

AN INTEGRATIVE REVIEW OF UTILIZING MUTUAL GOAL SETTING WITH
THE ELECTIVE CORONARY ARTERY BYPASS GRAFT PATIENT TO
IMPROVE POSTOPERATIVE PHYSIOTHERAPY ADHERENCE

by

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A scholarly project submitted in partial fulfillment

of the requirements for the degree

of

Doctorate of Nursing Practice

In

Family and Individual Health

MONTANA STATE UNIVERSITY

Bozeman, Montana

April 2018

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DEDICATION

I am dedicating this Doctorate of Nursing Practice Scholarly Project to my parents, to my husband, and to my future daughter. My parents have always encouraged me to go after my dreams, and helped me see my potential as a scholar and as a human being. I also credit them for instilling in me at an early age the work ethic needed to get through a doctoral program. My husband, Eric, has also been instrumental in my achievements throughout this DNP program. He picked up the burden of being the primary financial provider for us while I was in school. He also gave me numerous pep-talks when I was feeling over-whelmed and losing sight of the light at the end of the tunnel. Lastly, I dedicate this paper to my future daughter, Millie, who should be blessing my husband and I with her presence shortly after the completion of my DNP program. She was with me during the entirety of my last two semesters through the program, making her presence known from time to time in the form of nausea, pain, discomfort, and fatigue. However, Millie endured long hours of clinical and sitting down at a desk typing assignments, papers, and my DNP project.

This DNP Project has been very beneficial for me as a future nurse practitioner. The biggest lesson learned was that evidence may not currently exist to answer a question pertaining my specific population. However, I utilized theory and assumptions from health behavior sciences regarding anxiety and depression and how they affect patient adherence levels to find evidence in similar populations (cardiac rehabilitation and heart failure patients). The data found in other populations were extrapolated and synthesized to support the integration of a nurse practitioner and mutual goal setting as part of the standard care of the elective CABG patient.

This work will directly impact my future practice as my plans are to specialize in care of cardiac patients in Great Falls, Montana. Great Falls is experiencing a shortage of cardiology providers and many patients seek care of their cardiac diseases in distant cities. The lack of access to cardiology care in Great Falls may increase cardiac patients' anxiety and uncertainty about who will manage their care, and potentially negatively affect health outcomes. By developing therapeutic relationships and engaging in mutual goal setting with cardiology patients who are in need of elective CABG procedures, nurse practitioners may help to offset the stress this patient population may be feeling regarding inconsistency in cardiology providers in Great Falls, MT.

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ABSTRACT

The purpose of this integrative literature review was to determine if mutual goal setting improved postoperative adherence to physiotherapy in adult patients undergoing elective coronary artery bypass graft (CABG) surgery. The integrative review was conducted using the methodology outlined by Whittemore and Knafl (2005). Literature was gathered by searching databases with key search terms related to physiotherapy adherence and goal setting. A review of abstracts and full-text using inclusion and exclusion criteria was conducted to determine which reports to include in the review. There no reports or studies that discussed the effects of mutual goal setting on physiotherapy adherence in the adult elective CABG patient. Reports and studies that looked at the effects of mutual goal setting in patients with heart disease and patients in cardiac rehabilitation programs were analyzed. The results from those reports and studies were extrapolated and applied to the adult elective CABG patient on the basis that the groups share similar levels of anxiety and depression, which evidence has shown affects adherence to physiotherapy. The results were analyzed based on outcome measurement of adherence (objectively measured levels of adherence or subjectively reported by participants' perception of how adherent they were). Results were inconclusive, but most of the studies suggest that goal setting, used alone or in conjunction with other motivational techniques, can improve adherence to physiotherapy in heart disease patients.

CHAPTER ONE

INTRODUCTION

Coronary artery disease (CAD) is the leading cause of mortality in the U.S. (Bilal, 2014) with 15.5 million sufferers over the age of 20 (Mozzafarian et al., 2015). Coronary heart disease accounts for 1 in 7 deaths, killing over 360,000 people per year in the U.S. (American Heart Association [AHA], 2017). In addition, myocardial infarctions (\$11.5 billion) and CAD (\$10.4 billion) are two of the 10 most expensive hospital principal discharge diagnoses (AHA, 2017).

The primary treatment for CAD when percutaneous intervention is not a viable option is coronary artery bypass grafting (CABG) surgery. The surgery provides revascularization to the myocardium and subsequently improves the patient's quality of life (QOL) and reduces cardiac-related mortality (Bilal, 2014). CABG surgeries are performed urgently, emergently or electively based on the stability of the patient's coronary artery disease. Elective CABG surgeries are recommended for stable CAD patients who meet the American College of Cardiology Foundation/American Heart Association [ACCF/AHA] (2011) criteria and indications for CABG surgery. While the number of CABG surgeries has declined recently due to newer, less invasive interventions, cardiovascular surgeries are the third most prevalent procedures performed in the U.S. (Weiss & Elixhauser, 2014). In 2011, there were 213,700 CABG surgeries performed in the U.S (2014). Despite the positive benefits of the CABG surgery, risks in the form of postoperative complications exist even when done electively. Almashrafi and

Vanderbloemen (2016) found a 48% prevalence rate of postoperative complications among CABG patients (see Table 1). Many postoperative complications are preventable including atelectasis, acute respiratory distress, deep venous thromboses, and pulmonary emboli (Aranki, Aroesty, & Suri, 2015).

Complications can also have devastating consequences in terms of cost to the patient, and the U.S. healthcare system. CABG patients who experienced postoperative complications spent eight more days in the hospital compared to patients who did not experience complications (Almashrafi & Vanderbloemen, 2016). Extended length of stay can affect the flow of patients within the healthcare system as patients with complications delay patient turnover and surgical flow through the operating room. In one 600-bed hospital, CABG complications resulted in 310 additional overnight patient stays over a one year time span (2016). These additional overnight patient stays can result in increased cost of care to the U.S. healthcare system. Investigators in a Virginia hospital reported an increased cost of \$14,687 for CABG patients who experience any complication postoperatively (LaPar et al., 2013). Cost in terms of decreased QOL of the patient is also a concern related to surgical complications. Pinto, Faiz, Davis, Almoudaris, and Vincent (2016) found a statistically significant decrease in physical and mental QOL indicators in patients who suffered surgical complications.

Complications can be prevented with consistent patient adherence to a postoperative plan of care that consists of ambulation, adequate caloric intake, pain control, and incentive spirometry (Ahmed, Ibrahim, Soussi, & El Said, 2006). However, researchers have found that patient adherence to a preventative plan of care is low in the

immediate and extended postoperative period (Abookire et al., 2001; Yam et al., 2006).

In CABG patients discharged from the hospital, only 25-40% are adherent to their cardiac rehabilitation program after six months (U.S. Department of Health and Human Services [DHHS], 1996).

Patient adherence to treatment plans is greatly affected by the patient's psychosocial and psychological wellbeing. CABG patients experience significant levels of depression, anxiety, and decreased perceptions of control during preoperative and the immediate post-operative period (Gallagher & McKinley, 2009; Chunta, 2009).

Depressed patients were three times more likely to be non-adherent to treatment plans than non-depressed patients (DiMatteo, Lepper, & Croghan, 2000). Halpin and Barnett (2005) found that patients who had a pessimistic state of mind prior to surgery had an increased length of stay of two days and also had greater risk for postoperative permanent stroke and prolonged ventilation times. Prolonged ventilation time after surgery is associated with increased mortality rates in postoperative CABG patients (Saleh et al., 2012). Preoperative anxiety has also been shown to correlate with adverse outcomes after cardiac surgery (Asilioglu & Celik, 2004). The work of this literature review was guided by evidence showing that depression and anxiety affect patient adherence, which in turn can affect clinical outcomes.

Theoretical Concept

King's Theory of Goal Attainment asserts that if nurses and patients interact to set mutual goals, patients are more likely to adhere to treatment protocol (Watson, 2000).

Using therapeutic approaches in the preoperative stage to align the provider and the patient in a shared framework and collaboration on the patient's plan of care can increase patient adherence to a plan of care, which improves postoperative outcomes (Kleinsinger, 2010).

In a constantly evolving health care system, nurse practitioners are assuming an increasing role in preoperative surgical risk assessment in a multitude of settings (Thanavaro, 2015). Given that just over half of all CABG surgeries are done electively, there is an opportunity for nurse practitioners working in the cardiology outpatient setting to develop an interpersonal relationship and utilize therapeutic relationships with the CABG patient in the preoperative phase. Using King's Theory of Goal Attainment, the nurse practitioner can partner with the patient to help them enter surgery in the psychosocial state that will optimize the patient's recovery.

Dr. Imogene King highlighted "nursing as a profession, rather than an occupation or craft, and spoke of the need to focus on and organize existing knowledge in nursing as well as expand the knowledge base for nursing practice" (Frey, Sieloff, & Norris, 2002, p. 108). King first developed the Conceptual Systems Framework in 1971, and then derived the Theory of Goal Attainment from her Conceptual Systems Framework in 1981 (Frey et al., 2002). King wrote that the "complexity of life in the future will require a systems approach in organizing health care systems to serve people nationally and internationally" (King, 1992, p. 19). King's Theory of Goal Attainment provides concepts that will help nurses use communication to help patients positively adapt to the changing environment (King, 1992).

King's Theory of Goal Attainment is a middle-range, prescriptive theory.

Middle-range theories are more "concrete and narrower than grand theories; they are made up of a limited number of concepts and propositions that are written at a relatively concrete and specific level" (Fawcett, 2005, p. 35). Middle-range theories also focus on answering specific nursing practice questions (Alligood & Marriner-Tomey, 2010).

King's Theory of Goal Attainment focuses on answering the nursing question of how to help patients achieve their goals by understanding how the systems and relationships of individuals and groups interact.

King's Theory of Goal Attainment is also a predictive theory because it is "knowledge building and attempts to explain how two or more concepts relate to each other" (Butts & Rich, 2015, p. 101). These types of middle-range theories move beyond "explanation to the prediction of precise relations between concepts or the effects of one or more concepts on one or more concepts" (Fawcett, 2005, p. 36). In the Theory of Goal Attainment (1992), the concept of goal attainment is predicted by the effects of transaction between the nurse and the patient via the interaction of multiple concepts.

King's Goal Attainment Theory used an interacting systems framework in the theory development. These systems include the individual or personal system, the group or interpersonal system, and the social system (King, 1981). Different concepts exist within each of the three systems. The concepts within the personal system are perception, self, growth and development, body image, space, and time (King, 1981). These are fundamental to how the patient views their personal goals, beliefs, and values. The concepts within the interpersonal system are interaction, communication, transaction,

role, stress, and coping (King, 1981). These concepts define the relationship and show collaboration between two or more people within the system. The concepts within the social system are organization, authority, power, status, decision making, and control (King, 1981). These concepts provide a framework for social interaction and relationships and establish rules of behavior and courses of action (King, 1981).

An example of putting this theory into practice would be a cardiology nurse practitioner who can engage with the patient as a “whole” as they may have other concerns in their life other than physical concerns that relate to the upcoming surgery. As noted before, patients who are under emotional stress or have other psychosocial issues are less likely to be adherent to the postoperative treatment plan, and are at risk for postoperative complications. The development of an interpersonal relationship between the nurse practitioner and the patient will help the patient identify any concerns they may have, and will help the patient who set the mutual goal enter the surgery in the psychosocial state that they prefer to optimize the surgery outcomes.

Purpose

Postoperative complications following CABG surgery are prevalent, and they present a burden to the patient, the U.S. healthcare system, and the economy. Many of these complications can be prevented if patient adherence to a treatment plan following surgery is optimal. The purpose of this integrative literature review is to determine if utilizing mutual goal setting therapies with the elective adult CABG patient in the preoperative setting will improve postoperative adherence to physiotherapy.

CHAPTER TWO

LITERATURE REVIEW

Background

Optimal management of risk factors and symptoms plays an important role in improving the health outcomes, QOL, and healthcare utilization in the cardiovascular patient (Foody et al., 2003). Lack of adherence to diet, lifestyle modifications, and medication regimens are barriers that many healthcare professionals encounter when managing the care of these patients. In CABG patients who were six months postoperative, the DHHS (as cited in Zarani et al., 2012) found that only 25-40% were adherent to cardiac rehabilitation, exercise, diet, smoking cessation, and medications. Adherence during the immediate post-operative period in the CABG patient is especially important as it is correlated to post-operative outcomes and complications (Ahmed et al., 2006).

Interventions aimed at improving patient adherence and preventing postoperative outcomes have been implemented throughout the perioperative phase in the CABG patient. Recently, more focus has been placed on implementing a variety of interventions in the preoperative stage to improve postoperative outcomes and prevent complications. Interventions have targeted preoperative education, behavioral and lifestyle modification, and physiotherapy rehabilitation in the open-heart surgery patient.

Significance

In 1994, Recker postulated the theory that preoperative teaching during the admission process of the cardiac surgical patient on the day of surgery may produce positive outcome results, such as a shortened length of hospital stay. Nurse-led education conducted in the preoperative period focuses on providing cardiac surgery patients with information about the surgery, the hospitalization process, expected outcomes, postoperative pain control, postoperative pulmonary care, heart healthy nutrition and cardiac rehabilitation (Zhang et al., 2012). Research teams who have assessed the outcomes of preoperative education interventions have provided mixed results. Martin and Turkelson (2006) found that education of patients prior to surgical intervention improved patients' anxiety and decreased postoperative complications. Zhang et al. (2012) found that preoperative education conducted in the hospital setting decreased postoperative incidence of lower extremity edema, constipation, urinary retention, pulmonary complications, cardiovascular complications, and shortened length of stay. Shuldham (2011) demonstrated that preoperative education had no postoperative benefit to the CABG patient. Snowdon, Haines and Skinner (2014) found that preoperative education did not improve the incidence of pulmonary complications, time to extubation or length of stay but did improve postoperative physical functioning.

Other interventions aimed at improving coping with major surgery (counseling, religious therapy, and relaxation therapy) have also shown mixed results. Preoperative counseling did not decrease the length of stay but did show cost effectiveness by lowering total costs and improving the cost-effectiveness ratio per quality-adjusted life

year (Snowdown, Haines, & Skinner, 2014). Chaplain visits to improve coping skills had no beneficial effects on anxiety, depression and hopelessness (Bay, 2008). Cognitive-behavioral interviewing decreased depression, but had no long term beneficial effects in decreasing healthcare utilization (Furze, 2009). Nurse-led lifestyle counseling improved the physical quality of life, but had no effects on blood pressure, lipids, body mass index (BMI) anxiety, depression, length of stay, or psychological indicators on the QOL scale (Goodman, 2008). Relaxation therapy reduced pain, tension, and anger, but had no effect on heart rate (HR), blood pressure (BP), depression, fatigue, or confusion (Kshetry, 2006; Leserman, 1989).

Aside from emotional and mental interventions, other interventions have been targeted to optimize the cardiovascular, respiratory, and musculoskeletal system during the preoperative period to mitigate the negative effects of anesthesia. Interventions such as deep breathing training, inspiratory muscle training, exercise training, and early mobilization were aimed at developing these behaviors preoperatively so they could be practiced postoperatively (Snowdon, Haines & Skinner, 2014). Preoperative exercise training resulted in a shorter time to extubation (TTE) (Herdy et al., 2008). Researchers found that preoperative exercise to decrease length of stay and postoperative pulmonary complications (PPC) produced mixed results (Arthur et al, 2000; Hulzebos et al., 2006; Rosenfeldt et al., 2011; Herdy et al., 2008; Ku et al., 2002). Most researchers found preoperative physiotherapy to be beneficial in preventing the incidence of PPCs (Hulzebos et al., 2006; Weiner et al., 1998; Rajendran et al., 1998) except for two studies in which investigators found no benefit but also no harm (Stiller et al., 1994; & Yanez-

Brage et al., 2009). When looking at specific PPCs, Hulzebos et al., (2006) found that preoperative physiotherapy reduced the incidence of postoperative pneumonia (Hulzebos et al., 2006) and Yanez-Brage et al., (2009) showed a decrease in postoperative atelectasis. Investigators found mixed results regarding the benefit of preoperative physiotherapy on postoperative physical functioning. Rosenfeldt et al., (2011) found no postoperative benefit to physical function at six weeks using the Short Form 36 Physical Component Summary score while Arthur et al., 2000 found a significant increase in the QOL physical component score postoperatively.

Preoperative physiotherapy prior to open heart surgery may have some postoperative mental health benefits, but the evidence is lacking. Ku et al., 2002 reported a significant improvement in postoperative anxiety scores with preoperative exercise instruction and programming. However, Arthur et al., 2000 reported no beneficial effects of preoperative physiotherapy on QOL psychological components (i.e. psychological stress, role limitations, and social support systems) postoperatively.

In many studies, a multi-faceted approach was taken with complex interventions in preventing postoperative complications after CABG surgery. The HeartOp Program, which combined cognitive-behavioral therapy with nurse-led home telephone calls prior to surgery, produced positive results in decreasing postoperative depression (Furze et al., 2009). Goodman et al., (2008) found that combining nurse-led education with emotional support helped patients preserve their physical functioning QOL. McHugh et al., 2001 combined health education with motivational interviewing which showed improvements in postoperative QOL indicators including physical functioning, role limitation due to

physical health problems, bodily pain, general health, energy and vitality, social functioning, mental health, and role limitations cause by mental health problems. Lin et al. (2017) reported that psycho-education, motivational interviewing, and short message services improved medication adherence rates, pharmacy refill rates, lipid profiles, and QOL scores in CABG patients.

Need for Review

In the studies described above, some of the components of mutual goal setting were utilized in the preoperative intervention; however, none of the studies specifically included mutual goal setting, used all of the components of mutual goal setting, or used the Theory of Goal Attainment. In managing heart failure patients, mutual goal setting has shown promise in helping patients with understanding their disease, and improving patient self-efficacy in managing their disease in the home setting. Watson (2000) used mutual goal setting to produce a significant increase in patients' perceived understanding of the diagnosis of heart failure. In utilizing mutual goal setting to improve patient self-efficacy in managing their disease, Ranta (2000) found no difference after three months, but Rogers (2001) found that patients in the test group had higher levels of self-efficacy when compared to the control group after six months. Many of these studies have shown that preoperative interventions using education, emotional-mental therapy, and physiotherapy provided benefit in improving postoperative outcomes and preventing complications. The mutual goal setting studies with heart failure patients resulted in improved patient understanding of disease process and disease management self-efficacy.

However, none of these studies explored utilizing mutual goal setting to improve postoperative physiotherapy adherence in the elective CABG patient.

CHAPTER THREE

METHODS

Within this chapter, the methods and procedures of this integrative review are discussed and explained in detail. This includes definitions of terms used in this review, study design, the literature search strategy, inclusion and exclusion criteria, and data synthesis and analysis.

Definitions

1. Mutual goal setting implies that the person's values were explored and mutually determined health attainment goals were identified. (Watson, 2000).
2. Adults were defined as patients who are 18 years of age or older.
3. Elective CABG patients were defined as patient's whose cardiac function has been stable in the days or weeks prior to the operation and the CABG procedure could be deferred without increased risk of compromised cardiac outcomes (Society of Thoracic Surgeons, 2003).
4. Patient adherence signified that the patient followed through with a treatment plan. (Roter et al. 1998).
5. Physiotherapy was defined as any physical activity aimed at improving physical functioning and/or preventing physical decline/complications (i.e. early mobilization, physical therapy, respiratory exercises, etc.) (Mendes et al., 2014).

6. Cardiac disease was defined as any condition that affected the function of the heart including coronary artery disease, heart failure, arrhythmias, and heart valve problems (AHA, 2017).

Design

The purpose of this integrative literature review was to determine if preoperative mutual goal setting with the elective CABG surgery patient improves postoperative adherence to physiotherapy. The starting date of the integrative review was August 2015 with an end date of December 2017. Whittemore and Knafel's (2005) methodology was used as a guideline during the conduct of the integrative review process.

Problem Identification

In the first phase of the project, the clinical problem was identified, the purpose of the review was determined, and the variables of interest were identified. The author's experience working with open heart surgery patients during the immediate postoperative period provided the background for the problem identification. The problem identified in practice was lack of adherence to prescribed postoperative physiotherapy while in the hospital. The purpose of this integrative review was to determine whether mutual goal setting done during the preoperative period would enhance or improve postoperative adherence to physiotherapy in adults following elective CABG surgery. Elective CABG surgery was selected because patients undergoing this procedure do not urgently or emergently need surgery, and mutual goal setting could be accomplished in the days and weeks leading up to their surgery. Also during the problem identification stage,

empirical and theoretical literature was identified as the appropriate sampling frame for the literature search.

Literature Search

The literature search strategy was determined to include types of studies, databases searched, the date range of articles retrieved, keywords and MESH headings used in the search, and inclusion criteria, and exclusion criteria. Lastly, the review strategy was determined which consisted of an initial review of the abstracts gathered during the literature search followed by an in-depth appraisal of the study. Qualitative and quantitative studies using a variety of research approaches, and published reviews were included in the integrative review. Databases searched using the Montana State University library site included CINAHL, Medline, PubMed, and PsychInfo. The research registry ClinicalTrials.gov was also searched to find any current or ongoing studies related to the problem. Ancestry searching was not done because patient ancestry and genetics would not provide useful insight into the problem identified for the purpose of this review. Consultation with a Montana State University librarian occurred on two different occasions for assistance with development of search strategies and search terms. The initial keywords used to search CINAHL, Medline, PubMed, and PsychInfo were postoperative adherence, mutual goal setting, and coronary artery bypass graft (CABG). These search terms yielded no results in any of the databases. The search terms used in ClinicalTrials.gov were “CABG or coronary artery bypass grafting” AND “goal setting” AND “adherence.”

After the initial search yielded no results, the decision was made to broaden the search to determine what effect mutual goal setting had on physiotherapy adherence among patients with heart failure and cardiac rehabilitation patients. This was based on the assumption that results found in the heart disease population could be extrapolated to the elective CABG patient since they share similar rates of anxiety and depression, which in turn affect adherence to physiotherapy. The key terms and MESH headings used in CINAHL, Medline, PubMed, and PsychInfo were “goal setting” + “adherence” + “cardiovascular” OR “heart disease” OR “cardiac disease”. The references in the articles found in CINAHL, Medline, PubMed, and PsychInfo were mined to discover any other existing evidence. The results of the reference mining were then used to develop the phrase used in Google Scholar was “goal-setting to improve exercise adherence in cardiovascular patients”. The clinical trial database, ClinicalTrials.gov, was searched using the search term “heart disease” + “physiotherapy adherence”. See table 2 for the results of the search for each database.

Inclusion and Exclusion Criteria

Initial screening of the search involved scanning each document and using the inclusion criteria. Inclusion criteria for the integrative review included peer-reviewed journal articles and empirical reports, written in the English language, with information related to the effects of mutual goal-setting in adult patients with diagnosed heart disease on patient’s physiotherapy adherence. Articles were included if they were published between 1989 and 2017. After screening documents for inclusion criteria, the included documents were screened for duplication. Next, the documents were screened using the

exclusion criteria. Studies were excluded if adherence to physiotherapy was not an outcome, if the patient population included patients who did not have heart disease, if research studies had not been completed, if research studies did not have published results, or if the patient population included patients younger than 18 years of age. After scanning the documents for inclusion and exclusion criteria, the full text of each article was read to screen for inclusion and exclusion criteria. If full-text articles were unavailable, inter-library loan requests were submitted through the Montana State University Library.

Data Evaluation

The final sample for this integrative review included only empirical studies as no theoretical reports were found in the search process. Empirical reports included randomized-controlled trials, systematic reviews, and meta-analyses. Since these sources were similar in that they were empirical studies, evaluation of the data was similar. Extraction of specific methodological features and data relevance was done in order to evaluate overall quality of each report (Cooper, 1998). Each study was appraised (see Appendix A) using the framework posited by Melnyk and Fineout-Overholt (2015). The studies were reviewed for scientific rigor, sample size, and ability to be generalized to the elective CABG surgical patient population. No report was excluded based on the evaluation of the quality of the data; however, it was taken into consideration in the data analysis stage and the discussion stage when conclusions were formed and implications for practice and research were discussed.

Data Synthesis and Analysis

Analysis began by exploring relevant data concerning the epidemiology of coronary artery disease, CABG procedures, surgical complications associated with CABG procedures, methods to decrease complication rates after CABG surgery, and reviewing literature on goal setting, adherence, and King's Theory of Goal Attainment. Data was extracted from primary resources on sample characteristics, interventions, and outcomes measured. Categories for sample characteristics include diagnoses, gender, and age. Each study was then compared for outcomes related to using goal setting to improve patient adherence to physiotherapy. The outcomes of each study were then used to organize the literature.

During the organization phase of data synthesis and analysis, it was noted that all of the reports discussed interventions that used goal setting in combination with other methods (i.e. motivational interviewing, graphic feedback, etc). However, the interventions that were used in conjunction with goal setting fit within the concepts described in King's Interpersonal System (1981). Differences in measurement of patient adherence also differed between studies. There was enough similarity in outcome measurements to organize the literature based on outcomes.

CHAPTER FOUR

RESULTS

The purpose of this integrative literature review was to determine if mutual goal-setting during the preoperative stage increased postoperative physiotherapy adherence in adult elective CABG patients. Twenty-nine studies met the inclusion and exclusion criteria based on abstract review. Of the twenty-nine studies, eight studies met the inclusion and exclusion criteria after a full-text review. The information on the author and year of publication, type of study, population, design, measured outcome(s), the effects of goal-setting on patient adherence to physiotherapy, and the study appraisals can be found in Appendix B. Five of the studies were randomized controlled trials, and three of the studies were systematic reviews. There were no qualitative studies that provided evidence as to the experience of mutual goal setting's effect on physiotherapy adherence from a patient or provider perspective. Also, there were no clinical guidelines found that addressed CABG patient postoperative physiotherapy in relation to patient adherence. .

Description of StudiesDiagnosis

Four of the studies included cardiac rehabilitation patients in their sample population (Beswick et al., 2005, Karmali et al., 2014, Focht et al., 2004; Janssen et al., 2014). These patients had one or more of the following diagnoses: congestive heart failure, cardiovascular surgery, myocardial infarction (or ischemic coronary heart

disease), percutaneous transluminal arthroplasty, or chronic stable angina. The other four studies included patients from heart failure clinics (Duncan et al., 2002; Duncan et al., 2003; Tierney et al., 2012; Thakur, 2016). The patients from the heart failure clinics were diagnosed with ischemic or nonischemic heart failure.

Gender

Most of the studies had mostly male participants (Duncan & Pozehl, 2002; Karmali et al., 2014; Duncan & Pozehl, 2003; Janssen et al., 2014, & Tierney et al., 2011). One randomized controlled trial had an equal number of male and female participants in the study (Focht et al., 2004). In the study published by Thakur (2016) most of the participants were female. In the review published by Beswick et al. (2005), there was no comment on the gender distribution in the reviewed studies.

Age

Researchers included participants 18 years or older (Karmali et al., 2014; Tierney et al., 2011), 60 years or older (Thakur, 2016), 18-75 years (Janssen et al., 2014), and 50 to 80 years old (Focht et al., 2004).

Interventions

A variety of approaches were used throughout the randomized controlled trials and the studies in the systematic reviews to improve adherence to exercise and physical activity. There were six theoretical frameworks described in six of the studies in this review: Bandura's Social Learning Theory (Duncan et al., 2002; Duncan et al., 2003; Tierney et al., 2012), Self-Regulation Theory derived from the Cognitive-Behavioral

Theory (Janssen et al., 2014), Social-Cognitive Theory (Focht et al., 2014), Group Theory (Focht et al., 2014), Theory of Self-Empowerment (Thakur, 2016), and the Transtheoretical Model (Tierney et al., 2012). Goal-setting was used in combination with other techniques to improve physical activity adherence. Self-monitoring of adherence and goal-attainment was used in six of the studies (Duncan et al., 2002; Duncan et al., 2003; Janssen et al., 2014; Focht et al., 2014; Beswick et al., 2005; & Karmali et al., 2014). Motivational interviewing was used in two studies as a way to elicit participants' desires and motivation to achieve goals (Janssen et al., 2014; & Focht et al., 2014). Discovering actual and potential barriers to goal achievement and problem-solving to overcome those barriers was used in all eight studies. Feedback regarding goal attainment progress was used in four studies (Duncan et al., 2002; Duncan et al., 2003; Janssen et al., 2014; Beswick et al., 2005; & Karmali et al., 2014). Developing supportive relationship with the provider was described in the intervention in two studies (Duncan et al., 2002; & Duncan et al., 2003). Other interventions used in conjunction with goal-setting included family support (Janssen et al., 2014; Beswick et al., 2005; Karmali et al., 2014; & Thakur, 2016), group encouragement and motivation (Focht et al., 2014; & Karmali et al., 2014), development of strategies to cope with goal failure (Focht et al., 2014; & Karmali et al., 2014), recognition of personal strengths and resources (Thakur, 2016), oral and written patient commitments (Beswick et al., 2005; & Karmali et al., 2014), and stress management (Karmali et al., 2014).

Outcomes

Amount of Exercise

Six of the eight studies measured exercise adherence in terms of the amount of exercise performed by the participants. The absolute measurement of exercise frequency or the number of exercise sessions performed during the study was used in six of the studies (Duncan et al., 2002; Duncan et al., 2003; Tierney et al., 2012; Beswick et al., 2005; & Karmali et al., 2014). The absolute duration of exercise or the number of minutes exercise was performed during each session was measured in three studies (Duncan et al., 2002; Tierney et al., 2012; & Karmali et al., 2014). In one study, exercise adherence was also defined as the number of kilocalories per kilogram per day and also the absolute distance measured by a pedometer while walking (Tierney et al., 2012).

Four studies (Tierney et al., 2012; Duncan et al., 2002; Duncan et al., 2003; & Focht et al., 2004) found increased adherence to physical activity compared to control groups. The measurement of adherence in these studies included the absolute and relative measurement of physical activity in terms of frequency and duration. The intervention groups in three of the studies performed more exercise sessions than the control group that was statistically significant (Duncan et al., 2002; Duncan et al., 2003; & Tierney et al., 2012). In two of the studies, the intervention group performed more minutes of exercise compared to the control group (Duncan et al., 2002; & Tierney et al., 2012). In the review done by Tierney et al. (2012), the intervention group also walked longer distances and burned more kilocalories per kilogram per day than the control group. The relative amount of exercise frequency and/or duration (the documented number of

sessions and/or minutes compared to set exercise goals) was significantly higher than the control group in three of the studies (Duncan et al., 2002; Focht et al., 2004; and Tierney et al., 2012).

Two of the studies that measured the amount of exercise performed by participants had inconclusive results (Karmali et al., 2014; & Beswick et al., 2005). In the review done by Beswick et al. (2005), the studies were grouped by themes identified in the interventions (patient commitment, family involvement, self-management strategies, education, and psychological interventions). The findings from the Beswick et al., study showed there is inconclusive evidence to suggest effectiveness of the interventions studied in this review, but adherence may be improved by nurse-led strategies to aid in self-management such as goal setting. In the review done by Karmali et al., only three of the eight studies found increased physical activity adherence among groups that used daily diary entries, goal setting and action planning when compared to control groups. The findings were inconclusive to suggest that goal setting or any combination of interventions used with goal setting were beneficial to improving physiotherapy adherence, but there was some evidence that using action planning and self-monitoring may be beneficial to improving physiotherapy adherence.

Patient Perception

In addition to the quantitative measurement of exercise, participant perception of exercise adherence and goal-attainment was measured in five of the studies (Duncan et al., 2002; Janssen et al., 2014; Thakur, 2016; Tierney et al., 2012; & Beswick et al., 2005).

Duncan et al., (2002) measured the effects of goal-setting, graphic feedback (graphic depiction of each patient's exercise goals in comparison to each patient's exercise participation) and problem-solving guidance using a 10-point scale of patient's perception about their past exercise progress and their confidence in continuing to exercise. The intervention produced higher scores in participants' confidence in meeting exercise goals ($t=-2.51, p<0.05$) and in perceived adherence to goals for home exercise ($t=-2.22, p<0.05$) when compared to the control group.

Janssen et al., (2014) measured the effect of motivational counseling which included setting personal health goals using a self-regulation skills assessment battery. This battery used a 5-point Likert scale assessing patient's perception of goal-efficacy, self-monitoring and feedback, self-criticism, self-reward, and problem coping. At 6 months, the intervention group had higher scores on the self-regulation battery overall compared to the control group ($F(1,165)=4.67, p=0.03, g=0.32, 95\% CI=-1.02$ to -0.04). The intervention group also had significantly higher scores when they rated their goal-efficacy ($t(173)=-2.83, p=0.01$) and their self-monitoring and feedback ($t(173)=-3.93, p<0.05$). At 15 months, the intervention group's self-regulation battery scores did not differ from the control group.

Thakur (2016) measured the effects of a health empowerment intervention which helped participants identify health goals and ways to attain them by using a 5-point Goal Attainment Scale for each health goal set by the participants. Participants who received the health empowerment intervention had significantly higher scores on the Goal Attainment Scale ($F=14.805, df=1, p=0.00, Cohen's d=0.76$). The intervention had a

moderate to high effect size which underscores the practical importance of the health empowerment intervention on personal health goal attainment.

Beswick et al., (2005) conducted a systematic review of intervention studies to improve adherence in cardiac rehabilitation. The review included studies that measured the participants' subjective adherence or goal-attainment with a variety of scales and questionnaires using a variety of interventions. Beswick et al., (2005) found that participants who received goal-setting and problem identification did not have significantly higher scores on scales where participants rated their health behaviors and attitudes. However, Beswick et al. (2005) concluded that the results may have been skewed due to the possible effect continuous self-evaluation had on the control group's scores.

Tierney et al. (2012) conducted a systematic review to examine the effectiveness of strategies used to promote exercise adherence in patients with heart failure. This review also included studies that measured participants' subjective perception of adherence and/or goal attainment. The authors found short-term positive effects associated with goal-setting, feedback, and problem solving on the development of self-efficacy.

Conclusion

The studies in this review provided evidence that mutual goal-setting, either used alone or in conjunction with other motivational techniques, could improve the objective and subjective measures of participants' adherence to physiotherapy and goal attainment. Of the six studies that objectively measured participants' adherence, four of them found that interventions oriented around goal-setting produced higher exercise adherence rates when compared to control groups. Two of the six studies (Karmali et al.; Beswick et al.) had inconclusive results, but suggested that strategies to improve self-management like goal-setting, action planning, and self-monitoring could improve exercise adherence.

The majority of studies that measured participants' subjective perception of adherence or goal achievement concluded that goal-setting had positive effects on participants' subjective measurement or perception of exercise adherence. Only one study (Beswick et al.) found goal-setting had no effect on participants' perception of adherence or goal attainment. However, Beswick et al. suggested the possibility that continual self-evaluation could have acted as an intervention itself, therefore inadvertently elevating the control groups' scores.

CHAPTER FIVE

DISCUSSION

This integrative review analyzed the effects of mutual goal setting on physiotherapy adherence in adult patients who had elective CABG surgeries. However, no studies that specifically addressed this particular population were found in the databases searched. There were a number of studies measured the effect of goal-setting on physiotherapy adherence in other cardiovascular patient populations including persons with heart failure and persons enrolled in cardiac rehabilitation programs. In this review, the population of interest was expanded. The integrative review focused on the effects of goal-setting on physiotherapy two cardiac populations to extrapolate the evidence and apply it to elective CABG patients.

Elective CABG patients are like cardiac rehabilitation and heart failure patients in that research has shown all three groups have high rates of anxiety and depression. Depression has a prevalence rate of 21.6% with a range of 9 to 60% among heart failure patients (Rutledge, Reis, Linke et al., 2006). Anxiety affects approximately 40% of heart failure patients, a prevalence rate that is 60% higher than seen in the healthy population (Konstam, Moser, & De Jong, 2005). In cardiac rehabilitation patients who have coronary heart disease, prevalence rates for major depression and anxiety disorders are 16% to 25% and 10% to 29%, respectively (Serber, Todaro, Tilkemeier, & Niaura, 2009). CABG patients also experience significant levels of depression, anxiety, and decreased perceptions of control during the preoperative and the immediate post-operative period

(Gallagher & McKinley, 2009; Chunta, 2009). One study showed depression and anxiety prevalence rates of 28.5% prior to CABG surgery and 17.5% and 24.7% after CABG surgery (Krannich et al., 2007).

Psychological disturbances, like depression and anxiety, can play a large role in a patient's ability to engage in and adhere to a plan of care. Depressed patients are three times more likely to be non-adherent to treatment plans than non-depressed patients (DiMatteo, Lepper, & Croghan, 2000). This link between anxiety and depression as it relates to the lack of treatment adherence also pertains to physiotherapy treatment plans. A systematic review found strong evidence that depression and anxiety were barriers to treatment adherence in outpatient physiotherapy clinics (Jack, McLean, Moffett, & Gardiner, 2010). Therefore, anxiety and depression could be two factors that contribute to low levels of physiotherapy adherence amongst cardiac rehabilitation, heart failure, and CABG patients and those interventions that improved adherence in one group could potentially improve adherence in another.

In this integrative review, Dr. King's Theory of Goal Attainment was used to guide a review of the effects of goal-setting on physiotherapy adherence in patients with cardiovascular disease. Kleinsinger (2010) found that engaging patients in goal-setting could improve adherence to physiotherapy. The results as to whether goal-setting improved adherence to physiotherapy was not conclusive. Most studies showed that goal-setting, either used alone or in conjunction with other motivational interventions, improved patient exercise adherence whether it was measured objectively (the percentage of exercise goals met) or subjectively (the patient's perception of adherence and goal

attainment). One study showed that there was no difference in exercise adherence between groups that received goal-setting and those that did not, while two systematic reviews had mixed results on goal-setting's effect on physiotherapy adherence. However, the authors of those studies did speculate whether part of the data collection procedure, such as continuous self-evaluation, inadvertently acted as an intervention to improve exercise adherence. Data from the studies also supported that feedback (either from intervention administrators or from the participant themselves) positively influenced exercise adherence.

Strengths

This integrative review did have several strengths. Of the eight studies included, three of the studies were systematic reviews, one of which was from the Cochran Library of Systematic Reviews (Karmali et al., 2014). These systematic reviews were of randomized-controlled trials, which present a high level of evidence. The other five studies were randomized-controlled trials, which also rate as higher levels of evidence (Melnyk & Fineout-Overholt, 2015). Two of these RCT studies had sample sizes greater than 100, which added strength to the evidence presented. The strengths of each study are described in Appendix B.

Limitations

There were several limitations of this integrative review. The clear limitation was that no studies were found that specifically looked at the effects of goal-setting on physiotherapy adherence in adult elective CABG patients. Therefore, data from similar studies with cardiac rehabilitation and heart failure patients were used to support that depression and anxiety was central to adherence. Another limitation is that none of the studies explicitly used goal-setting as the intervention. All the studies combined goal-setting with other motivational interventions such as graphic feedback, motivational interviewing, or problem-solving strategies to influence patient adherence to exercise. Therefore, it cannot be said that goal-setting alone improves patient adherence to physiotherapy but it may improve adherence when employed with other motivational techniques. Methods of data collection and measurement were also limitations as all the studies had different methods of measuring patient adherence to exercise or their perception of adherence. This lack of homogeneity was the reason the systematic reviews included in this review were unable to perform meta-analyses. Sample sizes in three of the randomized controlled trials were also small (less than 50 participants), and therefore provided weaker evidence in supporting the hypothesis. The last limitation of this review is that no qualitative evidence was found during the search to include in this integrative review. Inclusion of both quantitative and qualitative evidence in integrative reviews gives a more broad view and understanding of the phenomenon of concern (Whittemore & Knafl, 2005).

Implications for Practice

The findings of this integrative review did not definitively confirm that mutual goal-setting improves patient adherence to physiotherapy in elective CABG patients since there currently are no studies that looked at this intervention with this specific population. However, the findings in studies that used cardiac rehabilitation and heart failure patients suggested that interventions that utilize goal-setting (in conjunction with other interventions) may be beneficial in improving adherence to physiotherapy. Since these populations are similar in that they tend to have higher rates of depression and anxiety, which in turn affect adherence, it may be beneficial to use interventions that utilize goal-setting with CABG patients to improve physiotherapy adherence.

Implementation of mutual goal setting into practice with elective CABG patients to improve physiotherapy adherence during the immediate postoperative period will require an interdisciplinary approach to the care of the preoperative CABG patient among nursing, cardiothoracic surgery, and physical therapy providers. Surgeons can utilize nursing to engage in mutual goal setting with their elective CABG patients during the preoperative phase. During the mutual goal setting process, perceptual agreement occurs between nurse and patient in which these two parties collaborate and agree upon mutual goals related to physiotherapy to achieve success. After goal setting occurs, the nurse and the patient communicate their values, attitudes, and ideas in shared interaction to explore means of achieving the mutually set goals. Issues like anxiety and depression that may be a barrier to patients' attainment of their goals can be addressed in the action plan by means of anxiety and depression screening, and referral to the appropriate mental

health care professionals for further and evaluation and treatment. It is assumed that better management of anxiety and depression prior to surgery will produce improved adherence rates to physiotherapy in the postoperative period. The nurse outlines and communicates the mutually set physiotherapy goals and the action plan discussed during the preoperative phase to nursing, physical therapy, and surgical staff who will take care of the patient during the immediate postoperative period. Nursing, physical therapy, and cardiothoracic surgical staff can then work together to help the patient meet their physiotherapy goals by using the strategies outlined in the action plan. The hypothesis that this process will improve patients' adherence to physiotherapy activity in the postoperative period, which could prevent postoperative complications like reintubation.

The advanced practice nurse (APRN) should assess the risks and benefits when the decision is made to include mutual goal setting as part of the preoperative care of the CABG patient. The APRN should evaluate the potential usefulness of mutual goal setting before integrating this into common practice with CABG patients. Also, all of the studies that used mutual goal setting in conjunction with other methodologies created interventions that were grounded in theory (i.e. Social Learning Theory, etc). If the decision is made to use mutual goal setting in practice with elective CABG patients, the design of the intervention should be guided by theory.

Implications for Research

A lot of research has been done on the effects of goal setting in cardiac rehabilitation and heart failure patients in terms of adherence to physiotherapy. However,

no studies to date have looked at how this particular method affects physiotherapy in the elective CABG patient during the immediate postoperative period. These three populations share an emotional and psychological profile in terms of anxiety and depression; however the timeline and environment in which physiotherapy is performed differs. Cardiac rehabilitation and heart failure patients are not performing their physiotherapy in the hospital during the immediate postoperative period. CABG patients are engaging in their first physiotherapy activities immediately after surgery, while in the hospital. These patients have other external factors that may influence adherence such as new environment, lack of control, separation from family and loved ones, acute pain, etc. Future research done specifically with this population could provide data that was gathered in an environment that takes these factors into consideration to obtain more control of variables.

Another recommendation for future research relative to measuring patient adherence to physiotherapy is the standardization of how activity is measured. Measurements of adherence and activity performed differed from study to study. Currently, there exists a gap in the literature for well-developed measures that capture physiotherapy adherence, especially if it the physiotherapy is done at home (Bollen, Dean, Siegert, Howe, & Goodwin, 2014). The systematic reviews included in this study also noted that this lack of standardization prevented homogeneity of data and therefore meta-analyses were unable to be performed.

Lastly, future research should develop interventions that are grounded in theory (i.e. Bandura's Social Theory, King's Goal Attainment Theory, etc). In all of the studies,

goal setting was used in conjunction with other strategies (i.e. problem-solving, feedback, etc). Therefore, the studies aren't measuring just one intervention, but a group of interventions that were based upon theory. These theories can then be compared against each other to determine if one theory, and therefore one set of interventions, is superior to the other in terms of improving physiotherapy adherence during the immediate postoperative period in elective CABG patients over the age of 18.

Conclusion

Findings from this review suggest that goal setting with patients, when used in conjunction with other methods, can improve physiotherapy adherence in cardiac rehabilitation and heart failure patients. Because these two populations share similar depression and anxiety profiles with CABG patients, goal setting with elective CABG patients may also be beneficial in increasing postoperative physiotherapy (like early and frequent ambulation, incentive spirometry, and increase amount of hours sitting in the chair) adherence. Future research is needed, specifically at using interventions that include goal setting with elective CABG patients and also develop standardized measurements of adherence.

DNP Essentials

This integrative review utilized the scholarship of integration by using concepts from nursing and rehabilitation therapy to create a new practice concept. This review illuminated data that currently existed regarding the use of mutual goal setting to improve

physiotherapy adherence in patients who have diagnosed cardiovascular disease, and integrated that data to bring new insight into the care of the elective CABG patient. This review is an original work in the scholarship of integration in that it brings about a new concept that requires the collaboration between multiple disciplines (Moran, Burson, & Conrad, 2017). Cardiovascular surgery and physiotherapy authors suggest that increased engagement in physiotherapy activities during the postoperative period in CABG patients produces positive outcomes like shortened length of stay (van der Peijl et al., 2004) and decreased complications (Ettema et al., 2014).

Many of the *DNP Essentials* (AACN, 2006) were met with the completion of the DNP Scholarly Project. These include:

- *Essential I (Scientific Underpinnings for Practice)*: Science from nursing in the form of King's Theory of Goal Attainment was integrated with knowledge from psychosocial sciences regarding anxiety and depression's role in patient adherence. Actions and advanced strategies to enhance patient adherence to physiotherapy were described in the discussion section of this paper (AACN,).
- *Essential II (Organizational and Systems Leadership for Quality Improvement and Systems Thinking)*: A care delivery approach of integrating the nurse practitioner into the standard care of the preoperative elective CABG patient to meet the current and future needs of elective CABG patients based on the scientific findings in nursing and health behavior sciences (AACN).
- *Essential III (Clinical Scholarship and Analytical Methods of Evidence-Based Practice)*: Analytical methods from Melnyk and Fineout-Overholt (2015) were

used to critically appraise existing literature to determine the best evidence for practice. Findings from this review were applied in the discussion to improve practice and care of the elective CABG patient. The findings from this review will be disseminated through publication in the Montana Nurses Association's quarterly publication *The Pulse* (AACN) and presentation to cardiovascular health care providers in Great Falls, Montana.

- *Essential VI (Interprofessional Collaboration for Improving Patient and Population Health Outcomes)*: The leadership role of the nurse practitioner caring for the elective CABG patient is described in the discussion section of this paper. It was noted that nurses can become a leader in coordinating multiple disciplines to help patients actualize their postoperative goals and improve physiotherapy adherence (AACN).
- *Essential VII (Clinical Prevention and Population Health for Improving the Nation's Health)*: Epidemiological data regarding coronary artery disease, CABG surgeries, postoperative outcomes, and patient adherence were analyzed and related to the population health of patients with coronary artery disease who need elective CABG surgery. The concept of mutual goal setting was explored by including psychosocial dimensions of the patients (anxiety and depression) to address health promotion and improve the health status of elective CABG patients in the postoperative period (AACN).
- *Essential VIII (Advanced Nursing Practice)*: Including the nurse practitioner in care of the elective CABG patient is described in the discussion section of this

paper and is based on nursing science using King's Theory of Goal Attainment. The intervention describes the development of a therapeutic relationship with patients, families, and the interdisciplinary team to facilitate improved physiotherapy adherence during the clinical postoperative period, to improve patient outcomes.

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APPENDICES

APPENDIX A

RAPID CRITICAL APPRAISAL TOOLS

Rapid Critical Appraisal of Case-Control Studies

1. Are the results of the study valid?

- | | | | |
|--|-----|----|---------|
| a. How were the cases obtained? | Yes | No | Unknown |
| b. Were appropriate controls selected? | Yes | No | Unknown |
| c. Were data collection methods the same for the cases and controls? | Yes | No | Unknown |

2. What are the results?

- | | | | |
|--|-----|----|---------|
| a. Is an estimate of effect given (do the numbers add up?) | Yes | No | Unknown |
| b. Are the multiple comparisons of data? | Yes | No | Unknown |
| c. Is there any possibility of bias or confounding? | Yes | No | Unknown |

3. Will the results help me in caring for my patients?

- | | | | |
|---|-----|----|---------|
| a. Were the study patients similar to my own? | Yes | No | Unknown |
| b. How do the results compare with previous studies? | | | |
| c. What are my patients/family's values and expectations for the outcome? | | | |

Rapid Critical Appraisal of Qualitative Evidence

1. Are the results of the study valid (i.e. trustworthy and credible?)

a. How were study participants chosen?			
b. How were accuracy and completeness of data assured?			
c. How plausible/believable are the results?	Yes	No	Unknown
i. Are implications of the research stated?	Yes	No	Unknown
(1) May new insights increase sensitivity to other's needs?	Yes	No	Unknown
(2) May understandings enhance situational competence?	Yes	No	Unknown
d. What is the effect on the reader?	Yes	No	Unknown
(1) Are results plausible and believable?	Yes	No	Unknown
(2) Is the reader imaginatively drawn into the experience?	Yes	No	Unknown

2. What were the results?

a. Does the research approach fit the purpose of the study?	Yes	No	Unknown
i. How does the researcher identify the study approach?	Yes	No	Unknown
(1) Are language and concepts consistent with the approach?	Yes	No	Unknown
(2) Are data collection and analysis techniques appropriate?	Yes	No	Unknown
ii. Is the significance/importance of the study explicit?	Yes	No	Unknown
(1) Does review of the literature support a need for the study?	Yes	No	Unknown
(2) What is the study's potential contribution?			
iii. Is the sampling strategy clear and guided by study needs?	Yes	No	Unknown
(1) Does the researcher control selection of the sample?	Yes	No	Unknown
(2) Does sample composition and size reflect study needs?	Yes	No	Unknown
b. Is the phenomenon (human experience) clearly identified?	Yes	No	Unknown
i. Are the data collection procedures clear?	Yes	No	Unknown
(1) Are sources and means of verifying data explicit?	Yes	No	Unknown
(2) Are researcher roles and activities explained?	Yes	No	Unknown
ii. Are data analysis procedures described?	Yes	No	Unknown
(1) Does analysis guide direction of sampling and when it ends?	Yes	No	Unknown
(2) Are data management processes described?	Yes	No	Unknown
c. What are the reported results (description or interpretation)?	Yes	No	Unknown
i. How are specific findings presented?			
(1) Is presentation logical, consistent, and easy to follow?	Yes	No	Unknown
(2) Does quotes fit the findings they are intended to illustrate?	Yes	No	Unknown

ii. How are overall results presented?

(1) Are meanings derived from data described in context?

Yes No Unknown

(2) Does the writing effectively promote understanding?

Yes No Unknown

3. Will the results help me in caring for my patients?

a. Are the results relevant to persons in similar situations?

Yes No Unknown

b. Are the results relevant to patient values and/or circumstances?

Yes No Unknown

c. How may the results be applied in clinical practice?

Rapid Critical Appraisal of Randomized Clinical Trials (RCTs)

1. Are the results of the study valid?

- a. Were the subjects randomly assigned to the experimental and control groups? Yes No Unknown
- b. Was random assignment concealed from the individuals who were first enrolling subjects into the study? Yes No Unknown
- c. Were the subjects and providers blind to the study group? Yes No Unknown
- d. Were reasons given to explain why subjects did not complete the study? Yes No Unknown
- e. Were follow-up assessments conducted long enough to full study the effects of the intervention? Yes No Unknown
- f. Were the subjects analyzed in the group to which they were randomly assigned? Yes No Unknown
- g. Was the control group appropriate? Yes No Unknown
- h. Were the instruments used to measure the outcomes valid and reliable? Yes No Unknown
- i. Were the subjects in each of the groups similar on demographic and baseline clinical variables? Yes No Unknown

2. What are the results?

- a. How large is the intervention or treatment effect? (NNT, NNH, effect size, level of significance)? _____
- b. How precise is the intervention or treatment (CI)? _____

3. Will the results help me in caring for my patients?

- a. Were all clinically important outcomes measured? Yes No Unknown
- b. What are the risks and benefits of the treatment? _____
- c. Is the treatment feasible in my clinical setting? Yes No Unknown
- d. What are my patients/family's values and expectations for the outcome that is trying to be prevented and the treatment itself? _____

Rapid Critical Appraisal of Systematic Reviews of Clinical Interventions/Treatments

1. Are the results of this review valid?

- | | | | |
|---|-----|----|---------|
| a. Are the studies contained in the review randomized controlled trials? | Yes | No | Unknown |
| b. Does the review include a detailed descriptions of the search strategy to find all relevant studies? | Yes | No | Unknown |
| c. Does the review describe how validity of the individual studies was assessed (e.g. methodological quality, including the use of random assignment to study groups and complete follow-up of the subjects)? | Yes | No | Unknown |
| d. Were the results consistent across studies? | Yes | No | Unknown |
| e. Were individual patient data or aggregate data used in the analysis? | Yes | No | Unknown |

2. What were the results?

- | | |
|--|-------|
| a. How large is the intervention or treatment effect (OR, RR, effect size, level of significance)? | _____ |
| b. How precise is the intervention or treatment (CI)? | _____ |

3. Will the results assist me in caring for my patients?

- | | | | |
|--|-----|----|---------|
| a. Are my patients similar to the ones included in the review? | Yes | No | Unknown |
| b. Is it feasible to implement the findings in my practice setting? | Yes | No | Unknown |
| c. Were all clinically important outcomes considered, including risks and benefits of treatment? | Yes | No | Unknown |
| d. What is my clinical assessment of the patient and are there any contraindications or circumstances that would inhibit me from implementing the treatment? | Yes | No | Unknown |
| e. What are my patient's and his or her family's preferences and values about the treatment that is under consideration? | Yes | No | Unknown |

Rapid Critical Appraisal of Cohort Studies

1. Are the results of the study valid?

- | | |
|--|--------------------|
| a. Was there a representative and well defined sample of patients at a similar point in the course of the disease? | Yes No Unknown |
| b. Was follow up sufficiently long and complete? | Yes No Unknown |
| c. Were objective and unbiased outcome criteria used? | Yes No Unknown |
| d. Did the analysis adjust for important prognostic risk factors and confounding variables? | Yes No Unknown |

2. What are the results?

- | | |
|--|--|
| a. What is the magnitude of the relationship between predictors (i.e. prognostic indicators and targeted outcome)? | |
| b. How likely is the outcome event(s) in a specified period of time? | |
| c. How precise are the study estimates? | |

3. Will the results help me in caring for my patients?

- | | |
|---|--------------------|
| a. Were the study patients similar to my own? | Yes No Unknown |
| b. Will the results lead directly to selecting or avoiding therapy? | Yes No Unknown |
| c. Are the results useful for reassuring or counseling patients? | Yes No Unknown |

APPENDIX B

EVALUATION TABLE

Citation	Design/ Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Strength of Evidence
Beswick et al (2005)	Systematic Review to evaluate interventions to improve uptake, adherence, and compliance in cardiac rehabilitation	N= 12 studies related to adherence. # of studies measuring effect of goal-setting on adherence (n=4). Total number of patients=234	Adherence to Exercise sessions: How many cardiac rehab sessions did the patient attend compared to the set goal.	Number of sessions attended/Goal for sessions attended	Three qualitative overviews, studies were grouped by quality of evidence. Themes from the qualitative analyses were identified.	Goal-setting was identified as an intervention to aid in self-management. Three of the four studies showed no statistically significant difference in adherence to exercise therapy with goal-setting.	Level of evidence=1. Strengths: Detailed description of search strategy; Description of validity assessment; includes RCTs; patients in review are similar to mine (post-op CABG, or post-MI patients). Feasibility is possible with current nursing staff in coronary care unit; treatment is patient-focused and empowering. Total patient population from the studies was large. Limitations: Included non-randomized trials, results were not consistent across studies; no statistical analysis of the aggregate data; adherence to specific exercise goals not included in studies. It is not known whether goals were mutually-set or prescribed.
Duncan et al. (2002)	RCT Intervention: Adherence facilitation + exercise(goal-setting, graphic feedback, and problem solving guidance) Control: Exercise only	N=13 heart failure patients enrolled in a 12-week home exercise program; mean age =66. Female (n=2); Male (n=11). Ejection fraction (EF) of 40% or less.	<u>Exercise Adherence:</u> 1.frequency of exercise, 2.average duration of each session, 3.percent adherence of frequency 4.percent adherence of duration <u>Patient Perception:</u> Confidence, Satisfaction, and adherence to attaining goals	1. # of sessions completed 2. mean duration of each session 3. (number of sessions/goal)x 100 4.(mean duration/goal)x 100 Patient Perceptions: 10-point Likert scale	Descriptive statistics (frequencies, mean, standard deviation); two-tailed and independent t-tests for group differences for adherence outcomes and exercise perceptions	Intervention group had higher percentage of frequency adherence, mean number of sessions completed, percentage of duration adherence, mean duration per session, confidence in meeting goals, satisfaction with progress, and perception of adherence.	Level of evidence = 2. Strengths: Random assignment; Follow-up assessment was long enough to study effects; subject analyzed to each group they were assigned to; control group was appropriate; measurement instruments valid and reliable; similar demographics. Limitations: No blinding of subjects and providers; no reasons given for attrition; Unknown if assignment was concealed; Statistical reporting was incomplete (no confidence interval). Sample size was small.
Duncan et al. (2003)	RCT Intervention: Adherence facilitation program (goal-setting, graphic feedback, and problem-solving guidance) Control: No intervention	N=14 patients; Intervention (n=7); Control (n=7) The patients were currently enrolled in a heart failure clinic; EF 40% or less; mean age 66.4 years old; majority men.	Exercise adherence: The number of exercise sessions completed compared to goals	Exercise diaries were used to determine frequency of exercise at home; cardiac rehabilitation staff kept record of attendance during supervised sessions.	Two-tailed t-tests to determine differences between groups for the adherence variable of exercise frequency; Descriptive statistics (means and standard deviations) were used for each phase	Phase I (12-week supervised exercise): No significant difference in adherence as measured by number of sessions completed Phase II (12-week home-based exercise): Adherence was significantly higher in intervention group	Level of evidence=2 Strengths: RCT; randomized assignment; reasons for attrition explained; follow-up length of time adequate; subjects analyzed into groups they were assigned; control group is appropriate; measurement tools were valid and reliable; subjects in both groups similar in demographic and clinical variables. Risks and benefits considered. Limitations: no intervention effect calculated; random assignment not concealed from those enrolling participants; providers not blinded to study group; unclear if adherence was measured against goals. Small sample size

Citation	Design/ Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Strength of Evidence
Focht et al. (2004)	RCT: Cognitive-Behavioral group-mediated therapy which included goal-setting in a cardiac rehab program Control: standard cardiac rehab program	N=132 cardiac rehab participants ; age 50-80; hisotry of MI, heart cath, HF, chronic stable angina, or heart surgery; Intervention (n=65); Control (n=67); even gender distribution	Adherence to exercise is defined by the attendance to exercise therapy sessions during the trial	Adherence= # of sessions attended divided by the total # of sessions available	ANCOVA	Higher rates of attendance in intervention group F(1,100)=15.04, p<0.05; Intervention attendance rate: mean=90.88% , SE=2.65; Control attendance rate: M=77.88%, SE=2.04).	Level of evidence=2 Strengths: Random assignment; reasons for attrition given and described; subjects analyzed in assigned groups; control group appropriate; instruments were valid and reliable; groups similar in demo and clinical variables; large sample size; Large effect size. Limitations: Unknown if random assignment concealed to those enrolling participants; No double-blinding; the follow-up assessment was stopped at 3-months for measuring adherence.
Janssen et al. (2014)	RCT; Intervention: Self-regulation program focuxed on maintenance of lifestyle change with goal-setting and barrier identification after completion of cardiac rehab program.	N=210 cardiac rehabilitation patients; 80% men, 20% women; roughly 30% post-CABG patients; Average Age=57.	Exercise behavior defined by the number of steps walked using a pedometer. Self-regulation skills were measured using the Self-Regulation Skills Battery (SRSB) which measures the participants perception of goal-efficacy, self-monitoring and feedback, self-criticism, self-reward, and coping.	Exercise behaviors: steps/day. The SRSB used a 5-point Likert scale assessing 23 aspects of goal-pursuit.	Baseline characteristics of each group measured with t test and Pearson's Chi squared. ANCOVA used to test interaction between group participation and change from baseline to follow-up. One-way ANCOVA used to test differences in SRSB scores between groups.	Exercise behavior: Intervention group walked more stpes than the contro1l group over time (F(2,169)=11.03, P=0.00). Self-Regulation: At 6 months, intervention group reported higher scores (M=17.07, SD=1.67) compared to the control (M=16.54, SD=1.60). One-way ANCOVA showed significant effect F(1,165)=4.67, P=0.03, 95% CI -1.02 to -0.04). Intervnetion group scored higher in goal-efficacy (t(173)-2.83,p=0.01).	Level of Evidence=2. Strengths: Patients randomized between groups. Random assignment concealed from those first enrolling subjects. Double-blinding was accomplished. Reasons for attrition explained/described. Follow-up assessments adequate in length to measure effects. Subjects were analyzed into groups they were assigned. Control group was appropriate. Reliability/validity for the SRSB measurement tool. Patients in each group were similar in demographics and clinical variables. Effect size with CI given for outcomes. Limitations: Reliability/validity for measurement using pedometer was not discussed. Small sample size.

Table 2. Evaluation Table

Citation	Design/ Method	Sample/ Setting	Major Variables Studied and Their Definitions	Measurement of Major Variables	Data Analysis	Study Findings	Strength of Evidence
Karmali et al. (2014)	Systematic Review of patient uptake and adherence in cardiac rehabilitation	N=8 studies that measured adherence to cardiac rehabilitation. Three of these studies evaluated goal-setting's effect on adherence. Total of 316 patients in these three studies.	Exercise adherence defined as the extent to which the participant's behavior concurred with the advice given by health care providers.	Exercise Adherence: # of sessions attended/maximum number of sessions available; Adherence to exercise amount (hours/month and minutes per week); adherence to exercise frequency (sessions per week and month).	Qualitative analysis of studies; heterogeneity explored among studies and studies grouped according to whether the interventions were intended to increase uptake of or adherence to cardiac rehab.	Two of the three studies found no statistical difference between the control and the intervention group in exercise adherence.	Level of evidence= 1 Strengths: Two studies were RCTs. Detailed description of the search strategy; Description of how validity of individual studies were assessed. A qualitative analysis of the aggregate data was provided. The patients were similar to my population; the total patient population among the three studies was large. Limitations: One study was quasi-randomized; no meta-analysis of the quantitative data; none of the studies were assessed to have a low risk of bias
Tierney et al. (2012)	Systematic Review of interventions to improve exercise adherence in heart failure patients	N= 9 studies; Five of those studies used goal-setting as the intervention. These studies had a sum total of 2,988 participants. Four of studies had male majority participants.	Exercise adherence:: measure of adherence to or rates of exercise/physical activity	N/A	Heterogeneity of interventions and outcome measures meant it was not possible to combine results in a meta-analysis. A narrative approach to reviewing located papers was conducted	Four of those five studies measured physical activity rates in the short term. In all of those studies, the intervention group had greater rates of reported activity than the controls. In the other study, long-term exercise adherence was assessed; findings showed now sustained activity at 12 months.	Level of evidence=1 Strengths: Studies are all RCTs; Review has detailed description of search strategies; Description of validity analysis is described; Results were consistent across studies. Aggregate qualitative data was used in analysis. Samples are heart failure patients. Findings are feasible for implementation. Large sample size. Limitations: Data did not have heterogeneity, unable to perform meta-analysis; No intervention/treatment effect noted; Risks and benefits of treatment not considered.
Thakur (2016)	RCT Intervention: Health Empowerment Intervention focusing on strategies to identify and build upon self-capacity, informed decision making and goal setting, and attainment of personal health goals.	N=20 (ten participants in each group); Heart failure patients in Arizona, age 60+, convenience sampling; 80% were female.	Goal Attainment: The ability of the participant to actualize their personal health goals.	Goal Attainment Scale: A five point scale with ratings based on achievement of one or more desired goals which are realistic to achieve in a given time frame	Descriptive statistics used to summarize group demographics; ANCOVA was used to analyze goal attainment scores between the two groups	ANCOVA was statistically significant for the intervention group (F=14.805). The interventional group had purposeful participation in attainment of personal health goals after the intervention.	Level of Evidence=2 Strengths: randomized controlled design, no attrition, random assignment concealed when first enrolling subjects, subjects analyzed in the group to which they were assigned; control group was appropriate, instruments to measure goal attainment were valid and reliable; demographics between groups were similar. Limitations: Providers not blind to study group; small sample size; measures were self-reported; the majority of participants were white and female; all health goals were grouped together and unable to analyze if exercise goals specifically were attained; the intervention was 6 weeks long.

APPENDIX C

SYNTHESIS TABLE

Synthesis Table			
Study	Design	Sample	Outcome
Beswick et al. (2005)	Systematic Review	N=12 studies Total Patients: 234 cardiac rehab patients	No effect
Duncan et al. (2002)	RCT	N=13 heart failure patients Mean age=66 Male= 11 Female=2 EF= <40%	↑ adherence ↑ patient perception of adherence/goal-attainment
Duncan et al. (2003)	RCT	N=14 heart failure patients Mean age=66.4 Majority men EF <40%	↑ adherence
Focht et al. (2004)	RCT	N=132 cardiac rehab patients Age: 50-80 Diagnoses: MI, heart cath, HF, chronic stable angina, heart surgery Even gender distribution	↑Adherence
Janssen et al. (2014)	RCT	N=210 cardiac rehab patients Men=80% Women=20% 30% are post-CABG Average age=57	↑Adherence ↑Patient perception of adherence/goal attainment
Karmali et al. (2014)	Systematic Review	N=8 studies 316 patients total cardiac rehabilitation patients	↑adherence (all studies except 1)
Tierney et al. (2012)	Systematic Review	N=9 studies 2,988 patients total heart failure patients Majority were male	↑ Adherence (all studies except 1) ↑ patient perception of adherence/goal-attainment
Thakur et al. (2016)	RCT	N=20 heart failure patients Age: 60+ Female=80% Male=20%	↑ patient perception of adherence/goal-attainment

TABLES

Table 1. Postoperative CABG Complication Rates

<i>Complication Type</i>	<i>Prevalence Rate</i>
Stroke	1.4-3.8% (Diodato & Cedrawy, 2014)
Depression	17.5%-28.7% (Hata et al., & Krannich et al., as cited in Ettema et al., 2014);
Delirium	17.5% to 28.7% (Gamberini et al., & Rudoph et al., as cited in Ettema et al., 2014);
Nosocomial Infections	10.6% to 54.5% (DeRiso et al., Segers et al., & Tepaske et al., as cited in Ettema et al., 2014);
Acute Renal Failure	2%-3% (Diodato & Chedrawy)
Pressure Ulcers	14.3%-18% (Feuchtinger et al., & Gomez et al., as cited in Ettema et al., 2014);
Pulmonary Complications	10.6%-12.1% (Al-Sarraf et al., Hulzebos et al., & Zarbock et al., as cited in Ettema et al., 2014);
Deep Vein Thrombosis	12.4%-14.8% (Schwann et al., & Ho et al., as cited in Ettema et al., 2014)
Atrial Fibrillation	15.2-33.3% (Calo et al., as cited in Ettema et al., 2014).

Table 2. Results of the Literature Search							
Number of articles found using key words	CINAHL N=21	Medline N=17	PsychInfo N=6	PubMed N=18	Google Scholar N=17,700	Clinical Trials.gov N=12	Web of Science N=0
Number of articles meeting inclusion criteria	5	8	2	6	24	7	0
Number of articles after excluding duplicates	5	6	1	1	22	7	0
Number of articles after using exclusion criteria	3	4	1	0	21	0	0
Number of articles meeting inclusion and exclusion criteria after reading full text articles	8						