

General

The impact of depression on outcomes in revision knee replacement surgery

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Keywords: depression, revision total knee arthroplasty, mental health, patient reported outcomes, complications

<https://doi.org/10.52965/001c.166115>

Orthopedic Reviews

Vol. 18, 2026

Introduction

Revision total knee arthroplasty is associated with more variable functional recovery and greater postoperative burden than primary surgery. Depression may influence recovery, but its effect in revision knee replacement remains incompletely defined.

Objective

To synthesise evidence on the association between depression or poor preoperative mental health and outcomes after revision total knee arthroplasty.

Methods

PubMed, MEDLINE, and Embase were searched on August 12, 2025. Adult revision total knee arthroplasty studies assessing depression or mental health in relation to postoperative outcomes were eligible. Owing to heterogeneity in exposure definitions, outcomes, and follow-up, findings were narratively synthesised.

Results

Of 103 records identified, 44 duplicates were removed and 59 records screened; 6 studies were included. Depression or poorer preoperative mental health was associated with worse postoperative function, persistent pain, greater narcotic analgesic use, lower satisfaction, infection, reoperation or re-revision, readmission, emergency department attendance, prolonged stay, non-home discharge, and higher costs. However, patients with poorer mental health could still achieve clinically meaningful functional improvement.

Conclusion

Depression is associated with poorer outcomes after revision total knee arthroplasty but should not be considered a contraindication to surgery. Mental health recognition, expectation-setting, and multidisciplinary optimisation may improve perioperative care.

INTRODUCTION

Total knee arthroplasty (TKA) can provide substantial pain relief and improve function and health-related quality of life in people with advanced knee arthritis.¹

Nevertheless, aseptic loosening, infection, instability, wear, stiffness, and periprosthetic fracture may necessitate revision total knee arthroplasty (rTKA). Demand for revision

knee arthroplasty is expected to increase as the number of primary procedures rises.²

Compared with primary surgery, rTKA is technically more complex and typically associated with less predictable patient-reported recovery, making identification of potentially modifiable patient-level risk factors important.³

Depression is a common comorbidity among people undergoing lower-limb arthroplasty and has been associated with persistent pain, poorer patient-reported outcomes,

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dissatisfaction, complications, and greater resource use after total joint arthroplasty.³

Psychological factors, including poorer preoperative mental health and pain catastrophising, may also influence recovery after hip and knee arthroplasty.⁴

Patients undergoing rTKA differ from those undergoing primary surgery. They commonly have a longer surgical history, greater preoperative disability, and more complex indications for intervention, which may amplify the relationship between mental health and postoperative recovery. Evidence specific to the rTKA population is dispersed across registry, database, and institutional cohort studies. This systematic review therefore evaluated the association between depression or poor preoperative mental health and postoperative functional outcomes, complications, pain, satisfaction, quality of life, and healthcare utilisation after revision knee replacement surgery.

METHODS

ETHICAL CONSIDERATIONS

This systematic review synthesised aggregate data from previously published studies. No participants were recruited, no individual-level identifiable data were accessed, and no intervention was delivered. Institutional review board approval and participant consent were therefore not required. Data were handled using information publicly reported in the included publications, with no collection or storage of personal identifiers.

STUDY DESIGN

This systematic review was reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 statement.⁵

SEARCH STRATEGY

A comprehensive literature search was performed in PubMed, MEDLINE, and Embase on August 12, 2025. The search was designed and reported using principles from the PRISMA-S extension.⁶

Controlled vocabulary and free-text terms were combined using Boolean operators. Core concepts included “depression,” “depressive disorder,” “mental health,” “psychological distress,” “revision total knee arthroplasty,” “revision knee replacement,” “revision knee surgery,” “outcomes,” “complications,” “quality of life,” “patient-reported outcome measures,” “pain,” and “satisfaction.” Database-specific syntax was adapted for each platform. Reference lists of eligible studies were also reviewed for additional relevant articles.

ELIGIBILITY CRITERIA

Studies were eligible if they included adults aged 18 years or older undergoing rTKA; evaluated depression or preoperative mental health as an exposure; and reported postoperative functional outcomes, pain, quality of life, sat-

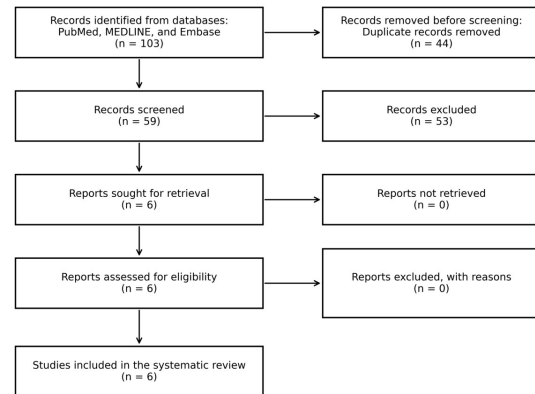


Figure 1. PRISMA 2020 flow diagram of study selection

isfaction, complications, or healthcare utilisation. Only full-text, English-language articles published in peer-reviewed journals were included. Studies of primary TKA without separately extractable rTKA data, studies without depression- or mental-health-specific assessment, studies without relevant postoperative outcomes, conference abstracts, editorials, letters, reviews, protocols, and case reports or case series with fewer than 10 patients were excluded. Studies including hip and knee arthroplasty were eligible only when rTKA findings could be extracted separately.

STUDY SELECTION

Records identified through database searching were imported into reference-management software and duplicate records removed. Titles and abstracts were screened against the predefined eligibility criteria. Full texts of potentially eligible records were assessed for inclusion. Of 103 records identified, 44 duplicate records were removed, leaving 59 records for title and abstract screening. Fifty-three records were excluded at screening. Six full-text reports were assessed, all met the eligibility criteria, and 6 studies were included. The selection process is shown in [Figure 1](#).

DATA EXTRACTION

Data were extracted using a standardised form. Extracted information included author and year, study setting and design, sample size, depression or mental-health measure, revision indication where reported, duration of follow-up, functional outcomes, pain outcomes, satisfaction and quality-of-life outcomes, complications, healthcare utilisation, and main findings. Extracted data were checked against the source publication before narrative synthesis.

OUTCOME MEASURES

The primary outcomes were postoperative functional outcomes and complications following rTKA in patients with depression or poor preoperative mental health. Secondary

outcomes were pain severity, persistent pain, postoperative analgesic use, satisfaction, health-related quality of life, length of stay, readmission, emergency department attendance, revision or re-revision, reoperation, costs, and other markers of healthcare utilisation.

QUALITY ASSESSMENT

Risk of bias was appraised using the Newcastle-Ottawa Scale for cohort studies. This tool evaluates selection of cohorts, comparability, and outcome ascertainment.⁷

Scores of 7 to 9 were interpreted as good methodological quality, 4 to 6 as moderate quality, and fewer than 4 as low quality. The assessment was used to inform interpretation of the findings rather than to exclude studies.

DATA SYNTHESIS

A meta-analysis was not undertaken because the included studies differed substantially in depression definitions, comparators, outcome measures, effect estimates, and follow-up duration. A narrative synthesis was undertaken across predefined domains: functional outcomes and patient-reported outcome measures, pain and analgesic use, satisfaction and quality of life, postoperative complications, and healthcare utilisation.

RESULTS

STUDY SELECTION

The search identified 103 records across PubMed, MEDLINE, and Embase. After removal of 44 duplicate records, 59 records underwent title and abstract screening. Fifty-three records were excluded, and 6 full-text reports were assessed. All 6 full-text reports fulfilled the eligibility criteria and were included in the final review ([Figure 1](#)).

STUDY CHARACTERISTICS

The six included studies were observational cohort, registry, and administrative database analyses conducted in the United States, United Kingdom, and Singapore. Sample sizes ranged from 245 rTKA patients in a single institutional registry to 13,973 rTKA patients in a large administrative database. One study included primary and revision hip and knee arthroplasty populations but reported rTKA-specific outcomes. Depression or mental health was measured using diagnostic coding, registry comorbidity data, electronic medical record diagnosis, the EQ-5D anxiety/depression domain, or the 36-Item Short Form Survey mental component summary. Follow-up ranged from 90 days to 5 years. Study characteristics are summarised in [Table 1](#).

FUNCTIONAL OUTCOMES AND PATIENT-REPORTED OUTCOME MEASURES

Sabah et al evaluated 10,727 patients undergoing elective rTKA in the National Health Service Patient-Reported Outcome Measures programme. The mean Oxford Knee Score

change was 12.4 points and 65.6% achieved improvement above the minimal important change threshold; however, depression and problems in the EQ-5D anxiety/depression domain were associated with lower improvement.⁸

Goh et al reported poorer absolute Knee Society Score, Oxford Knee Score, and Short Form-36 physical scores at 6 months and 2 years among patients with low preoperative mental component summary scores. Both groups nonetheless had comparable improvement from baseline and similar proportions achieved a minimal clinically important difference.⁹

PAIN OUTCOMES AND ANALGESIC USE

In a registry study, Singh and Lewallen found that depression was associated with moderate-to-severe pain after rTKA (odds ratio, 1.8; 95% confidence interval, 1.1-3.1).¹⁰

In a second registry analysis, depression predicted narcotic analgesic use for index-knee pain at 5 years after rTKA (odds ratio, 4.58; 95% confidence interval, 1.58-13.18).¹¹

SATISFACTION AND QUALITY OF LIFE

In the NHS cohort, 69.7% of patients reported satisfaction and 74.1% considered the operation successful; depression and anxiety/depression-related EQ-5D problems were associated with less functional improvement.⁸

Goh et al reported lower 2-year satisfaction among patients with lower preoperative mental health compared with controls (72.2% vs 84.5%).⁹

POSTOPERATIVE COMPLICATIONS

Wilson et al examined 13,973 rTKA patients and found that preoperative depression was associated with extended length of stay, non-home discharge, 90-day readmission, emergency department attendance, revision surgery, and increased costs.¹²

Harmer et al found depressive and/or anxiety disorders in 35% of revision TKA patients and reported an increased risk of infection, re-revision, and reoperation in this population; the hazard ratio for any infection after rTKA was 1.8.¹³

HEALTHCARE UTILISATION

The Wilson et al study demonstrated associations between preoperative depression and longer admission, non-home discharge, 90-day readmission, emergency department attendance, and higher costs after rTKA.¹²

The association between depression and longer-term narcotic use also suggests an ongoing resource burden beyond the immediate postoperative period.¹¹

RISK OF BIAS ASSESSMENT

The included studies received Newcastle-Ottawa Scale scores of 7 or 8 out of 9, indicating generally good methodological quality ([Table 2](#)). Important limitations included reliance on diagnostic coding or routine comorbidity data to identify depression, incomplete patient-reported out-

Table 1. Characteristics of included studies

Study	Country / data source	Study design	Sample size / population	Depression or mental health measure	Follow-up	Outcomes assessed	Key findings relevant to this review
Wilson et al, 2020	United States; Truven MarketScan database	Retrospective cohort	13,973 rTKA and 10,017 revision THA patients; prosthetic joint infection excluded	Preoperative depression diagnosis in administrative data	One year pre- and postoperatively; 90-day utilisation outcomes	Length of stay, non-home discharge, readmission, emergency department attendance, revision, costs	In rTKA, depression was associated with extended stay, non-home discharge, 90-day readmission, emergency department attendance, revision surgery, and higher costs.
Singh and Lewallen, 2013	United States; total joint registry	Registry-based cohort	1,533 rTKA patients at 2 years; 881 at 5 years	Depression and anxiety recorded as psychological comorbidities	2 and 5 years	Moderate-to-severe index-knee pain	Depression was associated with moderate-to-severe pain after rTKA (odds ratio, 1.8).
Sabah et al, 2021	United Kingdom; NHS PROMs programme	National PROMs cohort	10,727 elective rTKA patients, 2013-2019	Depression comorbidity; EQ-5D anxiety/depression domain	6 months	Oxford Knee Score, EQ-5D, satisfaction, perceived success, adverse events	Depression and EQ-5D anxiety/depression problems were associated with lower Oxford Knee Score improvement.
Singh and Lewallen, 2014	United States; total joint registry	Registry-based cohort	1,533 rTKA patients at 2 years; 881 at 5 years	Depression recorded as comorbidity	2 and 5 years	NSAID and narcotic medication use for index-knee pain	Depression predicted narcotic medication use at 5 years (odds ratio, 4.58).
Harmer et al, 2023	United States; linked electronic medical record system	Retrospective cohort	21,469 primary and revision hip/knee arthroplasties, including rTKA	Depressive/anxiety disorders from diagnostic data and validated natural language processing	Variable longitudinal follow-up	Infection, revision, re-revision, reoperation, function, dissatisfaction	Depressive/anxiety disorders were present in 35% of rTKA patients and were associated with infection, re-revision, and reoperation.
Goh et al, 2021	Singapore; institutional joint registry	Retrospective cohort	245 rTKA patients	SF-36 mental component summary; low mental health defined as score <50	6 months and 2 years	Knee Society Score, Oxford Knee Score, SF-36 physical score, satisfaction	Low mental health was associated with poorer postoperative PROMs and lower satisfaction, although clinically meaningful improvement was similar.

come follow-up in registry studies, single-centre design in one study, and residual confounding from chronic pain, comorbidity burden, frailty, socioeconomic circumstances, and opioid exposure.

OVERALL SYNTHESIS

Across the included studies, depression or poorer preoperative mental health was consistently associated with poorer outcomes after rTKA. The most consistent patterns were worse absolute functional outcomes, persistent pain, increased analgesic use, lower satisfaction, more complications, and higher healthcare utilisation. The relationship was not uniform: poorer mental health did not preclude meaningful functional improvement, but was associated with a lower postoperative outcome level and greater risk of dissatisfaction.

DISCUSSION

PRINCIPAL FINDINGS

This review found consistent associations between depression or poor preoperative mental health and adverse outcomes after rTKA. These associations included inferior pa-

tient-reported outcomes, persistent pain, increased narcotic analgesic use, lower satisfaction, complications, and greater healthcare use.⁸⁻¹³

The findings are congruent with broader total joint arthroplasty literature, in which depression has been associated with persistent pain, lower satisfaction, complications, and higher healthcare costs.^{3,4}

FUNCTIONAL OUTCOMES AND PATIENT-REPORTED OUTCOME MEASURES

Sabah et al and Goh et al both demonstrated that poorer preoperative mental health was associated with worse postoperative function. In the latter study, patients with poorer mental health achieved a comparable relative improvement and similar minimal clinically important difference attainment, despite poorer absolute postoperative scores.^{8,9}

This distinction is clinically important. Depression should not be used to deny access to rTKA when surgery is otherwise indicated, but it may identify patients more likely to have residual limitation or perceive a smaller benefit. Depression may influence pain appraisal, sleep, coping, motivation, and engagement with rehabilitation; it may also mark a broader burden of chronic pain, multimorbidity, or psychosocial vulnerability.

Table 2. Newcastle-Ottawa Scale risk-of-bias assessment of included studies

Study	Selection	Comparability	Outcome	Total NOS score	Overall quality	Key methodological considerations
Wilson et al, 2020	3/4	2/2	2/3	7/9	Good	Large administrative database study with adjusted analyses; coding-based depression and complication ascertainment may cause misclassification and residual confounding.
Singh and Lewallen, 2013	3/4	2/2	3/3	8/9	Good	Registry-based cohort with adjusted analyses; questionnaire non-response may introduce response bias.
Sabah et al, 2021	3/4	2/2	3/3	8/9	Good	Large national PROMs cohort; routine data and incomplete PROM response may introduce non-response and exposure-measurement bias.
Singh and Lewallen, 2014	3/4	2/2	3/3	8/9	Good	Registry-based cohort with long-term follow-up; medication use was self-reported and 5-year attrition may affect estimates.
Harmer et al, 2023	3/4	2/2	3/3	8/9	Good	Large linked electronic medical record cohort; mixed primary/revision and hip/knee population, with rTKA-specific findings extracted.
Goh et al, 2021	3/4	2/2	2/3	7/9	Good	Single-centre registry with validated PROMs; smaller sample and SF-36 mental component summary is not a depression-specific diagnosis.

PAIN OUTCOMES AND ANALGESIC USE

The association between depression and moderate-to-severe pain, as well as the more than four-fold higher odds of narcotic use at 5 years, highlights persistent pain as an important pathway through which mental health may affect rTKA recovery.^{10,11}

Similar associations between psychological distress, pain catastrophising, anxiety, depression, and poorer post-operative pain and function have been reported after total hip and knee arthroplasty.¹⁴

Persistent pain after rTKA can have mechanical, infective, inflammatory, neuropathic, and psychological contributors. Preoperative assessment should therefore consider mental health alongside implant-related and biological causes of pain, particularly in patients with chronic pain or established opioid exposure.

POSTOPERATIVE COMPLICATIONS AND HEALTHCARE UTILISATION

The associations reported by Wilson et al and Harmer et al extend beyond subjective recovery. Depression or depressive/anxiety disorders were associated with readmission, emergency department use, prolonged stay, non-home discharge, infection, reoperation, re-revision, and higher costs.^{12,13}

Broader arthroplasty evidence has also linked preoperative depression with postoperative readmission.¹⁵

These relationships are likely multifactorial. Depression may coexist with impaired sleep, lower activity, smoking, obesity, diabetes, chronic pain, and other comorbidities. Although included studies used adjusted analyses, residual confounding cannot be excluded. The findings should consequently be interpreted as prognostic associations rather than proof that depression alone causes complications.

SATISFACTION AND QUALITY OF LIFE

Satisfaction after rTKA appears especially vulnerable to poorer mental health. In the included studies, lower pre-operative mental health was associated with lower satisfaction even where clinically meaningful functional gain occurred.^{8,9}

This gap between measured improvement and satisfaction reinforces the value of individualised counselling. Patients should be informed that rTKA may relieve symptoms and improve function, while outcomes may remain less predictable than after primary surgery and mental health may affect recovery, pain, and satisfaction.

CLINICAL IMPLICATIONS

Depression should be recognised as a relevant risk factor rather than an absolute contraindication to rTKA. Validated approaches to identifying depressive symptoms, including the Patient Health Questionnaire-9 and Hospital Anxiety

and Depression Scale, could support assessment when integrated within local pathways.^{16,17}

Patients with significant symptoms may benefit from co-ordinated primary care, mental health, pain, physiotherapy, and perioperative input. Optimisation should aim to improve wellbeing, set realistic expectations, address chronic pain and opioid use, and support rehabilitation. These measures should be framed as a means of improving the chance of a successful recovery rather than as a barrier to surgery.

STRENGTHS OF THIS REVIEW

This review addressed a focused question in the understudied rTKA population. It used three major databases and synthesised evidence across functional outcomes, pain, satisfaction, quality of life, complications, and healthcare utilisation. Included studies represented several healthcare systems and incorporated large registry and administrative datasets alongside institutional cohorts.

FUTURE RESEARCH

Prospective studies should use depression-specific, validated measures; distinguish active symptoms from historical diagnoses and treated from untreated depression; and report standardised rTKA outcomes. Interventional research is needed to establish whether psychological therapy, medication optimisation, pain-management programmes, sleep interventions, prehabilitation, or integrated perioperative mental health pathways improve outcomes after rTKA.

LIMITATIONS

All included studies were observational, precluding causal inference. Depression definitions differed across administrative coding, electronic medical record diagnosis, registry comorbidity data, the EQ-5D anxiety/depression domain, and the Short Form-36 mental component summary. Several studies included mixed arthroplasty populations or combined depression with anxiety; rTKA-specific data were extracted where reported. Heterogeneous outcomes and

follow-up intervals prevented meta-analysis. The review was limited to English-language, peer-reviewed literature and did not include grey literature, creating potential language and publication bias.

CONCLUSION

Depression and poorer preoperative mental health are associated with worse outcomes after revision total knee arthroplasty, including worse absolute functional outcomes, persistent pain, increased narcotic analgesic use, lower satisfaction, complications, and greater healthcare utilisation. Patients with depression may nevertheless achieve clinically meaningful postoperative improvement. Depression should therefore be identified, discussed, and optimised as part of routine preoperative planning, rather than viewed as a contraindication to revision surgery. Prospective studies are needed to determine whether targeted mental health interventions can improve recovery after rTKA.

ACKNOWLEDGMENTS

None

AUTHORS' CONTRIBUTIONS

Conceptualization: [BA]. Methodology: [BA]. Formal analysis: [BA]. Investigation: [BA]. Writing – original draft: [BA]. Writing – review and editing: all authors.

CONFLICT OF INTEREST DISCLOSURES

The authors declare no conflicts of interest

FUNDING AND FURTHER INFORMATION

No external funding was received for this work

Submitted: June 23, 2026 EDT. Accepted: July 22, 2026 EDT.

Published: August 10, 2026 EDT.

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