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Symptom Management Strategies Used by Elderly Patients following Coronary Artery Bypass Surgery

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1. Introduction

A major component of nursing care following coronary artery bypass graft surgery (CABS) is focused on educating patients to recognize and manage postoperative symptoms. The symptoms commonly experienced have been well documented in the literature and include sleep disturbances (Tranmer & Parry, 2004; Zimmerman, Barnason, Nieveen, & Schmaderer, 2004), fatigue (Tranmer & Parry; Zimmerman et al.), swelling (Tranmer & Parry; Zimmerman et al.), shortness of breath (SOB), appetite problems, and chest and leg incision pain (Zimmerman et al.). While much has been done to document postoperative symptoms, very little has been done to describe the strategies that patients use to manage these symptoms.

The Conceptual Model for Symptom Management (Dodd et al., 2001) identifies three dimensions (symptom experience, symptom management strategies, and outcomes) which are interrelated and must be considered for effective management of any symptom or group

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of symptoms. Patients identify troublesome symptoms and select symptom management strategies to attempt to resolve symptoms and improve outcomes. Strategies may change as symptoms change over time or may be influenced by a patient's receptiveness to the strategy.

Postoperative teaching for CABS patients routinely includes content related to symptoms and symptom management; however, shortened length of stay for CABS patients results in limited time available for postoperative teaching in the hospital. To bridge this gap, home health nurses may provide care related to the assessment and management of symptoms post-CABS, but not all patients receive home health care. Nursing intervention studies have incorporated symptom management strategies as a component used to augment postoperative teaching and enhance recovery (Hiltunen et al., 2005; Kleinpell & Avitall, 2007; Tranmer & Parry, 2004; Zimmerman et al., 2004). However, the actual use of symptom management strategies by post-CABS patients has not been explored. Nurses involved in postoperative education in acute care and home settings provide symptom management suggestions to patients and their families. Patients often learn through vicarious experience or modeling from others with similar experiences. Symptom management strategies that other post-CABS patients have used successfully may improve a patient's willingness to try a strategy. Conversely, nurses should also be aware of symptom management strategies that patients report as difficult to implement or not useful. Symptom management education could be enhanced and tailored with more specific knowledge of strategies actually used by patients.

The purpose of this study was to describe the symptom management strategies used by older adults following CABS. The specific aims of this study were to examine data 3 and 6 weeks following CABS to: 1) identify categories of symptom management strategies from patient's self-report data; 2) describe symptom management strategies used for frequently reported symptoms including shortness of breath (SOB), fatigue, incision pain, sleep disturbance, swelling and appetite problems; and 3) determine if patients used appropriate strategies to manage symptoms by comparing reported symptom management strategies to current evidence.

2. Background

Common symptoms and management strategies are provided to CABS patients through postoperative education. General nursing interventions i.e. pain management, anxiety reduction, and activity prescriptions are often suggested for symptom management following CABS. Exercise promotion and energy management were the nursing interventions used most often by Advanced Practice Nurses (APN's) in the first three months after a cardiac event (Hiltunen et al., 2005). Guidelines for general symptom management strategies are available as patient education materials through the American Heart Association (2007) and the Society of Thoracic Surgeons (2008). However, nursing studies have not examined what strategies CABS patients actually use to manage symptoms postoperatively.

Fatigue is a common symptom reported by post-CABS patients (Tranmer & Parry, 2004; Zimmerman et al., 2004). Through meta-analysis, the only intervention found to reduce postoperative fatigue in abdominal, gynecological, orthopedic, and cardiac patients was the use of pain medication during the early recovery period (Rubin, Hardy, & Hotopf, 2004). The authors postulate that pain management enhances sleep and may contribute to a reduction in fatigue. There was no evidence that interventions to improve nutrition or sleep hygiene decreased postoperative fatigue. Increasing activity as prescribed post-bypass and

scheduling activity and rest periods are strategies commonly encouraged to decrease fatigue in post-CABS patients.

A variety of interventions have been examined for effectiveness in sleep problem management. Cochrane reviews examining sleep interventions for elderly patients found a small effect for cognitive behavioral interventions (Montgomery & Dennis, 2003). Behavioral interventions components that were found to promote sleep included relaxation training, sleep restriction therapy, education, and stimulus control procedures. Many cognitive behavioral interventions overlap with similar interventions included within programs. Sleep restriction therapy involved assisting patients to monitor time spent in bed and restrict time in bed to actual sleep time. Patient education topics included discussing realistic sleep expectations, misconceptions about insomnia, and effective sleep strategies. Stimulus control procedures encompassed routines for sleeping and waking to decrease anxiety experienced when lying in bed unable to sleep.

Postoperative pain management is often encouraged to provide pain relief as well as to enhance sleep and activity progression. Watt-Watson et al., (2004) provided post-CABS patients with an education booklet emphasizing the use of pain relief methods and the impact pain management has on recovery. Significant differences were not observed on analgesics received or pain scores in the first five days following CABS between those patients receiving the pain management education intervention (n=204) and those receiving usual care (n=202). However, significantly more patients in the intervention group (90 vs. 81%, $p<.01$) asked for medication before the nurse asked if they needed pain medication. The intervention group compared to the control group had significantly fewer concerns about taking analgesics ($p<.05$) and about addiction ($p<.04$).

Appetite problems are often reported during the early recovery period (Zimmerman et al., 2004) and may reflect physiological and psychosocial changes after surgery. General interventions to stimulate appetite include assessing food preferences, small frequent meals, and pleasant eating environment.

Shortness of breath and swelling are symptoms that may be associated with the sternal incision, surgical manipulation of peripheral veins used for grafts, fluid overload, pleural effusion, and congestive heart failure. General postoperative interventions such as elevating legs, increasing activity, daily weights, medication education, and pulmonary hygiene techniques are typically suggested to manage these symptoms. Tranmer and Parry (2004) reported that cardiac symptoms (pain, leg swelling, SOB) were prevalent 5 weeks after cardiac surgery. However, no significant differences in the mean number of symptoms or symptom distress were found between patients receiving follow-up phone calls from advanced practice nurses providing education and tailored symptom management assistance (n=92) and patients in the control group (n=92).

Nursing intervention studies to enhance postoperative symptom management have been conducted with few differences noted between patients receiving or not receiving the intervention (Barnason, et al., 2009, Tranmar & Parry, 2002; Watt-Watson et al., 2004). Reasons for similarities may be attributed to homogenous sample selections, difficulty measuring changes in symptoms, or placebo effects related to the attention provided to control groups. The actual process and use of symptom management strategies has had little attention. A clear understanding of the use of symptom management strategies following CABS surgery may provide the basis for new interventions aimed at assisting patients and their families during postoperative recovery.

3. Methods

3.1. Research Design

This paper reports the results from a secondary analysis of a randomized controlled trial (RCT) that tested the effects of a symptom management home care intervention on recovery outcomes and functioning in elderly CABS patients following hospital dismissal. The primary study (Symptom Management Intervention in Elderly CABG Patients, PI Zimmerman, 1 R01 NR07759) used a randomized, two group repeated measures design with physical and psychosocial functioning variables measured at time of discharge, 3 and 6 weeks and 3 and 6 months postoperative. The 6 week intervention was delivered via the Health Buddy (HB®) telehealth device that is attached to the subject's telephone line. The comparison group received usual care only. A complete description and results of this study are in press (Barnason et al., 2009).

Subjects were recruited, enrolled and randomly assigned to the intervention or routine care group in the primary study with data entered as subjects progressed through the study. IRB approval was granted for the primary study and no further approval was indicated for this secondary analysis. The control group received routine care i.e. postoperative education and one postoperative visit with the cardiac surgeon. The intervention group received routine care plus an intervention consisting of 42 telehealth sessions initiated upon hospital dismissal. Each daily session was delivered via the Health Buddy telehealth device that is attached to the telephone line and downloads every night to a free secure Internet site. Every day the patient would respond to questions displayed on the screen of the Health Buddy by pushing one of 4 buttons on the box. The daily session provided content including assessment and management of symptoms, positive reinforcement, and recovery instructions. Symptom management strategies were tailored to the individual patient's self-report of symptoms. Symptom management strategies suggested in the intervention included information typically included in postoperative education and strategies found in nursing literature. The research team accessed the secure Internet site daily to monitor patient responses.

3.2 Study Sample

The sample for this study was older adult (≥ 65 years) patients three and six weeks post-CABS ($n=236$). Patients were recruited from four Midwestern hospitals and met the following inclusion criteria: a) 65 years of age or older and having undergone CABS; b) oriented to person, place, and time; c) not visually impaired, able to hear, and able to speak and read English; d) not receiving home health care; e) have a phone with a non-rotary phone service; f) discharged within seven days after surgery; and g) no physical impairments that would limit their physical functioning after surgery. Subjects in both the intervention and control groups were included in this analysis to provide complete data related to symptom management strategies used for each symptom.

3.3 Measurement and Procedures

Demographic and clinical data were obtained from the subject and medical record at time of dismissal. Symptom perception, symptom evaluation, and symptom management strategies were assessed in all patients three and six weeks postoperatively using the Cardiac Symptom Survey (CSS). Data were collected by trained master's prepared research nurses via telephone interview at the follow-up times.

The CSS is a 40-item scale which assesses symptom perception, evaluation, and response for ten symptoms: angina, SOB, fatigue, depression, sleep problems, incision pain, leg swelling, fluttering/palpitations, anxiety, and poor appetite. The CSS demonstrated content

validity and responsiveness to change in initial tool development (Nieveen, Zimmerman, Barnason, & Yates, 2008). Reliability and validity have been documented with Cronbach's alphas of frequency and severity scores ranging from .85–.98 and test-retest correlations of .84–1.0 across all symptoms.

When patients reported the presence of a symptom, the research nurse then asked the patient to rate the symptom's frequency, severity, interference with physical function, and interference with enjoyment of life. Patients reporting a symptom were then asked if they were using any strategy ("doing anything") to manage their symptom. The patient's self-reported response such as "rest" was recorded and entered as a direct quote in the database. This procedure was followed with each symptom in the CSS. The direct quotes reported at 3 and 6 weeks were used for analyses in this study.

3.4 Data Analysis

Ten symptoms (angina, SOB, fatigue, depression, sleep problems, incision pain, swelling in the legs, fluttering/palpitations, anxiety, and poor appetite) were assessed using the CSS. Angina, fluttering, anxiety, and depression symptoms were rarely reported in the study sample (3.5–11% at 6 weeks), thus these symptoms were not included in this analysis.

The aims of the study were tested using descriptive statistics. Frequency counts for the symptom management strategies for each symptom at both 3 and 6 weeks were calculated. Frequency counts were compared between the intervention and control groups and by gender to determine if there were differences.

The symptom management strategies were recorded as string variables in the original study database. For the purpose of this analysis, the variables for each symptom at each time point (3 and 6 weeks) were printed for coding. The symptom management strategies were listed for each symptom. The Principal Investigator (PI) initially consolidated the strategies into 8 categories based on clinical similarities. For example, strategies including "rest", "slow down", and "sit down" were grouped into a larger category including activities resulting in decreased energy expenditure. These categories were reviewed by a cardiovascular research nurse for a fit between the raw data and the identified categories. Any disagreements related to the categories were discussed. Modifications were made until there was agreement on the final categories. Following final categorization, the symptom management strategies were re-coded for frequency calculations for each symptom. The reported symptom management strategies for the six symptoms were compared to symptom management strategies included in usual postoperative education guidelines (American Heart Association, 2007; Society of Thoracic Surgeons, 2008), home care nursing guidelines (Frantz & Walters, 2001), nursing textbooks and current nursing literature (Hiltunen et al., 2005). For example, appropriate symptom management strategies for incision pain included taking pain pills before activity, relaxation, and splinting chest incision when coughing and deep breathing. These strategies were coded as "appropriate." Strategies such as "rough it" and "wear looser shoes" were coded as "other" strategies.

4. Results

The sample was comprised of 236 older adult (≥ 65 years) patients in the early recovery period (three and six weeks postoperatively) following CABS. Patients ranged in age from 65 to 86 years with a mean age of 71.2 ± 4.9 . The mean number of grafts was 3.4 ± 1.2 with 5.4 ± 1.2 days as the mean length of stay following surgery. Consistent with the CABS populations reported in the literature, men comprised the majority of the sample ($n=191$, 81%).

4.1 Aim 1: Categories of Symptom Management Strategies

The first aim of this study was to identify categories of symptom management strategies from patient's self-report data. A listing of patient responses revealed 41 different symptom management strategies for all of the symptoms. Categories of strategies were not established a priori, but were grouped into larger categories based on response similarity. For example, verbatim patient responses including "rest, take a nap, rest after meals, and limit activity" were grouped into a category named "rest". Nine categories emerged from the verbatim responses (See Table 1).

4.2 Aim 2: Frequently Reported Symptom Management Strategies by Symptom

The second aim of this study was to describe the symptom management strategies used for the most frequently reported symptoms (fatigue, incision pain, sleep disturbance, appetite problems, swelling, and SOB). As expected, the frequency of each symptom decreased between 3 and 6 weeks following surgery. Similarly, the frequency of reported symptom management strategies decreased for each symptom between 3 and 6 weeks with the exception of sleep disturbance and appetite. A higher percentage of patients experiencing the symptom reported using strategies to manage these two symptoms at 6 weeks compared to 3 weeks. Mean symptom evaluation scores (calculated as the mean of the symptom frequency and severity ratings) were generally low, ranging from 1.1 (SOB) to 3.0 (fatigue) at 3 weeks and from 0.7 (incision pain) to 1.7 (sleep disturbance) at 6 weeks. Symptoms with the highest mean ratings were fatigue, appetite problems, and sleep disturbances at 3 weeks and sleep disturbances, fatigue and swelling 6 weeks after CABS.

Three weeks after surgery, few patients experienced SOB (n=55), however a high percentage (69%) reported using a strategy to manage their SOB (see Table 2). Similarly, 59% of the patients experiencing fatigue reported using a symptom management strategy. Fewer patients experiencing sleep disturbances (39%), incision pain (39%), swelling (47%), and appetite problems (18%) reported using a strategy to manage their symptom.

Six weeks after surgery, only 20.6% of the patients experienced SOB with 58% reporting the use of a strategy to manage this symptom. Sleep disturbances were reported by 25.7% of the patients with 52% reporting the use of a symptom management strategy. Again, fewer patients experiencing incision pain (23%), swelling (40%), and appetite problems (20%) reported using a strategy to manage their symptom.

Few patients reported using more than one strategy for a symptom, however, a variety of strategies were reported for each symptom (See Tables 3 and 4). For example, three weeks after surgery, 29 participants reported using rest to relieve their SOB, 2 participants used repositioning, 2 used adjunct treatments, 1 called the physician and 21 did nothing. Rest, medications, and repositioning were the most frequently used strategies overall. Medications were reported as a strategy to manage fatigue, sleep disturbance, incision pain and swelling. Few patients reported strategies such as altering routine or seeking help.

The majority of patients used rest to relieve their SOB and fatigue. Other strategies used to manage SOB at 3 and 6 weeks included medications (oxygen, inhaler), repositioning (sit up) and adjunct treatments (deep breaths). A few patients (n=4) reported using activity to manage their fatigue at 3 weeks and only 1 patient continued to use this strategy 6 weeks postoperatively. One patient reported using sleeping pills to manage his fatigue. Only 1 patient altered the home routine by scheduling activity and rest periods to alleviate fatigue.

Patients reported using a wider variety of strategies for the management of sleep disturbances. Medication use (pain medications before bedtime and sleeping pills) as well as repositioning (sleep in recliner and change positions) were reported most often. Distraction

(relaxation, listen to music) was also used by patients to assist with sleeping. However, approximately half of the patients experiencing sleep disturbances did not report using a strategy to manage their symptom 3 and 6 weeks after surgery.

Pain management was achieved primarily through the use of medications (pain medication); however, repositioning, rest, and distraction were other strategies that were reported. Repositioning (elevate feet) and medications (diuretics) were most frequently reported to manage swelling. However, adjunct treatments (anti-embolic hose and looser shoes) were also reported. At 3 weeks, patients reported changing their diet by eating small meals, including favorite foods, reducing seasoning, and forcing themselves to eat while only 1 patient reported using distraction. Six weeks after surgery, 1 patient reported using activity to improve appetite.

Additional analyses were performed to compare use of strategies by gender. Proportions of men and women that used and did not use strategies were very similar 3 weeks post-CABS. However, some differences were noted 6 weeks after surgery. A higher percentage of men (47%) reported using strategies to manage fatigue compared to women (31%). However, women reported using more symptom management strategies to manage sleep disturbances (60%) and appetite problems (60%) compared to men (49% and 12%, respectively). A significant difference ($\chi^2 = 6.0$, $df = 1$, $p = .014$) was found at 6 weeks with a larger proportion of women reporting strategies used for appetite problems than men. However, this value is likely inflated as 2 cells had expected counts below 5.

Analyses to determine if there were differences between symptom management strategy use by group (intervention vs. control) were also performed. Chi square analyses for each symptom at 3 and 6 weeks revealed no significant differences in the proportions of patients in the intervention group that used or did not use strategies compared to the control group.

4.3 Aim 3: Appropriateness of the Symptom Management Strategies

The third aim of the study was to compare reported symptom management strategies to current evidence to determine if patients used appropriate strategies to manage symptoms. The number of appropriate strategies for each symptom at each time point was compared to the number of “other” strategies (See Table 7).

The majority of responses for most symptoms reflected appropriate strategies typically provided in postoperative education. Sleep disturbance was unique in that a greater number of strategies were used by patients that were not evidence based. The majority of these strategies were reported as sleeping in the recliner and taking naps to aid their sleep. Other strategies which were reported that were not considered appropriate for the symptom included “rough it” and limiting activity to relieve pain, wear looser shoes and massage legs to relieve swelling, sleeping pills to relieve fatigue, and forcing themselves to eat for appetite problems. These strategies appear to provide short-term symptom relief but use of some strategies could result in adverse events. For example, wearing looser shoes does not decrease edema, but may make the edema less of a problem and allow activity. Conversely, massaging edematous lower legs in the presence of venous thromboembolism, could potentially dislodge a clot. Intentionally avoiding pain medications and limiting activity to avoid pain could predispose patients to complications related to immobility.

Six weeks after surgery, nearly all patients reported using strategies which were appropriate to relieve the symptom. However, nearly half of the patients experiencing sleep disturbances used strategies that were not evidence based.

5. Discussion and Practice Implications

Symptom management begins with symptom assessment and subsequent identification and implementation of intervention strategies (Dodd et al., 2001). This study attempted to identify intervention strategies used by older adults following CABS. Study participants were part of a RCT which provided recovery education and symptom management strategy suggestions tailored to the individual's symptom reports. The reported symptom management strategy data were obtained via phone interview from participants reporting a symptom at 3 and 6 weeks post-CABS.

Little is known about the strategies that patients use to manage symptoms following CABS. All patients in this study received printed postoperative instructions including suggestions related to symptom management at the time of hospital dismissal. In addition, patients in the intervention group received supplemental recovery information. However, symptom management strategy use was reported by approximately half of the subjects for the symptoms of SOB, fatigue, and swelling and less than half of the patients reporting sleep disturbances, incision pain, and appetite problems. Mean symptom evaluation scores were generally low; therefore, perhaps patients did not perceive a need to use strategies to manage them. Our results indicate that actual symptom management strategy use may be limited despite dismissal teaching, provision of printed education materials, and follow-up assessments. Similarly, Watt-Watson et al., (2004) reported that patients receiving a pain education program had less concern about requesting analgesics and potential addiction compared to the control group, but no differences in reported pain scores and analgesics received. Further examination of patient knowledge, attitudes, and use of symptom management strategies is necessary to fully understand how best to assist patients. Creative methods used in symptom management education such as bullet point, simple approaches to symptoms may encourage strategy use. Follow-up information querying patients as to what they understood from their symptom management education and what strategies they actually used would assist in refining educational approaches.

The older adults in this study reported a variety of different strategies for each symptom which were largely consistent with usual postoperative symptom management education. Common strategies included rest, medications, and repositioning to manage SOB, fatigue, sleep disturbances and incision pain. Identification of specific strategies patients actually use can be emphasized as strategies that have been found to work for other patients after CABS. Additionally, identification of specific strategies that were not used may warrant additional query as to whether the strategy was difficult to use, was applied correctly, or patients recognized the need for strategy use.

Few patients reported using activity or altering their routine to manage a symptom. However, increasing activity has been shown to relieve fatigue in cardiac patients. Meta-analysis revealed that cardiac rehabilitation exercise programs have been associated with improvements in feelings of energy and fatigue following myocardial infarction or CABS (Puetz, Beasman, & O'Connor, 2006). In addition, energy management and exercise promotion were the most frequent Nursing Intervention Classification (NIC) interventions used by advanced practice nurses administering an intervention to patients (n=110) during the first 12 weeks post-CABS or myocardial infarction (Hiltunen et al., 2005).

A small percentage of patients reported the use of strategies that may bring only short-term relief (wearing looser shoes for swelling and taking naps for fatigue) or could be potentially harmful (leg massage for swelling and limiting activity for pain). In this study, only 40% of patients experiencing leg swelling reported using a strategy. Symptoms such as SOB and swelling are key indicators of potential complications. Similarly, Edwardson and Dean

(1999) reported that 41% of elderly community dwelling subjects (n=601) did not respond appropriately to at least half of their symptoms, choosing either to ignore their symptoms or failing to recognize significant symptom clusters. In their study some participants did not perceive that they needed to use symptom management strategies for symptoms such as shortness of breath, swollen feet and legs and tiredness which in turn had a negative effect on outcomes. Key symptoms such as SOB and swelling are important to emphasize in dismissal and home care teaching. Identification of high-risk patients and tailoring education to address these symptoms and associated symptom management strategies are critical postoperative nursing interventions.

6. Study Limitations

Study findings are limited due to the convenience sample. Because study subjects were Caucasian, primarily male (81%), and went home from the hospital within 7 days of their CABS they may not be representative of the general CABS populations. Hence, these results may not be able to be generalized to female or patients of diverse ethnic backgrounds.

Patients in this study were expected to have the ability to report symptom management strategies. The protocol for CSS administration required the nurse researcher to ask the patient if they experienced the symptom, followed by their rating of frequency, severity, interference with physical function, and interference with enjoyment of life. Following the rating on these four areas, the patient was asked if they used any strategies to manage that particular symptom. Patients may have been concentrating on the ratings making it difficult to switch to a short answer response. In addition, patients that did not report experiencing the symptom were not asked about symptom management strategies. These patients may have been using strategies which effectively managed their symptoms and this information was not captured.

No probing or suggestions were made by the research nurse, therefore some responses were general (e.g., rest). More information would have been useful to determine if the patient was employing the strategy in the appropriate way. The timing of the follow-up interviews (3 and 6 weeks following surgery) may reflect fewer experienced symptoms as patient recovery progresses.

7. Conclusions

Symptom management strategies are used to enhance patient outcomes however, questions about initiation of strategies, effectiveness, and appropriate use need further exploration (Dodd et al., 2001). The older adult patients in this study experienced physical symptoms including SOB, fatigue, incision pain, sleep disturbances, swelling, and appetite problems following their CABS. The majority of patients used appropriate symptom management strategies to manage these symptoms; however, nearly half the patients did not report using any strategies. It is unclear whether subjects failed to report strategies or actually did not employ strategies. Patients may not have clearly perceived their symptoms, or felt their symptom was not severe enough to require action, or may not have known what to do to manage the symptom. The reasons that patients select or do not select specific strategies is an important consideration when assisting patients in symptom management. Strategy use in CABS patients is an understudied area of nursing research. In addition, strategy use in patients with diverse ethnic backgrounds, significant co-morbidities and/or postoperative complications, younger adults, women, and those requiring home health care or rehabilitation has not been studied.

Clearly, patients have many options for symptom management following CABS. However, establishing what patients are taught about symptom management, what strategies they decide to use or not use, and how effectively those strategies work would be helpful for nurses assisting postoperative recovery. It is important for clinicians to recognize that patients may not be attuned to potentially dangerous symptoms and strategies to manage them. This knowledge could be used to refine nursing interventions which empower postoperative patients to manage symptoms and enhance recovery.

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Table 1

Symptom Management Categories, Definitions, and Responses

Category	Definition	Verbatim Response
Rest	Activity which results in a decrease in energy expenditure.	Rest Take a nap Sleep Rest after meals Limit activity
Medications/Prescribed Treatments	Behavior involving the use of prescribed or over the counter medication	Diuretics Sleeping pills Pain pills Cough medicine Use Oxygen Use inhaler
Seek help	Behavior in which the patient seeks medical attention or verbalizes concerns to others	Call doctor Talk to others
Activity	Activity which increases the person's energy expenditure	Walk Exercise
Alter routine	A change in usual home routine to assist in decreasing the occurrence of a symptom	Space activity and rest Schedule activity and rest periods Limit naps Limit fluids at bedtime
Distraction	Behavior used to divert attention from a troublesome symptom	Listen to music Relaxation at bedtime
Reposition	Behavior involving a change in body position from the usual pattern.	Sit up Elevate leg with incision Pad incision under bra Elevate feet Sleep in recliner
Adjunct treatments	Behaviors that involve specific therapies or sensory changes to relieve symptoms	Blow nose Deep Breaths Heating pad Massage Wear looser shoes Rough it Anti-embolic hose Continuous Positive Airway Pressure (CPAP) Dialysis
Change diet	Behaviors involving change in eating patterns or foods consumed.	Small meals Eat favorite foods Force self to eat Warm milk at bedtime Limit seasoning in foods

Table 2

Mean Symptom Evaluation Descriptive Statistics and Symptom Management Strategies Reported Post-CABS.

Symptom	Reported Symptom	Reported Using a Symptom Management Strategy	Mean Symptom Evaluation Score	Symptom Evaluation Score
	n (%)	n (%)	M (S.D.)	Range
SOB				
3 Weeks	55 (24.9)	34 (62)	1.1 (2.2)	0–9
6 Weeks	45 (20.6)	26 (58)	.8 (1.7)	0 – 9
Fatigue				
3 Weeks	119 (53.8)	69 (58)	3.0 (3.2)	0 – 10
6 Weeks	66 (30.3)	29 (52)	1.6 (2.6)	0 – 9.5
Sleep Disturbance				
3 Weeks	89 (40.3)	44 (39)	2.4(3.4)	0 – 10
6 Weeks	56 (25.7)	29 (52)	1.7 (3.0)	0 – 10
Incision Pain				
3 Weeks	106 (48)	41 (39)	1.2 (1.4)	0 – 5
6 Weeks	62 (28.4)	14 (23)	.7 (1.2)	0 – 5.5
Swelling				
3 Weeks	68 (30.8)	31 (46)	1.8 (2.9)	0 – 9.5
6 Weeks	50 (22.9)	20 (40)	1.2 (2.4)	0 – 9
Appetite Problems				
3 Weeks	78 (35.3)	14 (18)	2.5 (3.6)	0 – 10
6 Weeks	30 (13.8)	6 (20)	1.0 (2.7)	0 – 10

Table 3

Frequency of Symptom Management Strategies by Symptom at 3 Weeks Post-CABS

Symptom Management Category	SOB n=55*	Fatigue n=119*	Sleep Disturbance n=89*	Incision Pain n=106*	Swelling n=68*	Appetite Problems n=78*
Rest	29	63	3	4		
Medications		1	13	26	5	
Reposition	2		16	7	24	
Activity		4	2			1
Alter Routine		1	2			
Distraction			6	3		1
Adjunct Treatments	2		1	1	2	
Change Diet			1			11
Seek Help	1					
No Strategies	21	50	45	65	37	65

* Total number of subjects reporting symptom

Table 4

Frequency of Symptom Management Strategies by Symptom at 6 Weeks Post-CABS

Symptom Management Category	SOB n = 45*	Fatigue n = 66*	Sleep Disturbance n = 56*	Incision Pain n = 62*	Swelling n = 50*	Appetite Problems n = 30*
Rest	22	28	1			
Medications			9	11	6	
Reposition			10	1	10	
Activity		1	1		2	1
Distraction			6	1		
Adjunct Treatments	4		1	1	2	
Alter Routine			1			
Change Diet						4
Seek Help						1
No Strategies	19	37	27	48	30	24

* Total number of subjects reporting symptom

Table 5

Symptom Management Strategy Use by Gender

	Male		Female	
	No strategies N (%)	Used strategies N (%)	No strategies N (%)	Used strategies N (%)
Shortness of Breath *				
3 Weeks	17 (40)	26 (60)	4 (33)	8 (67)
6 Weeks	14 (41)	20 (59)	5 (46)	6 (54)
Fatigue *				
3 Weeks	39 (41)	56 (59)	11 (46)	13 (54)
6 Weeks	28 (53)	25 (47)	9 (69)	4 (31)
Sleep Disturbance *				
3 Weeks	36 (51)	34 (49)	9 (47)	10 (53)
6 Weeks	21 (51)	20 (49)	6 (40)	9 (60)
Incision pain *				
3 Weeks	56 (62)	34 (38)	9 (56)	7 (44)
6 Weeks	42 (76)	13 (24)	6 (86)	1 (14)
Swelling *				
3 Weeks	32 (55)	26 (45)	5 (50)	5 (50)
6 Weeks	24 (58)	17 (42)	6 (67)	3 (33)
Appetite Problems				
3 Weeks *	52 (82)	11 (18)	13 (87)	2 (13)
6 Weeks	22 (88)	3 (12)	2 (40)	3 (60)

* Differences not significant

Table 6

Symptom Management Strategy Use by Group

	Intervention Group		Control Group	
	No strategies N (%)	Used strategies N (%)	No strategies N (%)	Used strategies N (%)
Shortness of Breath *				
3 Weeks	9 (35)	17 (65)	12 (41)	17 (59)
6 Weeks	9 (45)	11 (55)	10 (40)	15 (60)
Fatigue *				
3 Weeks	21 (40)	31 (60)	29 (43)	38 (57)
6 Weeks	16 (59)	11 (41)	21 (54)	18 (46)
Sleep Disturbance *				
3 Weeks	21 (49)	22 (51)	24 (52)	22 (48)
6 Weeks	13 (50)	13 (50)	14 (47)	16 (53)
Incision pain *				
3 Weeks	27 (57)	20 (43)	38 (64)	21 (36)
6 Weeks	17 (68)	8 (32)	31 (84)	6 (16)
Swelling *				
3 Weeks	15 (50)	15 (50)	22 (58)	16 (42)
6 Weeks	13 (56)	10 (44)	17 (63)	10 (37)
Appetite Problems *				
3 Weeks	28 (85)	5 (15)	37 (82)	8 (18)
6 Weeks	8 (80)	2 (20)	16 (80)	4 (20)

* Differences not significant

Table 7

Frequency of Patients Using Appropriate or “Other” Symptom Management Strategies

	Used Appropriate Strategies N (%)	Used “Other” Strategies N (%)
Shortness of Breath		
3 Weeks	30 (88)	4 (12)
6 Weeks	25 (96)	1 (4)
Fatigue		
3 Weeks	64 (98)	1 (2)
6 Weeks	29 (100)	0
Sleep Disturbance		
3 Weeks	25 (57)	19 (43)
6 Weeks	16 (55)	13 (45)
Incision pain		
3 Weeks	32 (78)	9 (22)
6 Weeks	12 (86)	2 (14)
Swelling		
3 Weeks	30 (97)	1 (3)
6 Weeks	20 (95)	1 (5)
Appetite Problems		
3 Weeks	11 (85)	2 (15)
6 Weeks	6 (100)	0