SYSTEMATIC REVIEW OF OUTCOMES OF TOTAL JOINT REPLACEMENT

CLASS PARTICIPATION

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CHAPTER I

Introduction

Problem

As nursing has developed as a profession, nursing care has shifted from interventions in practice because it is “what has always been done”, to interventions supported by research. This approach to nursing is called evidence based practice (EBP) and is “the conscientious, explicit, and judicious use of theory-derived, research-based information in making decisions about care delivery to individuals or groups of patients and in consideration of individual needs and preferences” (Schmidt & Brown, 2012, p. 35). EBP addresses the parts of the healthcare field that can be applied to the scientific method and then applies the method to determine the best prediction of outcomes that can be expected from an intervention. EBP takes into account many areas of healthcare, including patient outcomes, healthcare provider judgment and patient preferences, all directed toward improving the quality of clinical judgment (Legg, 2008).

The evidence-based practice movement began at McMaster University in Canada and was pursued initially by Dr. Archie Cochrane and Ian Chalmers. In 1992, the United Kingdom’s Department of Health set up the UK Cochrane Centre. Ian Chalmers was made director of the organization. Its success in the UK lead to the creation of a branch in New York, named the National Health Service (NHS) Centre for Reviews and Dissemination. The Cochrane Collaboration continues to improve patient care and is now
a global movement, aiming to spread information on best practice as well as encourage further evidence based research.

The focus of this project is to examine the body of evidence on the education and outcomes of patients undergoing total joint replacement. This project is adds to the body of nursing knowledge through a rigorous synthesis of empirical literature to identify best nursing practice.

Total joint replacement (TJR) is the most frequent non-obstetric inpatient surgery in the United States. Hospital reports claim that 995,000 TJRs were performed in U.S. in the year 2009 (American Academy of Orthopaedic Surgeons, 2012). This is nearly double the number of replacement procedures being performed in 1990. As the United States population continues to age these numbers are expected to increase. The primary reason patients elect to undergo a TJR is osteoarthritis, a degenerative disease that affects approximately 30 million Americans (American Academy of Orthopaedic Surgeons, 2012). TJR allows patients to experience a better quality of life and perform the activities they enjoy doing for longer (Howell & Rogers, 2009).

Many hospitals offer ongoing “joint classes” to patients in preparation for TJR procedures. These classes may be led by any of several types of clinicians, including but not limited to medical doctors, nurses, surgeons, and occupational or physical therapists. A recent Google search for “hospital joint replacement class” revealed more than 490 institutions in the United Stated currently offering joint replacement classes. Although no cost analyses of joint classes have been reported, their frequency and level of skill of providers suggest that they represent a significant cost to the institutions that offer them.
With such a large number of people undergoing this procedure, a synthesis of evidence of outcomes of TJR classes is needed. With current budget cuts and the unstable status of the healthcare system, it is important to make the most of hospitals’ tight budgets and ensure that the money is being spent on educational means that are supported with extensive research (McClellan, McGinnis, Nabel, & Olsen, 2008). It is widely accepted that patient education is integral to the healthcare continuum. Dreeben-Irimia (2010) discusses the importance of patient education in improving care and outcomes. Some benefits discussed concern patient adherence to medical advice, increases in patient satisfaction, the promotion of patient-centered care, maximization of patient independence, and overall healthier lifestyles. No recent synthesis of evidence of the effectiveness of these classes in promoting postoperative outcomes has been published.

**Purpose**

The purpose of this thesis was to synthesize evidence pertaining to the effect of pre-operative educational classes on post-operative outcomes of TJR patients. This information will provide an evidence base for nurses and other health care providers in planning strategies to optimize patient outcomes for total joint replacement.

Not only do systematic reviews help to improve patient care, but also cut hospital costs and allow for money to be spent appropriately. A study conducted in 2012 addressing the cost-effectiveness of TJR procedures found that the average cost of the procedure is 17,450 US dollars (Slover, Rubash Malchau, & Bosco, 2012). This cost may be billed to the patient or insurance agencies, but many times can fall onto the hospital. Not only this, but educational classes lead by healthcare workers often falls to the
hospitals. The average cost to the hospital for one hour of work of an advanced practice nurse is 21.24 - 45.75 USD, for a physical therapist is 36.66 USD per hour, and for an occupational therapist is 33.98 USD per hour (United States Bureau of Labor Statistics, March 2012). Hospitals must be able to justify the money spent to hold these classes for patients by finding evidence supporting positive post-operative outcomes. A systematic review of studies of outcomes of total joint replacement can provide evidence of effectiveness of these classes in providing the desired outcomes.
CHAPTER II

Systematic Review Basics

Definition

A systematic review is defined as “the application of scientific strategies that limit bias to the systematic assembly, critical appraisal and synthesis of all relevant studies on a specific topic” (Wright, Brand, Dunn, & Spindler, 2007, p. 23). In this systematic review, all articles pertaining to pre-operative educational classes and their effect on post-operative outcomes will be critically appraised and compiled to form one body of work. This compilation of all current studies helps to give healthcare workers a scientifically-based, objective synthesis of information on a topic to guide best practice.

Healthcare providers need to be able to have reliable information readily available and need that is met by systematic reviews, which allow for this type of “quick transfer” of information from nurse researchers to professionals providing direct care to patients (Trivella & Struthers, 2010). This helps to improve patient outcomes and gives healthcare workers confidence that they are providing the best care possible, as evident by research.

Procedure for Conducting a Systematic Review

There are certain steps that must be taken when conducting a systematic review. The Cochrane Handbook lists multiple steps to writing a review including defining the review question and developing criteria for including studies, searching for studies,
selecting studies and collecting data, assessing risk of bias in included studies, analysing data and undertaking meta-analyses, addressing reporting biases, presenting results, and interpreting results and drawing conclusions (Higgins & Green, 2011). While this is a very in depth and precise procedure, Holly, Salmond and Saimbert (2012) take these guidelines and condense them into four steps – ask, acquire, appraise, and apply. This approach to writing a systematic review was used for the ease of the reader and to address the need for the information in the systematic review to be quickly transferred and understood by healthcare professionals (Holly, Salmond & Saimbert, 2012; Trivella & Struthers, 2010).
CHAPTER III

Recommended Steps for Systematic Review

Ask

The first step of a systematic review is to “ask” a “PICO” style question. PICO is an acronym for Patient/Population, Intervention, Comparison, and Outcomes (Holly, Salmond, Saimbert, 2012). A well written and focused PICO question is vital to the development of the systematic review. The PICO acts as the blueprint for the project proposal and helps guide the search for and selection of studies; suggests situations in which the outcomes will be useful, allows for a starting place when forming inclusion and exclusion criteria can be set, and generally guides the direction of the review (Holly, Salmond, Saimbert, 2013). Based on the purpose of the review, the following PICO question was devised: (P) In preoperative patients undergoing total joint replacement surgery (I) what effect do preoperative educational classes have on (O) measurable postoperative patient outcomes?

The PICO questions serves as a foundation for planning the review. The plan is outlined in a written proposal that forecasts beginning and ending dates of the project, background information about the population and purpose for the study, objectives and rationale for these objectives, and criteria for the studies to be included. The search strategy may also be identified at this point (Holly, Salmond, & Saimbert, 2012).
Acquire

“Acquiring” evidence is the next step in the systematic review process. Evidence is accrued from sources according to the inclusion criteria. It is suggested in the Cochrane Handbook that articles should be searched for in a hierarchal order, with systematic reviews being most highly valued, followed by clinical guidelines, randomized controlled trials (RCT’s), non-randomized controlled trials and finally qualitative studies (Higgins & Green, 2011).

Systematic reviews are searched for first because of their high rigor and validity. Systematic reviews are conducted using an explicit, rigorous process to comprehensively identify, critically appraise, and synthesize relevant studies making them more reliable and valuable than individual studies (Holly, Salmond, Saimbert, 2012). Next in this hierarchal system are clinical practice guidelines. According to the Institute of Medicine (1990), clinical guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances. These guidelines help to inform healthcare providers and the patient population of medical recommendations and best practice.

Randomized controlled trials, or RCT’s, are the mostly highly regarded experimental study. RCT’s are experimental, prospective studies in which participants are randomly allocated to intervention or control groups, thereby reducing the risk of bias within the study. (Straus, Richardson, Glasziou, & Haynes, 2005). Non-randomized controlled trials can be included in a systematic review but introduce a greater chance for bias in the review because of the differences between people in the control versus
intervention group (selection bias) and should therefore be interpreted with caution (Higgins & Green, 2011).

All of these forms of evidence can be found from sources such as previously conducted systematic reviews, clinical guidelines found at National Guideline Clearinghouse, and online sources including CINAHL, EBSCOhost, OVID, or PubMed where randomized controlled trials as well as qualitative studies can be found. Before acquiring the evidence reports, the reviewer sets inclusion and exclusion criteria based on the nature of the PICO question and must be well supported and explained. For example, the Cochrane Collaboration has a set inclusion criteria stating that they only include randomized controlled trials and clinical controlled trials, whereas the Joanna Briggs Institute (JBI) accepts all study designs as long as they are deemed appropriate, meaningful and effective. It is important to be careful when selecting inclusion criteria as it may be a spot for bias if rational is not given for the criteria set.

Acquiring literature is an exhaustive and meticulous process. One of the most important parts of searching literature for a systematic review is that it must be systematic. This involves conscientious retrieval of all available literature on the subject. The process of retrieving all literature decreases any potential bias in the study. The researcher must be candid in studies that have been included and excluded and give clear reasons as to why this has occurred. Retrieval of studies is deliberate and pre-planned and then systematically executed. Every potential evidence source is examined against the inclusion/exclusion criteria and a decision made whether to keep or exclude the source. Not only must studies be retrieved systematically, but the retrieval must be tracked.
Where studies have been found as well as search terms must be recorded and available. Each search engine has its own search strategies that must be identified and utilized. Findings can be chronicled in chart form using pre-existing charts or adaptations of pre-existing charts, as done in this review in which an adaptation of a chart created by Holly, Salmond, and Saimbert (2012) was used.

**Appraise**

Evidence sources meeting the inclusion criteria collected in the “acquire” stage, are then “appraised.” Critical appraisal involves a rigorous review of each report to assess for methodological rigor and validity of the results (Holly, Salmond, & Saimbert, 2012). Critical appraisal involves the review of each evidence source for quality, confidence, trustworthiness, and clinical usefulness. Critical appraisal determines the quality of the evidence according to criteria appropriate to the type of evidence. Appraisal regularly happens with the use of an appraisal tool, often in checklist form, where specific questions are asked about the article. Yes and no questions are designed to check for validity. As with all other aspects of creating a systematic review, it is important to be able to provide rationale for the use of the critical appraisal tool that is ultimately used in the study.

Holly, Salmond, and Saimbert (2012) suggest three broad questions to address when critically appraising quantitative studies. These questions are 1) are the results valid? 2) what are the results? and 3) will the results help with one’s own patient population? With regards to the first question, validity refers to the extent to which its design and conduct are likely to have been protected from bias and how close the study’s
results are to the truth (Holly, Salmond, & Saimbert, 2012). This can involve many parameters including if subjects were blinded, the number of participants, how participants were assigned to treatment groups, as well as ethical concerns.

**Apply**

Systematic reviews are created in order to “improve quality health care by providing health care professionals with evidence-based recommendations for the treatment of clients” (Holly, Salmond, & Saimbert, 2012, p. 271). Results found in the systematic review can be used to guide the efforts of multidisciplinary teams in order to decide the route that patient care should take. An evidence-informed approach to policy making helps care providers make informed decisions based upon a wide range of research (Holly, Salmond, & Saimbert, 2012).

Systematic reviews may make direct recommendations for care, such as “evidence does/does not support the intervention”, but does not have to. They may make suggestions for further research or simply serve as a reference so that care providers can make informed decisions on patient care.
CHAPTER IV

Systematic Review of Reports of Outcomes of TJR Classes

As outlined in chapter III, the four steps of writing a systematic review are ask, acquire, appraise, and apply. Chapter IV documents how these steps were implemented to answer the PICO question, “(P) In preoperative patients undergoing total joint replacement surgery (I) what effect do preoperative educational classes have on (O) postoperative patient outcomes?” By taking the steps necessary to complete this body of work I was able to ensure that the review would be thorough and complete as well as easily read and disseminated.
Abstract

Background:
Total joint replacement (TJR) is one of the most frequently performed surgeries in the United States. Many hospitals offer “joint classes” to prepare patients for TJR procedures. No recent synthesis of evidence of the effectiveness of these classes in promoting postoperative outcomes has been published. With such a large number of people having this procedure, a synthesis of evidence of outcomes of TJR classes is needed.

Objectives:
The purpose of this evidence-based literature review is to synthesize available evidence to address the following PICO question: (P) In preoperative patients undergoing total joint replacement surgery (I) what effect do preoperative educational classes have on (O) postoperative patient outcomes?

Search strategy:
Key words derived from the PICO question were used for free text searching in several databases including CINAHL, EMBASE, PubMed, Cochrane Collaboration Products, PsycINFO, and ProQuest Dissertations.

Selection criteria:
Randomized controlled trials and quasi-experimental studies comparing educational class interventions given preoperatively to patients undergoing total hip or total knee replacement surgery were included in the review. Any study not reporting measured
outcomes (qualitative), including a postoperative intervention, not published in English, or not published in the past 10 years were excluded from the review.

**Main results:**

Significant results were found concerning anxiety, patient satisfaction, patient knowledge, and empowerment (Johansson, K., Salanterä, S., & Katajisto, J., 2005; Sjöling, Slover, J. D., Rubash, H. E., Malchau, H., & Bosco, J. A., 2003; Thomas & Sethares, 2008). These results fall within the psychological realm, whereas the results that fell within the physiological realm—pain and falls—and healthcare associated realm—postop rehab utilization and medication utilization—were found to be insignificant. Physical function and length of stay provided contradictory results (Beaupre, L. A., Lier, D., Davies, D. M., & Johnston, D. 2005; Clarke, H. D., Timm, V. L., Goldberg, B. R., & Hattrup, S. J., 2012; Giraudet-Le Quintrec et al., 2003; Johansson et al., 2007; Jones et al., 2011; Sjöling et al., 2003; Thomas & Sethares, 2008; Yoon et al., 2010).

**Conclusions:**

There is insufficient evidence for or against the use of preoperative educational classes to improve postoperative outcomes with regards to physical recovery or healthcare associated outcomes. There is support for the use of preoperative educational classes in psychological outcomes including anxiety, patient satisfaction, patient knowledge and empowerment based upon several studies that measured these two outcomes.
Objectives

The purpose of this systematic review was to synthesize available evidence to address the following PICO question: In preoperative patients undergoing total joint replacement surgery what effect do preoperative educational classes have on postoperative patient outcomes?

Methods

Criteria for considering studies for this review

Types of reports

The inclusion criteria for the reports for this systematic review are Systematic reviews of randomized controlled trials; reports of primary randomized controlled trials; and reports of observational prospective studies. While considered to be a lower level of evidence than RCTs, observational studies were included “because it is unusual to find sufficient evidence from randomized trials to answer all key questions concerning benefit or the balance of benefits and harms (Chandler, Clarke & Higgins, 2012, p. 18).

Qualitative studies were excluded as they cannot be appropriately compared to quantitative studies. While methods of integrating findings from randomized controlled trials and qualitative studies are currently being scrutinized by the Cochrane Library and proposals for studies hoping to bridge this gap were presented in the most recent edition of Cochrane Methods, no consensus has been met. Because of this it was decided to exclude qualitative studies to maintain the integrity of the work (Chandler, Clarke & Higgins, 2012).
Characteristics of Studies

All studies must include an educational in-class intervention in the preoperative period only, have reported summaries of outcomes, be published in English to reduce possibility of incorrect translation, and be published within the past ten years to ensure outcomes are measured according to current medical practices with regards to TJR procedures.

Population

All patients undergoing planned total hip or total knee replacement.

Types of interventions

The preoperative joint class could be presented in any manner (verbal, written, audiovisual) as long as the intervention involved an in-person classroom setting. The classes had to be led by one or more healthcare professionals (e.g. advanced practice nurses, physical therapists, occupational therapists, medical doctors, or anesthesiologists). Type of information and delivery style was not restricted by inclusion criteria.

Types of outcomes measures

Outcomes measured were required to be patient centered as opposed to nursing outcomes. Types of outcomes measured fall into three categories, physiologic, psychological, and hospital associated. Examples of physiologic are physical function, pain and falls, examples of psychological are anxiety, patient knowledge, and empowerment, and examples of hospital associated outcomes are rehabilitation utilization, length of stay and patient satisfaction.
Study Selection

One reviewer conducted the searches and identified a pool of potentially eligible reports. These studies were then assessed against the inclusion criteria to decide which would finally be included in the study.

Search methods for identification of studies

Key words derived from the PICO question were used for free text searching in CINAHL, PubMed, Cochrane Collaboration Products, PsycINFO, and ProQuest Dissertations. Free text searching allows for a broad and comprehensive start to the searching process, locating key words throughout the reports (Higgins & Green, 2011). Common search strategies including identifying synonyms, applying limits and using Boolean operators, were used (Higgins & Green, 2011). Refined searching was conducted using controlled vocabulary terms identified from articles located in the initial search. Citation searching, which involves an evaluation of sources cited in the originally identified reports, was conducted to ensure that all resources were located.

The following strategy was used to search CINAHL database:

CINAHL

- Search: “Total Joint Replacement”
  - Selected Topics: “Arthroplasty, Rep, Hip”
  - “Arthroplasty, Rep, Knee”
  - “Arthroplasty, Rep”
    - Combined with OR
    - AND “Education”
• Initial Search: 719 Results
  ○ 33 found to have applicable titles
    ▪ 20 dropped for various reasons
      • Descriptive study: 3
      • Case Study: 2
      • Qualitative Study: 2
      • Not published in English: 4
      • Post-operative interventions: 3
      • Greater than 10 years old: 6
    ▪ 13 articles utilized for Critical Appraisal
      ▪ AND “Pre-Operative Education”
        • Initial Search: 12
          ○ None found to be applicable
      ▪ AND “Class”
        • Initial Search: 39
          ○ 2 found to be applicable
            ▪ 1 dropped
              • Post-operative Intervention: 1
                ▪ 1 article utilized for Critical Appraisal
      ▪ AND “Teach”
        • Initial Search: 18
          ○ 1 found to be applicable
- 1 article utilized for Critical Appraisal

  - **Total Articles from CINAHL: 15**

Other search strategies can be found as additional tables in the appendix section of this document (appendices I, II, III, IV).

Search results are summarized in the chart that follows.

**Data analysis.**

**Critical Appraisal**

The purpose of critically appraising reports is assessing in order to determine methodological rigor and validity of the results (Holly, Salmond, & Saimbert, 2012). The
evidence’s quality, confidence, trustworthiness, and clinical usefulness is determined through the critical appraisal process. The criteria for critical appraisal are specific to the type of evidence. Criteria are usually organized as critical appraisal tools in checklist or chart formats. The appraisal tool for this study was derived from criteria found in two sources; the Holly, Salmond and Saimbert (2012) book on systemic reviews as well as from guidelines outlined in the Cochrane Database for Systematic Reviews. The appraisal tool consisted of seven yes and no questions testing for validity as well as two open ended questions regarding results of the study and application to the patient population. The main source for these questions was from the Cochrane Database for Systematic reviews, a source widely accepted as the leader in the systematic review process and known for its use of evidence based practice. The questions in the critical appraisal tool included:

1. Type of study
2. Was randomization used?
3. Was power analysis used and met?
4. Was allocation adequately concealed from the researcher? (For RCTs only)
5. Have the authors identified all important confounding factors?
6. Was loss to follow-up with drop-out participants reported?
7. Was the follow up of the participants complete/long enough?
8. Was blinding of the assessor carried out? (For RCTs only)
9. Outcomes measured/results
10. Strength
The chart (Appraisal table 1.1) can be viewed on pages 36-41. The systematic review used in my review was appraised using the PRISMA checklist and can be found in the chart (Appraisal table 1.2) on pages 42-47. A more in depth description of each of the studies (including an analysis of the methods, participants, interventions, outcomes, results, and additional notes on the study) can be found in the chart (Characteristics of Studies table 2.1) on pages 47-52.

The researcher must take the evidence that he/she has gathered and determine a grading as well as provide recommendations based upon the findings. One system identified by the Cochrane Database is GRADE approach. The GRADE approach, adopted by The Cochrane Collaboration, specifies four levels of quality (high, moderate, low and very low) where the highest quality rating is for a body of evidence based on randomized trial (Higgins & Green, 2011). Review authors can downgrade randomized trial evidence depending on the presence of five factors and upgrade the quality of evidence of observational studies depending on three factors. The five factors that may merit a downgrade are:

1. Limitations in the design and implementation of available studies suggesting high likelihood of bias.
2. Indirectness of evidence (indirect population, intervention, control, outcomes).
3. Unexplained heterogeneity or inconsistency of results (including problems with subgroup analyses).
4. Imprecision of results (wide confidence intervals).
5. High probability of publication bias.
The three factors that allow for an upgrade are…

1. Large magnitude of effect.
2. All plausible confounding would reduce a demonstrated effect or suggest a spurious effect when results show no effect.
3. Dose-response gradient.

(Higgins & Green, 2011).

Results

Description of studies

The description of each of the 8 studies (excludes the systematic review) can be found in the table “Characteristics of studies” on pages 47-52.

Studies were excluded for reasons including their study type, publication language, use of postoperative interventions, lack of measurable outcomes, and year of publication. After excluding studies that did not meet inclusion/exclusion criteria, 8 studies including 1,547 participants that met the inclusion criteria for the various studies were included in this review.

Types of studies with outcomes measured

Of the reports that met the inclusion criteria only two studies monitored a single outcome, falls (Clarke et al., 2012) and length of stay (Yoon et al., 2010). The effect of education on physical function, pain (Beaupre et al., 2005; Giraudet-Le Quintrec et al., 2003), postoperative rehabilitation utilization (Beaupre et al., 2005; Jones et al., 2011), and use of analgesic medications (Giraudet-Le Quintrec et al., 2003; Sjöling et al., 2003) was also measured. The topics of patient knowledge (Johansson et al., 2005; Thomas &
Sethares, 2008), length of stay (Beaupre et al., 2005; Johansson et al., 2005; Jones et al., 2011; Sjöling et al., 2003; Yoon et al., 2010), anxiety (Giraudet-Le Quintrec et al., 2003; Sjöling et al., 2003), patient satisfaction (Giraudet-Le Quintrec et al., 2003; Sjöling et al., 2003; Thomas & Sethares, 2008), and empowerment (Johansson et al., 2005) were also considered.

**Risk of bias in included studies**

Many of the studies have significant methodological weaknesses that introduced possibility of bias.

Of the studies identified, two did not use or were unknown with regards to the use of randomized assignment, allocation concealment, and subject blinding (Sjöling et al. 2003) (Yoon et al., 2010), six studies did not use or were unknown with regards to blinding of the researcher (Giraudet-Le Quintrec et al., 2003; Johansson et al., 2005; Sjöling et al., 2003; Thomas & Sethares, 2008), two did not or were unknown with regards to follow-up with drop-out participants (Sjöling et al., 2003; Yoon et al., 2010), and six studies did not or were unknown with regards to blinding of the assessor (Giraudet-Le Quintrec et al., 2003; Johansson et al. 2005; Sjöling et al., 2003; Thomas & Sethares, 2008).

**Outcomes of interventions**

**Physical Function**

Two studies measured physical function as one of their outcomes (Beaupre et al. 2005; Giraudet-Le Quintrec et al., 2003). The first of these two, a study conducted by Beaupre et al. looked at several physical function outcomes over a one year period. These
outcomes included range of motion and strength, neither of which were found to be
affected significantly by an educational intervention (see table 3.2). The only physical
outcome tested by Giraudet-Le Quintrec et al. was time taken to first stand post-
operatively which was found to be significantly sooner in the experimental group (-0.35;
95% CI, -0.72 to +0.02; \( p = 0.07 \)). A \( p \) value of 0.10 was determined to be significant in
this report (2003).

Pain

None of the studies that assessed pain as an outcome demonstrated significant
outcomes (Beaupre et al., 2005; Giraudet-Le Quintrec et al., 2003; Thomas & Sethares,
2008). Beaupre et al. measured pain using the WOMAC pain scale with no significant
results (EG: \( M = 49 \) [SD = 15] versus CG: \( M = 49 \) [SD = 20], \( p = 0.91 \)) (2005). Giraudet-
Le Quintrec et al. measured pain levels on the visual analogue scale and found that the
experimental group had a mean of 21 with a standard deviation of 18, compared to the
control group having a mean of 28 with standard deviation of 22, \( p = 0.07 \) (2003).
Thomas also employed the use of the visual analogue scale and too got no significant
results (Experimental: mean 2.75 ± 1.82 vs. Control: mean 3.5 ± 2.6, \( p = 0.18 \)) (2008).

Postoperative Rehabilitation Utilization

Two studies measured postoperative rehabilitation utilization (Beaupre et al.,
2003; Jones et al., 2011). The first of the two studies was Beaupre et al. who found no
significant results within a year of surgery. Results of this study with regards to
rehabilitation utilization can be found on table 3.3 (2003).
The second study was that conducted by Jones et al. and found no significant difference between control and experimental group as far as readmissions to medical care facilities within three months of surgery ($p = 0.92$) (2011).

**Length of Stay**

Length of stay was measured as an outcome by five of the studies (Beaupre et al., 2003; Jones et al., 2011; Johansson et al., 2007; Sjöling et al., 2003; Yoon et al., 2010). Two of the five studies did find significant results. Jones et al. results showed significant results of an experimental group with an average length of stay of 7.0±5.7 days versus the control group which had an average length of stay of 5.0±3.2 days (2011). Yoon et al. measured total hip and total knee replacement separately and found significant results in both (THA = EG: 3.1 ± 0.8 days vs CG: 3.9 ± 1.4 days; $P = .0001$) (TKA = EG: 3.1 ± 0.9 days vs CG: 4.1 ± 1.9 days; $P = .001$) (2010).

Beaupre et al. (EG: mean LOS 10.2 days [SD=4.5] versus CG: mean LOS 11.7 days [SD = 5.2], $p = 0.10$) (2003), and Sjöling et al. (mean = 11 days for both groups) did not find a significant difference in length of stay between experimental and control groups (2003). Johansson et al. found that the length of hospital stay was shorter among experimental patients than control patients (EG: $M = 6.78$ days; CG: $M = 8.18$ days), but these differences were not statistically significant (2007).

**Falls**

Only one study measured postoperative falls and found insignificant support for preoperative intervention to reduce falls (EG: 7/172 versus CG: 0/72 falls) (Clarke et al., 2012).
Anxiety

Two studies that measured anxiety as an outcome (Giraudet-Le Quintrec et al., 2003; Sjöling et al., 2003). Giraudet-Le Quintrec et al. found a significant decrease in anxiety preoperatively (-4.98; 95% CI, -8.62 to -1.34; p = 0.01), but insignificant results postoperatively (EG: -4.16 [SD = 10.74] versus CG: -2.53 [SD = 11.58], p = 0.51) according to the State Anxiety Inventory Score (2003).

Sjöling et al. found a significant difference in state anxiety (EG = 23.6% claimed anxiety was “much less than normal” or “less than normal” versus CG = 3.3% claimed anxiety was “much less than normal” or “less than normal”, P=0.009) but an insignificant difference in trait anxiety (p = 0.2). These results were found using the Mann-Whitney Test (2003).

Analgesic Medication Utilization

Two studies measured anxiety as an outcome were conducted, neither of which found significant results (Giraudet-Le Quintrec et al., 2003; Sjöling et al., 2003). Giraudet-Le Quintrec et al.’s findings were that 8% and 31% of experimental patients and 9% and 25% of control patients used Morphine and psychotropics respectively (p = 1.0 for Morphine, p = 0.49 for Psychotropics) (2003).

Sjöling et al. asked patients about the control of their analgesia –40% of experimental and 50% of control rated it very important, 43.3% of experimental and 46.7% rated it fairly important, and 16.7% of experimental and 3.3% of control rated it as unimportant (p = 0.23) (2003).
**Patient Satisfaction**

Two studies measured patient satisfaction, both found significant results (Sjöling et al., 2003; Thomas & Sethares, 2008). Sjöling et al. recorded the following statistics (EG very satisfied = 100%; CG very satisfied = 87%) ($x^2$-test: $P < 0.05$) (2003). Thomas found that the experimental group rated all aspects of the interdisciplinary educational session as very satisfactory but descriptive statistics were done only on experimental group (40.8 ± 4.7, range 24–45) (2008).

**Patient Knowledge**

Patient knowledge was measured in two studies, both of which found significant results (Johansson et al., 2005; Thomas & Sethares, 2008). Johansson et al. found that experimental group patient knowledge was higher at admission ([EG: M = 4.05, S.D.= 0.51] vs [CG: M = 3.77, S.D. = 0.69] $p = 0.021$) and at discharge: ([EG: M = 4.30, S.D. = 0.49] vs [CG: M = 4.03, S.D. = 0.64] $p = 0.022$). Johansson et al. also compared the length of admission discussion time and found that the experimental group spent significantly less time asking questions before surgery than the control group, indicating fewer questions and greater understanding of the procedure ([EG: M = 13.25 min] vs [CG: M = 33.36 min, $p<0.001$]) (2005).

Thomas found that experimental group patients could verbalize importance of exercises ([EG: M = 38.23±7.21] vs [CG: M = 26.4±10.1], $p<0.001$) as well as demonstrating postoperative skills: ([EG: M = 21.43±6.89] vs [CG: M = 15.08±6.89], $p<0.001$) more effectively than control group patients (2008).
**Empowerment**

In the one study that measured empowerment (Johansson et al., 2003), the experimental group (EG: M = 4.20, S.D. = 0.63) reported feeling more empowered due to their education than the control group (CG: M = 2.97, S.D. = 1.15, p<0.001) (2003).

**Discussion**

**Limitations within the systematic review**

Due to the nature of the study, only one researcher located and appraised studies. This was occasionally cross-referenced with an advisor, but in an unsystematic manner. All steps in the process were clearly stated so as to achieve maximum validity and minimum bias, but the fact remains that only one researcher completed the review.

It should be noted that the interventions, while all in a classroom setting, were somewhat varied. It is evident that there is no standardization of preoperative education for total joint replacement surgeries. A point in the inclusion criteria was that all educational interventions had to be in a class-like setting, but the length, timing, teaching method, educators, and materials were different between studies. These differences can be observed more in depth on Table 2.1 Characteristics of Included Studies on pages 47-52.

**Conclusions**

There is insufficient evidence for or against the use of preoperative educational classes to improve postoperative outcomes with regards to physical recovery or healthcare associated outcomes. Physical recovery in this situation includes transfer activities, walking, and climbing stairs a day earlier than the control and range of motion.
Length of stay in the hospital was also reported in several studies. These outcomes merited significant or insignificant changes in each study, often contradicting each other and leading to an inconclusive result overall.

The systematic review suggests some support for the use of preoperative educational classes in psychological outcomes including anxiety and empowerment. While there were some contradicting results concerning these outcomes, a significant decrease in anxiety and increase in empowerment were found in a majority of the studies.

Because these outcomes are still subject to some contradiction between studies, more evidence is needed to decide if preoperative education is necessary. The support for psychological outcomes may offer some reason for healthcare workers to provide such services to clients and encourage clients to participate in such classes.
CHAPTER V

Summary

Writing a systematic review is a long and often cumbersome task culminating in a valuable product that provides healthcare professionals with a focused synthesis of relevant evidence and recommendations to guide practice. This form of work is of immense importance to the healthcare field because of the need for evidence-based practice to achieve optimal patient outcomes. The extreme care, caution, and transparency that is required to complete a review ensures that the work is a true representation of all applicable studies and provides one of the best places to find evidence based practice guidelines to implement in the healthcare field.

While there are many limitations in the area of preoperative educational classes including a lack of standardization and reliable outcomes, there is little evidence to support the use of these classes to improve physical outcomes. Where these classes do have an effect are in the psychological outcomes, including areas such as empowerment, anxiety, and apparent knowledge.

Although this systematic review did not include a cost/benefit analysis, systematic reviews such as this do help to provide evidence for and against such classes. Providing healthcare facilities with information such as this study helps to ensure that money is being used effectively and with appropriate evidence to support their decisions.
The creation of this review has not only provided me personally with the knowledge of writing systematic reviews, but with a deeper understanding of their use in my professional practice. According to the Institute of Medicine (1990), healthcare in the United States is, in many areas, falling behind that of other developed countries. These sad truths bring to light the fact that we need to make changes and improve the care we provide. The primary way we can do this in the nursing field is by integrating evidence based practice (McClellan, McGinnis, Nabel, & Olsen, 2008). Being able to find information to support interventions quickly will help to make me a better and more efficient nurse, making me the best employee I can be as well as providing the absolute best care I can for my patients. While the process of writing a systematic review is long and cumbersome, I have enjoyed it and will value the knowledge I have gained for the rest of my life.
References


Howell, S., MD, & Rogers, S. M. (December, 2009). Method for quantifying patient expectations and early recovery after total knee arthroplasty.32(12)


Jones, S., Alnaib, M., Kokkinakis, M., Wilkinson, M., St Clair Gibson, A., & Kader, D.  
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arthroplasty. Source. *North East Orthopaedic and Sports Injury Group, Department  
of Orthopaedics, Queen Elizabeth Hospital, Gateshead, UK.*, 1(93), 71-75.

471.

Liberati A., Altman D.G., Tetzlaff J., Mulrow C., Loannidis, A. Clarke, M …  
Devereaux, P. (2009). The PRISMA statement for reporting systematic reviews and  
meta-analyses of studies that evaluate health care interventions: Explanation and  

"Summary." *Evidence-Based Medicine and the Changing Nature of Health Care:  
Meeting Summary (IOM Roundtable on Evidence-Based Medicine).* Washington,  

McDonald S, Hetrick SE, Green S. Pre-operative education for hip or knee  
CD003526. DOI: 10.1002/14651858.CD003526.pub2.

and application of research* (2nd ed.). Sudbury, MA: Jones and Bartlett Learning.


Appraisal Table 1.1  
Critical Appraisal tool for Quantitative studies (Developed from information in Holly, Salmond, and Saimbert’s book on systematic reviews, the Critical Appraisal Skills Programme [CASP], and the Cochrane Database for Systematic Reviews)

<table>
<thead>
<tr>
<th>Type of study</th>
<th>Selection Bias (validity)</th>
<th>Attrition Bias (validity)</th>
<th>Detection Bias</th>
<th>Results</th>
<th>GRADE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beaupre Lier, Davies, &amp; Johnston (2005)</strong></td>
<td>RCT</td>
<td>Yes</td>
<td>Used - not met</td>
<td>Yes</td>
<td>Yes</td>
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</tbody>
</table>
• SF- Vitality
  o Baseline EG: 46 (22)
  o Baseline CG: 52 (20)
  o Over Time EG/CG: See table 3.1
• SF- Social function
  o Baseline EG: 65 (27)
  o Baseline CG: 67 (26)
  o Over Time EG/CG: See table 3.1
• SF- Role emotional
  o Baseline EG: 60 (44)
  o Baseline CG: 67 (40)
  o Over Time EG/CG: See table 3.1
• SF- PCS
  o Baseline EG: 29 (7)
  o Baseline CG: 29 (6)
  o Over Time EG/CG: See table 3.1
• SF- MCS
  o Baseline EG: 51 (11)
  o Baseline CG: 54 (13)
  Over Time EG/CG: See table 3.1

Insignificant

• ROM
• Strength
• Pain
• Function
• Health Related Quality of Life (HRQOL)
• postoperative rehabilitation services
• LOS


<table>
<thead>
<tr>
<th>Quasi-Experimental Patients from one surgeon served as the experimental group</th>
<th>No</th>
<th>No</th>
<th>No</th>
<th>Yes</th>
<th>No (in hospital)</th>
<th>No</th>
<th>Insignificant</th>
<th>Low</th>
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<tbody>
<tr>
<td>Control group: (7/172 falls)</td>
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<td>Intervention group: (0/72 falls)</td>
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<td>Falls were associated with hygiene activities.</td>
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<tr>
<td>Of the 7 falls, the rate was similar between pts with and without a sciatic block</td>
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<td>(CI -0.07 to 0.04)</td>
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</table>
patients of 5 other surgeons served as the control.

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Random</th>
<th>Allocation</th>
<th>Blinding</th>
<th>Masking</th>
<th>Patient No: in-hospital</th>
<th>Significant</th>
<th>Modelling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Giraudet-Le Quintrec et al. (2003)</td>
<td>RCT</td>
<td>Yes</td>
<td>Yes</td>
<td>Unkn</td>
<td>No</td>
<td>No</td>
<td>Pain (VAS)</td>
<td>High</td>
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<td>o Pre-op: ([IG: 24±21] vs [CG: 35±29]) P=0.04</td>
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<td>Anxiety (STAI)</td>
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<td>o Pre-op: (-4.98; 95% CI, -8.62 to -1.34; p=0.01)</td>
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<td></td>
<td>o Significant difference in standing post-op (-0.35; 95% CI, -0.72 to +0.02; p=0.07)</td>
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<td>Anxiety (post-op)</td>
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<td>Pain (post-op)</td>
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<td>Complications</td>
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<td>Medication</td>
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<td>Discharge</td>
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<td></td>
<td>Patient Satisfaction</td>
<td></td>
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<tr>
<td>Johansson Salanterä, &amp; Katajisto, (2005)</td>
<td>RCT</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes Yes Yes Unkn</td>
<td>Orthopedic patient knowledge</td>
<td>High</td>
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<td>o at admission: ([EG: M=4.05, S.D. = 0.51] vs [CG: M=3.77, S.D.=0.69] p = 0.021)</td>
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<td>o at discharge: ([EG: M=4.30, S.D.=0.49] vs [CG: M=4.03, S.D.=0.64] p=0.022)</td>
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<td>Empowerment</td>
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<td>o ([EG: M=4.20, S.D.=0.63] vs [CG: M= 2.97, S.D.=1.15, p&lt;0.001])</td>
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<td>Length of admission discussion</td>
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</table>
Insignificant

- Orthopaedic patient knowledge
  - prior to admission: no significant difference ([EG: M=3.60, S.D.=0.55] vs [CG: M=3.44, S.D.=.73] P=0.209)

- LOS
- Need for further care

<table>
<thead>
<tr>
<th>Jones et al. (2011)</th>
<th>Quasi-Experimental Control group enrolled first, experimental second, cannot account for chronological variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Unknown</td>
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</table>

- Mean length of hospital stay
  - (7.0+/-.5.7 days vs. 5.0+/-.3.2 days)

- Percentage of EG leaving in early stage (1–4 days)

(Jones et al., 2011 January; 93(1): 71–75)

Insignificant

- No significant difference in readmission in first 3 months

<table>
<thead>
<tr>
<th>Sjöling, Nordahl, Olofsson, &amp; Asplund (2003)</th>
<th>Quasi-Experimental First subject randomized, alternative to CG/EG after</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
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</table>

- Patient satisfaction
  - (EG very satisfied =100%; CG very satisfied =87%) (x²-test: P < 0.05).

- Anxiety
  - EG= 23.6% claimed anxiety was “much less than normal” or “less than normal”
  - CG= 3.3% claimed anxiety was “much less than normal” or “less than normal”
  - P= 0.009
Insignificant
- Basic analgesic treatment regimen
  - (EDA was used for 44.3 h [S.D. 15.5] postoperatively)
- Pain relief time
  - (for day of surgery through day 4, $P = 0.6\sim 0.98$); use of analgesics ($EG = 36.8 \text{ mg [S.D. 24.3]}, CG = 33.7 \text{ mg [S.D. 20.1]}$)
- Trait Anxiety
  - $p = 0.2$
- Length of stay
  - (mean of 11 days).

<table>
<thead>
<tr>
<th>Thomas &amp; Sethares (2008)</th>
<th>Quasi-Experimental Groups enrolled based on subject choice</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>Yes</th>
<th>Unknown</th>
<th>No</th>
<th>Significance</th>
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<td>Knowledge of Postoperative</td>
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<td>- Verbalizing importance of exercises: ($[EG: M=38.23\pm7.21] \text{ vs } [CG: M=26.4\pm10.1], p&lt;0.001$)</td>
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<td>- Demonstrating postoperative skills: ($[EG: M=21.43\pm6.89] \text{ vs } [CG: M=15.08\pm6.89], p&lt;0.001$),</td>
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<td>- EG rated all aspects of the interdisciplinary educational session as very satisfactory</td>
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<td>- Satisfaction: descriptive statistics done only on experimental group ($40.8\pm4.7$, range 24–45)</td>
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</tbody>
</table>

Insignificant
- Pain
- Expectations
<table>
<thead>
<tr>
<th>Yoon et al. (2010)</th>
<th>Quasi-Experimental Groups enrolled based on subject choice</th>
<th>No</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Significant</th>
<th>Mod</th>
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<td>o (3.1 ± 0.8 days vs 3.9 ± 1.4 days; P = .0001)</td>
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<td>o (3.1 ± 0.9 days vs 4.1 ± 1.9 days; P = .001)</td>
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<td>• Insignificant</td>
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<td>• No difference between in person vs. phone interview</td>
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<td>o THA (phone LOS, 3.3 ± 1.4 vs in person LOS, 3.2 ± 0.83; P = .85)</td>
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<td></td>
<td></td>
<td></td>
<td>TKA (phone LOS, 3.2 ± 1.1 vs in person LOS, 3.3 ± 1.2; P = .60)</td>
<td></td>
</tr>
</tbody>
</table>
### Appraisal Table 1.2
#### PRISMA Checklist

<table>
<thead>
<tr>
<th>Section/topic</th>
<th>#</th>
<th>Checklist item</th>
<th>Reported on page #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TITLE</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Title</td>
<td>1</td>
<td>Report is a systematic review</td>
<td>1</td>
</tr>
<tr>
<td><strong>ABSTRACT</strong></td>
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</tr>
</tbody>
</table>
| Structured summary   | 2 | **Background:** Hip or knee replacement is a major surgical procedure which can be physically and psychologically stressful for patients. It is hypothesized that education before surgery reduces anxiety and enhances postoperative outcomes.  
**Objectives:** To determine whether preoperative education improves postoperative outcomes (anxiety, pain, mobility, length of stay and the incidence of DVT) in patients undergoing hip or knee replacement surgery.  
**Data sources:** Cochrane Central Register of Controlled Trials, MEDLINE, EMBASE, CINAHL, PEDro. Handsearched Australian Journal of Physiotherapy  
**Study eligibility criteria:** Randomised trials of preoperative education (verbal, written or audiovisual) delivered by a health professional within six weeks of surgery to patients undergoing hip or knee replacement.  
**Participants:** All studies included patients undergoing planned total hip or total knee replacement.  
**Interventions:** Any preoperative education regarding the surgery and its postoperative course that is delivered by a health professional within six weeks of surgery. Education could be given verbally or in any written or audiovisual form, and could include preoperative instruction of postoperative exercise routines.  
**Study appraisal:** The common system of grading the strength of scientific evidence for a therapeutic agent that is described in the CMSG module scope and in the Evidence based Rheumatology BMJ book was used to rank the evidence included in this systematic review. Four categories are used to rank the evidence from research studies from highest to lowest quality; platinum, gold, silver, and bronze. The ranking is included in the synopsis of the review.  
**Synthesis method**  
**Result:** Insufficient evidence to support or refute the use of preoperative education to improve postoperative outcomes in people undergoing hip and knee replacement surgery, especially with respect to functioning and length of hospital stay.  
**Limitation:** Studies used in the review were of varying methodological quality.  
**Conclusions:** More evidence is needed to support preoperative education to improve postoperative outcomes.  
**Implications of key findings:** There is insufficient evidence from the available studies to support the use of preoperative education over and above standard care to improve postoperative outcomes. There is evidence that preoperative education has a modest beneficial effect on preoperative anxiety.  
**Systematic review registration number.** |
| **INTRODUCTION**      |   |                                                                               |                    |
| Rationale            | 3 | Hip and knee replacement is a major surgical procedure and information         | 1                  |
regarding education on this subject is needed in order to reach the large number of people having this procedure.

### Objectives

<p>| | | |</p>
<table>
<thead>
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<tbody>
<tr>
<td><strong>4</strong></td>
<td><strong>To determine whether preoperative education improves postoperative outcomes (anxiety, pain, mobility, length of stay and the incidence of DVT) in patients undergoing hip or knee replacement surgery.</strong></td>
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</tr>
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</table>

### METHODS

#### Protocol and registration

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<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>None noted</strong></td>
<td><strong>na</strong></td>
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#### Eligibility criteria

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<tbody>
<tr>
<td><strong>6</strong></td>
<td><strong>Randomised or quasi-randomised studies comparing educational interventions given preoperatively to patients undergoing total hip or total knee replacement surgery. Patients must be undergoing planned total hip or total knee replacement. Preoperative intervention must be within six months of surgery. Excluded studies comparing various methods of delivery of preoperative education in the absence of a control group receiving standard or routine care as well as studies that incorporated some form of postoperative intervention.</strong></td>
<td><strong>3</strong></td>
</tr>
</tbody>
</table>

#### Information sources

<p>| | | |</p>
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<tbody>
<tr>
<td><strong>7</strong></td>
<td><strong>Cochrane central register of controlled trials, MEDLINE, preMEDLINE, EMBASE, CINAHL, PsycINFO and PEDro were searched. Handsearching of the Australian Journal of Physiotherapy was conducted.</strong></td>
<td><strong>4</strong></td>
</tr>
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</table>

#### Search

<p>| | | |</p>
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</table>
| **8** | **For Cochrane Central Register of Controlled Trials**  
1. ARTHROPLASTY REPLACEMENT explode all trees (MeSH)  
2. JOINT PROSTHESIS explode all trees (MeSH)  
3. ((hip* near replac*) or (hip* near prosthe*) or (hip* near arthroplast*))  
4. ((knee* near replac*) or (knee* near prosthe*) or (knee* near arthroplast*))  
5. PATIENT EDUCATION explode all trees (MeSH)  
6. PREOPERATIVE CARE explode all trees (MeSH)  
7. (information or instruct* or educat* or advice* or support*)  
8. (preoperative* or pre-operative* or (pre next operativ*))  
9. (#1 or #2 or #3 or #4)  
10. (#5 or #6 or #7 or #8)  
11. (#9 or #10) | **4** |

#### Study selection

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<tbody>
<tr>
<td><strong>9</strong></td>
<td><strong>One reviewer conducted the searches and IDed a pool of potentially eligible studies. Two reviewers independently assessed these studies against the inclusion criteria and disagreement was resolved through discussion.</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>

#### Data collection process

<p>| | | |</p>
<table>
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<tr>
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<tbody>
<tr>
<td><strong>10</strong></td>
<td><strong>Studies were assessed independently by all three reviewers and disagreements were resolved through discussion.</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>

#### Data items

<p>| | | |</p>
<table>
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<tr>
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</tr>
</thead>
</table>
| **11** | **1. Was the study described as randomised?  
2. Was the allocation concealment adequate?  
3. Were the participants blinded?  
4. Was there blinded outcome assessment?  
5. Was there a description of withdrawals and drop-outs?  
6. Were the results analysed according to intention-to-treat principles?** | **4** |

#### Risk of bias in individual studies

<p>| | | |</p>
<table>
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<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>12</strong></td>
<td><strong>Included studies were of varying methodological quality. Not all studies reported having allocation that was adequately concealed and blinding of participants was not clear in all studies. Most studies failed to report if an</strong></td>
<td><strong>5</strong></td>
</tr>
</tbody>
</table>
intention-to-treat analysis was undertaken.

| Summary measures | 13 | State the principal summary measures (e.g., risk ratio, difference in means). |
| Synthesis of results | 14 | Each postoperative measure (anxiety, length of stay, mobility, postoperative pain, patient satisfaction, exercise compliance, and postoperative complications) were compared among the studies that reported these outcomes. |
| Risk of bias across studies | 15 | Due to the nature of the RCT’s used in the systematic review, blinding was unattainable. |
| Additional analysis | 16 | n/a |

### Results

| Study selection | 17 | 17 eligible studies |

8 studies excluded:
- Information not specific to hip or knee surgery (2 studies)
- Study not randomized (2 studies)
- Postoperative intervention (2 studies)
- Not studying preoperative education (1 study)
- Did not investigate postoperative outcomes (1 study)

9 studies used in review

See Appendix I

| Study characteristics | 18 | See Study Characteristics table in Appendix I |
| Risk of bias within studies | 19 | See Study Characteristics table in Appendix I (section titled “Risk of bias”) |
| Results of individual studies | 20 | Butler (1996)
  - Significant: pre-operative anxiety
  - Insignificant: LOS; mobility; patient satisfaction; postoperative anxiety
  Clode-Baker (1997)
  - Significant
  - Insignificant: pre-operative anxiety; LOS; postoperative anxiety |
<table>
<thead>
<tr>
<th>Study</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooil (1997)</td>
<td>Did not present data in a form that could be reviewed, reports McDonald (2008).</td>
</tr>
<tr>
<td>Crowe (2003)</td>
<td>Significant: pre-operative anxiety; postoperative complications</td>
</tr>
<tr>
<td></td>
<td>Insignificant: LOS; mobility;</td>
</tr>
<tr>
<td>Daltroy (1998)</td>
<td>Significant:</td>
</tr>
<tr>
<td></td>
<td>Insignificant: pre-operative anxiety; LOS; mobility;</td>
</tr>
<tr>
<td>Doering (2000)</td>
<td>Significant: pre-operative anxiety</td>
</tr>
<tr>
<td></td>
<td>Insignificant: LOS; post-operative pain; postoperative anxiety</td>
</tr>
<tr>
<td>Lilja (1998)</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Insignificant: pre-operative anxiety; postoperative anxiety</td>
</tr>
<tr>
<td>Santavirta (1994)</td>
<td>Significant</td>
</tr>
<tr>
<td></td>
<td>Insignificant: Patient satisfaction; postoperative complications</td>
</tr>
</tbody>
</table>

**Synthesis of results**
- While preoperative anxiety was found to be significantly decreased in three studies ([Butler, 1996], [Crowe, 2003], [Doering, 2000]), the change was found to be insignificant in three studies ([Clode-Baker, 1997], [Daltroy, 1998], [Lilja, 1998]).
- Post-operative anxiety was found to be significant in one study (Crowe, 2003), it was found to be insignificant in four studies ([Butler, 1996], [Clode-Baker, 1997], [Doering, 2000], [Lilja, 1998]).
- Finally, measures of post-operative complications were found to be significant in one study (Crowe, 2003), and insignificant in one study (Santavirta, 1994).
- Other than this, none of the outcomes tested, including length of stay, mobility, post-operative pain or patient satisfaction merited statistical significance.

**Risk of bias across studies**
- All studies were reported as randomised but half had inadequate reporting of the study methods. Trial populations were generally moderate in size.
- Most studies failed to report if an intention-to-treat analysis was undertaken.

**Discussion**
- There is insufficient evidence to support the use of pre-operative educational interventions above and beyond the standard educational practices.

**Limitations**
- Few studies have been done and therefore, review is limited.
- Overall small sample sizes.
- Hospital protocol reduces differences in patient outcomes.
Conclusions | 26 | The study does not support or refute the use of preoperative educational classes, but does indicate the need for further research.

<table>
<thead>
<tr>
<th>Funding</th>
</tr>
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<tbody>
<tr>
<td>Funding</td>
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</tbody>
</table>

Funding | n/a | n/a |
<table>
<thead>
<tr>
<th>Study</th>
<th>Methods</th>
<th>Participants</th>
<th>Interventions</th>
<th>Outcomes</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beaupre et al. (2005)</td>
<td>All subjects were assessed 6 weeks preoperatively (before the exercise/education intervention), immediately preoperatively (after the exercise/education intervention), and 3, 6 and 12 months after surgery utilizing the Western Ontario McMaster Osteoarthritis Index, the SF-36, and knee range of motion (ROM) and strength measures.</td>
<td>One hundred thirty-one subjects were randomized to either the control (n = 66) or treatment (n = 65) group 6 weeks before TKA surgery. Subjects were similar in demographic characteristics and all measurements at the baseline assessment.</td>
<td>Patients in the treatment group underwent a 4-week exercise/education program before surgery. Data on length of stay, numbers of community rehabilitation or homecare visits following discharge from the surgical hospital, and the costs associated with these services were also collected.</td>
<td>No differences were seen in knee measurements (ROM and strength), pain, function, or HRQOL between the 2 groups following the intervention program or at any postoperative measurement point. Patients in the treatment group used fewer postoperative rehabilitation services and stayed for a shorter time in hospital than the control group, but these differences did not attain statistical significance.</td>
<td>Number of participants required by the Power Analysis was not met.</td>
</tr>
<tr>
<td>Clarke et al. (2012)</td>
<td>Retrospective study of patients who did and did not receive preoperative education. Participant blinding: n/a Participant records were reviewed for history of falls while in the hospital setting.</td>
<td>244 patients who underwent primary TKA at a single institution between March and November 2009, 72 patients of one surgeon were enrolled in a preoperative nurse-led education program, this was compared to the control group of 172 patients who underwent TKA at the same institution but did not receive education.</td>
<td>None</td>
<td>Control group: (7/172falls)</td>
<td>Other factors that could have influenced outcomes include the use of femoral and sciatic blocks that may have influenced results. This was discussed by the author.</td>
</tr>
</tbody>
</table>
This was a prospective, randomized, controlled trial. Patients were blinded to group assignment while clinicians were not. To detect a suggested minimal clinically important difference of 5 points on the STAI with 95% power (type 1 error = 0.05), the authors calculated a required sample size of 50 patients for each group. Intention-to-treat analysis was performed, and the randomization list was concealed. Variable relationships were analyzed using t tests and chi-square tests, whereas differences between the 2 groups over time (1 and 7 days postoperation) were analyzed with a multiple regression model adjusted for baseline group differences.

At 2 to 6 weeks before surgery, all patients received typical, patient-tailored, preoperative information from their surgeon and anesthetist, as well as a standardized surgery and rehabilitation information leaflet. In addition, the experimental group attended a half-day session with 2 to 5 other patients. A varying team consisting of a rheumatologist, orthopaedic surgeon, anesthetist, physical therapist, and psychiatrist briefed the group for one-half hour each, and answered patients’ questions. Spouses, friends, and relatives of the patients were also invited to attend the session.

As measured by the visual analog scale, univariate analysis found that the experimental group experienced less pain just before surgery ($P = 0.04$). In multivariate analysis adjusted for gender, initial STAI scores, depression score, health assessment questionnaire score, and autologous blood transfusion, the experimental group was less anxious just prior to surgery ($P = .01$), had less pain before and after surgery ($P = .02$ and $P = .04$, respectively), and stood sooner than the control group following surgery ($P = .07$).

Well designed, despite being single-blinded design. Outcome bias minimal because all data was patient reported.

### Johansson et al. (2005)

Elective hip arthroplasty patients were randomized into groups, data was collected using structured questionnaires, Patients getting elective hip arthroplasty within six weeks, aged 18 or over, capable of completing the questionnaires. Intervention group received preadmission education using the concept map method (systematic oral education) with written

- Power analysis used, results are significant
- Orthopaedic Patient Knowledge Questionnaire used to test

While there was no significant difference in physiological outcomes, psychological outcomes with
the Orthopaedic Patient Knowledge Questionnaire prior to admission, at admission, and a shorter version at discharge. A randomized two-group pre-test post-test design was used to compare voluntary, adult and elective orthopaedic patients from a surgical ward at one university hospital during a period of one year. Group A received written material plus verbal education using the concept map method, group B received written educational materials alone based on the idea of empowering through education.

Power analysis completed and showed a requirement of 120 participants. Out of 156 possible patients 123 were recruited. Group A had 62 patients with 7 dropouts, group B had 61 patients with 10 dropouts.

The education program was delivered in a group format within a 4-week period prior to their knee arthroplasty. The aim of the programme was to provide patients with an optimal level of preparation for knee arthroplasty surgery and help them to understand the

- Mean length of hospital stay was significantly shorter in experimental group (7.0+/−5.7 days vs. 5.0+/−3.2 days)
- Significantly higher percentage leaving in early stage (1–4 days) in experimental group
- No significant difference in readmission in first 3 months

Authors admit to contradicting previous Cochrane review and attribute this to the use of “face-to-face” contact. This is unsubstantiated.

Jones et al. (2011) Prospective data collection, first nine months prior to implementation of education program and last 14 months after implementation of education program. A joint arthroplasty nurse was appointed to implement and organize the educational sessions.

472 patients who underwent knee arthroplasty between January 2006 and November 2007. All surgeries were performed using the same surgical techniques and type of prosthesis. 150 participants in control group (prior to implementation of education).

empowerment
- prior to admission: no significant difference
- at admission: study group significantly higher
- at discharge: study group significantly higher
- No significant difference in LOS or post op care

Study sample was representative and therefore results can be generalized to this orthopaedic group.
of educational program), 322 participants in educational group (after implementation of educational program). 32 participant’s data excluded. Essential role they could play in their recovery after knee arthroplasty. Statistical analyses were performed using SPSS, group differences examined using interdependent t-tests, and length of hospital stay using a Mann-Whitney U-test. A 2x2 chi-squared test was used to examine differences between the CG and the EG for the percentage of patients discharged in the early period following surgery (1-4 days_ and later period (5 days on).

| Sjöling et al. (2003) | Study followed a prospective experimental design with two parallel groups of equal size, a treatment group (n=30) and a control group (n=30). The same investigator informed all patients (treatment and control) in an information session that took 20-40 minutes. Variables tested using the Mann-Whitney test, the Chi-square test and Spearman’s rank correlation. | Participants had a diagnosis of osteoarthritis as reason for surgery, scheduled for TKA, aged 50 years old or older, mentally oriented and able to understand questionnaires. Participants could not have rheumatoid arthritis or postoperative state of confusion, in all, 67 participants were asked to participate in the study; five declined and two other patients developed postoperative. Both groups received routine information and the treatment group received specific information verbally and in a leaflet with contents based on a literature review concerning the patients’ own role in pain management by trying to improve knowledge in many areas including letting staff know at an early stage when their pain returned, in order to receive treatment and prevent peaks of pain. | - No significant difference in basic analgesic treatment regimen, pain relief time, use of analgesics, trait anxiety, and length of stay. - Patient satisfaction was significantly higher in the treatment group and state anxiety significantly lower. Study showed that additional information given in class sessions had no significant effect on any outcome tested except patient satisfaction and state anxiety. Unknown if a power-analysis was used to determine desired number of participants. |
The design for this study was a two-group, quasi-experimental, posttest-only design. All participants attended and received the “standard” education provided in the preadmission testing (PAT) process. The treatment group also attended an interdisciplinary educational program for total joint arthroplasty patients. A brochure describing the program was distributed to individuals being scheduled for arthroplasty. Subjects who chose to attend the interdisciplinary educational program were compared with those who received the standard outpatient teaching in the PAT center. Outcomes for knowledge and state of confusion resulting in the desired total of 60 subjects. Mean age of patients was 71 years old ranging from 54-86 years of age.

- Significant difference in knowledge postoperatively as signified by verbalizing importance of exercises and demonstrating postoperative skills. Satisfaction of educational experience was also significant.
- Results involving pain level and expectations were insignificant.

Thomson & Sethares (2008)
skill demonstration were evaluated on the second day after surgery on the orthopaedic unit. The sample size of 156 was determined on the basis of a power analysis.

| Yoon et al. (2010) | Patients were contacted via phone and asked if they would join the study. All data were collected retrospectively by a blinded third party research assistant. Comparisons between the experimental and control cohorts were examined using an independent samples t test for each of the independent variables. The variables of sex, age, number of comorbidities, and surgeon were then used in a stepwise forward regression using SPSS. From April 2006 to May 2007, 261 eligible patients (male, 170/261) were successfully contacted and offered voluntary participation in the CHKR Preoperative Patient Education Program. Of the 261 patients, 168 (64%) chose to participate, whereas 93 (36%) did not. Patients, in either the control or experimental groups, observed to display any confounding factors that could have potentially influenced LOS unrelated to the patient education, surgery, or medical condition (ie, insurance discrepancies, logistical issues, and others) were excluded from this study. Participants attended all in-hospital teaching sessions that were supplemented with anatomical models and DVD media upon patient request. Duration of the education session was typically 1 hour but varied per patient. |

- Significantly lower LOS for experimental group for THA and TKA
- No difference between in person vs. phone interview

Power analysis completed to determine number of participants. Little standardization of clients, could join any time from 30 days to 2 business days before surgery and had choice of phone or in person
Table 3.1 SF-36 scores over time

<table>
<thead>
<tr>
<th></th>
<th>Physical Functioning</th>
<th>Role Physical</th>
<th>Bodily Pain</th>
<th>General Health</th>
<th>Mental Health</th>
<th>Vitality</th>
<th>Social Function</th>
<th>Role Emotional</th>
<th>PCS</th>
<th>MCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>P value, group †</td>
<td>0.45</td>
<td>0.46</td>
<td>0.75</td>
<td>0.40</td>
<td>0.31</td>
<td>0.04</td>
<td>0.63</td>
<td>0.29</td>
<td>0.64</td>
<td>0.18</td>
</tr>
<tr>
<td>P value, time ‡</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.23</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
</tr>
<tr>
<td>P value, group*, time †</td>
<td>0.07</td>
<td>0.10</td>
<td>0.26</td>
<td>0.63</td>
<td>0.51</td>
<td>0.70</td>
<td>0.38</td>
<td>0.47</td>
<td>0.29</td>
<td>0.65</td>
</tr>
</tbody>
</table>

|                      | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treat | Con | Treatment, n: 51, Control, n: 58

Table 3.2 Knee ROM and strength scores over time

<table>
<thead>
<tr>
<th></th>
<th>ROM</th>
<th>Quadriceps Strength ‡</th>
<th>Hamstring Strength ‡</th>
</tr>
</thead>
<tbody>
<tr>
<td>p value (group) †</td>
<td>0.98</td>
<td>0.89</td>
<td>0.52</td>
</tr>
<tr>
<td>p value (time) ‡</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>p value (group*, time †)</td>
<td>0.13</td>
<td>0.24</td>
<td>0.78</td>
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</table>

<table>
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<tr>
<th></th>
<th>Treatment Mean (SD)</th>
<th>Control Mean (SD)</th>
<th>Treatment Mean (SD)</th>
<th>Control Mean (SD)</th>
<th>Treatment Mean (SD)</th>
<th>Control Mean (SD)</th>
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</thead>
<tbody>
<tr>
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<td>42</td>
<td>49</td>
<td>42</td>
<td>49</td>
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<tr>
<td>Initial assessment</td>
<td>107 (14)</td>
<td>105 (21)</td>
<td>22 (8)</td>
<td>24 (11)</td>
<td>16 (6)</td>
<td>17 (7)</td>
</tr>
<tr>
<td>Immediate preoperative</td>
<td>109 (12)</td>
<td>105 (18)</td>
<td>26 (11)</td>
<td>25 (10)</td>
<td>18 (9)</td>
<td>20 (16)</td>
</tr>
<tr>
<td>3-Month postoperative</td>
<td>93 (15)</td>
<td>93 (15)</td>
<td>27 (10)</td>
<td>27 (8)</td>
<td>18 (7)</td>
<td>18 (6)</td>
</tr>
<tr>
<td>6-Month postoperative</td>
<td>95 (14)</td>
<td>96 (17)</td>
<td>29 (9)</td>
<td>29 (9)</td>
<td>19 (6)</td>
<td>20 (7)</td>
</tr>
<tr>
<td>1-Year postoperative</td>
<td>99 (16)</td>
<td>103 (16)</td>
<td>30 (10)</td>
<td>29 (8)</td>
<td>21 (8)</td>
<td>21 (6)</td>
</tr>
</tbody>
</table>

ROM: knee flexion + extension (i.e., total range of sagittal knee motion), measured in degrees. ‡ Measured in pounds of force. † Two-way repeated measures ANOVA.

Table 3.3 Health service utilization following acute-care discharge

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treatment, Mean (SD)</th>
<th>Control, Mean (SD)</th>
<th>n</th>
<th>Control, Mean (SD)</th>
<th>Treatment, Mean (SD)</th>
<th>n</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute care LOS</td>
<td>6.7 (2.2)</td>
<td>7.3 (2.5)</td>
<td>55</td>
<td>60</td>
<td>7.3 (2.5)</td>
<td>7.7</td>
<td>0.14</td>
</tr>
<tr>
<td>Transfer LOS</td>
<td>7.7 (2.0)</td>
<td>7.7 (2.8)</td>
<td>23</td>
<td>31</td>
<td>7.7 (2.8)</td>
<td>7.7</td>
<td>0.66</td>
</tr>
<tr>
<td>Readmission LOS</td>
<td>3.4 (0.55)</td>
<td>3.8 (2.0)</td>
<td>5</td>
<td>6</td>
<td>3.8 (2.0)</td>
<td>3.8</td>
<td>0.95</td>
</tr>
<tr>
<td>Total LOS</td>
<td>10.2 (4.5)</td>
<td>11.7 (5.2)</td>
<td>55</td>
<td>60</td>
<td>11.7 (5.2)</td>
<td>10.2</td>
<td>0.10</td>
</tr>
</tbody>
</table>

* Independent T test. LOS: length of stay, in days.
Table 4.1

Results of database search

<table>
<thead>
<tr>
<th>Reports Resulting from Search (N=72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reports dropped</td>
</tr>
<tr>
<td>Descriptive study: 3</td>
</tr>
<tr>
<td>Case Study: 2</td>
</tr>
<tr>
<td>Qualitative Study: 6</td>
</tr>
<tr>
<td>Not published in English: 4</td>
</tr>
<tr>
<td>Post-operative interventions: 5</td>
</tr>
<tr>
<td>Intervention not a class setting: 2</td>
</tr>
<tr>
<td>Greater than 10 years old: 6</td>
</tr>
<tr>
<td>No measured outcomes: 1</td>
</tr>
<tr>
<td>RCT: 3</td>
</tr>
<tr>
<td>Quasi Experimental: 5</td>
</tr>
<tr>
<td>Systematic Review: 1</td>
</tr>
</tbody>
</table>
Appendix I

Description of Studies in McDonald Systematic Review

<table>
<thead>
<tr>
<th>Butler 1996</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods</strong></td>
</tr>
<tr>
<td><strong>Participants</strong></td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td><strong>Notes</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk of bias</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
</tr>
<tr>
<td>Allocation concealment?</td>
</tr>
</tbody>
</table>
# Clode-Baker 1997

<table>
<thead>
<tr>
<th><strong>Methods</strong></th>
<th>Randomised parallel group trial stratified by age. Randomisation performed by an independent statistician, but unclear if allocation was concealed. Participant blinding: unclear. Outcome assessment blinding: no. Description of withdrawals: no. Intention-to-treat analysis: not stated.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participants</strong></td>
<td>78 people undergoing total hip replacement (52 female, 26 male; aged 65 years and younger (n = 25), 66 to 74 (n = 27), 75 and over (n = 27)). Exclusion criteria: none stated. Location: United Kingdom.</td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
<td>Intervention group (n = 41) mailed information about the hospital stay and postoperative recovery, consisting of a 20 minute video, booklet and set of life-size plastic model bones approximately 4 weeks before surgery. Control group (n = 37) received no preadmission information but were seen routinely on admission by nursing staff who provided information about the hospital stay.</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Hip function evaluation; general health state (Nottingham Health Profile); stress and arousal (Stress Arousal Checklist); anxiety and depression (Hamilton Anxiety and Depression Scale); days to mobilisation; length of hospital stay; pain (descriptive ordinal scale); sleep disturbance; patient satisfaction</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>24% of patients were undergoing their second primary total hip replacement: “nearly all” of these patients were in the intervention group</td>
</tr>
</tbody>
</table>
### Crowe 2003

#### Methods

#### Participants
133 participants undergoing total hip replacement (n = 65) or total knee replacement (n = 68). Intervention group 51 female, 14 male (mean age 67, SD 12); control group 55 female, 13 male (mean age 71, SD 11).
Inclusion criteria: admission for elective hip or knee replacement, participants not functioning well, limited social support and/or comorbid medical conditions. Exclusion criteria: functioning well, managing activities of daily living and access to good care-giver support, limited English, undergoing a revision or second joint replacement within two years.
Location: Canada.

#### Interventions
Intervention group (n = 65) provided with a preoperative education package consisting of a 50 minute video and a booklet giving information on length of stay, discharge criteria, respite care and diet. Some patients given tour of the hospital unit, demonstration of equipment, dietician counselling and social work input. All participants received individualised counselling from an occupational therapist.
Control group (n = 68) received one standard preoperative clinic visit (lasting about 7 hours) 1 to 2 weeks before surgery. Participants were informed about the hospital stay and the immediate postoperative phase.

#### Outcomes
Days to eligibility for discharge; preoperative anxiety (Spielberger State-Trait Anxiety Inventory); length of hospital stay; days to mobilisation (out of bed, walking and climbing stairs).

#### Notes
Randomisation resulted in uneven numbers of hip and knee replacements in each group.

### Risk of bias

<table>
<thead>
<tr>
<th>Item</th>
<th>Authors' judgement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation concealment?</td>
<td>Yes</td>
<td>A - Adequate</td>
</tr>
</tbody>
</table>
### Cool 1997

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participants</strong></td>
<td>42 participants (30 female, 12 male) undergoing total hip replacement. Intervention group aged 54 to 84 years (mean 69, SD 8); control group aged 56 to 84 years (mean 69, SD 8). Exclusion criteria: previous hip replacement. Location: United Kingdom.</td>
</tr>
<tr>
<td><strong>Interventions</strong></td>
<td>Intervention group (n = 21) given an information sheet containing instructions regarding postoperative protocol and list of exercises as well as verbal explanation of contents; exercises and activities taught through demonstration by a physiotherapist. Control group (n = 21) given the same information sheet, asked to read and follow instructions but received no further contact with demonstrator</td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
<td>Recall of exercises and recognition of advice on the first postoperative day; patient satisfaction (with content and delivery of information)</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Risk of bias

<table>
<thead>
<tr>
<th><strong>Item</strong></th>
<th><strong>Authors’ judgement</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation concealment?</td>
<td>Unclear</td>
<td>B - Unclear</td>
</tr>
</tbody>
</table>
Daltrey 1998  (Continued)

| Outcomes | Anxiety at day four (Spielberger State-Trait Anxiety Inventory); pain (charted medication); length of hospital stay; mental status (Mini-Mental State Exam) on day 4; use of continuous passive motion machine; postoperative complications; usefulness of intervention materials |
| Notes | Data from the Information and relaxation group (n = 52) were excluded from the analyses because our inclusion criteria specified that the education/information intervention should be the sole component of the intervention |

**Risk of bias**

| Item | Authors' judgement | Description |
| Allocation concealment? | Unclear | B - Unclear |

Doering 2000

| Methods | Randomised parallel group trial with unstated allocation concealment. Participant blinding not stated. Outcome assessment blinding: for physiotherapy measures and use of analgesics but not for other outcomes. Description of withdrawals: pre-randomisation only. Intention-to-treat analysis: not stated |
| Participants | 100 participants undergoing total hip replacement. Intervention group 21 female, 25 male (mean age 59, SD 11); control group 17 female, 31 male (mean age 60, SD 9). Inclusion criteria: admission for total hip replacement surgery, age > 17 years, osteoarthritis of the hip. Exclusion criteria: previous hip surgery, comorbidity associated with severe pain, scheduled elective hip replacement, comorbidity that might alter cortisol and catecholamine excretion, psychiatric comorbidity. Location: Austria. |
| Interventions | Intervention group (n = 46) shown a 12 minute videotape in the presence of an investigator the night before surgery containing procedural information (pre and postoperative), behavioural instructions and information about the sensory experiences a patient is likely to have. Control group (n = 54) received preoperative information delivered by a surgeon and anaesthetist, and routine information sheets |
| Outcomes | Anxiety (Spielberger State-Trait Anxiety Inventory); depression (von Zerssen Depression Scale); days to mobilisation (standing and climbing stairs); length of hospital stay; pain (postoperative analgesics); blood pressure; cortisol excretion |
| Notes | |

**Risk of bias**

| Item | Authors' judgement | Description |
| Allocation concealment? | Unclear | B - Unclear |
### Daltroy 1998

<table>
<thead>
<tr>
<th>Methods</th>
<th>Randomised trial using a 2 x 2 factorial design stratified by joint (hip or knee) and age (18 to 70 years or &gt;70 years). Allocation concealment not stated. Participant blinding: not stated. Outcome assessment blinding: yes. Description of withdrawals: unclear. Intention-to-treat analysis: not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>222 participants (146 female, 76 male; mean age 64, SD 12) undergoing total hip replacement (n = 104) or total knee replacement (n = 118). Exclusion criteria: previous hip or knee replacement, inability to speak English or fill out questionnaires. Location: USA.</td>
</tr>
<tr>
<td>Interventions</td>
<td>Information group (n = 58) received a 12 minute audio-tape slide programme on the postoperative in-hospital rehabilitation experience. Relaxation group (n = 58) received training in Benson's Relaxation Response with a bedside audiotape. Information and relaxation group (n = 52) received the information intervention followed by relaxation training. Control group (n = 54) received neither intervention.</td>
</tr>
</tbody>
</table>

### Lilja 1998

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>55 participants (17 female, 33 male; median age 65) undergoing total hip replacement. Inclusion criteria: &lt; 75 years of age. Exclusion criteria: none stated. Location: Sweden.</td>
</tr>
<tr>
<td>Interventions</td>
<td>Intervention group (n = 22) given extended formalised information concerning pre and postoperative procedures by an anaesthetic nurse for 30 minutes the day before surgery. Control group (n = 28) informed about pre and postoperative routines by a ward nurse</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Anxiety (Hospital Anxiety and Depression Scale); stress and pain (visual analog scale); serum cortisol (radioimmunoassay)</td>
</tr>
<tr>
<td>Notes</td>
<td>Aim of the study was to evaluate effects of extended preoperative information on perioperative stress</td>
</tr>
</tbody>
</table>

### Risk of bias

<table>
<thead>
<tr>
<th>Item</th>
<th>Authors’ judgement</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
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<td>B - Unclear</td>
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</table>
### Santavirta 1994 (Continued)

<table>
<thead>
<tr>
<th>Allocation concealment?</th>
<th>Unclear</th>
<th>B - Unclear</th>
</tr>
</thead>
</table>

### Wijgman 1994

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>64 participants (48 female, 16 male; mean age 65) undergoing cemented or uncemented total hip replacement. Inclusion criteria: primary coxarthrosis confirmed by X-ray. Exclusion criteria: pathological malformations (other than hip problems) which could interfere with rehabilitation. Location: Netherlands.</td>
</tr>
<tr>
<td>Interventions</td>
<td>Intervention group (n = 31) received preoperative instructions (30 minutes) in groups of 4 to 6 delivered by two physiotherapists as well as preoperative exercise therapy including muscle-setting exercises. Control group (n = 32) not described.</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Function/disability (Harris Hip Score); days to mobilisation (standing, walking and climbing stairs); length of hospital stay; pain (medication)</td>
</tr>
<tr>
<td>Notes</td>
<td>Original publication in Dutch.</td>
</tr>
</tbody>
</table>

### Risk of bias

<table>
<thead>
<tr>
<th>Item</th>
<th>Authors' judgement</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocation concealment?</td>
<td>Unclear</td>
<td>B - Unclear</td>
</tr>
</tbody>
</table>

SD: standard deviation
**Santavirta 1994**

<table>
<thead>
<tr>
<th>Method</th>
<th>Randomised parallel group trial with unstated allocation concealment. Participant blinding: not stated. Outcome assessment blinding: no. Description of withdrawals: to point of surgery only. Intent-to-treat analysis: not stated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participants</td>
<td>60 participants undergoing total hip replacement. Intervention group 19 female, 8 male (mean age 59 years, SD 6); control group 19 female, 14 male (mean age 58, SD 5). Inclusion criteria: age &gt; 17 years. Exclusion criteria: previous major orthopaedic surgery, severe disabilities. Location: Finland.</td>
</tr>
<tr>
<td>Interventions</td>
<td>Intervention group (n = 27) before admission received an 18 page patient guide information booklet on total hip replacement surgery and rehabilitation. On admission, had a 20 to 60 minutes teaching session delivered by one of the investigators concerning total hip replacement and rehabilitation planned according to each participant’s situation. Control group (n = 33) received the 18 page booklet only.</td>
</tr>
<tr>
<td>Outcomes</td>
<td>Patient knowledge (disease, treatment and rehabilitation); patient satisfaction; patient compliance (questionnaire)</td>
</tr>
<tr>
<td>Notes</td>
<td>Measurements taken on admission to hospital and 2 to 3 months postoperatively</td>
</tr>
</tbody>
</table>

**Risk of bias**

<table>
<thead>
<tr>
<th>Item</th>
<th>Authors’ judgement</th>
<th>Description</th>
</tr>
</thead>
</table>

**Characteristics of excluded studies [ordered by study ID]**

<table>
<thead>
<tr>
<th>Study</th>
<th>Reason for exclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bondy 1999</td>
<td>Studied the effects of anaesthetic patient education on preoperative anxiety. Although the patients were undergoing total hip replacements, the information was not specific to hip or knee replacement surgery</td>
</tr>
<tr>
<td>Brull 2002</td>
<td>Not a trial of preoperative education. Anxiety and depression were measured in a randomly selected group of patients undergoing elective hip or knee replacement with the aim of measuring the effects of preoperative anxiety and depression on postoperative recovery</td>
</tr>
<tr>
<td>Gammon 1996b</td>
<td>In addition to receiving preoperative education, patients in the intervention group were also exposed to a postoperative teaching programme before discharge. The study was excluded because it is not possible to isolate the effects of the preoperative education</td>
</tr>
<tr>
<td>Reference</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Haslam 2001</td>
<td>A trial to detect differences between acupuncture and advice/exercise in the symptomatic treatment of osteoarthritis of the hip. Patients were on a waiting list for hip replacement but did not have surgery as part of the study. Advice given was not related to surgery for hip replacement.</td>
</tr>
<tr>
<td>Hough 1991</td>
<td>Not a randomised trial.</td>
</tr>
<tr>
<td>Mikulaninec 1987</td>
<td>Preoperative instruction was of a general nature and not specific to hip or knee replacement. It was designed for patients undergoing a range of general surgical procedures including abdominal, thoracic, perineal and orthopaedic surgery.</td>
</tr>
<tr>
<td>Reoch 1995</td>
<td>Not a randomised trial.</td>
</tr>
<tr>
<td>Wong 1985</td>
<td>The intervention combined preoperative instruction of rehabilitation exercises with postoperative behavioural strategies (including an alarm clock reminder to do exercises and verbal reinforcement from nurses).</td>
</tr>
</tbody>
</table>
Appendix II

PubMed

- Search: “Total Joint Replacement”
  - MeSH terms:
    - OR “arthroplasty” AND “education”
    - Initial Search: 37 results
      - 12 already used from CINAHL
      - 2 identified as applicable titles
        - 2 excluded
        - Qualitative Study: 1
        - Post-operative intervention: 1
  - Search: “Arthroplasty” AND “Education”
    - Initial Search: 637 results
      - MeSH terms AND “class”
      - Initial Search: 17 results
        - 6 already used from CINAHL
        - 2 identified as applicable titles
          - 2 articles utilized for Critical Appraisal
  - Search: “Joint” AND “Replacement” AND “Education”
    - Initial Search: 90 results
      - 0 applicable titles
Appendix III

Cochrane Collaboration

- Search “Total Joint Replacement”
  - AND “Education”
    - Initial Search: 6 results
      - 1 applicable title (RCT)
        - 1 used in study
    - AND “Preoperative Education”
      - Initial Search: 2
        - 1 already used
  - AND “Class”
    - Initial Search: 8
      - 0 applicable titles
- Search: “Arthroplasty”
  - AND “Education”
    - Initial Search: 1
      - 1 already in use (systematic review)
  - AND “Preoperative Education”
    - Initial Search: 1
      - 1 already in use (systematic review)
- Search: “Total Joint Arthroplasty”
AND “Education”
  - Initial Search: 8
    - 1 already in use (RCT)
  - Search: “Total Knee Arthroplasty”
    o AND “Education”
      - Initial Search: 1
        - 0 applicable titles
  - Search: “Total Hip Arthroplasty”
    o AND “Education”
      - Initial Search: 1
        - 0 applicable titles
Appendix IV

PsychINFO

- Search “Total Joint Replacement”
  - AND “Education”
    - Initial Search: 13 results
      - 1 already used
      - 0 applicable titles
    - AND “Preoperative Education”
      - Initial Search: 6
        - 1 already used
        - 0 applicable titles
    - AND “Class”
      - Initial Search: 4
        - 1 applicable title: Dissertation
          - Excluded: Qualitative
        - 1 already used
  - Search: “Arthroplasty”
    - AND “Education”
      - Initial Search: 23
        - 1 identified as an applicable title
          - 1 used in Critical Appraisal
- AND “Preoperative Education”
  - Initial Search: 4
    - 1 already used
- AND “Class”
  - Initial Search: 4
  - 0 applicable titles
Appendix V

Thesis Database

- Search “Total Joint Replacement”
  - AND “Education”
    - Initial Search: 30 results
      - 0 applicable titles
  - AND “Preoperative Education”
    - Initial Search: 0
  - AND “Class”
    - Initial Search: 53
      - 0 applicable titles