Review Paper

ANNALS OF SURGERY OPEN

OPEN

Pain Management in the Postoperative Period for People With Dementia: An Integrative Review

Emily K. Neville, MD,*† Snezana Stolic, PhD,‡ Ruth A. Wagstaff, PhD,§ and Christine C. Neville, PhD‖

Objective: With the increased global prevalence of older people with dementia, more will present for surgery over the coming decades. Therefore, the objective of this study was to synthesize the existing research about how pain in managed for people with dementia in the postoperative period and discuss the implications for clinical practice.

Methods: For this integrative review, the Cumulative Index to Nursing and Allied Health literature, Medline/Pubmed, ProQuest, ERIC, and Health Source Nursing were searched to identify original empirical research published between 2000 and 2021. Tasks were divided between reviewers to ensure independent study selection, data extraction, and risk of bias assessment.

Results: Eleven articles were eligible. The evidence is incompletely developed therefore the review focused on pain assessment, the types and amount of pain relief, that people with dementia receive less analgesia than people without dementia and the challenges for effective pain management. Most studies were surgery for hip fracture so there is scope to look at outcomes for other types of surgery. Analgesia was administered but it was noted that even over a 20-year period, people with dementia received less than cognitively intact people. Pain management could have a stronger evidence-base with more psychometric development of pain assessment tools. Challenges are due to the impaired ability of the person with dementia to communicate pain and that clinicians have difficulty understanding pain behavior in people with dementia.

Conclusion: Adequate pain management for people with dementia in the postoperative period is important for a faster and better recovery.

Key words: age, analgesia, dementia, frail elderly, integrative review, older people, opioids, pain, pain assessment, postoperative pain management, postoperative treatment, surgery

INTRODUCTION

Some of the most common reasons for hospitalization of people with dementia are trauma or fall, ischemic heart disease, and gastrointestinal disease.[1] These conditions may require surgical intervention with pain at wound sites as a consequence.[2,3] Everyone perceives and interprets pain differently based on their own experiences, making it difficult to predict an individual's response to postoperative pain including stress responses such as anxiety and facial or verbal expressions.[4] However, it becomes more complicated for people with dementia as the brain structures involved in pain processing alter the pain experience.[5] Lawn et al's[5] analysis of psychophysical and neuroimaging studies determined that people with dementia potentially suffer more pain and have greater emotional reactivity and pain processing. This makes self-report of pain increasingly difficult as dementia progresses and emphasizes the need for safe and effective pain management which can include analgesia.

Adequate analgesia postoperatively maximizes mobilization, improves recovery time, lessens the risk of chronic pain, and reduces hospital length of stay[6–8] but appropriate pain management in the postoperative period for people with dementia remains challenging. Multimodal analgesic regimes are common postoperatively and rely on self-reported pain, ideally with clinicians using valid and reliable pain measures to ensure adequate administration of analgesia.[9] However, Tsai et al[10] found that the management of pain in people with dementia in hospital is poor, as validated tools are often not used, or pain assessed frequently enough. This is concerning because good pain management including timely administration of analgesia in the postoperative period depends on reliable assessment. A recent narrative review of perioperative care for older adults highlighted their needs and common strategies for pain management,[11] whereas this integrative review appraised research studies to establish what has taken place in regard to pain management specifically for people with dementia in the unique postoperative setting. Therefore, the aims of this integrative review were to: (1) identify and examine the existing research about how pain in managed for people with dementia in the postoperative period, and (2) discuss the implications for clinical practice.

METHODS

Whittemore and Knafl's[12] integrative review method was chosen as it allows a comprehensive analysis of literature about a specific aspect of a healthcare problem. The Strengthening the

*From the *Department of General Surgery, St Vincent's Hospital, Melbourne, VIC, Australia; †University of Notre Dame Australia, School of Medicine, Wagga Wagga Rural Clinical School, Wagga Wagga, NSW, Australia; ‡School of Nursing and Midwifery, University of Southern Queensland, Ipswich, QLD, Australia; §School of Nursing and Midwifery, University of Southern Queensland, Toowoomba, QLD, Australia; and ‖School of Nursing and Midwifery, University of Southern Queensland, Toowoomba, QLD, Australia.*

Disclosure: The authors declare that they have nothing to disclose.

SDC *Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.annalsofsurgery.com).*

Reprints: Emily K. Neville, MD, Department of General Surgery, St Vincent's Hospital Melbourne, 41 Victoria Parade, Fitzroy Victoria 3065, Australia. Email: dremilyneville@gmail.com.

Annals of Surgery Open (2023) 3:e301

Received: 13 September 2022; Accepted 31 May 2023

Published online 5 July 2023

DOI: 10.1097/AS9.0000000000000301

Report of Observational Studies in Epidemiology Statement: Guidelines for Reporting Observational Studies checklist was also adopted.[13] Due to the nature of pain assessment, many studies are observational as it is difficult to conduct randomized control trials. The following question guided the search: How is pain managed in the postoperative period for people with dementia?

LITERATURE SEARCH

Following the design of the protocol, authors 2 and 3 independently conducted the literature search, screening and then compared their final lists. Differences in the final screen were discussed and a consensus reached about whether a paper was included. All the papers on the final screening were included. Five electronic databases were used to identify original research published between 2000 and 2021: the Cumulative Index to Nursing and Allied Health literature, Medline/Pubmed, ProQuest, Educational Resources Information Centre, and Health Source Nursing. The search terms were following MeSH (medical subject headings) terms and text words in various combinations and permutations (a) the *Evaluations* terms: "surgery" OR "operation" OR "surgical procedure" OR "postoperative" OR "recovery" OR "pain*" OR "pain management" OR "pain assessment" OR "pain reduction" OR "pain control" OR "analgesia," (b) the *Population* terms: "health care prof*" OR "dementia" OR "cognitive impairment" OR "patient," and (c) the *Design* terms: "experimental" OR "impact" OR "study" OR "evaluation" effect. All relevant studies were imported into Endnote X9.

DATA EVALUATION

A total of 747 records were retrieved. Duplicates were removed by hand and by a reference software manager. The titles and/or abstracts of the remaining 718 records were screened according to the inclusion and exclusion criteria. A total of 632 records were excluded, leaving 86 articles to be assessed for eligibility. During full text review, 39 articles were excluded based on inclusion criteria. The reference list of eligible articles was checked and those that met the criteria were retrieved and reviewed to ensure for data completeness an additional one article was included.[12] A total of 11 studies met the eligibility criteria for this review. See Figure 1 for the study selection process.

INCLUSION CRITERIA

Studies had to meet the following inclusion criteria: (a) available in English language, (b) published in peer-reviewed journals between 2000 and 2021, (c) to be quantitative, qualitative, or mixed methods, (d) sample included clinicians in a health

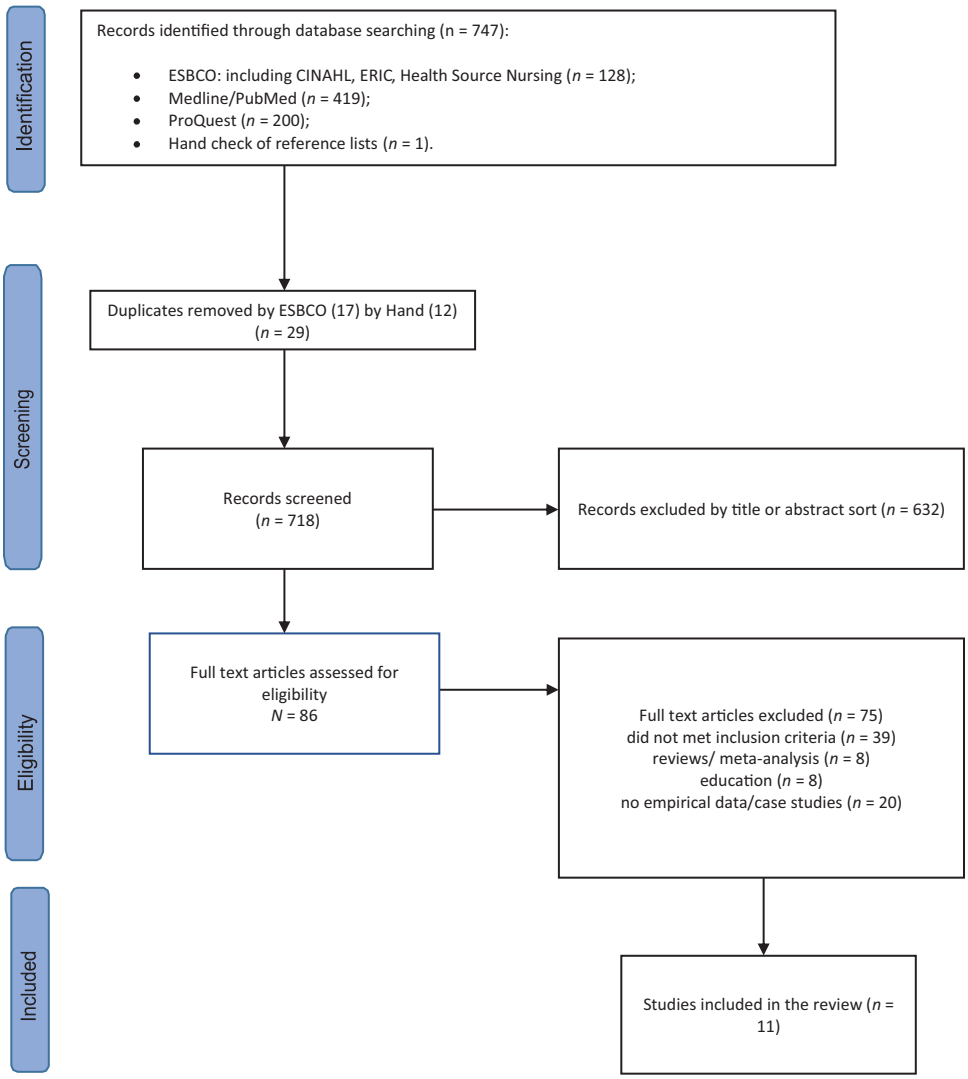


FIGURE 1. Study selection process.

setting, (e) study outcomes measured pain in postoperative period, and (f) participants were cognitively impaired or had dementia.

EXCLUSION CRITERIA

Studies were excluded if they focused on delirium, development, risk, complication, clinical outcomes other than pain, chronic disease, nursing homes, older adults without dementia. Studies about the preoperative period, were not surgery, were follow-up, conditions rather than pain, or forecasting pain were also excluded. Also, studies reporting staffing satisfaction, perceptions or attitudes were excluded, as was research conducted outside the hospital setting. The hospital setting was chosen exclusively as this environment can be distressing for people with dementia due to an inability to cope with unfamiliar surroundings, people, and routines.[14] Qualitative studies of pain experiences and meaning studies of older adults who were not hospitalized were excluded.

QUALITY APPRAISAL

The risk of bias for each study was assessed. As seen in Table 1, the risk of bias for randomized control studies was assessed using the Cochrane Risk of Bias-2.[22] As seen in Table 2, the risk of bias in nonrandomized studies was assessed using the Risk of Bias in Non-Randomized Studies of Interventions.[24] As seen in Table 3, qualitative studies were assessed using the Joanna Briggs Institute Checklist for Qualitative Research.[28]

RESULTS

Pain management for people with dementia who live at home, in aged care facilities, or are in hospital for short-term treatment has been of primary concern to clinicians. However, postoperative pain management for people with dementia has not been systematically reviewed. This review found that the evidence is incompletely developed, and more work is needed to further set the agenda to improve pain management in the postoperative period for people with dementia. Close examination of the results allowed for some themes to be identified. These were assessment of pain, types and amount of pain relief, and the challenges for effective pain management. The extracted data used in the review is in Supplemental Table 1, http://links.lww.com/AOSO/A225.

ASSESSMENT OF PAIN

Although pain is a subjective experience and self-report is the gold standard, self-report is not always possible, especially in severe dementia.[19] When self-report is not possible, observational pain assessment tools can be used.[11] This review identified four pain assessment tools were used in the postoperative period.

The Numeric Rating Scale (NRS) is recommended for use by the American Geriatrics Society (AGS) for people with mild to moderate dementia who can self-report.[29] Sieber et al[21] used the NRS to measure postoperative pain in people with and without dementia following hip surgery. They reported that there was missing data and postulated that some people with possible dementia may not have reported pain. However, their statistical analysis demonstrated that the intact pain report data sets did not differ from the pain sets with missing data.

The Visual Analogue Scale (VAS) is a measure of pain levels where "0 centimeters (cm)" is *no pain* and "10 cm" is *extreme pain*. A cross is placed on a 10 cm line to indicate pain level.[30] This can be done by self-report or a clinician can act as a proxy when a person cannot rate their pain. Clinicians assess pain behavior and facial expression to estimate pain level.[16] When the VAS was used in the postoperative environment, one study reported it had limited use[23] but another did not report this as a limitation.[16]

TABLE 1.

Summary of ROBINS-I Assessment for Nonrandomized Studies

	Bias Due to Confounding	Bias in Selection of Participants Into the Study	Bias in the Classification of Interventions	Bias Due to Deviations From Intended Interventions	Bias Due to Missing Data	Bias in Measurement Outcomes	Bias in Selection of Reported Results	Overall
DeWaters et al[15]	C	L	L	L	C	L	L	C
Garlich et al[16]	S	L	L	M	L	S	L	S
Jensen-Dahm et al[17]	M	NI	L	M	M	M	L	S
Morrison & Siu[18]	M	L	M	L	NI	M	L	S
Natavio et al[19]	M	L	L	L	NI	M	L	S
Neuman et al[20]	C	NI	M	M	L	M	L	C
Sieber et al[21]	M	L	M	NI	NI	M	M	S

When assessing for overall level, NI, is considered serious as it questions the transparency of the findings, and where one or more bias domains cannot be assessed due to NI, the risk of bias is considered serious. C in a red cell = critical risk of bias; L in a green cell = low risk of bias; M in a blue cell = moderate risk of bias; NI in a gray cell = No information/not possible to assess; ROBINS-I = Cochrane Risk of Bias in Non-randomized Studies of Interventions; S in an orange cell = serious risk of bias.

TABLE 2.

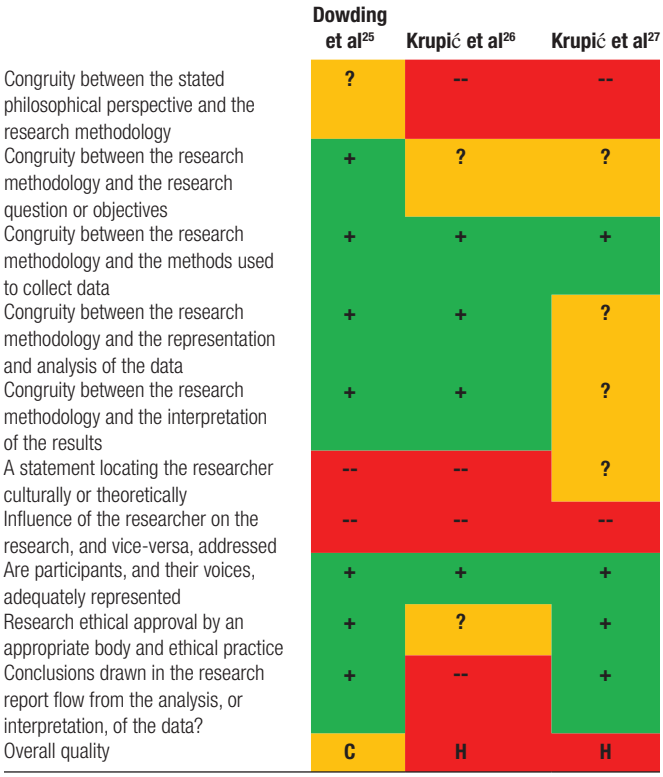
Summary of Cochrane Risk of Bias for Randomized Control Studies (RoB-2)

	Risk of Bias From the Randomization Process	Risk of Bias Due to Deviations From Intended Interventions	Risk of Bias Due to Missing Outcome Data	Risk of Bias in Measurement of the Outcome	Risk of Bias in Selection of the Reported Result	Overall Risk of Bias
Unneby et al[23]	--	?	--	--	?	--

Green square with + = Low risk of bias; Orange square with a? = some concern; Red square with - = high risk of bias.

TABLE 3.

Summary of the Joanna Briggs Institute Checklist for Qualitative Research



Green square with a cross= yes; Red square with a - = no; Orange square with a? = uncertain; C = some concern about the reliability and validity; high risk of invalid and unreliable findings.

The Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) is a 60 item, observational tool comprising five subscales that measure facial expression, activity, body movement, social personality, mood and "other," for example, changes in eating and sleeping habits.[31] The higher the score (0–60), the more intense the level of pain. The PACSLAC had good inter-rater reliability when tested with people with severe dementia and was liked by clinicians because it includes a comprehensive list of observable pain behaviors.[19] Although it has 60 items, it is easy to use and requires about 5 minutes to complete.[32] Given the PACSLAC includes all 6 pain behavior categories of the AGS Guidelines,[29] that is, (1) facial expressions; (2) verbalizations, vocalizations; (3) body movements; (4) changes in interpersonal interactions; (5) changes in activity patterns or routines; and (6) mental status changes, it could be time well spent if the outcomes aid clinical decision-making.

The Pain Assessment in Advanced Dementia Scale (PAINAD) has 5 items and observes negative vocalization, body language, consolability, breathing, and facial expression.[33] It is a Likert-like scale from 0 (*normal behavior/vocalization*) to 2 (*more frequent or extreme behavior/vocalization*). Scores range from 0 to 10 and the higher the score the higher the pain level. Natavio et al[19] found the PAINAD had reasonably good inter-rater reliability when used by several clinicians to assess people with severe dementia. DeWaters et al[15] who assessed pain in hospitalized cognitively impaired and intact older adults admitted for surgical repair of hip fracture reported the PAINAD as a valid (concurrent $r = 0.915$, $P < 0.001$; discriminant $z = -2.755$, $P = 0.006$, n = 12) and reliable (inter-rater ICC = 0.98; internal consistency $\alpha = 0.847$) tool for use in the postoperative setting for older people with cognitive impairment who are unable or reluctant to self-report pain. Clinicians liked using it because it takes limited time to complete and was easy to use. However, the PAINAD includes only 3 of the 6 categories of nonverbal pain behaviors in the AGS Guidelines: (1) facial expressions; (2) verbalizations, vocalizations; and, (3) body movements,[29] thereby compromising its ability to detect the more subtle changes in behavior.[32]

TYPES AND AMOUNT OF PAIN RELIEF

In 4 repair of hip fracture studies, opioids were used for the postoperative management of pain. Morrison and Sui[18] in 2000 recorded the mean daily dose of parenteral morphine sulphate through to day 3 as 4.1 mg for people without dementia and 1.5 mg for people with dementia ($P = 0.002$). This means that on average, people without dementia received triple the amount of analgesia as those with dementia despite more than 40% of people without dementia reporting severe to very severe pain. Moreover, only 24% of people with dementia had a standing order for analgesia with the other 76% receiving it if they were assessed as having visible pain-related behavior.

Later in 2011, Sieber et al[21] noted that during the post-anesthesia period, intravenous hydromorphone was administered every 5 minutes by 0.1 to 0.2 mg increments, and when discharged to an intensive care unit (ICU), analgesia was changed to intravenous morphine sulphate 1 to 2 mg every 5 minutes until pain relief was achieved. On transfer to a general ward, analgesia was changed to patient-controlled analgesia (PCA) morphine dose of standardized boluses of 0.5 to 1 mg. PCA was discontinued when pain was under good control and acetaminophen (500–1000 mg q8h) and/or oxycodone (2.5–10 mg q4h) for breakthrough pain once oral medications were tolerated. Sieber et al[21] reported that dementia was associated with less opioid use ($P < 0.001$). Additionally, people with dementia were less likely than people without dementia to receive PCA on arrival to the hospital ward, although it is unknown if people with dementia could effectively use PCA.[11,21]

In 2016, Jensen-Dahm et al[17] reported that during the first 72-hour postoperative period, the mean doses of oral morphine equivalents were between 25 and 30 mg. People with dementia received lower doses of morphine on day 1 [dementia vs no dementia: 29.0 (26.4–31.8) vs 34.7 (33.1–36.4) mg, $P = 0.001$] and day 2 [27.8 (25.4–30.5) vs 31.2 (29.9–32.4) mg, $P = 0.019$] but not on day 3 ($P = 0.10$) and were more likely to get pro re nata (PRN) medication, but the proportion of PRN medication decreased over time. Jensen-Dahm et al[17] postulated that the lower doses of opioids may be an indication of uncertainty about how to manage pain in people with dementia. Then in 2020, Natavio et al[19] with a convenience sample of 30 people with dementia noted the use of intravenous morphine or fentanyl or oral tylenol with an individual median morphine equivalent dose of between 5.0 and 6.0 mg during the 24- to 72-hour assessment period (T. Natavio, PhD, College of Nursing, Wayne State University, Detroit, Michigan, 03/03/23, email correspondence, personal communication). The greater amount of postoperative analgesia was reported by the last 2 studies.[17,19]

Three studies reported that preoperative nerve blocks for hip fracture repair are an alternative pain management strategy for postoperative pain management for people with dementia as opioids are difficult to adjust and side effects are common.[16,23,34] Unneby et al[23] used 40 mL levobupivacaine 0.25% (a local anesthetic) as a femoral nerve block and a second femoral nerve block was administered to 9 of 129 participants when surgery was delayed and PRN. They went on to report lower pain scores and lesser opioid-related side effects.[23] Garlich et al[16] found that fascia iliac block of a single shot of 30- to 40-mL bolus injection of 0.25% bupivacaine with 1:200,000 epinephrine, and a continuous in place nerve catheter of an injected bolus of 10 to 20 mL of 0.2% bupivacaine followed by a continuous infusion of 0.2% bupivacaine at 6 mL/h until the morning of postoperative day 1 was equally effective in reducing preoperative opioid intake.[16] In addition to these findings, White et al[34] suggested

that continuous nerve blocks using a well-secured catheter when prolonged analgesia is required, reduces, and sometimes avoids opioid use. They recommended including a perioperative care bundle and a memory aid in the chart documents with reminders about anesthetic considerations and pain management.[34] Neuman et al[20] who in their study identified predictors of nerve block receipt established that a history of dementia was associated with a reduced chance of receiving a nerve block (Odds Ratio [OR] = 0.88; 95% Confidence Interval [CI] = 0.80–0.98; $P = 0.02$) and put this down to different perceptions of pain management needs for different groups of people.

Two studies examined nonopioid drug administration. Natavio et al[19] provided no more details other than that nonopioids were administered. Jensen-Dahm et al[17] reported that during the first 3 postoperative days, the mean dosage of paracetamol was 2500 and 3500 mg. People with dementia received lower doses during the first 3 postoperative days (day 1: $P < 0.0001$; day 2: $P = 0.037$; day 3: $P < 0.0001$). Additionally, they found that although Non-steroidal anti-inflammatory drugs were administered during this time, there was not enough administered for a meaningful analysis.[17]

CHALLENGES FOR EFFECTIVE PAIN MANAGEMENT

One qualitative study examined the confidence of orthopedic nurses in pain assessment of people with dementia who had limited or no verbal communication skills. Nurses who lacked confidence in identifying pain behavior also lacked confidence in their analgesic decisions. In contrast, nurses who were confident in their observational pain assessment skills were also confident in their analgesic choices.[19] Therefore, confidence in pain assessment is likely to impact management.

In another qualitative study, nurses in an orthopedic ICU reported pain assessment difficult due to communication barriers. If a person could not verbalize their pain, nurses depended on observing nonverbal cues such as facial expression, mood changes, and body language. They also relied on the family or carers, previous hospital notes, senior nurses, or nurses experienced with dementia care to confirm their pain assessment.[26,27] Nurses reported the challenges due to lack of dementia-specific education, insufficient time to know the person's normal behavior and to elicit responses to questions, and not having family or carers in the ICU who knew the person's normal and pain-related behavior.[27]

Dowding et al[25] in their qualitative work, found that most nurses did not use pain assessment tools but depended on past experiences, including the expectation that pain was likely to be expressed as changes in behavior, facial expressions, vocalizations, and cues such as being in a surgical ward and analgesic prescription. However, once the person with dementia was discharged from the surgical ward, there was less likelihood that changes in behavior would be linked to pain.

RISK OF BIAS IN QUANTITATIVE STUDIES AND QUALITY OF QUALITATIVE STUDIES

There were 7 nonrandomized clinical studies.[15–21] Five of the studies were assessed as at an overall risk of serious[16–19,21] and 2 at an overall risk of critical bias.[15,20] In all the studies, there was a risk of bias due to confounding variables, and 5 of the 7 studies omitted information needed to assess at least one area of potential bias.[17–21] Six nonrandomized studies were at low risk of bias in the selection of reported results,[15–20] and one at medium risk of bias (Table 1).[21] There was one randomized clinical trial, and it was assessed at an overall high risk of bias as 3 potential areas of bias were assessed at high risk of bias and there was concern about 2 other areas (Table 2).[23]

There were 3 qualitative studies.[25–27] The overall quality of one study was assessed as some concern,[25] and 2 studies were at a high risk of invalid and unreliable findings.[26,27] There was at least one quality category. None of the authors addressed their influence on the research or their theoretical approach to the study, and there was a lack of congruity between the philosophical perspective of the research and the methodology of the study. All studies were assessed as expressing the voice of the participants (Table 3).

DISCUSSION

How pain is assessed is compounded by the effects of anesthetic medication, frailty, and cognitive changes that may influence pain-related behavior.[35–38] Krupić et al[26] found that clinicians relied on recognizing facial expression and body language for signs of pain before using the first premise of pain assessment, that is, asking the person if they have pain. People with dementia can self-report pain, particularly in the earlier stages of dementia.[11,39] Four pain assessment tools were used in 6 of the reviewed studies: the NRS,[15,18,21] the VAS,[16,23] the PACSLAC,[19] and the PAINAD.[15,19] The gold standard for pain assessment are the guidelines of International Association for the Study of Pain.[40] The International Association for the Study of Pain recommend that the results of neuropsychological screening should guide the interpretation of self-report and measures of observed facial expression, vocalizations, and movement.[41] However, the neuropsychological cut-offs which indicate the reliability of self-report was not disclosed. Guidelines for determining the weight of self-report and clinical observation are yet to be established.

Additionally, the pain assessment tool needs to be fit for purpose. A recent review of the psychometric properties of pain assessment tools for people with dementia found facial expressions were the most reliable pain behavior measure with less support for movement and vocalization.[42] Theoretically, facial pain expression should be a reliable indicator of pain as people with dementia generally have a more animated pain expression than people without dementia.[41] However, the lack of certainty in interpreting behavior in people with dementia as pain related,[43] often results in clinical decisions which favor the trial of nonpharmacological treatments before administering analgesia.[44]

Our findings suggest that the amount of postoperative pain relief for people with dementia has received more attention over the last 20 years.[17,19,21] However, we found less pain relief is prescribed to people with dementia than people without dementia.[17,19–21] There are several possibilities for lower levels of pain relief. One is that opioids are prescribed with caution given the risks associated with sedation and impaired mental function.[17] Moreover, the more challenging clinicians find it to assess pain, especially in severe dementia, the more likely that lower doses of opioids and less PRN opioid is administration.[17] Consequently, the need for analgesia is underestimated and pain management becomes trial and error.[27] Other possibilities for lower levels of pain relief are that poor knowledge of dementia syndrome and of the person, in general, make it challenging to identify signs of pain and to trust self-report in those who can verbalize pain levels.[26,27,45,46]

It is concerning that research 20 years ago also flagged the need for improved postoperative pain management for people with dementia. Concerns about unwanted side effects such as confusion, increased risks of falls from pharmacological interventions are most valid. Interestingly, it was noticeable that nonpharmacological interventions were not captured in the literature search or examined in any of the reviewed studies. Some nonpharmacological interventions are transcutaneous electrical nerve stimulation, exercise, relaxation, distraction, heat and/or cold packs, biofeedback, massage, body positioning, pressure care, adequate food, and fluid.[11,47–49] There is a growing evidence-base for these interventions[50] but there is more scope for research into clinical application for people with dementia in the postoperative period.

Specific challenges were that some clinicians lack confidence in identifying pain and would appreciate the help of more experienced clinicians, family, and other carers. A 2-pronged approach to increase clinicians' confidence in administering adequate pain relief has been suggested.[27,34] One approach put forward by the reviewed study of Krupić et al[27] is improved education for (a) pain management in dementia, (b) communicating with a person with dementia, (c) strategies to involve carers and family in perioperative care since they may be able to distinguish between the normal, changed, and pain behavior of the person with dementia, and (d) understanding pain from the perspective of people with dementia. Another approach identified in White et al's[34] guidelines and supported by Krupić et al[27] is to collect pain-related information in the preoperative period and pass on the information to the perioperative team. Knowing what is the person's normal behavior and preoperative behavior is paramount for the accurate interpretation of pain behavior in the postoperative period. Pain behaviors such as agitation, sleep difficulties, anxiety, and vocalization also constitute the "behavioral and psychological symptoms of dementia" (BPSD).[51,52] Therefore, to differentiate between BPSD and what behavior is being magnified by pain requires timely and accurate recording and would benefit from the inclusion of a valid and reliable tool for measuring BPSD.[53] Furthermore, our findings would build on these recommendations by establishing the level of dementia if a diagnosis is not available and this can be done with the Mini-Cog,[11,54,55] Mini Mental State Exam (MMSE),[56] or the Global Deterioration Scale (GDS).[57] This information will determine if a self-report pain assessment tool or an observational one is required. It is important that the same process is used each time pain is assessed particularly if analgesia is administered. Such actions would enhance the decision-making process of whether to give more pain relief thereby countering the issue of under-treatment. Being open to nonpharmacological pain management strategies and the routine use of evidence-based clinical practice guidelines are also recommendations from this review and others.[11]

There is increasing evidence that preoperative interventions can achieve better outcomes after surgery. An example is the American College of Surgeons Geriatric Surgery Verification Program[58] which has been built and centered around evidence-based standards. Another example is the use of transitional pain services[59] that are responsible for acute pain management of people in hospital but also deal with other areas of pain medicine, such as chronic pain management at a tertiary level and community primary care services.[60] Some issues regarding preoperative pain management for people with dementia include consent and capacity, preoperative risk assessment and management, and potential for interactions between drugs used specifically to treat dementia and those used in surgery.[61] A variety of pain services have been available to prepare people for surgery and reduce their anxiety[11] but are not designed for people with dementia. However, if family or carers provide the pain service team with comprehensive information about the person with dementia, it can help recovery postsurgery.[60,61]

Dementia education is an urgent need for clinicians who work in the postoperative period.[26,27] Krupić et al[26,27] reported that clinicians had a poor understanding of dementia and limited communication skills. They noted that clinicians wanted the best for people with dementia, but that the day's overall work schedule could be severely disrupted by a person with dementia and caused stress within the clinical setting.[27] Additionally, Natavio et al[19] reported a significant number of clinicians lacked confidence in recognizing pain and analgesia decisions. These findings add to the growing evidence for more dementia education.[14,27] Such challenges to optimal care provide a starting point for education programs with topics that demystify dementia by explaining BPSD, increase awareness of stereotypes, and provide practical opportunities to develop relevant communication and observation skills.

There are guidelines for pain assessment in dementia[29] and specifically for perioperative care[34] but Krupić et al[26,27] showed that these are not in routine use. However, the guidelines could do with some more detail to support clinical decision-making. Future research could establish a comprehensive framework of recommended neuropsychological cut-offs to determine when self-reported pain needs to be supported by observational pain assessment tools.[41] Evidence also suggests that current assessment tools may be adequate, but the barrier is clinicians need more confidence to implement the guidelines and to use the pain assessment tools.[26] The barriers for greater clinical confidence have been identified[25–27] and to further this work, evidence-based interventions need to be developed and tested. This may lead to clinical decision-making resulting in better postoperative care for people with dementia through improved pain management.

The findings also highlight the need for person-centered care. The complexity of BPSD, the unpredictable effect of operative pain on behavior, challenging communication styles, and the time-consuming nature of caring for people with dementia in acute settings, suggest that perioperative clinicians specializing in dementia care, would provide direct support for people with dementia. Specialist clinicians would optimize person-centered care and increase the likelihood of optimal perioperative analgesia. It is expected that specialist clinicians would minimize the negative effects of hospitalization, and shorten hospital stays and thereby reduce overall costs.[62]

LIMITATIONS

The small number of reviewed studies is a limitation, but it suggests that the research for pain management in the postoperative period for people with dementia is scarce: this review found 11 studies published over 20 years. Most of the studies investigated pain management after surgery for hip fracture. Therefore, these findings may not generalize to non-orthopedic postoperative pain management and indicates the need for further research.

Cognitive impairment and dementia were often not clearly defined or used interchangeably. For instance, one study used "probably dementia" which is inconclusive.[21] Four studies determined the presence of dementia with the MMSE[15,18,19,23,56] and one also used the GDS[57] to indicate the severity of dementia.[18] Given most studies did not consider the severity of dementia and that there are great variations in a person's ability to respond in the mild, moderate, and severe stages makes clinical application of the findings more challenging.[16,17,25] This highlights the need for coordinated and standardized research protocols to move the research agenda forward.

The risk of bias and quality assessments suggest that the results may not reflect what occurs in the normal postoperative period as there was a known researcher–participant relationship, but the possible effects were not discussed[27] and confidentiality protocols not disclosed.[26] It was also noted that, the risk of socially desirable responses is not included in the JBI risk of bias assessment. Therefore, the risk of bias due to undisclosed information could be attributed to socially desirable responses as well as implicit researcher bias.

Seven of the studies were conducted in the United States,[15,16,18–21,25] 3 in Sweden,[23,26,27] and 1 in Denmark.[17] This represents a concentration of knowledge generation from the United States and Northern Europe so there is further scope for different cultural and health system perspectives.

CONCLUSIONS

Our aims were to synthesize the literature about how pain in managed for people with dementia in the postoperative period and discuss the implications for clinical practice. We found that the limited research on this topic has focused on surgery for hip fracture. Pain is usually managed with analgesics, however people with dementia received less pain relief than cognitively

intact people. Moreover, there is little evidence that research-based pain assessment in the postoperative period occurs and the psychometric properties of pain assessment tools in this setting is to be further established. The difficulty of pain management is partially due to dementia impairing the ability of the person to communicate pain, but also because clinicians have difficulty understanding pain behavior in people with dementia. Good pain management for people with dementia in the postoperative setting is important for recovery and to minimize hospital stays. More knowledge is required for this topic, and it is time to understand the needs of people with dementia for better outcomes and to support the clinicians who care for them.

ACKNOWLEDGMENTS

E.K.N. participated in research design; writing of the paper; performance of the research; data analysis. S.S. participated in research design; writing of the paper; performance of the research; data analysis. R.W. participated in research design; writing of the paper; performance of the research; data analysis. C.N. participated in research design; writing of the paper; performance of the research; data analysis.

REFERENCES

1. Rudolph JL, Zanin NM, Jones RN, et al. Hospitalization in community-dwelling persons with Alzheimer's disease: frequency and causes. *J Am Geriatr Soc*. 2010;58:1542–1548.
2. Eriksson K, Wikstrom L, Fridlund B, et al. Association of pain ratings with the prediction of early physical recovery after general and orthopaedic surgery-a quantitative study with repeated measures. *J Adv Nurs*. 2017;73:2664–2675.
3. Nilsson U, Idvall E. Pain assessments in day surgery patients. *J Clin Nurs*. 2010;19:2942–2943.
4. Stolic S, Mitchell M. Pain management for patients in cardiac surgical intensive care units has not improved over time. *Aust Crit Care*. 2010;23:157–159.
5. Lawn T, Aman Y, Rukavina K, et al. Pain in the neurodegenerating brain: insights into pharmacotherapy for Alzheimer disease and Parkinson disease. *Pain*. 2021;162:999–1006.
6. Eriksson K, Wikstrom L, Lindblad-Fridh M, et al. Using mode and maximum values from the numeric rating scale when evaluating postoperative pain management and recovery. *J Clin Nurs*. 2013;22:638–647.
7. Beloeil H, Sulpice L. Peri-operative pain and its consequences. *J Visc Surg*. 2016;153:S15–S18.
8. Zhang S, Huang Q, Xie J, et al. Factors influencing postoperative length of stay in an enhanced recovery after surgery program for primary total knee arthroplasty. *J Orthop Surg Res*. 2018;13:29.
9. Kaptain K, Bregnballe V, Dreyer P. Patient participation in postoperative pain assessment after spine surgery in a recovery unit. *J Clin Nurs*. 2017;26:2986–2994.
10. Tsai IP, Jeong SY, Hunter S. Pain assessment and management for older patients with dementia in hospitals: an integrative literature review. *Pain Manag Nurs*. 2018;19:54–71.
11. Shellito AD, Dworsky JQ, Kirkland PJ, et al. Perioperative pain management issues unique to older adults undergoing surgery: a narrative review. *Ann Surg Open*. 2021;2:e072.
12. Whittemore R, Knafl K. The integrative review: updated methodology. *J Adv Nurs*. 2005;52:546–553.
13. von Elm E, Altman D, Egger M, et al. Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *BMJ*. 2007;335:806–808.
14. Digby R, Lee S, Williams A. The experience of people with dementia and nurses in hospital: an integrative review. *J Clin Nurs*. 2017;26:1152–1171.
15. DeWaters T, Faut-Callahan M, McCann JJ, et al. Comparison of self-reported pain and the PAINAD scale in hospitalized cognitively impaired and intact older adults after hip fracture surgery. *Orthop Nurs*. 2008;27:21–28.
16. Garlich JM, Pujari A, Moak Z, et al. Pain management with early regional anesthesia in geriatric hip fracture patients. *J Am Geriatr Soc*. 2020;68:2043–2050.
17. Jensen-Dahm C, Palm H, Gasse C, et al. Postoperative Treatment of Pain after Hip Fracture in Elderly Patients with Dementia. *Dement Geriatr Cogn Disord*. 2016;41:181–191.
18. Morrison RS, Siu AL. A comparison of pain and its treatment in advanced dementia and cognitively intact patients with hip fracture. *J Pain Symptom Manage*. 2000;19:240–248.
19. Natavio T, McQuillen E, Dietrich MS, et al. A Comparison of the Pain Assessment Checklist for Seniors with Limited Ability to Communicate (PACSLAC) and Pain Assessment in Advanced Dementia Scale (PAINAD). *Pain Manag Nurs*. 2020;21:502–509.
20. Neuman MD, Elkassabany NM, Ochroch J, et al. Nerve block use after hip fracture versus elective hip or knee arthroplasty: retrospective analysis. *J Am Geriatr Soc*. 2020;68:835–840.
21. Sieber FE, Mears S, Lee H, et al. Postoperative opioid consumption and its relationship to cognitive function in older adults with hip fracture. *J Am Geriatr Soc*. 2011;59:2256–2262.
22. Sterne JAC, Savovic J, Page MJ, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. *BMJ*. 2019;366:l4898.
23. Unneby A, Svensson O, Gustafson Y, et al. Femoral nerve block in a representative sample of elderly people with hip fracture: a randomised controlled trial. *Injury*. 2017;48:1542–1549.
24. Sterne JA, Hernan MA, Reeves BC, et al. ROBINS-I: a tool for assessing risk of bias in non-randomised studies of interventions. *BMJ*. 2016;355:i4919.
25. Dowding D, Lichtner V, Allcock N, et al. Using sense-making theory to aid understanding of the recognition, assessment and management of pain in patients with dementia in acute hospital settings. *Int J Nurs Stud*. 2016;53:152–162.
26. Krupić F, Sadic S, Seffo N, et al. Experience of registered nurses in assessing postoperative pain in hip fracture patients with dementia. *Med Glas (Zenica)*. 2018;15:75–80.
27. Krupić F, Grbic K, Senorski EH, et al. Experience of intensive care nurses in assessment of postoperative pain in patients with hip fracture and dementia. *Mater Sociomed*. 2020;32:50–56.
28. Aromataris E, Munn Z. JBI systematic reviews. In: Aromataris E, Munn Z, eds. *JBI Manual for Evidence Synthesis*. JBI, 2020:chap 1.
29. The American Geriatrics Society. The American Geriatrics Society (AGS) Guidelines on Persistent Pain in Older Persons. *JAGS*. 2002;50:S205–S224.
30. Huskisson EC. Measurement of pain. *Lancet*. 1974;2:1127–1131.
31. Fuchs-Lacelle S, Hadjistavropoulos T. Development and preliminary validation of the pain assessment checklist for seniors with limited ability to communicate (PACSLAC). *Pain Manag Nurs*. 2004;5:37–49.
32. Herr K, Bjoro K, Decker S. Tools for assessment of pain in nonverbal older adults with dementia: a state-of-the-science review. *J Pain Symptom Manage*. 2006;31:170–192.
33. Warden V, Hurley AC, Volicer L. Development and psychometric evaluation of the Pain Assessment in Advanced Dementia (PAINAD) scale. *J Am Med Dir Assoc*. 2003;4:9–15.
34. White S, Griffiths R, Baxter M, et al. Guidelines for the peri-operative care of people with dementia: guidelines from the association of anaesthetists. *Anaesthesia*. 2019;74:357–372.
35. Hadjistavropoulos T, Herr K, Prkachin KM, et al. Pain assessment in elderly adults with dementia. *Lancet Neurol*. 2014;13:1216–1227.
36. Oosterman JM, Hendriks H, Scott S, et al. When pain memories are lost: a pilot study of semantic knowledge of pain in dementia. *Pain Med*. 2014;15:751–757.
37. Wikstrom L, Eriksson K, Fridlund B, et al. Healthcare professionals' descriptions of care experiences and actions when assessing postoperative pain - a critical incident technique analysis. *Scand J Caring Sci*. 2016;30:802–812.
38. Bjekic J, Zivanovic M, Puric D, et al. Pain and executive functions: a unique relationship between Stroop task and experimentally induced pain. *Psychol Res*. 2018;82:580–589.
39. Achterberg WP, Pieper MJ, van Dalen-Kok AH, et al. Pain management in patients with dementia. *Clin Interv Aging*. 2013;8:1471–1482.
40. International Association for the Study of Pain. *Revised Definition of Pain*. Available at: https://www.iasp-pain.org/PublicationsNews/NewsDetail.aspx?ItemNumber=10475. Accessed July 5, 2022.
41. Lautenbacher S, Kunz M. Assessing pain in patients with dementia. *Anaesthesist*. 2019;68:814–820.
42. Smith TO, Harvey K. Psychometric properties of pain measurements for people living with dementia: a COSMIN systematic review. *Eur Geriatr Med*. 2022;13:1029–1045.
43. Rababa M, Aldalaykeh M. Responding to varying levels of certainty about pain in people with dementia after initial pain assessment. *Dement Geriatr Cogn Disord Extra*. 2019;9:271–280.

44. Gilmore-Bykovskyi AL, Bowers BJ. Understanding nurses' decisions to treat pain in nursing home residents with dementia. *Res Gerontol Nurs*. 2013;6:127–138.
45. Denness KJ, Carr ECJ, Seneviratne C, et al. Factors influencing orthopedic nurses' pain management: a focused ethnography. *Can J Pain*. 2017;1:226–236.
46. Jang JH, Park WH, Kim HI, et al. Ways of reasoning used by nurses in postoperative pain assessment. *Pain Manag Nurs*. 2020;21:379–385.
47. Proc JL, Jordan H, Docherty AB. Perioperative care of people with dementia. *Br J Hosp Med (Lond)*. 2020;81:1–9.
48. Hartjes TM, Meece L, Horgas AL. CE: assessing and managing pain, agitation, and delirium in hospitalized older adults. *Am J Nurs*. 2016;116:38–46.
49. Chapman S. Managing pain in the older person. *Nurs Stand*. 2010;25:35–39.
50. Tick H, Nielsen AR, Bonakdar R, et al. Evidence-based nonpharmacologic strategies for comprehensive pain care: the consortium pain task force white paper. *Explore*. 2018;14:177–211.
51. Kwon CY, Lee B. Prevalence of behavioral and psychological symptoms of dementia in community-dwelling dementia patients: a systematic review. *Front Psychiatry*. 2021;12:741059.
52. Cummings J, Mintzer J, Brodaty H, et al; International Psychogeriatric Association. Agitation in cognitive disorders: International Psychogeriatric Association provisional consensus clinical and research definition. *Int Psychogeriatr*. 2015;27:7–17.
53. Neville C, Byrne G. Behaviour rating scales for older people with dementia: Which is the best for use by nurses?. *Australas J Ageing*. 2001;20:166–172.
54. Borson S, Scanlan J, Brush M, et al. The mini-cog: a cognitive 'vital signs' measure for dementia screening in multi-lingual elderly. *Int J Geriatr Psychiatry*. 2000;15:1021–1027.
55. Pas MT, Olde Rikkert M, Bouwman A, et al. Screening for mild cognitive impairment in the preoperative setting: a narrative review. *Healthcare (Basel)*. 2022;10:1112.
56. Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". a practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res*. 1975;12:189–198.
57. Reisberg B, Ferris SH, de Leon MJ, et al. The Global Deterioration Scale for assessment of primary degenerative dementia. *Am J Psychiatry*. 1982;139:1136–1139.
58. American College of Surgeons. Geriatric Surgery Verification. Available at: https://www.facs.org/quality-programs/accreditation-and-verification/geriatric-surgery-verification/. Accessed January 15, 2023.
59. Katz J, Weinrib A, Fashler SR, et al. The Toronto general hospital transitional pain service: development and implementation of a multidisciplinary program to prevent chronic postsurgical pain. *J Pain Res*. 2015;8:695–702.
60. Baird E, Partrick B. Delivering an acute pain service. *Anaesth Intensive Care Med*. 2022;23:507–510.
61. Alcorn S, Foo I. Perioperative management of patients with dementia. *BJA Education*. 2017;17:94–98.
62. Dewing J, Dijk S. What is the current state of care for older people with dementia in general hospitals? A literature review. *Dementia*. 2014;15:106–124.