

Barriers to Adherence to Clinical Practice Guidelines in the Non-Surgical Management of Knee Osteoarthritis among Older Adults: A Systematic Review

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Abstract: *Knee osteoarthritis (KOA) is a leading cause of pain, disability, and reduced independence among older adults. Although clinical practice guidelines consistently recommend education, structured exercise, weight management, and other non-surgical strategies as first-line care, implementation remains inconsistent. This systematic review identified and synthesised barriers to adherence with guidelines for non-surgical KOA management among adults aged 60 years and older. Guided by a pre-specified protocol and PRISMA reporting principles, searches were conducted in PubMed/MEDLINE, CINAHL, Embase, and Web of Science from database inception to December 2025. Eligible studies examined factors limiting guideline-concordant care. Two reviewers independently screened records, extracted data, and mapped barriers to the Theoretical Domains Framework, followed by narrative synthesis. Twenty-two studies were included. Barriers were concentrated in four areas: limited clinician knowledge and skills; beliefs and expectations regarding exercise, weight management, passive care, or surgery; social and professional influences, including inconsistent interdisciplinary messages; and environmental constraints, such as brief consultations, fragmented referral pathways, limited allied health access, and reimbursement barriers. Findings indicate that guideline adherence is shaped by interacting clinician, patient, professional, and system-level factors. Effective implementation requires integrated educational, behavioural, and service-redesign strategies tailored to older adults.*

Keywords: knee osteoarthritis; clinical practice guidelines; adherence; barriers; older adults.

1. Introduction

Knee osteoarthritis (KOA) is a chronic, degenerative joint condition that contributes substantially to pain, mobility limitation, and disability in older adults. Population-based evidence indicates that KOA is common in middle-aged and older populations; global estimates suggest that approximately one in five adults aged ≥ 40 years has KOA (Cui et al., 2020). International clinical practice guidelines (CPGs) consistently recommend non-surgical, conservative management as the foundation of KOA care. Core components include patient education and self-management support, structured exercise therapy, and weight management for individuals with overweight/obesity, with escalation to surgery reserved for persistent severe symptoms despite optimal conservative care (American Academy of Orthopaedic Surgeons, 2021; Bannuru et al., 2019; Kolasinski et al., 2020; National Institute for Health and Care Excellence, 2022). Broader syntheses of osteoarthritis guidelines likewise show strong convergence around early, active, and self-management-oriented care pathways (Nelson et al., 2014). Despite convergent guideline recommendations, real-world practice frequently diverges from

guideline-concordant non-surgical pathways. For example, patients proceeding to total knee arthroplasty often report limited uptake of recommended conservative interventions prior to surgery (King et al., 2020). Such evidence-practice gaps are consequential because guideline-concordant conservative care can improve pain and function and may postpone or reduce the need for invasive procedures, particularly when implemented early and delivered consistently (Bannuru et al., 2019; Kolasinski et al., 2020; Østerås et al., 2019). Implementation research suggests that low adherence to CPGs is rarely explained by knowledge deficits alone. Barriers typically operate across patient, clinician, organisational, and health-system levels, including beliefs about treatment effectiveness, competing priorities, limited access to allied health services, fragmented referral pathways, and inconsistent messages across disciplines (Bahns et al., 2024; Egerton et al., 2017; Selten et al., 2017; Snijders et al., 2011; Zadro et al., 2019).

To support actionable implementation strategies, barrier synthesis benefits from theory-informed frameworks that organise determinants of behaviour and link them to intervention functions. The Theoretical Domains Framework (TDF) integrates key constructs from behaviour-change theories and is widely used to diagnose determinants of healthcare professional and patient behaviours in guideline implementation research (Atkins et al., 2017; Cane et al., 2012; Michie et al., 2005). Therefore, the objective of this systematic review was to identify and synthesise barriers to adherence to CPG recommendations for the non-surgical management of KOA among adults aged ≥ 60 years, and to map these barriers to TDF domains to inform multi-level implementation approaches.

2. Methods

This review was conducted using a pre-specified protocol developed a priori and reported in accordance with the PRISMA 2020 statement (Page et al., 2021). Figure 3 summarises the workflow from searching to synthesis.

2.1 Eligibility criteria

Studies were eligible if they: (i) included adults aged ≥ 60 years with KOA, or explicitly focused on KOA management in older populations; (ii) examined barriers to adherence to, uptake of, or implementation of CPG recommendations for non-surgical KOA management; (iii) used quantitative, qualitative, or mixed-methods designs; and (iv) were published in English. Studies focusing exclusively on surgical decision-making without reference to conservative guideline recommendations were excluded.

2.2 Information sources and search strategy

Electronic searches were conducted in PubMed/MEDLINE, Embase, CINAHL, and Web of Science from database inception to December 2025. The strategy combined controlled vocabulary and keywords for KOA (e.g., “knee osteoarthritis”), clinical practice guidelines (e.g., “guideline” or “recommendation”), and implementation determinants (e.g., “barrier”, “facilitator”, “adherence”, “uptake”). Reference lists of eligible studies and relevant reviews were hand-searched to identify additional records.

2.3 Study selection

After duplicate removal, titles and abstracts were screened for potential eligibility. Full texts were retrieved for records judged potentially relevant. Two reviewers independently completed screening at each stage, and disagreements were resolved by discussion to reach consensus.

2.4 Data extraction

A structured extraction form was used to capture study characteristics (country/setting, sample, design), the guideline(s) referenced, and reported barrier statements related to non-surgical KOA management. Where studies reported facilitators alongside barriers, facilitators were extracted to support interpretation of implementation opportunities.

2.5 Coding framework and synthesis

Barrier statements were mapped to domains of the Theoretical Domains Framework (TDF) version 2 by two reviewers (Cane et al., 2012). Coding decisions were compared and reconciled by consensus. A narrative synthesis was conducted, grouping barriers into higher-order themes aligned with TDF domains and organising them into patient-, clinician-, organisational-, and system-level determinants. Because of substantial heterogeneity in study designs and outcomes, meta-analysis was not undertaken.

2.6 Methodological quality appraisal

To support interpretation, methodological quality was appraised using design-appropriate tools for qualitative, quantitative, and mixed-methods evidence. Quality appraisal was used to describe confidence in the evidence rather than to exclude studies a priori. For qualitative components, sampling adequacy and data saturation considerations were interpreted in line with established guidance (Francis et al., 2010).

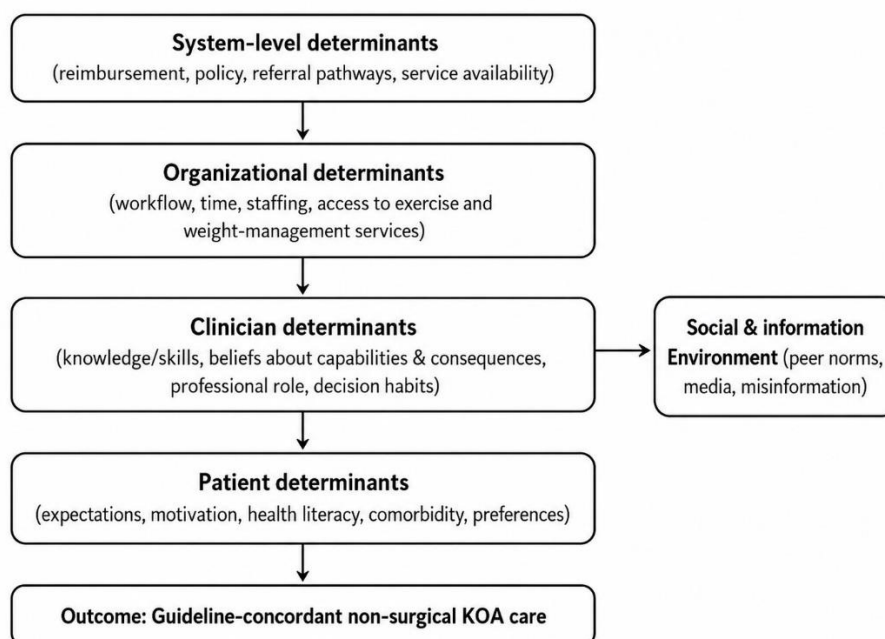


Figure 3: Review workflow: search and retrieval, screening, data extraction, TDF coding, and narrative synthesis

3. Results

3.1 Study selection

The database search identified 1,847 records. After removing 423 duplicates, 1,424 records were screened by title and abstract. Eighty-nine full-text articles were assessed for eligibility, and 22 studies met the inclusion criteria (Figure 1).

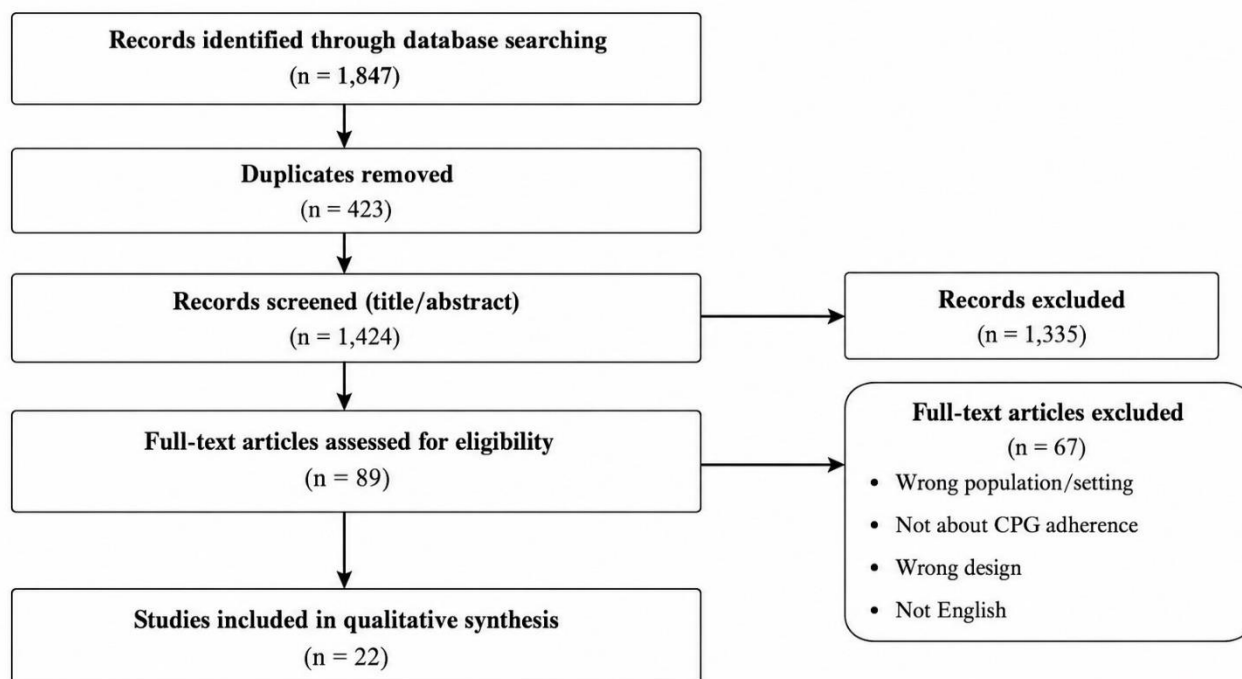


Figure 1: PRISMA flow diagram for study identification, screening, eligibility, and inclusion

3.2 Overview of included evidence

Included studies used qualitative, quantitative, and mixed-methods designs to explore barriers to guideline-concordant non-surgical KOA management. Across studies, barriers spanned multiple levels of the care system, including clinician knowledge and skills, patient beliefs and expectations, team and professional norms, and structural constraints related to time, access, and reimbursement. These determinants mapped primarily to the TDF domains commonly reported in implementation research (Atkins et al., 2017; Cane et al., 2012).

3.3 Barriers mapped to TDF domains

3.3.1 Knowledge and skills

Multiple studies reported limited clinician awareness of specific guideline recommendations and uncertainty about applying them to older adults with multimorbidity, high pain levels, or advanced radiographic disease. Knowledge gaps and skill deficits were particularly evident for exercise prescription progression, behaviour-change counselling to support physical activity and weight management, and appropriate referral pathways (Bahns et al., 2024; Egerton et al., 2017; Selten et al., 2017).

3.3.2 Beliefs about consequences and capabilities

Barriers were frequently linked to beliefs about treatment effectiveness and perceived capability to achieve behaviour change. Clinicians reported doubts about whether exercise and weight management would be effective for patients with severe symptoms or older age, and some expressed low confidence in motivating sustained lifestyle change. Patients, in turn, sometimes questioned the value of conservative care, particularly when pain was high or when they expected structural findings to mandate surgery (Egerton et al., 2017; Selten et al., 2017; Snijders et al., 2011).

3.3.3 Patient expectations, motivation, and emotion

Patient-level determinants included preferences for passive treatments, fear of pain exacerbation during exercise, competing health priorities, and low motivation for lifestyle change. Qualitative syntheses highlight that older adults may interpret KOA as an inevitable part of ageing and therefore place limited value on self-management, particularly when clinical messaging is inconsistent (Egerton et al., 2017; Selten et al., 2017).

3.3.4 Social and professional influences

Clinical team norms and interprofessional dynamics influenced adherence. Studies reported inconsistent advice across primary care, physiotherapy, and orthopaedic services, which undermined patient trust and diluted self-management messages. Peer influence and local practice culture also shaped clinician decision-making, including defaulting to imaging, injections, or early referral rather than structured conservative pathways (Bahns et al., 2024; Egerton et al., 2017; Zadro et al., 2019).

3.3.5 Environmental context and resources

Time constraints in primary care consultations, limited access to supervised exercise programmes, insufficient availability of multidisciplinary services (e.g., dietetics), and reimbursement restrictions were consistently described as structural barriers. These constraints contributed to fragmented care pathways and reduced opportunities for follow-up and reinforcement of behaviour change (National Institute for Health and Care Excellence, 2022; Selten et al., 2017).

Table 1: Summary of key barriers to guideline-concordant non-surgical KOA care mapped to TDF domains

Barrier theme	Illustrative barrier statements	Primary TDF domains	Implementation implications (examples)
Limited guideline knowledge and practical skills	Unfamiliarity with specific CPG recommendations; uncertainty about exercise progression and behaviour-change counselling; unclear referral pathways.	Knowledge; Skills; Memory, Attention and Decision Processes	Targeted training; decision aids; simplified guideline summaries; local referral algorithms.
Scepticism about benefits and low confidence for behaviour change	Doubts about exercise/weight management effectiveness in severe	Beliefs about Consequences; Beliefs about Capabilities; Optimism	Audit and feedback; peer modelling; skills-based

Barrier theme	Illustrative barrier statements	Primary TDF domains	Implementation implications (examples)
	disease; low confidence in motivating older adults to sustain lifestyle change.		coaching; shared decision-making tools.
Patient expectations and preferences	Expectation for passive care or surgery; perception that KOA is inevitable with ageing; fear of pain during exercise.	Beliefs about Consequences; Emotion; Goals; Intentions	Patient education aligned to guidelines; motivational interviewing; graded activity messaging.
Inconsistent messages across disciplines	Conflicting advice from different clinicians; professional norms favouring imaging or early referral; limited interprofessional coordination.	Social Influences; Social/Professional Role and Identity; Reinforcement	Interprofessional pathways; shared care plans; multidisciplinary education; standardised messaging.
Structural constraints in access, time, and financing	Short consultations; limited access to supervised exercise or dietetics; long waiting times; reimbursement barriers.	Environmental Context and Resources	Service redesign; referral pathway optimisation; commissioning and reimbursement alignment; use of group programmes.

Note. Barrier themes and domain mappings reflect patterns reported across included studies and related evidence syntheses (Egerton et al., 2017; Selten et al., 2017).

4. Discussion

This review synthesised barriers to adherence to non-surgical KOA guideline recommendations in older adults and organised them using the TDF. The findings reinforce that implementation challenges are multi-level: knowledge and skill gaps interact with beliefs about effectiveness, patient expectations, professional norms, and structural constraints. These patterns are consistent with prior qualitative and mixed-methods syntheses in osteoarthritis and primary care implementation research (Bahns et al., 2024; Egerton et al., 2017; Selten et al., 2017). From a clinical perspective, the results highlight a persistent mismatch between guideline-recommended conservative pathways and how KOA is frequently framed in routine practice. When KOA is communicated primarily as a structural deterioration problem with an implicit trajectory toward surgery, patient expectations may shift away from active self-management, while clinicians may deprioritise education and exercise progression in favour of short-term symptomatic options. Guidelines emphasise that education and exercise therapy are foundational and should be offered early and consistently (American Academy of Orthopaedic Surgeons, 2021; Bannuru et al., 2019; Kolasinski et al., 2020; National Institute for Health and Care Excellence, 2022).

4.1 Implications for implementation

A practical implication is that interventions should not rely on education alone. Theory-informed strategies should be selected to address the specific TDF domains identified. For example, Knowledge and Skills barriers may be addressed through competency-based training and decision support, whereas Beliefs about Consequences and Capabilities may require audit and feedback, peer modelling, and structured behaviour-change counselling supports (Atkins et al., 2017; Michie et al., 2005). At the system level, structural barriers such as limited access to supervised exercise

programmes or dietetics and restrictive reimbursement policies will continue to undermine adherence even when clinician motivation is high. Implementation trials and real-world programmes indicate that structured, standardised models of osteoarthritis care can improve delivery and uptake of core conservative elements when pathways and referrals are designed to support guideline-concordant practice (sterås et al., 2019; Snijders et al., 2011).

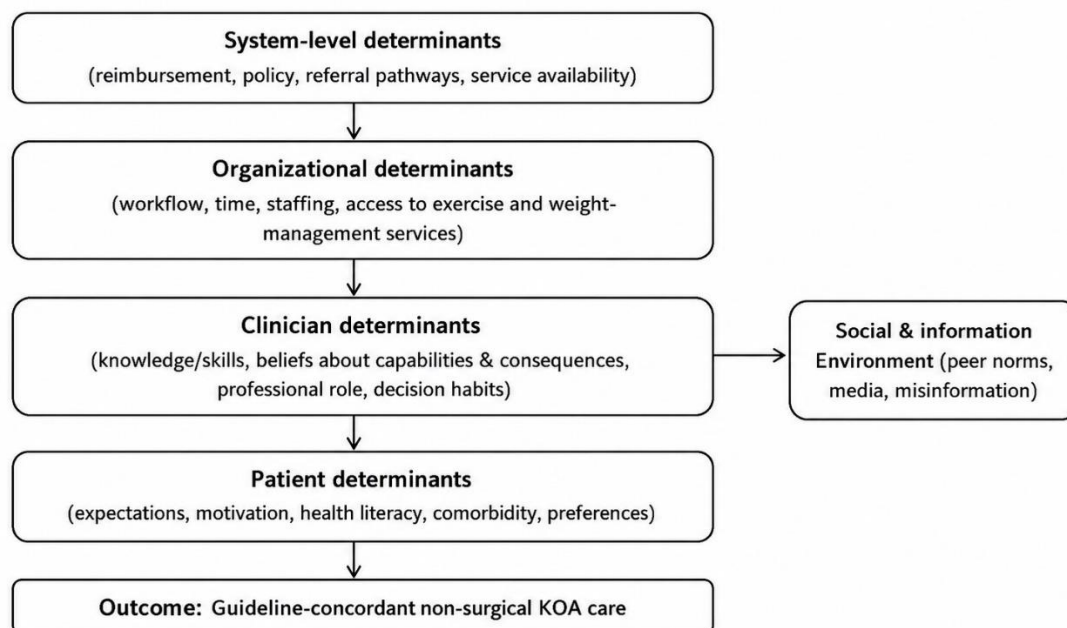


Figure 2: Multi-level determinants influencing guideline-concordant non-surgical KOA care

4.2 Strengths and limitations

Strengths of this review include PRISMA-consistent reporting and theory-informed coding to support actionable interpretation (Page et al., 2021). However, several limitations should be considered. First, heterogeneity in study designs and outcome definitions limited quantitative synthesis. Second, some evidence relied on self-reported clinician behaviour, which is vulnerable to social desirability and recall bias. Third, restricting inclusion to English-language publications may have excluded relevant studies from non-English settings.

4.3 Recommendations for research and practice

Future studies should prioritise rigorous evaluation of implementation strategies that combine clinician-level behaviour change supports with pathway redesign and improved access to allied health services. Research should also examine whether barriers differ meaningfully across healthcare systems and across stages of KOA severity in older adults, and should report implementation outcomes using standard frameworks to improve comparability (Atkins et al., 2017; Zadro et al., 2019).

5. Conclusion

Barriers to adherence to non-surgical KOA clinical practice guidelines among older adults are multi-level and span key TDF domains, including Knowledge and Skills, Beliefs about Consequences

and Capabilities, Social Influences, and Environmental Context and Resources. Improving guideline-concordant care requires coordinated implementation strategies that align clinician training and decision support with patient-facing communication, interprofessional pathway consistency, and system-level access and financing reforms.

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Conflict of Interest Statement (Mandatory)

The authors declare that there is no conflict of interest regarding the publication of this study.

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