the full text of each guideline, including background, contextual, and recommendation sections. This approach was adopted to capture how sex-related considerations were framed, contextualised, and justified throughout the document, rather than limiting analysis to recommendation statements alone.

3. Results

The literature searches initially returned 664 records from both the electronic databases ($n = 237$) and the Grey Literature Registers ($n = 427$). Following screening, a total of eight records were considered eligible for inclusion. One additional CPG was added during reference list searching of the included records, delivering a total of nine records included in this review (Figure 1).

Table 2. Data charting.

	Title	Organisation	Year	Location	Population
CPG (n = 4)	Spondyloarthritis in over 16s: diagnosis and management [41]	NICE	2017	UK	Spondyloarthritis in adults who are 16 years or older; adults who are 16 years or older with axial or peripheral symptoms who have previously been diagnosed with juvenile idiopathic arthritis.
	Management of chronic pain [34]	SIGN	Published: 2013 Updated: 2019	Scotland (UK)	Adults with chronic non-malignant pain in non-specialist settings.
	Low back pain and sciatica in over 16s: assessment and management [40]	NICE	Published: 2016 Updated: 2020	UK	Low back pain and sciatica in people aged 16 and over.
	Chronic pain in over 16s: assessment of all chronic pain and management of chronic primary pain [33]	NICE, in partnership with Royal College of Physicians	Published: 2021 Updated: 2022	UK	Chronic pain (chronic primary pain, chronic secondary pain, or both) in people aged 16 years and over.
CGD (n = 5)	TNF-alpha inhibitors for ankylosing spondylitis and non-radiographic axial spondyloarthritis [39]	NICE	2016	UK	Adults with severe active ankylosing spondylitis and severe non-radiographic axial spondyloarthritis where the disease has responded inadequately to, or who cannot tolerate, conventional therapy.
	Ixekizumab for treating axial spondyloarthritis [35]	NICE	2021	UK	Adults with active ankylosing spondylitis that is not controlled well enough with conventional therapy. Adults with active non-radiographic axial spondyloarthritis with objective signs of inflammation that is not controlled well enough with non-steroidal anti-inflammatory drugs.
	Secukinumab for treating non-radiographic axial spondyloarthritis [37]	NICE	2021	UK	Adults with active non-radiographic axial spondyloarthritis with objective signs of inflammation that is not controlled well enough with conventional therapy.
	Tofacitinib for treating active ankylosing spondylitis [36]	NICE	2023	UK	Adults with active ankylosing spondylitis that is not controlled well enough with conventional therapy.
	Digital technologies for managing non-specific low back pain: early value assessment [38]	NICE	2024	UK	People aged 16 years and over with non-specific LBP.

3.1. Document characteristics

Owing to the inclusion criteria applied during screening, all records included in this scoping review were UK-based, with one specifically from Scotland [34]. The National Institute for Health and Care Excellence (NICE) published eight records [33,35–41] (one in partnership with the Royal College of Physicians) [33], while the Scottish Intercollegiate Guidelines Network (SIGN) published one record [34]. Four of the records were CPGs [33,34,40,41] and five were CGDs [35–39]. All records were published between 2016 and 2024, with three being revisions of previously published CPGs (Table 2) [33,34,40]. The authors attempted to retrieve previous versions of these records, managing to retrieve only one draft version [42].

All records relate to pain management for adults aged 16 and over. Two of the records made recommendations in relation to chronic pain, and in both, neck and back pain were mentioned as frequently reported chronic pain conditions [33,34]. Of the remaining seven records, four were for spondyloarthritis [35,37,39,41], three of which specifically referred to active non-radiographic axial spondyloarthritis [35,37,39], one was for ankylosing spondylitis [36], and two focused on LBP and sciatica [40], including non-specific LBP [38].

3.2. Content analysis

None of the nine records included the word *'female.'* Four of the records made reference to *'woman'* or *'women,'* with a total count of eight mentions [33,34,39,41]. The word *'male'* was mentioned in one record, with two counts in total [39]. Reference to *'man'* or *'men'* was made in two records, with a total of four mentions throughout [39,41]. *'Gender'* was mentioned in one of the records [34], and the word *'sex'* was not mentioned at all. All nine records included the words *'people('s),'* *'person(s/'s),'* and *'individual(s/'s),'* with 628 mentions in total (Table 3) [33–41].

Table 3. Content analysis of gender and sex-related terms used within the nine included COGs and CGDs.

	Record	Female	Woman women	Male	Man Men	People('s) Person(s/'s) Individual(s/'s)	Gender	Sex
CPG ($n = 4$)	**Spondyloarthritis in over 16s: diagnosis and management** [41]	0	2	0	2	115	0	0
	Management of chronic pain [34]	0	3	0	0	70	1	0
	Low back pain and sciatica in over 16s: assessment and management [40]	0	0	0	0	46	0	0
	Chronic pain in over 16s: assessment of all chronic pain and management of chronic primary pain [33]	0	2	0	0	114	0	0
CGD ($n = 5$)	**TNF-alpha inhibitors for ankylosing spondylitis and non-radiographic axial spondyloarthritis** [39]	0	3	2	2	128	0	0
	Ixekizumab for treating axial spondyloarthritis [35]	0	0	0	0	31	0	0
	Secukinumab for treating non-radiographic axial spondyloarthritis [37]	0	0	0	0	53	0	0
	Tofacitinib for treating active ankylosing spondylitis [36]	0	0	0	0	38	0	0
	Digital technologies for managing non-specific low back pain: early value assessment [38]	0	0	0	0	33	0	0

Bolded records are those that were included in the thematic analysis based on their inclusion of the terms 'woman' or 'women.'

As none of the included records mentioned *'female'* within the documents, upon completion of the content analysis, the authors decided to proceed with conducting the documentary analysis and thematic analysis on documents that included the words *'women'* or *'woman'* [33,34,39,41].

3.3. Documentary analysis

In total, three CPGs and one CGD were analysed. The three CPGs shared a similar structure. The average length of the CPGs was 47 pages, ranging from 33 to 70 pages. Each CPG consisted of an overview of the presenting condition, a contents page, a description of the target population, a context section including definitions, recommendations, key recommendations for research, more information and committee details, and information about the update and development of the guideline. The NICE guideline for spondyloarthritis provides diagnosis and management recommendations for adults who are 16 years or older [41]. The recommendations are for use within non-specialist and specialist care-settings. Suggested management approaches include pharmacological and non-pharmacological management including flare-ups, and surgical intervention. The NICE guideline which was developed in partnership with the Royal College of Physicians for assessment and management of chronic primary pain in over 16s provides non-pharmacological recommendations including exercise and physical activity, psychological therapy, acupuncture, electrical physical modalities, pain management programmes, manual therapy, and social interventions [33]. Pharmacological recommendations are also listed. SIGN's CPG also provides recommendations for the management of chronic pain using non-pharmacological approaches (self-management, psychologically based interventions, physical therapies, complementary therapies and dietary therapies), and pharmacological interventions [34].

The CGD which was 77 pages in length had a slightly different structure to the CPGs, starting with recommendations, followed by clinical need and practice, and then onto the different technologies used [39]. Features such as a committee discussion, cost effectiveness, implementation, review of the guidance, information and sources of evidence, and any other update information were included. Clinical effectiveness, adverse effects, and patient expert advice are discussed, alongside the implementations of these into future clinical practice.

3.4. Thematic analysis

Due to the absence of the word '*female*' across all documents, thematic analysis was conducted on documents containing '*women*' or '*woman*,' and three key themes were identified:

1. Use of sex-related epidemiological context in guideline framing
2. Patient-centred but not sex-considered approaches to healthcare
3. Women's health and reproductive health considerations

Themes derived from contextual sections of guidelines were interpreted as reflecting how populations and evidence are framed, rather than as direct determinants of clinical recommendations.

3.4.1. Use of sex-related epidemiological context in guideline framing

References to sex-related differences in prevalence were treated as contextual framing used by guideline developers to define scope and relevance, rather than as findings informing or shaping clinical recommendations. Across all four records, context is provided, enabling some comprehension relating to the size of the problem, or the number of individuals that are affected [33,34,39,41]. However, the level of detail

varies significantly between records. Notably, both CPGs for chronic pain management include data related to the adult population, although there was no explicit mention of any disparities between males and females:

> Across Europe, approximately 18% of the population are currently affected by moderate to severe chronic pain [34]

> In the UK the prevalence of chronic pain is uncertain, but appears common, affecting perhaps one-third to one-half of the population….The prevalence of chronic primary pain is unknown, but is estimated to be between 1% and 6% in England. [33]

In contrast in the CPG for diagnosis of spondyloarthritis, different prevalence rates were noted for men and women for ankylosing spondylitis [39], and in the CPG addressing axial spondyloarthritis, it was acknowledged that the condition does not discriminate between sex [41]:

> The prevalence of ankylosing spondylitis is thought to range from 0.05% to 0.23% and it is about 3 times more common in men than in women. [39]

> Spondyloarthritis affects about equal numbers of men and women [41]

3.4.2. Patient-centred but not sex-considered approaches to healthcare

The need for patient-centred, individualized care that meets the needs of the patient was frequently mentioned across all records [33,34,39,41]. This underlying theme features within the assessment and management recommendations and committee discussions throughout the documents, highlighting the importance of this type of approach for optimising patient care. For example, during the assessment of individuals with chronic pain, it is recommended to *'Offer a person-centred assessment… to identify factors contributing to the pain…'* [33] with further support elsewhere:

> a compassionate, patient-centred approach to assessment and management of chronic pain is likely to optimize the therapeutic environment and improve the chances of successful outcome [34]

Management and treatment recommendations frequently suggest *'Care management [which] encompasses the assessment of a patient's needs, development of an individualised care plan… and the monitoring and reassessment of those needs'* [34]' and for individual's personal preferences to be considered, on occasion specifically relating to self-management and exercise interventions:

> Provide advice and information relevant to the person's individual preferences, at all stages of care, to help them make decisions about managing their condition, including self-management [33]

> Refer people with axial spondyloarthritis to a specialist physiotherapist to start an individualized, structured exercise programme [39]

Whilst recommending an individualised, patient-centred approach is a positive step, allowing for the consideration of various personal factors, many records considered individual characteristics such as socioeconomic status, cultural and ethnic background, faith group, social and emotional factors, expectations and beliefs, and mental health. However, sex was notably omitted throughout all documents and their recommendations. Although one record referred to 'biological factors,' it did not explicitly mention 'biological sex.' 'Biological factors' could encompass a range of considerations distinct from 'biological sex' Furthermore, one publication stated a commitment to equality and diversity, specifically assessing its impact on six protected equality groups: age, disability, gender, race, religion/belief, and sexual orientation. Yet, sex was omitted (Figure 2).

3.4.3. Women's health and reproductive health considerations

Across the guidelines, women's health or reproductive health considerations were recommended to be considered during the decision-making process. Three guidelines referred to female-specific health conditions, including *'pregnancy'* [41] and *'endometriosis'* [33], both advising healthcare professionals to be aware of the potential significance of co-morbidities and underlying conditions during the assessment and management of chronic pain. Furthermore *'amenorrhoea'* was described as a potential side effect associated with long term use of opioids for chronic pain management [34].

Reproductive health considerations related to factors that should not be overlooked prior to pharmacological interventions being implemented. For instance, '*… breastfeeding mothers … should not use codeine*' [34] will directly influence decision making. Furthermore, information relating to libido may directly influence someone's decision to proceed with a pharmacological intervention if they are considering family planning in the near future:

> In women, observational studies have found … decreased libido in 61% to 100% of study participants treated with opioids long term. [34]

Whilst not a factor to consider during the decision-making process, it was also stated that *'Women with non-axial spondyloarthritis are less likely to have children'* [39] which may be an important factor for healthcare professionals to discuss with their patients as part of patient education to ensure patient expectations are in line with reality.

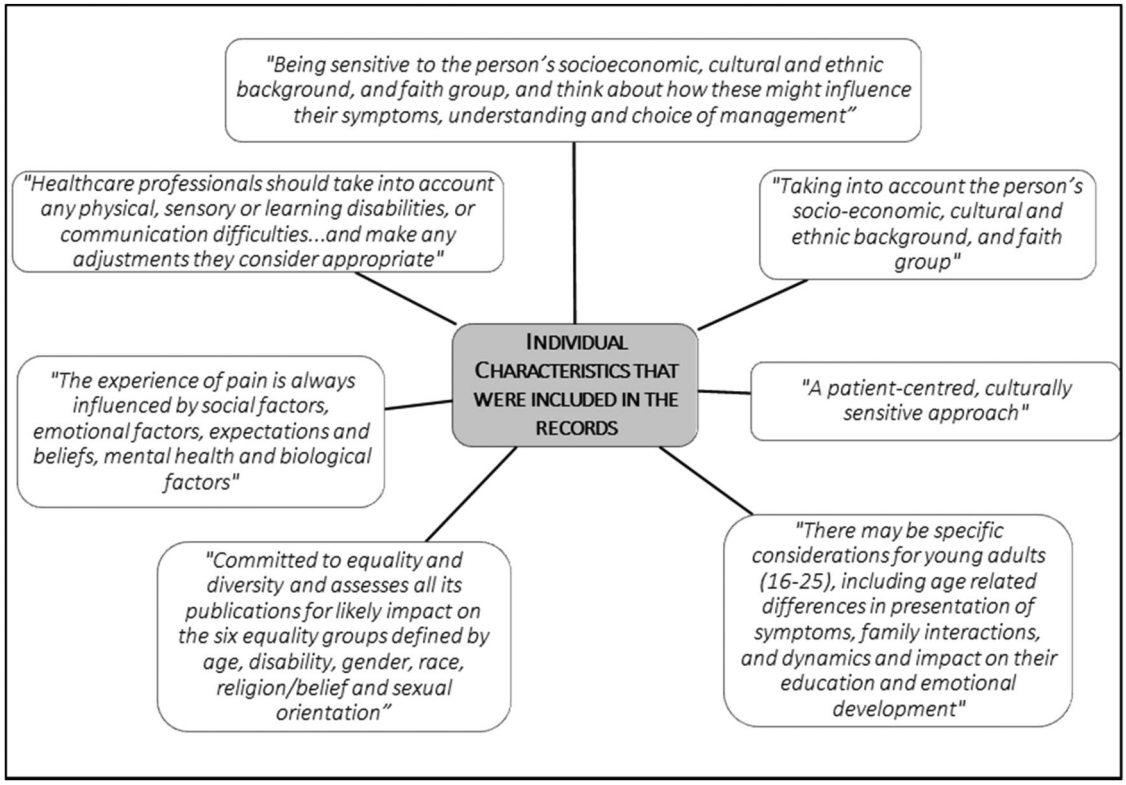

Figure 2. The individual characteristics that were considered in the CPGs and CGDs.

No rehabilitation or exercise-specific recommendations addressing pregnancy, postpartum recovery, or menopause-related MSK considerations were identified.

4. Discussion

This scoping review was designed to assess whether clinical guidance addressing chronic neck and back pain incorporates female-specific considerations. This review was intentionally limited to UK CPGs to allow detailed examination within a single healthcare and policy context; it is not intended as an international comparison of guideline content. However, this focus on UK guidance means that findings may not be directly transferable to other healthcare systems, where guideline development methods, evidence structures, and service delivery and priorities differ. The primary finding of this review is the notable absence of sex-specific terms such as 'male' and 'female,' in all records examined. Only four of the nine records used the term 'women,' focusing on gender identity rather than biological sex. This is concerning given the well-documented differences in the prevalence, experience, and management of chronic neck and back pain between males and females [2–6]. The absence of sex-specific language raises questions about whether current guidance adequately addresses the distinct biological and sex-related needs of patients, potentially leading to suboptimal treatment outcomes, particularly for females.

4.1. Absence of sex-specific terminology

The content analysis of the records revealed that gender-neutral terms like '*people*', '*person*', and '*individual*' were widely used, while terms related to biological sex were notably absent. Although the use of inclusive language is increasingly encouraged in medicine to avoid bias and promote equality, it is critical to recognise the significant disparities in health outcomes between sexes. For example, chronic MSK pain, including neck and back pain, affects males and females differently due to biological and hormonal variations [10–12,43,44]. Ignoring these differences within guidance may lead to a one-size-fits-all approach, which is ill-suited for addressing sex-specific needs in pain management. The lack of distinction between sex and gender within these guidelines could perpetuate a clinical environment that overlooks the unique physiological factors contributing to the higher prevalence of chronic pain in females.

While patient-centred and individualised care are emphasised across clinical guidance, these principles do not automatically ensure that sex-related factors are systematically addressed unless they are explicitly signposted and operationalised. Patient-centred care frameworks often focus on tailoring to individual preferences and circumstances, yet equity-

relevant variables (including sex) can remain underemphasised when guideline questions, evidence synthesis, and implementation tools do not explicitly incorporate them. Notably, several CPGs explicitly highlighted other equity-relevant factors (e.g. socioeconomic status, ethnicity etc) yet did not acknowledge sex, despite international guideline-development frameworks identifying sex as a core variable that should be considered and transparently reported. Consequently, 'individualisation' may function as a generic instruction that places responsibility for recognising and integrating sex-related considerations entirely at the clinician level, rather than being supported through guideline-level transparency regarding when such factors are relevant or where evidence is insufficient.

Interpretation of the findings of this review requires consideration of how clinical practice guidelines are developed. UK guidelines are typically designed to maximise generalisability across heterogeneous patient populations and are constrained by the availability and structure of the underlying evidence base. Where sex-stratified evidence is limited or inconsistent, guideline developers may prioritise broadly applicable recommendations and avoid explicit subgroup specification. However, international frameworks reinforce the need for explicit consideration. The GRADE-Equity guidance recommends [45] that equity-relevant variables, including sex, be systematically addressed during guideline development, with transparent reporting when subgroup-specific evidence is limited. Likewise, the SAGER guidelines [46] call for consistent inclusion and reporting of sex throughout research and evidence synthesis. These standards highlight that sex-related factors should not be left to implicit clinician judgement but should be incorporated at the guideline level to support equitable, evidence-informed care.

4.2. Sex differences in musculoskeletal pain

Chronic neck and back pain are more prevalent in females than males [4,6], with females showing a greater vulnerability [7]. For example, females have been found to have a 1.27 times higher prevalence of chronic low back pain compared to males, with neck pain also more commonly reported in female patients [7,47]. These differences are often attributed to hormonal fluctuations, variations in body composition, and MSK anatomy [10–12,43,44]. For instance, females tend to have wider pelvises, which can alter spinal biomechanics, contributing to a higher incidence of spinal disorders. Additionally, fluctuations in oestrogen levels, particularly during pregnancy and menopause, can influence pain perception, making chronic pain more pronounced in females [48]. Despite these well-documented differences, most pain management practices remain based on research conducted primarily on male subjects. The historical underrepresentation of females in clinical trials has led to a knowledge gap in how best to treat MSK pain in females. This disparity suggests that the higher prevalence of chronic pain in females may be due not only to biological differences but also to the failure of existing treatment protocols, largely based on male physiology, to adequately address female's needs [49]. Given that guideline developers depend on the available evidence base, the limited sex-stratified research underpinning UK CPGs may partly explain the absence of sex-specific recommendations

4.3. Historical context of exclusion

The exclusion of females from clinical trials has deep historical roots [50,51]. In 1977, the US FDA issued guidelines advising against the inclusion of females of childbearing potential in early-phase drug trials, largely due to concerns about potential risks to foetuses [52]. This exclusion created significant gaps in the understanding of how medical treatments, including pain management interventions, affect females [49,53]. It wasn't until the 1990s, with the passage of the NIH Revitalisation Act in 1993, that females were formally required to be included in federally funded clinical trials [49,52,53]. However, even after these regulatory changes, females continued to be underrepresented in pain research, including studies related to MSK conditions like chronic neck and back pain. The consequences of this historical exclusion are still felt today [52]. Many treatment protocols for chronic MSK pain were developed based on research conducted primarily on males, leading to a male-centric approach in pain management [54]. For example, females may require different dosages of pain-relieving medications or alternative therapeutic interventions due to their unique hormonal and anatomical characteristics [7]. Yet, these nuances are often overlooked in clinical practice [7,52,54]. These structural evidentiary gaps shape guideline development: when research does not provide robust sex-stratified data, guideline developers may be constrained in their ability to incorporate sex-specific recommendations, even when clinically relevant.

4.4. Implications for physiotherapy and rehabilitation practice

Although this review focused on the content and development of CPGs rather than on specific rehabilitation interventions, the findings have direct relevance for physiotherapy practice. Physiotherapists routinely deliver individualised care for people with

neck and back pain, taking into account a wide range of biological, functional, and psychosocial factors. However, the guidelines reviewed frequently relied on broad statements advocating 'individualised' or 'person-centred' care without operationalising how sex-related factors might influence rehabilitation assessment, exercise prescription, progression, or self-management strategies.

In the absence of explicit guidance, physiotherapists are required to rely on personal clinical judgement to account for sex-related considerations that may be relevant to MSK rehabilitation, such as pregnancy and postpartum recovery, menopause-related MSK changes, pain persistence, functional loading tolerance, and life-stage-related constraints on activity and adherence. This gap likely reflects not a lack of relevance but the constraints of guideline development, including scope decisions and stakeholder composition, which may influence whether sex-related considerations are foregrounded or deprioritised. The findings of this review suggest that this reliance on implicit individualisation places the responsibility for sex-informed care solely at the clinician level, rather than being supported by guideline-level signalling or evidence-informed recommendations.

Importantly, this does not reflect a deficit in physiotherapy practice or competence. Rather, it highlights a gap between the complexity of clinical rehabilitation and the level of specificity provided within current guideline frameworks. Greater transparency regarding the inclusion or exclusion of sex-related considerations, alongside clearer identification of evidence gaps and research priorities, may better support physiotherapists in delivering equitable and context-sensitive MSK care. From a physiotherapy perspective, the integration of sex-related considerations at the guideline development stage (rather than solely at the point of clinical interpretation) has the potential to enhance consistency, equity, and confidence in rehabilitation decision-making across MSK services.

From a guideline development perspective, these findings suggest the importance of more explicit consideration of equity-relevant variables within the scoping, question formulation, and evidence synthesis stages of CPG development. While national guidelines necessarily prioritise generalisability, greater transparency regarding when sex- and life-stage-related factors are considered relevant, and when evidence is insufficient to support specificity, may help bridge the gap between broad recommendations and the contextual realities of clinical practice. Incorporating equity considerations at the methodological level, rather than relying solely on generic principles of individualised care, may support more consistent and interpretable application of guidance across diverse patient populations.

4.5. Progress and future directions

In interpreting these study findings, it is important to recognise that the purpose of a scoping review is to map the presence and nature of content within existing guidance, rather than to determine the underlying reasons for omissions. Nonetheless, the consistent absence of sex-specific considerations across CPGs is itself informative. It reflects not only the limited availability of sex-stratified evidence, but also the historical tendency for research to conceptualise males and females as a homogeneous population and the selective prioritisation of other equity-relevant characteristics within guideline scope. Making these gaps visible is a key function of scoping methodology and highlights opportunities for future research and guideline development to address sex more explicitly as a core determinant of MSK health.

Although there has been growing recognition of the importance of sex-specific research and the need to stratify data by sex in clinical trials, progress remains uneven. International guidelines now often stress the importance of conducting separate analyses for males and females to account for biological differences in pain perception, drug metabolism, and treatment efficacy. Females, particularly those who are pregnant or breastfeeding, continue to be excluded from many studies, and sex-specific guidance for MSK pain management is still limited [51,52,55]. As a result, CPGs often adopt a homogeneous approach that may inadvertently reinforce a male-default model in clinical practice. Incorporating sex-specific nuances into guidelines for chronic neck and low back pain is essential, as assuming that males and females respond similarly to interventions risks perpetuating suboptimal care for females, who experience a higher prevalence and burden of chronic pain and are often inadequately served by existing models of care. These insights highlight both the progress made and the substantial opportunities that remain for advancing sex-inclusive MSK research and developing future CPGs that more accurately reflect the diverse needs of the populations they serve.

5. Conclusion

Failure to include sex as a factor within clinical guidelines is a significant oversight that may lead to suboptimal care for both female and male patients. This omission is particularly significant given that sex-based biological differences, such as hormonal fluctuations, skeletal structure, and pain perception, are well-documented contributors to the disparities in how chronic pain is experienced and managed between males and females. Without explicit consideration of biological sex, the guidelines risk overlooking these critical differences, which could

impact the effectiveness of pain management strategies for different patient groups. Accurate implementation of biological sex within clinical guidance will provide more comprehensive, effective, and equitable healthcare for all individuals. Future guidelines must bridge this gap to enhance the quality and specificity of neck and back pain management strategies, ensuring they cater to the distinct needs of everyone. While sex-focused research is already being conducted, more comprehensive and widely implemented sex-based analyses are needed to address the remaining gaps. This research must be systematically integrated into medical practice and guideline development to underpin and inform the creation of truly person-centred guidelines. From a physiotherapy perspective, the integration of sex-related considerations at the guideline development stage (rather than solely at the point of clinical interpretation) has the potential to enhance consistency, equity, and confidence in rehabilitation decision-making across MSK services.

Acknowledgments

The research team would like to thank Jane Bruney, subject librarian at the University of Lancashire for her support during the literature search. They would also like to thank the Institute for Applied Health and Wellbeing at the University of Lancashire for funding this piece of work through the University's Undergraduate Research Internship Programme.

Authors' contributions

CRediT: **Lauren Haworth**: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing; **Aaisha Sawlani**: Data curation, Formal analysis, Investigation, Writing – original draft; **Anastasia Topalidou**: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – review & editing.

Disclosure statement

The authors report there are no competing or conflicts of interests to declare.

Funding

This work was supported by the University's Undergraduate Research Internship Programme.

ORCID

Lauren Haworth http://orcid.org/0000-0002-1718-6564
Anastasia Topalidou http://orcid.org/0000-0003-0280-6801

References

1. Cohen SP, Vase L, Hooten WM. Chronic pain: an update on burden, best practices, and new advances. Lancet. 2021;397(10289):2082–2097. doi: 10.1016/S0140-6736(21)00393-7.
2. Fayaz A, Croft P, Langford RM, et al. Prevalence of chronic pain in the UK: a systematic review and meta-analysis of population studies. BMJ Open. 2016;6(6):e010364. doi: 10.1136/bmjopen-2015-010364.
3. Institute for Health Metrics Evaluation. 2024. Global burden of disease collaborative network. Global Burden of Disease Study 2021 (GBD 2021)'. https://www.healthdata.org/research-analysis/gbd. Last accessed 31.03.2025.
4. Ferreira ML, de Luca K, Haile LM, et al. Global, regional, and national burden of low back pain, 1990–2020, its attributable risk factors, and projections to 2050: a systematic analysis of the global burden of disease study. Lancet Rheumatol. 2023;5(6):e316–e329. 2021'. doi: 10.1016/S2665-9913(23)00098-X.
5. Kazeminasab S, Nejadghaderi SA, Amiri P, et al. Neck pain: global epidemiology, trends and risk factors. BMC Musculoskelet Disord. 2022;23(1):26. doi: 10.1186/s12891-021-04957-4.
6. Wu A-M, Cross M, Elliott JM, et al. Global, regional, and national burden of neck pain, 1990–2020, and projections to 2050: a systematic analysis of the global burden of disease study. Lancet Rheumatol. 2024;6(3):e142–e155. doi: 10.1016/S2665-9913(23)00321-1.
7. International Association for the Study of Pain. 2024. Overview of sex and gender differences in human pain. 2024. https://www.iasp-pain.org/resources/fact-sheets/156455/. Last accessed 31.03.2025.
8. Zheng B, Zheng L, Li M, et al. Sex differences in factors associated with neck pain among undergraduate healthcare students: a cross-sectional survey. BMC Musculoskelet Disord. 2022;23(1):842. doi: 10.1186/s12891-022-05782-z.
9. Walker PL, Cook DC. Brief communication: gender and sex: vive la difference. Am J Phys Anthropol. 1998;106(2):255–259. doi: 10.1002/(SICI)1096-8644(199806)106:2.
10. Goymann W, Brumm H, Kappeler PM. Biological sex is binary, even though there is a rainbow of sex roles. Bioessays. 2023;45(2):e2200173. doi: 10.1002/bies.202200173.
11. Huang B, Hillman J, Biro FM, et al. Correspondence between gonadal steroid hormone concentrations and secondary sexual characteristics assessed by clinicians, adolescents, and parents. J Res Adolesc. 2012;22(2):381–391. doi: 10.1111/j.1532-7795.2011.00773.x.
12. Weiss E. No bones about it: sex is binary. Arch Sex Behav. 2024;53(5):1595–1608. doi: 10.1007/s10508-024-02851-3.
13. Grechenig P, Gänsslen A, Grechenig S, et al. Biomechanics of the pelvis. In: Pelvic ring fractures. Cham: Springer International Publishing; 2021. p. 47–62. doi: 10.1007/978-3-030-54730-1_3.
14. Sizer PS, James CR. Considerations of sex differences in musculoskeletal anatomy. In: The active female. New York, NY: Springer New York; 2014. p. 33–60. doi: 10.1007/978-1-4614-8884-2_3.
15. Chen D, Zhou J, Lin C, et al. A causal examination of the correlation between hormonal and reproductive factors and low back pain. Front Endocrinol (Lausanne)). 2024;15(May):1326761. doi: 10.3389/fendo.2024.1326761.

16. McCarthy M, Raval AP. The peri-menopause in a woman's life: a systemic inflammatory phase that enables later neurodegenerative disease. J Neuroinflammation. 2020;17(1):317. doi: 10.1186/s12974-020-01998-9.
17. Tommaso M. Pain perception during menstrual cycle. Curr Pain Headache Rep. 2011;15(5):400–406. doi: 10.1007/s11916-011-0207-1.
18. Rosenwohl-Mack A, Tamar-Mattis S, Baratz AB, et al. A national study on the physical and mental health of intersex adults in the U.S. PLOS One. 2020;15(10):e0240088. doi: 10.1371/journal.pone.0240088.
19. Biz C, Khamisy-Farah R, Puce L, et al. Investigating and practicing orthopedics at the intersection of sex and gender: understanding the physiological basis, pathology, and treatment response of orthopedic conditions by adopting a gender lens: a narrative overview. Biomedicines. 2024;12(5):974. doi: 10.3390/biomedicines12050974.
20. NHS England. 2019. Universal personalised care: implementing the comprehensive model. https://www.england.nhs.uk/personalisedcare/. Last accessed 31.03.2025.
21. Department of Health & Social Care. 2022. Women's health strategy for England. https://www.gov.uk/government/publications/womens-health-strategy-for-england. Last accessed 31.03.2025
22. Barlek MH, Rouan JR, Wyatt TG, et al. The persistence of sex bias in high-impact clinical research. J Surg Res. 2022;278(October):364–374. doi: 10.1016/j.jss.2022.04.077.
23. Zucker I, Prendergast BJ. Sex differences in pharmacokinetics predict adverse drug reactions in women. Biol Sex Differ. 2020;11(1):32. doi: 10.1186/s13293-020-00308-5.
24. Mays N, Pope C, Popay J. Systematically reviewing qualitative and quantitative evidence to inform management and policy-making in the health field. J Health Serv Res Policy. 2005;10 (1_suppl):6–20. doi: 10.1258/1355819054308576.
25. Armstrong R, Hall BJ, Doyle J, et al. "Scoping the scope" of a Cochrane review. J Public Health. 2011;33(1):147–150. doi: 10.1093/pubmed/fdr015.
26. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. Int J Soc Res Methodol. 2005;8(1):19–32. doi: 10.1080/1364557032000119616.
27. Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018;169(7):467–473. 10.7326/M18-085030178033
28. Page MJ, McKenzie JE, Bossuyt PM, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. doi: 10.1136/bmj.n71.
29. Rathbone T, Truong C, Haldenby H, et al. Sex and gender considerations in low back pain clinical practice guidelines: a scoping review. BMJ Open Sport Exerc Med. 2020;6(1):e000972. doi: 10.1136/bmjsem-2020-000972.
30. Canadian Agency for Drugs and Technologies in Health. 2019. Grey matters: a practical tool for searching health-related grey literature. https://www.cadth.ca/resources/finding-evidence/grey-matters. Last accessed 31.03.2025
31. Kredo T, Bernhardsson S, Machingaidze S, et al. Guide to clinical practice guidelines: the current state of play. Int J Qual Health Care. 2016;28(1):122–128. doi: 10.1093/intqhc/mzv115.
32. Elo S, Kyngäs H. The qualitative content analysis process. J Adv Nurs. 2008;62(1):107–115. doi: 10.1111/j.1365-2648.2007.04569.x.
33. NICE. 2022. Chronic Pain (Primary and Secondary). In over 16s: Assessment of All Chronic Pain and Management of Chronic Primary Pain'. https://www.nice.org.uk/guidance/ng193. Last accessed 31.03.2025.
34. SIGN. 2019. Management of chronic pain. https://www.sign.ac.uk/our-guidelines/management-of-chronic-pain/. Last accessed 31.03.2025.
35. NICE. 2021a. Ixekizumab for treating axial spondyloarthritis. https://www.nice.org.uk/guidance/ta718. Last accessed 31.03.2025.
36. NICE. 2023. Tofacitinib for treating active ankylosing spondylitis. https://www.nice.org.uk/guidance/ta920. Last accessed 31.03.2025.
37. NICE. 2021b. Secukinumab for treating non-radiographic axial spondyloarthritis. https://www.nice.org.uk/guidance/ta719. Last accessed 31.03.2025.
38. NICE. 2024. Digital technologies for managing non-specific low back pain: early value assessment. https://www.nice.org.uk/guidance/hte16. Last accessed 31.03.2025.
39. NICE. 2016b. TNF-alpha inhibitors for ankylosing spondylitis and non-radiographic axial spondyloarthritis. https://www.nice.org.uk/guidance/ta383. Last accessed 31.03.2025.
40. NICE. 2020. Low back pain and sciatica in over 16s: assessment and management. https://www.nice.org.uk/guidance/ng59. Last accessed 31.03.2025.
41. NICE. 2017. Spondyloarthritis in over 16s: diagnosis and Management. https://www.nice.org.uk/guidance/ng65. Last accessed 31.03.2025.
42. NICE. 2016a. Spondyloarthritis in over 16s: diagnosis and Management (Draft for Consultation). https://www.nice.org.uk/guidance/ng65/documents/draft-guideline. Last accessed 31.03.2025.
43. Baustian Kathryn M, J, Crandall, D. Martin. Sex and the human skeleton. In: The international encyclopedia of human sexuality. Hoboken, NJ: John Wiley & Sons; 2015. p. 1115–1354.
44. Spradley MK. Metric methods for the biological profile in forensic anthropology: sex, ancestry, and stature. Acad Forensic Pathol. 2016;6(3):391–399. doi: 10.23907/2016.040.
45. Welch VA, Akl EA, Guyatt G, et al. GRADE equity guidelines 1: considering health equity in GRADE guideline development: introduction and rationale. J Clin Epidemiol. 2017;90:59–67. doi: 10.1016/j.jclinepi.2017.01.014.
46. Heidari S, Babor TF, De Castro P, et al. Sex and gender equity in research: rationale for the SAGER guidelines and recommended use. Res Integr Peer Rev. 2016;1(1):2. doi: 10.1186/s41073-016-0007-6.
47. Jiménez-Trujillo I, López-de-Andrés A, del Barrio JL, et al. Gender differences in the prevalence and characteristics of pain in Spain: report from a population-based study. Pain Med. 2019;20(12):2349–2359. doi: 10.1093/pm/pnz004.
48. Peterson CK, Humphreys BK, Hodler J, et al. Gender differences in pain levels before and after treatment: a prospective outcomes study on 3,900 Swiss patients with musculoskeletal complaints. BMC Musculoskelet Disord. 2012;13(1):241. doi: 10.1186/1471-2474-13-241.
49. Society for Women's Health Research. 2024. A timeline to making women's health mainstream. https://swhr.org/about/1977-1989-timeline/. Last accessed 31.03.2025.

50. Samaei M, McGregor AJ, Jenkins MR. Inclusion of women in FDA-regulated premarket clinical trials: a call for innovative and recommended action. Contemp Clin Trial. 2022;116(May):106708. doi: 10.1016/j.cct.2022.106708.
51. Yakerson A. Women in clinical trials: a review of policy development and health equity in the Canadian context. Int J Equity Health. 2019;18(1):56. doi: 10.1186/s12939-019-0954-x.
52. Shields KE, Lyerly AD. Exclusion of pregnant women from industry-sponsored clinical trials. Obstet Gynecol. 2013;122(5):1077–1081. doi: 10.1097/AOG.0b013e3182a9ca67.
53. Biorasi. 2018. The tumultuous history of women's involvement in clinical research. https://biorasi.com/insight/the-tumultuous-history-of-womens-involvement-in-clinical-research/. Last accessed 31.03.2025.
54. Rudolph KE, Russell M, Luo SX, et al. Under-representation of key demographic groups in opioid use disorder trials. Drug Alcohol Depend Rep. 2022;4(September):100084. doi: 10.1016/j.dadr.2022.100084.
55. Dodd KS, Saczynski JS, Zhao Y, et al. Exclusion of older adults and women from recent trials of acute coronary syndromes. J Am Geriatr Soc. 2011;59(3):506–511. doi: 10.1111/j.1532-5415.2010.03305.x.

Appendices

Appendix 1. Search strings

MEDLINE and Epub ahead of Print, In-Process, In-Data-Review & Other Non-Indexed Citations and Daily (*via* Ovid) and Embase (*via* Ovid):

1. Chronic.af
2. (neck OR back OR shoulder OR cervical OR thoracic OR lumbar OR spine).af
3. pain.af
4. clinical practice guideline.af
5. #1 AND #2 AND #3 AND #4

CINAHL Ultimate:

1. Chronic
2. (neck OR back OR shoulder OR cervical OR thoracic OR lumbar OR spine)
3. pain
4. clinical practice guideline
5. S1 AND S2 AND S3 AND S4

Appendix 2. Data extraction table

Record information				Population characteristics	Female-Specific factors		Female-specific recommendations		
								Management	
Title	Organisation	Year	Location		Epidemiological	Biological	Assessment	Pharmacological	Lifestyle advice
Clinical practice guidelines									
Management of chronic pain	Scottish Intercollegiate Guidelines Network (SIGN)	First published: 2013 Revised edition published: 2019	Scotland	Adults with chronic non-malignant pain in non-specialist settings.	–	–	Initial Assessment: Identify patients at increased risk of poor outcomes by being aware of the presence of significant comorbidities: pregnancy	In 2013 the Medicines and Healthcare products Regulating Agency (MHRA) issued guidance that breastfeeding mothers should not use codeine. In women, observational studies have found a 23% to 71% occurrence of amenorrhoea and decreased libido in 61% to 100% of study participants treated with opioids long term.	–
Chronic pain (primary and secondary) in over 16s: assessment of all chronic pain and management of chronic primary pain (NG193)	National Institute for Health and Care Excellence (NICE) in partnership with Royal College of Physicians	Published: 2021 Updated: 2022	United Kingdom	Chronic pain (chronic primary pain, chronic secondary pain, or both) in people aged 16 years and over.	–	Chronic pain can be secondary to an underlying condition (e.g. endometriosis)	–	Recommendations 1.2.7 – 1.2.15 (Pharmacological management for chronic primary pain; Antidepressants for chronic primary pain) Most of the evidence was for women with fibromyalgia.	Recommendations 1.2.1 and 1.2.2 (Exercise programmes and Physical Activity for chronic primary pain) - Most of the evidence was for professionally led supervised group exercise for women with fibromyalgia (evidence for recommendation)
Low back pain and sciatica in over 16s: assessment and management (NG59)	National Institute for Health and Care Excellence (NICE)	Published: 2016 Updated: 2020	United Kingdom	Low back pain and sciatica in people aged 16 and over.	–	–	–	–	–
Spondyloarthritis in over 16s: diagnosis and management	National Institute for Health and Care Excellence (NICE)	2017	United Kingdom	Spondyloarthritis in adults who are 16 years or older; adults who are 16 years or older with axial or peripheral symptoms who have previously been diagnosed with juvenile idiopathic arthritis.	Spondyloarthritis affects a similar number of men and women	–	–	Consider pregnancy planning as a circumstance before prescribing DMARDs	–
Clinical guidance documents									
Digital technologies for managing non-specific low back pain: early value assessment (HTE16)	National Institute for Health and Care Excellence (NICE)	2024	United Kingdom	People aged 16 years and over with non-specific LBP.	–	–	–	–	–
Ixekizumab for treating axial spondyloarthritis (TA718)	National Institute for Health and Care Excellence (NICE)	2021	United Kingdom	Adults with active ankylosing spondylitis that is not controlled well enough with conventional therapy. Adults with active non-radiographic axial spondyloarthritis with objective signs of inflammation that is not controlled well enough with non-steroidal anti-inflammatory drugs.	–	–	–	–	–

(*continued*)

Appendix 2. Continued.

Record information				Population characteristics	Female-Specific factors		Female-specific recommendations		
								Management	
Title	Organisation	Year	Location		Epidemiological	Biological	Assessment	Pharmacological	Lifestyle advice
Secukinumab for treating non-radiographic axial spondyloarthritis (TA719)	National Institute for Health and Care Excellence (NICE)	2021	United Kingdom	Adults with active non-radiographic axial spondyloarthritis with objective signs of inflammation that is not controlled well enough with conventional therapy.	–	–	–	–	–
TNF-alpha inhibitors for ankylosing spondylitis and non-radiographic axial spondyloarthritis (TA383)	National Institute for Health and Care Excellence (NICE)	2016	United Kingdom	Adults with severe active ankylosing spondylitis and severe non-radiographic axial spondyloarthritis where the disease has responded inadequately to, or who cannot tolerate, conventional therapy.	The prevalence of ankylosing spondylitis is thought to range from 0.05% to 0.23% and it is about 3 times more common in men than in women Limited epidemiological data are available for non-radiographic axial spondyloarthritis, but it affects about equal numbers of men and women.	Evidence from patient experts: women with ankylosing spondylitis or non-radiographic axial spondyloarthritis are less likely to have children. Clinical Effectiveness Evidence: Among patients in the included RCTs for ankylosing spondylitis 65-97% were male. Among patients in the included in the RCTs for non-radiographic axial spondyloarthritis, 35-65% were male.	–	–	–
Tofacitinib for treating active ankylosing spondylitis (TA920)	National Institute for Health and Care Excellence (NICE)	2023	United Kingdom	Adults with active ankylosing spondylitis that is not controlled well enough with conventional therapy.	–	–	–	–	–

Appendix 2. Data extraction table continued.

Record information		
Title	Recommendations for future research	Limitations, as described by authors
Clinical practice guidelines		
Management of chronic pain	Studies to examine the effect on treatment outcomes of assessing the type, severity and impact of chronic pain using current validated instruments in primary care. Studies to help identify, at the time of diagnosis, which patients are likely to have poorer outcomes and whether referring them at an early stage improves outcomes and reduces harms. Investigation of the efficacy of simple approaches to enhancing professional-patient interactions in consultations in non-specialist settings to improve long-term health outcomes in patients with chronic pain. RCTs on the efficacy of paracetamol in patients with chronic low back pain. Studies of interventions to support reduction or cessation of prescription opioids. Studies of efficacy and harms of opioids beyond three months' use. Harms potentially include (but are not restricted to) problematic use, mortality, impact on endocrine and/or immune function, GI effects. Studies of factors affecting individual response to opioid therapy. Studies of harm reduction strategies for patients on continued opioid use for chronic pain. Investigation of strategies for combining drug therapies for optimal efficacy, safety and cost effectiveness. RCTs on the efficacy of pain neurophysiology education. RCTs on the efficacy of acceptance and commitment therapy. Large RCTs on the use of acupuncture compared to standard care or other therapies in reducing pain and improving quality of life. Researchers should ensure that the acupuncture is carried out by practitioners who have received professional training. Sham acupuncture is not a suitable comparator. Economic modelling into the cost effectiveness of an acupuncture service. Studies into the use of music in combination with other non-pharmacological therapies in patients with chronic pain to determine the outcomes of reduction in pain intensity, reduction in use of pharmacological therapies, and cost effectiveness' into the use of hypnosis for pain relief Studies into the use of herbal medicines, such as harposogide, for pain relief. Investigation into which specific dietary interventions may be beneficial to both specific (e.g diabetic neuropathic pain) and chronic pain conditions in general. Studies into the effect of vitamins A, B6, C, E, omega-3 fatty acids, salts (Ca, Mg, Se, Zn, Fe) and lactic ferments) in pain relief.	Difficulties in reporting make the interpretation of the evidence base challenging. Pain is defined by the International Association for the Study of Pain as 'an unpleasant sensory or emotional experience associated with actual or potential tissue damage or described in terms of such damage.' Chronic pain is a complex phenomenon with consequent challenges for its assessment and management both in clinical trials and routine clinical practice. This is further complicated by the fact that even in the same condition there may be quite different pain mechanisms among patients. While changes in the peripheral pain processing might predominate in one patient, central changes may be much more important in the next patient. While a particular treatment may work very effectively in one patient, it may not work at all in another patient with the same condition. In clinical trials, unless there is careful assessment of the chronic pain syndrome in each patient, potentially useful treatments may be discarded as being ineffective when the average response is considered. Even good-quality, adequately powered double-blinded randomised controlled trials may not provide the best approach for developing a strong evidence base for pain management. These limitations have been recognised internationally, leading to the development of the Initiative on Methods, Measurement and Pain Assessment in Clinical Trials (IMMPACT, www.immpact.org.) in 2002 In addition to the limitations of assessment and trial design, concerns have been raised about how analysis methods may either obscure clinically important positive outcomes, or overestimate treatment effects. If the average response is considered, a treatment may appear ineffective, whereas it could have the potential to be effective in a particular subgroup of the patients being studied. It may, therefore, be useful to analyse responders to a particular treatment separately from non-responders. Another important factor is how patients who drop out before completing the study are dealt with in the analysis. Using the last-observation-carried-forward (LOCF) for patients who drop out assumes that in a randomised controlled trial (RCT) dropouts will occur randomly between the treatment groups. The active treatment may be an effective analgesic but if it has an unpleasant side effect profile then dropouts are likely to be higher in a non-random manner in this treatment group. Pain scores prior to drop out may therefore demonstrate efficacy, but in clinical practice this treatment is unlikely to be tolerated. The majority of RCTs use the imputation method of LOCF and may therefore potentially overestimate the treatment effect.
Chronic pain (primary and secondary) in over 16s: assessment of all chronic pain and management of chronic primary pain (NG193)	Key Recommendations Psychological therapy – mindfulness for chronic primary pain: What is the clinical and cost effectiveness of mindfulness therapy for managing chronic primary pain in people aged 16 years and over? Psychological therapy – CBT for insomnia in chronic primary pain: What is the clinical and cost effectiveness of cognitive behavioural therapy (CBT) for insomnia or CBT for insomnia and pain for managing chronic primary pain in people aged 16 years and over? Manual therapies for chronic primary pain: What is the clinical and cost effectiveness of manual therapy for managing chronic primary pain in people aged 16 years and over? Repeat courses of acupuncture for chronic primary pain: What is the clinical and cost effectiveness of repeat courses of acupuncture or	–

(*continued*)

Continued.

Record information Title	Recommendations for future research	Limitations, as described by authors
	dry needling for managing chronic primary pain in people aged 16 years and over? Pharmacological interventions – gabapentinoids and local anaesthetics for complex regional pain syndrome: What is the clinical and cost effectiveness of gabapentinoids or local anaesthetics for managing complex regional pain syndrome in people aged 16 years and over? Other Recommendations Factors that may be barriers to successfully managing chronic pain, including chronic primary pain: What risk factors enable stratification of treatment for people aged 16 years and over with chronic pain? Social interventions for chronic pain, including chronic primary pain: What is the clinical and cost effectiveness of social interventions aimed at improving the quality of life of people aged 16 years and over with chronic pain? Psychotherapy for chronic primary pain: What is the clinical and cost effectiveness of psychodynamic psychotherapy for managing chronic primary pain in people aged 16 years and over? Relaxation therapy for chronic primary pain: What is the clinical and cost effectiveness of relaxation therapies for managing chronic primary pain in people aged 16 years and over? Laser therapy for chronic primary pain: What is the clinical and cost effectiveness of laser therapy for managing chronic primary pain in people aged 16 years and over? Transcranial magnetic stimulation for chronic primary pain: What is the clinical and cost effectiveness of transcranial magnetic stimulation for managing chronic primary pain in people aged 16 years and over?	
Low back pain and sciatica in over 16s: assessment and management (NG59)	Key Recommendations Pharmacological therapies: what is the clinical and cost effectiveness of opioids for the management of acute sciatica? What is the clinical and cost effectiveness of antidepressants for the management of sciatica? What is the clinical and cost effectiveness of benzodiazepines for the management of acute low back pain? What is the clinical and cost effectiveness of codeine with and without paracetamol for the management of acute low back pain? Radiofrequency denervation: What is the clinical and cost effectiveness of radiofrequency denervation for chronic low back pain in the long term? Other Recommendations Epidurals: What is the clinical and cost effectiveness of image-guided compared with non-image-guided epidural injections for people with acute sciatica? Spinal fusion: Should people with low back pain be offered spinal fusion as a surgical option?	–
Spondyloarthritis in over 16s: diagnosis and management	Referral criteria for people with suspected axial spondyloarthritis: What are the optimal referral criteria for people with suspected axial spondyloarthritis? Long-term complications of spondyloarthritis: What is the incidence of long-term complications, in particular osteoporosis, cardiovascular disease (CVD) and metabolic syndrome, in people with spondyloarthritis, and how does this compare with the general population? Are any specific spondyloarthritis features or risk factors associated with the incidence and outcomes of these complications? Educational intervention to improve healthcare professionals' awareness of spondyloarthritis: What is the effectiveness and cost effectiveness of educational interventions for healthcare professionals in order to increase the number of prompt diagnoses of spondyloarthritis? Pharmacological management of peripheral spondyloarthritis: What is the comparative effectiveness and cost effectiveness of standard	–

(*continued*)

Continued.

Record information		
Title	Recommendations for future research	Limitations, as described by authors
	DMARDs for managing peripheral spondyloarthritis, and is this effectiveness affected by differences in dose escalation protocols? Biological therapies for peripheral spondyloarthritis: What is the effectiveness and cost effectiveness of biological DMARDs in people with persistent peripheral spondyloarthritis (excluding psoriatic arthritis) or undifferentiated spondyloarthritis?	
Clinical guidance documents		
Digital technologies for managing non-specific low back pain: early value assessment (HTE16)	Evidence generation and more research are needed on: - pain and disability using the same outcome measure (musculoskeletal health questionnaire) - quality of life using the same outcome measure (EQ-5D-5L) - patient characteristics (such as type of back pain and severity) - time until return to normal daily activity - treatment adherence, that is, the number of people: - using a technology at baseline, 30 days and between 6 months and 1 year - who stop using a technology and their reasons for stopping - adverse events related to using the technology - healthcare resource use, including: - GP appointments - physiotherapy appointments - emergency department visits - how many people have self-referred for the technology and how many have been referred by a healthcare practitioner - the position of the technology in the care pathway - patients' views on the effects of the technologies collected using a qualitative survey or through interviews	–
Ixekizumab for treating axial spondyloarthritis (TA718)	–	–
Secukinumab for treating non-radiographic axial spondyloarthritis (TA719)	–	–
TNF-alpha inhibitors for ankylosing spondylitis and non-radiographic axial spondyloarthritis (TA383)	–	–
Tofacitinib for treating active ankylosing spondylitis (TA920)	–	–