*REVIEW ARTICLE*

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# Postoperative anxiety and depression in patients undergoing hip arthroplasty – narrative review

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## Abstract

**Introduction and Objective.** Total hip arthroplasty (THA) is one of the most commonly performed orthopaedic procedures worldwide, and is considered a highly effective treatment for relieving pain and improving mobility in patients with degenerative hip diseases. The aim of the review is to summarize current evidence regarding the incidence, determinants, and clinical implications of anxiety and depression following hip arthroplasty.

**Review Methods.** The article was designed as a narrative review. A literature search was conducted in the PubMed and Google Scholar databases for studies involving adult patients undergoing hip arthroplasty and assessing psychological outcomes before and after surgery. A total of 22 studies were included in the review.

**Brief description of the state of knowledge.** While clinical outcomes such as functional improvement and pain reduction have been extensively studied, increasing attention has recently been directed towards psychological outcomes following surgery. Anxiety and depression are common among patients undergoing orthopaedic procedures and may significantly influence postoperative recovery, rehabilitation and patient satisfaction.

**Summary.** While several investigations reported significant reductions in anxiety and depressive symptoms following surgery, other studies identified persistent or newly developed depression in a subset of patients. Psychological outcomes following hip arthroplasty appear multifactorial. Although many patients experience improvements in mental health after surgery, others remain at risk of developing postoperative depression. Early identification of high-risk individuals and implementation of multidisciplinary perioperative care may improve both psychological and functional outcomes.

## Key words

hip arthroplasty, postoperative, 'depression, anxiety, new onset depression

## INTRODUCTION

Hip arthroplasty is widely regarded as one of the most successful surgical procedures for improving quality of life in patients suffering from degenerative joint diseases, such as osteoarthritis, as well as traumatic conditions including hip fractures. With the aging of the global population and increasing prevalence of musculoskeletal disorders, the number of total hip arthroplasties performed annually continues to rise.

Traditionally, research on hip arthroplasty has focused primarily on surgical techniques, implant survival and functional outcomes. However, psychological well-being has increasingly been recognized as an important factor influencing postoperative recovery and long-term outcomes.

Anxiety and depression are common among patients undergoing orthopaedic surgery and may influence pain perception, rehabilitation effectiveness, and overall satisfaction with treatment. Some studies have demonstrated that hip arthroplasty is associated with significant improvements in patients' mental health status, which are largely attributed to substantial pain reduction and restoration of functional mobility. These changes contribute to increased independence in daily activities and enhanced overall quality of life, which in turn are reflected in decreased levels of anxiety and depressive symptoms as measured by standardized psychometric scales such as the Hospital Anxiety and Depression Scale (HADS)[1]. Conversely, other investigations have reported the persistence of depressive symptoms or the development of new-onset depression following hip arthroplasty, suggesting that surgical intervention alone may not be sufficient to address underlying psychological conditions in all patients [2].

Understanding the complex relationship between hip arthroplasty and mental health outcomes is therefore essential for optimizing perioperative care. The aim of the review is to evaluate current evidence regarding postoperative anxiety and depression among patients undergoing hip arthroplasty.

## MATERIALS AND METHOD

The study was designed as a narrative review. A literature search was conducted in PubMed and Google Scholar. The search strategy included combinations of the following terms: 'total hip arthroplasty', 'hip arthroplasty', 'postoperative anxiety', 'postoperative depression', 'new-onset depression'. Studies were considered eligible if they involved adult patients

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undergoing primary or revision hip arthroplasty, assessed anxiety, depression, quality of life or related psychological outcomes and reported preoperative and postoperative findings. Both prospective and retrospective observational studies, randomized controlled trials and database analyses were considered.

Studies were excluded if they focused exclusively on knee arthroplasty without separate hip arthroplasty data, involved paediatric populations, or did not provide clinically relevant psychological or functional outcomes.

Titles and abstracts were screened first, followed by full-text assessment of potentially relevant studies. The methodological quality of studies was considered descriptively with particular attention to study design, sample size, follow-up duration and risk of confounding.

## RESULTS

The reviewed literature demonstrated considerable variability in psychological outcomes following hip arthroplasty. Several studies reported significant improvements in anxiety and depressive symptoms after surgery, whereas others identified cases of persistent or newly developed depression.

To improve clinical interpretation, the included studies were grouped into four categories:
1) elective primary total hip arthroplasty;
2) hip fracture surgery and non-elective hip procedures;
3) revision arthroplasty and complication-related populations:
4) perioperative or environmental interventions.

This distinction is important because psychological trajectories may differ substantially between elective patients, trauma patients, and individuals undergoing revision surgery or experiencing postoperative complications.

**Elective primary total hip arthroplasty.** Most studies included in the review evaluated patients undergoing elective primary total hip arthroplasty. Overall, these studies consistently demonstrated improvements in anxiety and depressive symptoms following surgery, which were largely attributed to pain relief, improved mobility and restoration of functional independence. However, several investigations indicated that patients with preoperative psychological distress continued to experience worse functional outcomes, higher pain levels and lower patient satisfaction, despite overall postoperative improvement. One investigation evaluating patients undergoing total joint arthroplasty reported significant reductions in Hospital Anxiety and Depression Scale (HADS) scores at the six-month postoperative follow-up, suggesting that successful arthroplasty may improve patients' psychological well-being [3.]

Surgical technique may also influence psychological outcomes. A study comparing different surgical approaches demonstrated that patients treated with the direct anterior approach (DAA) or the *orthopädische chirurgie München* (OCM) technique experienced lower, at three month postoperative follow-up, anxiety and depression levels compared with those undergoing the traditional lateral approach [4]. Another investigation comparing conventional THA with minimally invasive mini-incision THA reported significant reductions in Hamilton Anxiety Scale (HAMA) and Hamilton Depression Scale (HAMD) scores following surgery in both groups [5]. Furthermore, a recent prospective cohort study demonstrated that patients with preoperative symptoms of anxiety and depression achieved significantly worse postoperative outcomes, including lower functional scores, reduced quality of life and decreased patient satisfaction up to two years postoperatively [6].

Importantly, although reductions in anxiety and depressive symptoms are commonly observed following hip arthroplasty, these improvements are not equivalent across all patient populations. Patients with preoperative psychological disorders show postoperative improvements in mental health; however, their early clinical outcomes remain significantly worse compared to individuals with good baseline mental health, indicating a persistent influence of preoperative psychological status on recovery [7].

In line with these findings, even though psychological symptoms may improve after surgery, patients with preoperative anxiety, depression or pain catastrophising continue to experience higher postoperative pain levels and reduced functional outcomes. This suggests that the psychological burden may have a lasting impact on both subjective and functional recovery following arthroplasty [8]. Moreover, improvement in hip function and increased activity level appear to be closely associated with improvements in anxiety, depression and pain catastrophizing, highlighting the bidirectional relationship between physical and mental recovery [9].

**Hip fracture surgery and non-elective populations.** Fewer studies evaluated non-elective or non-osteoarthritis populations. Nevertheless, available evidence suggests that psychological improvement may also occur in patients undergoing surgery for hip fractures or inflammatory joint disease, although the clinical context differs substantially from elective arthroplasty.

Improvements in quality of life and psychological health were observed in patients undergoing surgery for hip fractures. In a prospective longitudinal study by Căpăstraru et al., patients demonstrated significant improvements across multiple domains of quality of life, including physical functioning, pain reduction and emotional well-being, at three months postoperatively, indicating that successful surgical treatment may positively influence both physical and psychological recovery [10].

Significant improvements in anxiety and depression were also observed in patients with ankylosing spondylitis undergoing THA when assessed using the Self-rating Anxiety Scale (SAS) and Self-rating Depression Scale (SDS) at 12-month follow-up [11].

**New-onset depression and risk factors.** Several studies focused specifically on risk factors for postoperative psychological disorders and the development of new-onset depression following arthroplasty. These investigations suggest that postoperative psychological recovery is influenced not only by surgical success but also by socioeconomic, behavioural and clinical factors.

A national claims database analysis reported postoperative depression in approximately 6.8% of patients undergoing hip replacement surgery, 365 days after surgery, highlighting that a clinically relevant proportion of patients may develop new-onset depressive symptoms despite successful surgical intervention [12].

**Table 1.** Characteristics and Main Findings of Studies Included in the Review

| Study | Population | Study design | Follow-up | Assessment tool | Main findings | Key limitation |
|---|---|---|---|---|---|---|
| Zhang et al. (3) | THA/TKA patients | Observational study | 6 months | HADS | Significant reduction in anxiety and depression after arthroplasty | Mixed hip and knee population |
| Shi et al. (4) | Elective THA | Comparative study | 3 months | HADS | DAA and OCM approaches associated with lower anxiety/depression than lateral approach | Short follow-up |
| Yu et al. (5) | THA for femoral head osteonecrosis | Observational study | Postoperative follow-up | HAMA, HAMD | Significant reduction in anxiety and depression after surgery | Single population type |
| Aalders et al. (6) | Elective THA | Prospective cohort | 2 years | PROMs, anxiety/depression assessment | Preoperative anxiety/depression associated with inferior outcomes and lower satisfaction | Observational design |
| Tamate et al. (7) | Elective THA | Observational study | Early postoperative period | Mental health assessment | Worse early outcomes in patients with poor baseline mental health | Short-term assessment |
| Wood et al. (8) | THA/TKA patients | Observational study | Postoperative follow-up | Pain catastrophising, anxiety/depression scales | Higher pain and worse functional outcomes in psychologically distressed patients | Mixed arthroplasty population |
| Reine et al. (9) | THA patients | Observational study | Postoperative follow-up | Anxiety/depression assessment | Anxiety, depression and catastrophising associated with lower activity levels | Functional outcomes only |
| Căpăstraru et al. (10) | Hip fracture patients | Prospective longitudinal study | 3 months | QoL assessment | Improved physical and psychological quality of life after surgery | Non-elective population |
| Qian et al. (11) | THA in ankylosing spondylitis | Observational study | 12 months | SAS, SDS | Significant improvement in anxiety and depression | Specific disease population |
| O'Gara et al. (12) | Hip replacement patients | National database analysis | 365 days | Administrative diagnosis data | New-onset depression occurred in ~6.8% of patients | Database-based analysis |
| Figoni et al. (13) | Revision arthroplasty patients | Observational study | 1 year | Mental health diagnosis | Infection and implant failure increased mental health disorder risk | Retrospective design |
| Jeong et al. (14) | Arthroplasty patients | Database study | 6 months | Administrative diagnosis data | Low income associated with increased risk of depression | Limited socio-economic detail |
| Wilson et al. (15) | THA patients | Observational study | 1 year | Clinical and psychological variables | Opioid use, smoking and anxiety predicted postoperative depression | Retrospective design |
| Zalikha et al. (16) | THA/TKA patients | Propensity-weighted retrospective analysis | In-hospital | Anxiety/depression diagnosis | Anxiety and depression associated with anaemia and prolonged hospitalisation | No long-term follow-up |
| Jeong et al. (17) | Arthroplasty patients with NOD | Database study | Postoperative follow-up | Antidepressant use | Antidepressants did not reduce complication rates | Administrative data |
| Eminovic et al. (18) | THA/TKA patients | Randomised controlled trial | 3 and 6 days | HADS | Coloured rooms did not significantly improve outcomes compared with controls | Very short follow-up |
| Xing et al. (19) | THA patients | Observational study | Up to 1 year | PROMs, psychological assessment | ERAS associated with lower anxiety/depression and catastrophising | Multifactorial intervention |
| Ripoll-Romero et al. (20) | THA patients | Intervention study | 1 month | HADS, EQ-5D-5L | Emotional preparation improved outcomes similarly to standard care | No significant between-group differences |
| Pulkkinen et al. (21) | Arthroplasty patients | Randomised clinical trial | 3 months | STAI | Significant reduction in state and trait anxiety | Mixed arthroplasty population |
| Gudmundsson et al. (22) | Hip pathology patients | Observational study | Postoperative follow-up | Anxiety/depression/catastrophising scales | Functional improvement associated with improved mental health | Heterogeneous pathology |

**Table 2.** Main Risk Factors for Postoperative Anxiety and Depression After Hip Arthroplasty

| Category | Examples identified in included studies |
|---|---|
| Psychological factors | Pre-existing anxiety, depression, pain catastrophising |
| Behavioural factors | Opioid use, smoking, alcohol use disorder |
| Socio-economic factors | Low income, reduced social support |
| Surgical factors | Revision surgery, infection, implant failure |
| Recovery-related factors | Persistent pain, delayed rehabilitation, lower activity level |

Further studies identified specific risk factors associated with postoperative depression. Revision surgery due to periprosthetic joint infection or implant failure significantly increased the risk of developing a new mental health disorder at 1-year follow-up [13]. Socio-economic factors, including low income, were also associated with increased risk of new-onset depression within six months after arthroplasty [14]. Additional preoperative risk factors included opioid use, smoking, alcohol use disorder, and preexisting anxiety disorders, which have been shown to significantly increase the risk of postoperative depression. These factors may

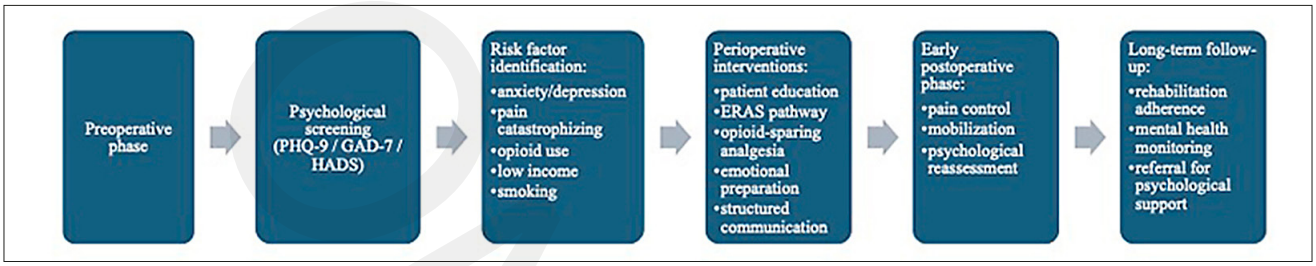


**Figure 1.** Proposed intervention points for identifying and managing anxiety and depression in patients undergoing hip arthroplasty

adversely affect pain modulation, coping mechanisms and physiological stress responses, thereby contributing to poorer psychological outcomes in the first postoperative year [15]. Psychological disorders may also negatively affect surgical outcomes. Patients with preoperative anxiety or depression have been reported to experience higher rates of postoperative complications such as anaemia and prolonged hospitalization [16].

Interestingly, although antidepressant therapy may improve patients' subjective well-being, it has not been shown to reduce arthroplasty-related complications in patients with new-onset depression. A recent study by Jeong et al. demonstrated that the use of antidepressants after total joint arthroplasty was not associated with a decreased risk of postoperative complications. This finding should not be interpreted as evidence against treating postoperative depression. Rather, it suggests that pharmacological treatment alone may be insufficient to modify complex surgical outcomes, which are influenced by biological, functional, behavioural and social factors. Antidepressants may improve mood and subjective well-being, but complication risk may require broader multidisciplinary management [17].

**Perioperative and environmental interventions.** Several studies investigated whether perioperative interventions could improve psychological outcomes independently of the surgical procedure itself. These interventions included environmental modifications, enhanced recovery after surgery (ERAS) pathways, emotional preparation and structured perioperative care models.

A randomized controlled trial evaluating the influence of coloured patient rooms found a reduction in anxiety and depression three and six days after operation in both intervention and control groups, although no statistically significant difference was observed between groups [18]. Similarly, structured perioperative interventions have shown mixed results. Enhanced recovery after surgery (ERAS) protocols have been associated with reduced perioperative patient-reported depression, anxiety, and pain catastrophizing at one week, six weeks, three months, six months and one year [19].

However, in a study evaluating nursing-led emotional preparation, no significant differences in anxiety or depression were observed between the intervention and control groups at hospital discharge. Although both groups demonstrated significant improvements in HADS scores and quality of life measures (EQ-5D-5L) at one-month follow-up, these improvements were comparable between groups after adjustment for baseline characteristics, suggesting that the intervention did not provide additional benefit beyond standard care [20]. Similarly, a randomized clinical trial investigating a nurse-led perioperative care model reported a significant decrease in State-Trait Anxiety Inventory (STAI) scores three months after surgery, indicating a reduction in both situational (state) and baseline (trait) anxiety levels among patients undergoing hip arthroplasty [21].

The timing of postoperative psychological assessment varied considerably across studies, ranging from hospital discharge and one-month follow-up to twelve months after surgery. Short-term improvements in anxiety were often observed soon after surgery or during early postoperative follow-up, possibly reflecting relief related to completion of the surgical procedure and early pain control. In contrast, studies with longer follow-up suggested that improvements in anxiety, depression and quality of life may persist up to twelve months in selected patient groups, particularly when functional recovery and pain reduction are maintained. However, the heterogeneity of follow-up periods limits direct comparison between studies.

## DISCUSSION

The findings of this review highlight the complex relationship between hip arthroplasty and psychological outcomes. Although many patients experience improvements in mental health following surgery, a subset develops new or persistent depressive symptoms. Improvements in psychological health after surgery are likely related to several factors, including reduction of chronic pain, improved mobility and increased independence. These improvements are often reflected in decreased HADS, HAMA and SDS scores following successful surgery.

In addition to the direct benefits of the surgery itself, perioperative care strategies may also contribute to postoperative psychological recovery. Recent evidence suggests that Enhanced Recovery After Surgery (ERAS) protocols are associated with further improvements in anxiety and depression outcomes following THA. Elements that may be particularly relevant for mental health include preoperative patient education, expectation management and structured perioperative communication. Preoperative education may reduce uncertainty and surgery-related fear, while early mobilization and improved pain control may enhance patients' sense of control and functional confidence. However, the available studies do not clearly isolate which of the ERAS components has the strongest independent effect on anxiety or depression.

However, several preoperative and postoperative factors appear to influence psychological outcomes. Pre-existing mental health disorders, socio-economic status (particularly low income) and substance use have been identified as important predictors of postoperative depression. The association between low income and new-onset depression

should also be interpreted in the context of healthcare system differences. In predominantly private or insurance-based systems, low income may limit access to rehabilitation, follow-up visits, psychological care and social support. In public healthcare systems, financial barriers may be partly reduced, but socio-economic disadvantage may still influence recovery through reduced health literacy, poorer living conditions, limited caregiver support, and higher baseline stress burden. The currently included studies, however, do not provide sufficient comparative data to determine whether the impact of low income differs between public and private healthcare systems.

Furthermore, psychological disorders may negatively influence surgical recovery. Patients experiencing anxiety or depression may report higher levels of postoperative pain, decreased physical activity and delayed rehabilitation. Moreover, recent evidence suggests that improvements in physical recovery and psychological well-being after hip arthroplasty are closely interconnected. Gudmundsson et al. demonstrated that greater functional improvement was associated with more pronounced reductions in anxiety, depression and pain catastrophising, highlighting the complex bidirectional relationship between physical and mental recovery [22]. These findings suggest that the successful restoration of mobility and reduction of pain may directly contribute to improved psychological status, while persistent psychological distress may negatively affect rehabilitation adherence, activity level and overall recovery trajectory.

A major limitation of the current literature is the heterogeneity of the included populations, outcome measures and follow-up periods. Elective THA patients, hip fracture patients and revision arthroplasty patients differ substantially in baseline health status, functional expectations and psychological vulnerability. Moreover, some studies rely on validated tools, such as HADS, STAI, HAMA or SDS, whereas others use diagnosis codes from administrative databases. This limits direct comparison and prevents firm conclusions regarding the true prevalence and duration of postoperative anxiety and depression.

Nevertheless, these findings highlight the need to shift from a purely surgical perspective towards a more comprehensive, patient-centred approach that incorporates psychological assessment and targeted interventions as integral components of perioperative care.

## CONCLUSIONS

Postoperative anxiety and depression are clinically relevant and multifactorial outcomes in patients undergoing hip arthroplasty. Although many patients experience psychological improvement after surgery, particularly when pain relief and functional recovery are achieved, this improvement is not universal. Patients with preoperative anxiety, depression, pain catastrophising, chronic opioid use, socio-economic disadvantage or postoperative complications, appear to be at increased risk of persistent symptoms or new-onset depression.

The available evidence suggests that psychological recovery should be interpreted in relation to follow-up duration, patient population and baseline mental health status. Short-term improvements may reflect pain reduction and relief after surgery, whereas longer-term outcomes are more closely related to sustained functional recovery, rehabilitation adherence and social support.

In daily orthopaedic practice, brief screening tools such as PHQ-9 and GAD-7 may be useful for rapid identification of patients requiring further evaluation, while HADS may serve as a more detailed instrument for patients at increased risk. Psychological assessment should be integrated with ERAS pathways, patient education, pain management, rehabilitation and multidisciplinary care.

Future prospective studies should standardize follow-up time points, separate elective THA from hip fracture and revision populations and evaluate which perioperative interventions most effectively improve both psychological and functional outcomes.

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