

Impact of outpatient total hip or knee replacement on informal caregivers at home: a scoping review

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Background: Although total hip arthroplasty (THA) and total knee arthroplasty (TKA) offer significant cost savings to our health care system, the degree to which the burden of postoperative care has been transferred onto the informal caregiver is often overlooked. We performed a scoping review to identify the characteristics and factors that contribute to the burden of care experienced after outpatient THA and TKA.

Methods: We systematically searched electronic literature databases according to scoping review guidelines from inception to June 2021 for articles reporting the experiences of informal caregivers providing care for patients having undergone outpatient THA or TKA. Our review included English-language studies that sought to elucidate the impact on caregivers in the acute postoperative period (up to 6 wk after surgery).

Results: Our search yielded 1423 unique articles, which were screened for inclusion. We removed 310 duplicate records and excluded another 1099 articles because they did not meet the inclusion criteria for full-text screening with relevancy. We thus assessed 14 articles for full-text review, and none were found to meet our inclusion criteria.

Conclusion: We found no published data pertaining to the burden borne by informal caregivers who provide perioperative care to patients who have undergone ambulatory THA or TKA. Further research is needed to identify, quantify and determine the modifiability of the various characteristics and factors that contribute to caregiver burden in the outpatient setting.

Contexte : L'arthroplastie totale de la hanche (ATH) et l'arthroplastie totale du genou (ATG) réalisées en contexte ambulatoire entraînent des économies considérables pour le système de santé, mais la part du fardeau des soins postopératoires qui est transférée aux aidants naturels est souvent ignorée. Nous avons effectué un examen de la portée pour cerner les caractéristiques et les facteurs contribuant au fardeau des soins après une ATH ou une ATG ambulatoire.

Méthodes : Nous avons procédé, en suivant la méthodologie de l'examen de la portée, à une interrogation systématique des bases de données électroniques, de leur mise en service à juin 2021, pour recenser des articles sur les expériences des aidants naturels qui offrent des soins aux patients ambulatoires ayant subi une ATH ou une ATG. Notre examen comprenait des études publiées en anglais tentant de mieux comprendre les répercussions sur les aidants naturels durant la période postopératoire aiguë (jusqu'à 6 semaines après l'intervention).

Résultats : Nos recherches ont repéré 1423 articles distincts, ensuite passés en revue pour inclusion. Nous avons retiré 310 doublons et exclu 1099 autres articles ne répondant pas aux critères d'inclusion d'un examen complet du texte pour en évaluer la pertinence. En fin de compte, 14 articles ont été soumis à l'examen complet du texte et aucun n'a répondu aux critères d'inclusion.

Conclusion : Nous n'avons trouvé aucune donnée publiée sur le fardeau assumé par les aidants naturels offrant des soins périopératoires aux patients ayant subi une ATH ou une ATG ambulatoire. D'autres recherches seront nécessaires pour cerner, quantifier et déterminer la variation des caractéristiques et facteurs contribuant au fardeau assumé par l'aidant en contexte ambulatoire.

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are 2 of the most common and successful surgical procedures performed worldwide, with more than 120 000 primary total joint arthroplasty (TJA) procedures performed annually in Canada.¹ Traditionally, patients undergoing a TJA procedure would remain in hospital for nearly 5 days after surgery to be monitored for pain management and rehabilitation. However, recent advances in perioperative care and management of surgery-related adverse effects have led to the development and implementation of outpatient TJA programs in Canada, allowing patients to return home on the same day of surgery.¹ The transition from a short-stay inpatient setting to an outpatient TJA setting offers substantial benefits to both the patient and the health care system, including increased patient satisfaction, reduced rates of hospital-acquired infections^{2,3} and a median cost savings of 30% compared to inpatient surgery.⁴ However, the impact of this transition on informal caregivers, such as family and friends who provide care to patients at home once they leave the hospital, remains poorly understood.

Caregiver burden is the response to the emotional, financial, physical, psychologic and social stressors incurred with having to care for another person.⁵ Existing literature examining informal caregiver burden focuses largely on provision of care for a loved one dealing with a chronic disease, such as dementia, in an outpatient setting. In the chronic setting, 1 in 3 caregivers report experiencing depression, and caregivers also often report high levels of anxiety and stress, financial strain, sleep deprivation and social isolation.⁵⁻¹¹ However, these findings are unlikely to be generalizable to the acute postoperative outpatient setting, such as caregivers of patients who have undergone outpatient TJA. Unlike long-term caregivers, whose burden of care increases as the patient's condition deteriorates, informal caregivers of patients who have had TJA initiate the caregiving process with the burden of care at its high point, after which it declines and ultimately resolves once the patient has recovered and no longer requires assistance from the caregiver.

Given the relative novelty of outpatient TJA programs in Canada, we performed a scoping review to identify and map the available evidence pertaining to factors that contribute to the burden of care of caregivers of patients who have undergone outpatient TJA.¹²⁻¹⁴ Our objectives were to identify the characteristics and factors that contribute to the burden of care of such caregivers, as well as the modifiable and actionable contributors of caregiver burden to help mitigate the burden experienced by the caregiver during the episode of care.

METHODS

This scoping review was performed following the Preferred Reporting Items for Systematic Reviews and

Meta-Analyses extension for Scoping Reviews (PRISMA-ScR).^{15,16} To minimize the risk of selection bias, we defined our inclusion and exclusion criteria a priori. Our protocol for this scoping review has been registered on Open Science Framework and can be found at <https://doi.org/10.17605/OSF.IO/4KPAX>.

Search strategy

To identify articles that reported the experiences of informal caregivers caring for patients after outpatient THA or TKA, we performed a comprehensive literature search of the following electronic databases: MEDLINE (including Epub Ahead of Print), Embase, EMCare Nursing, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Systematic Reviews, PsycINFO (OvidSP), Web of Science (Clarivate Analytics), Scopus (Elsevier), ClinicalTrials.gov and the World Health Organization International Clinical Trial Registry Platform (WHO ICTRP). We searched the databases for all relevant English-language articles from their respective inception dates to Nov. 20, 2020. We repeated the same search in June 2021 before final analyses to ensure the identification of any recent studies that met the inclusion criteria. The search strategy included a combination of MeSH terms and non-MeSH keywords (Appendix 1, available at www.canjsurg.ca/lookup/doi/10.1503/cjs.010022/tab-related-content) and was developed in collaboration with the information specialist at our institution.

Selection criteria

We included studies examining the experiences of adult (age > 18 yr) caregivers considered to be informal caregivers (defined as nonprofessional people providing care for another person in a home setting¹⁷) caring for patients after primary THA or TKA in an outpatient setting. To ensure that our review focused solely on the outpatient setting, only studies in which patients were discharged on the same calendar day of surgery were eligible. This is distinct from the term “outpatient” often used in the literature, meaning the patient is discharged within 23 hours after surgery, and the stay may include an overnight stay.¹

We considered articles that examined the experiences of the informal caregiver to identify the most important factors contributing to caregiver burden, including the emotional, physical, psychologic and social stressors associated with having to care for another person.⁵

Descriptive and observational study designs, including cross-sectional, case-control, and prospective and retrospective cohort studies, were eligible regardless of the year of publication and geographic location. Studies that included relevant surveys or questionnaires with appropriate outcome data were considered for inclusion, in addition

to systematic reviews, provided they were peer-reviewed. Additional inclusion criteria included abstracts relevant to the topic, studies in which the impact on caregivers was measured within the acute postoperative period (up to 6 wk after surgery) and studies in the English language.

We excluded studies focusing on patients who underwent THA or TKA and were discharged after a short overnight stay. Studies that investigated the transition toward outpatient surgical pathways and did not specifically aim to evaluate the perspective of key stakeholders such as caregivers were also excluded. Studies that measured the impact on caregivers beyond the acute postoperative period were excluded, as this duration may limit the caregiver’s ability to recall the caregiving experience.

Caregiver burden domains

To facilitate data collection, we aimed to categorize the various characteristics and factors that contributed to the burden of care under 6 domains: caregiving environment, caregiver-specific factors, dimensions of caregiving, duration of care, intensity of dependence and type of surgical procedure. We created these domains based on the dementia-related literature, in addition to our own experiences and interactions with patients undergoing outpatient TJA at our institution and their caregivers.¹⁸ Table 1 provides examples of factors that may contribute to the burden of care experienced by the caregiver, by domain.

Table 1. Characteristics and factors that may contribute to the burden of care experienced by the informal caregiver, organized by domain

Caregiver burden domain	Potential factors contributing to caregiver burden
Caregiving environment	<ul style="list-style-type: none"> • Number of dependents • Caregiver providing care for both older parents and their own children
Caregiver-specific factors	<ul style="list-style-type: none"> • Age • Gender • Health literacy • Relationship between patient and caregiver
Dimensions of caregiving	<ul style="list-style-type: none"> • Physical impact of caregiving • Emotional impact of caregiving • Social impact of caregiving • Financial impact of caregiving
Duration of care	<ul style="list-style-type: none"> • Hours • Days • Weeks • Months
Intensity of dependence	<ul style="list-style-type: none"> • Number of activities of daily living the caregiver is performing for the patient • Number of instrumental activities of daily living the caregiver is performing for the patient
Type of surgical procedure	<ul style="list-style-type: none"> • Major/minor surgery • Severity of patient pain
Adapted from Page and colleagues ¹⁸ with permission.	

Data extraction and analysis

Each title and abstract was screened independently by 2 reviewers (B.M.P. and O.V.). Removal of duplicates and screening were performed with Covidence software (Veritas Health Innovation). The full text of studies identified as being relevant was retrieved and screened to ensure that the concept, context and population met the inclusion criteria before a detailed independent full-text review by the 2 reviewers. Any disagreements were resolved with the help of a third reviewer (R.B.).

Two reviewers (B.M.P. and O.V.) independently extracted all relevant data into a collaborative data extraction form (Microsoft Excel). To check the accuracy and quality of all extracted data, each entry was cross-referenced in duplicate by the reviewers. Once articles were selected, the following data were recorded: author(s), country, year of publication, study design (e.g., qualitative/quantitative, caregiver recruitment methods), sample size, characteristics of participants (e.g., type of surgery, mean age), and related findings concerning characteristics and factors identified as having contributed to the burden of care experienced by the caregiver. The identified characteristic or factor was then assigned to the relevant caregiver burden domain and presented in the form of a narrative summary.

Methodologic quality and risk of bias

An assessment of the methodologic quality (risk of bias) of included studies was not performed; such an assessment is not commonly done for scoping reviews.^{15,16} Studies were not excluded because of their methodologic quality.

RESULTS

In total, we identified 1423 articles in the literature search, of which 310 were removed as duplicates. Of the 1113 articles that were screened, we excluded 1099 because the article concept, context or population did not meet the inclusion criteria (Figure 1). After full-text analysis of the 14 remaining articles, all 14 articles were excluded (Table 2), for the following reasons: the article focused on inpatient TJA ($n = 10$), the outcomes of the study were not relevant to understanding factors contributing to the burden of care of informal caregivers ($n = 3$), and the impact on caregivers was measured beyond the acute postoperative period ($n = 1$). Therefore, no articles met our inclusion criteria, and no data were available for extraction.

DISCUSSION

We performed a scoping review to identify the characteristics and factors contributing to the burden of care experienced by informal caregivers after outpatient TJA. Our primary finding was that, to our knowledge, there

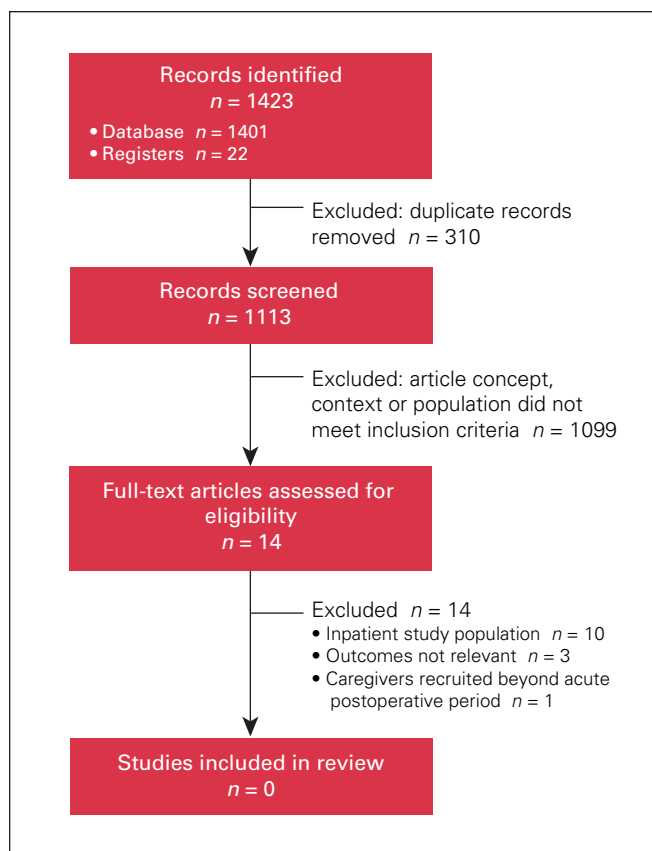


Fig. 1. Flow diagram showing search strategy.

Table 2. Studies excluded after full-text evaluation, with rationale for exclusion

Study	Rationale for exclusion
Churchill et al., ¹⁹ 2018	Caregivers recruited beyond acute postoperative period
Bull et al., ²⁰ 2017	Outcomes not relevant
Shepperd et al., ²¹ 2021	Inpatient study population
Weichih Chen et al., ²² 2021	Outcomes not relevant
Berthelsen et al., ²³ 2015	Inpatient study population
Berthelsen et al., ²⁴ 2017	Inpatient study population
Stark et al., ²⁵ 2016	Inpatient study population
Zietek et al., ²⁶ 2017	Inpatient study population
Zomar et al., ²⁷ 2021	Inpatient study population
Zomar et al., ²⁸ 2020	Outcomes not relevant
Jester, ²⁹ 2003	Inpatient study population
Berthelsen et al., ³⁰ 2017	Inpatient study population
Tseng et al., ³¹ 2019	Inpatient study population
Berthelsen et al., ³² 2014	Inpatient study population

are no studies investigating the factors contributing to caregiver burden in outpatient TJA.

More than 50% of TJA procedures are expected to be performed on an outpatient basis by 2026,³³ and, as health care systems work toward relieving the strain and surgical

backlog caused by the COVID-19 pandemic, the development of shorter-stay TJA programs has accelerated even further.³⁴ The unknown and unmeasured impact on informal caregivers has the potential to become an important societal problem. Aside from the financial, social and work-related stressors these caregivers experience, there is also the potential for health-related stressors. Based on our outpatient TJA program experience, the informal caregiver is most commonly the patient's spouse, is of similar age as the patient and, in the typical TJA population, has his or her own comorbidities. Among inpatients having undergone TJA, factors such as age,³⁵ employment status,³⁵ gender,²⁷ amount of assistance provided by the caregiver,²⁷ relationship to the patient²⁵ and perioperative phase³⁶ have been shown to be significant predictors of caregiver strain. Although it is reasonable to assume that these nonmodifiable predictors of caregiver strain in inpatient TJA would also be generalizable to outpatient TJA, there are likely additional modifiable factors that contribute to strain that are unique to caregivers of patients who have had outpatient TJA.

With outpatient TJA, the burden of care, including more acute caregiving needs such as mobility, medication dispensing, hygiene, toileting and food preparation, is transferred to the informal caregiver mere hours postoperatively. Based on our clinical experience, caregivers often highlight the need to be available 24 hours a day beginning immediately on discharge from hospital and lasting for at least the first 3 days postoperatively in order to tend to the patient's needs. Therefore, one modifiable factor would be to share the caregiving responsibilities with additional caregivers, especially on the day of surgery and first postoperative day, when the burden of care is at its peak. In addition, the physical demands placed on caregivers of patients who have had outpatient TJA may differ from those of inpatient caregivers, who traditionally initiate caregiving on postoperative day 2 and may have a better understanding of the physical demands and responsibilities after engaging with the in-hospital physical therapist. As such, although the outpatient's spouse or first-degree relative may be the most obvious and comfortable choice as caregiver, the physical burden underscores the need for a physically capable caregiver, who may not be available to all patients.

Finally, another factor that is readily modifiable and likely to contribute to the burden of care in the immediate postoperative period is the health literacy of the caregiver; i.e., the ability of the caregiver to find, understand and use information to inform health-related decisions and actions for themselves and others.³⁷ Indeed, outpatient caregivers have reported added stress and confusion when important health-related information is missing or not well known.¹⁹ Identifying caregivers well in advance of surgery and providing targeted high-yield education may better prepare the caregiver for common caregiving tasks and reduce the caregiver burden.

Limitations

This scoping review applied a systematic and rigorous search strategy to retrieve articles relevant to our research objectives. However, only publications in English were considered for inclusion, which may have induced language bias and may have omitted relevant studies published in other languages. No studies were found to have met our inclusion criteria, and, thus, no studies were included in our final analysis. We recognize that, even if data were available, any findings from a given country may not be generalizable to the next, given the differences in health care systems and available resources. For example, some same-day TJA programs in the United States offer visits by home care nurses,^{38,39} at-home physical therapy³⁸⁻⁴⁰ and calls by the lead surgeon on postoperative day 1,^{41,42} which may contribute to a lesser burden of care placed on the caregiver. These resources are not routinely available in many Canadian settings. Finally, we recognize that, by including only studies in which patients were discharged on the same calendar day as surgery, we excluded “ambulatory surgery” studies, wherein patients are discharged from hospital after a 23-hour stay. However, we believe that the burden of care for caregivers who begin the caregiving process after an overnight stay is materially different from that of caregivers who start the caregiving process on the same calendar day of surgery. For example, given that the local anesthetic used in regional blocks wears off anywhere from 6 to 8 hours after surgery, the first postoperative night is arguably the most painful for the patient and most burdensome for the caregiver. In addition, caregivers who begin the caregiving process after a 23-hour overnight stay may have a better understanding of how to deal with pain management, having had the opportunity to work with the in-hospital nursing team.

CONCLUSION

This scoping review underlines the substantial gap in knowledge surrounding the characteristics and factors that contribute to the burden of care experienced by informal caregivers in the acute postoperative period after outpatient TJA. Future research to identify, quantify and determine the modifiability of characteristics and factors that contribute to the burden of care is required to develop and inform strategies aiming to lessen the strain placed on caregivers and improve their caregiving experience.

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