Effect of a Preoperative Instructional Digital Video Disc on Patient Knowledge and Preparedness for Engaging in Postoperative Care Activities

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KEYWORDS

- Patient education • Preoperative instructional digital video disc
- Evidence-based practice

Health care delivery systems have been restructured in recent years to focus on achieving high-quality outcomes for patients by using the most cost-effective methods.[1] Optimizing outcomes for patients undergoing surgery requires the collaborative and coordinated efforts of physicians, nurses, and allied health personnel.[2] Preoperative teaching serves as a standard of nursing practice within the surgical setting.[3] Providing patients with supportive preoperative teaching that incorporates the most useful information about postoperative activities within a confined time frame has been a challenge.[1] The psychologic burden placed on patients in the preoperative

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period may be underestimated, and this burden lessens patients' ability to comprehend and contribute to the postsurgical plan. Patients have a defined learning curve for understanding the intricacies of the surgical procedure and facilitating their own recovery after surgery. The effectiveness of preoperative teaching depends, in part, on the learning needs, style, and preference of the patient. The amount of information conferred to patients may be overwhelming.[2] As a result, the patient may require repeated or frequent reinforcement. Once the patient has had the opportunity to grasp the information, additional questions may arise. Nurses are in a key position to provide preoperative teaching and respond to patients' questions and concerns.[2] Advancements in technology have provided nurses with the opportunity to improve and intensify preoperative educational strategies.

SCOPE OF THE PROBLEM IN EXISTING PRACTICE

In general, preoperative teaching should include significant information about the surgery and issues that patients are anticipated to face in the perioperative and postoperative periods. Surgical procedures expose patients to pain, bodily injury, and potential death.[4] Preoperative teaching readily and effectively enables patients to cope with their surgery, reduces the duration of hospitalization, elevates satisfaction, minimizes postsurgical complications, and augments patients' psychologic well-being.[4]

Preoperative teaching has been administered in various ways and formats:[2] verbal instruction, printed materials, demonstrations, and videotapes. Routine dissemination of information by means of verbal instruction with supplemental written material (information packets) has been the basis for preoperative teaching for decades. Such factors as degree of attentiveness, emotional aptitude, intellectual level, learning disabilities, and language or cultural barriers can affect patients' ability to assimilate the information.[2]

Currently, substantive inconsistencies are apparent in preoperative instruction for thoracic surgical patients who are scheduled to undergo such procedures as esophagectomy or lung volume reduction surgery. Ideally, a written preoperative instructional handout was to be given during each patient's preoperative surgical visit. Baseline data indicated that 23 (92%) of 25 patients did not receive the written handout. This lapse has resulted in a lack of knowledge and preparedness that prevents patients from immediately engaging successfully in postoperative self-care activities (eg, ambulation and pain management), which can lead to increases in patients' anxiety, postoperative complications, and length of stay in the hospital. Thus, the challenge was to develop structures and processes that would enable thoracic surgical patients to receive thorough preoperative teaching consistently.

An evidence-based project that included development of postoperative thoracic surgery information in a standardized format by using state-of-the-art digital video disc (DVD) technology was implemented. This staff nurse–driven project illustrates the contribution of preoperative teaching to improving patients' outcomes. The evidence-based literature and the evaluation of an audiovisual medium dedicated to providing patients with valuable information on the spectrum of care activities after thoracic surgery are discussed.

EVIDENCE-BASED LITERATURE

Preoperative teaching has been defined in the literature as an "interactive process of providing information and explanations about surgical processes, expected patient behaviors, and anticipated sensations and providing appropriate reassurance…to patients who are about to undergo surgery."[1] Postoperative care refers to nursing

activities performed during the patient's postoperative phase. Preoperative teaching not only provides patient-specific information about what to expect during the postoperative period but influences the attitudes and behaviors of patients with respect to their postoperative care.[1,5]

Little experimental or quasiexperimental research has explored the impact of preoperative instruction in patients undergoing thoracic surgery. Most studies have explored its impact among selected patients undergoing such procedures as cardiac surgery,[6] orthopedic surgery,[7] reproductive surgery,[4] and cancer surgery.[8] Published reports describe a positive relation between preoperative teaching and improved outcomes for patients and indicate that preoperative teaching is a cost-effective approach.[7] **Table 1** lists the relevant studies reviewed for this project and their respective level of evidence.

In a qualitative study by Doering and colleagues[6] of patients' perceptions of the quality of nursing and medical care during hospitalization after cardiac surgery, patients wanted to know what they could honestly and realistically expect during their postoperative recovery. Specific information embedded within the preoperative education provided by nurses can assist patients in understanding the level of their participation that is required during recovery. Meeting the informational and physical needs of patients is imperative.[6] Well-informed patients are more likely to experience positive outcomes and to have higher levels of satisfaction with their care. Such patients have the confidence to carry out behaviors necessary for successful postoperative outcomes.[4] Additional evidence supports the use of video-teaching versus routine care: video-teaching resulted in decreases in postoperative complications (eg, atelectasis) and length of stay among patients undergoing coronary artery bypass graft surgery.[9]

Stern and Lockwood[10] conducted a systematic review of randomized controlled trials investigating preoperative instruction of patients and the effect of such instruction on patients' understanding of, knowledge of, and ability to perform postoperative activities. On the basis of limited rigorous studies, these researchers concluded that preoperative teaching before admission and the use of preoperative videos improved patients' knowledge and skill.[10]

The teaching must take into consideration the emotional state of the patient and the patient's ability to cope,[11] factors that often may be overshadowed by feelings of anxiety or fear about the impending procedure.[2] The evidence supports the benefit of preoperative teaching in reducing anxiety and complications and in improving recovery. Studies have shown an inverse relation between preoperative teaching and postoperative anxiety, wherein improved outcomes were exemplified not only by lower levels of anxiety but by shorter stays in the hospital.[12]

Brumfield and colleagues[5] conducted a descriptive study to isolate important content areas in preoperative teaching as reported by patients and nurses in ambulatory surgery settings. Patients and nurses strongly favored the inclusion of situational information (eg, explaining activities, explaining events), patient role information (eg, anticipated behaviors), and psychosocial support (eg, emotional descriptors) in preoperative teaching. Patients undergoing ambulatory surgery preferred for this teaching to occur before admission. Early instruction targeted toward patients' priorities seems to be critical to enhancing postoperative outcomes.[5] Similar needs of patients were identified in the inpatient surgical setting.[13]

Fitzpatrick and Hyde[14] reported that nurse-related factors, such as individual knowledge and experience, may influence the preoperative education received by patients. This influence is particularly evident among novice nurses or nurses who are new to the clinic or unit. The diversity in degree of knowledge and experience

Table 1
Levels of evidence for the review of the literature

Authors	Level of Evidence
Bernier and colleagues, 2003	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Whyte and Grant, 2005	Level VI: evidence from expert opinion, multiple case reports, or national consensus reports
Lewis and colleagues, 2002	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Oetker-Black and colleagues, 2003	Level II: evidence from one or more randomized controlled trials with consistent results
Brumfield, and colleagues, 1996	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Doering and colleagues, 2002	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Johansson and colleagues, 2005	Level I: evidence from well-designed data meta-analysis or well-done systematic review with results that consistently support a specific action (eg, assessment, intervention, or treatment)
Evrard and colleagues, 2005	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Shaban and colleagues, 2002	Level IV: evidence from one or more quasiexperimental studies with consistent results
Stern and Lockwood, 2005	Level I: evidence from well-designed data meta-analysis or well-done systematic review with results that consistently support a specific action (eg, assessment, intervention, or treatment)
Doering and colleagues, 2000	Level II: evidence from one or more randomized controlled trials with consistent results
Devine and Cook, 1983	Level I: evidence from well-designed data meta-analysis or well-done systematic review with results that consistently support a specific action (eg, assessment, intervention, or treatment)
Yount and Schoessler, 1991	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Fitzpatrick and Hyde, 2006	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Thomas and colleagues, 1999	Level V: evidence from observational studies with consistent results (eg, correlational, descriptive studies)
Hathaway, 1986	Level I: evidence from well-designed data meta-analysis or well-done systematic review with results that consistently support a specific action (eg, assessment, intervention, or treatment)

possessed by nurses can produce inconsistent and ineffective preoperative preparation for patients. Addressing this challenge requires an organizational commitment to address internal practices[14] and might best be accomplished through structured preoperative education across the board.

Evrard and colleagues[8] surveyed 108 postsurgical oncology patients who had watched a preoperative DVD. The DVD content included general information pertaining to the hospital environment and postoperative complications in addition to specialized surgery-specific information. The survey asked patients to evaluate the following DVD content areas: (1) access to the information, (2) presentation, (3) patients' perception, and (4) global satisfaction. Seventy-one percent of the patients reported that the DVD provided a positive and encouraging experience, and 83% recommended its use as a preoperative teaching tool. Interestingly, among the 14 patients who experienced complications, only 21% thought that they had received thorough information from the DVD and only 12% believed that they were well prepared to handle postoperative complications. Notably, the patients were allowed to view the DVD only in the clinical setting and were unable to take the DVD home to review. This limitation undermines any chance for patients to reinforce the information and improve recall.[8]

Earlier research using meta-analyses (eg, Hathaway[15]) supported the value of traditional preoperative instruction to improve postoperative outcomes. Modern-day video technology has emerged as a suitable tool for relaying practical information in a timely manner. The visual and auditory emphasis of standardized educational videos provides an additive effect to traditional written preoperative instruction, an additive effect that increases recall.[16] Use of audiovisual materials, such as DVDs, benefits patients because they are able to refer back to and review the information at their convenience. The richness of this multimedia tool provides a venue for answering basic questions that come up after preoperative discussions with the surgeon or nurses. The timing of teaching is best when the DVD is viewed at home before the surgical procedure, in a less stressful environment. Preoperative teaching should be provided near the time of surgery. Teaching should not be provided too early; otherwise, patients are more likely to forget.

PURPOSE OF EVIDENCE-BASED PROJECT

The purpose of this evidence-based practice project was to determine the effects of developing and implementing an innovative preoperative instructional DVD on patients' level of knowledge, preparedness, and perceived ability to participate in postoperative care activities at a university-affiliated public medical center.

INTERVENTION FOR PROJECT IMPLEMENTATION

After gaps in existing preoperative teaching practice were identified and the literature was reviewed, this project was developed on the basis of the principles identified in the Iowa Model of Evidence-Based Practice.[17] The design used convenience sampling methods to survey a group of registered nurses from the medical observation unit before and after the intervention and to survey a group of thoracic surgical patients after the intervention.

This project had two intervention phases. The first intervention was to redesign the delivery of preoperative instruction by developing a preoperative instructional DVD for thoracic surgical patients that was evidence-based and prepared patients to engage in postoperative care activities. The staff nurse collaborated with the director of the medical observation unit on developing the DVD. Thoracic surgeons, clinic staff, and the nurse specialist were consulted about the content of the video. The

development of the DVD necessitated scripting, filming, editing, and replication. Partnership with a production crew resulted in the production of a user-friendly DVD. The following content areas of the preoperative teaching program were incorporated into the instructional DVD: pain management, surgical drainage, vital signs, incentive spirometry (IS), cough and deep breathing, chest physiotherapy (CPT), TED hose (antiembolism stockings)/sequential compression device (SCD), ambulation, diet/bowel activity/urine output, and discharge. Patients and staff nurses from the medical observation unit and thoracic surgeons were participants in the DVD. The final DVD was reviewed and approved by all key persons who had a stake in the process.

The second phase of the intervention implemented the delivery process for the preoperative instructional DVD to be given to patients. The system was changed to ensure that all patients were consistently provided with a preoperative instructional DVD. The staff nurse worked in partnership with the clinic staff and nurse specialist to assist in providing patients with the DVD and obtaining survey results. All nursing personnel involved in preoperative teaching and postoperative patient care were taught about the project and inclusion of the DVD. This process included providing each thoracic surgical patient with a preoperative packet during the preoperative clinic visit. The packet included a copy of the 14-minute DVD and a written survey to evaluate the patient's self-reported knowledge and preparedness for surgery. Patients were provided mailing instructions to return the completed survey. Nurses were instructed to complete surveys before and after the intervention that documented the nurses' assessment of patients' knowledge and preparedness to engage in postoperative care activities.

POSTINTERVENTION RESULTS

Data were analyzed by using descriptive statistics and Student's *t* tests.

Registered Nurses

Before and after the intervention, registered nurses completed a six-item survey to assess patients' knowledge of and preparedness to engage in postoperative care activities. The survey included questions related to the nurses' demographic characteristics.

Demographic characteristics of the 18 registered nurse participants indicated that most of the nurses were female (n = 16 [89%]) and rotated between the day shift and night shift (n = 16 [89%]). Most nurses possessed between 1 and 5 years of total nursing experience (n = 16 [89%]) and had between 1 and 5 years of experience in the medical observation unit of the University of California, Los Angeles (UCLA; n = 15 [83%]). At the time of the project, nearly all nurses served as a clinical nurse level II on the clinical ladder system (**Table 2**).

Based on the Likert scale (1 = not knowledgeable to 4 = very knowledgeable), nurses' response to the question "How knowledgeable do you feel your thoracic surgical patients were about each of the following important aspects of postoperative care?" indicated a significantly higher level of knowledge after the intervention for aspects of surgical drainage, IS, cough and deep breathing, and TED hose/SCDs ($z = -3.461$, -2.899, -3.095, and -2.960, respectively; $P \leq .004$; **Fig. 1**). Nurses also reported significant increases in knowledge about general care (mean: 1.94 versus 3.06; $P < .001$) and pain management (mean: 2.17 versus 3.22; $P < .001$) after the intervention.

Based on the Likert scale (1 = not engaged to 4 = very engaged), nurses' response to the question "How engaged do you feel your thoracic surgical patients were about

Table 2
Demographic characteristics of the nurses who completed surveys before and after the intervention

Variable	Sample (N = 18)	%
Title		
Clinical nurse I	1	5.6
Clinical nurse II	16	88.9
Clinical nurse III	1	5.6
Shift		
Days	1	5.6
Nights	1	5.6
Rotate	16	88.9
Gender		
Male	2	11.1
Female	16	88.9
Years of nursing experience		
<1	1	5.6
1–5	16	88.9
>10	1	5.6
Years of experience in the UCLA medical observation unit		
<1	2	11.1
1–5	15	83.3
6–10	1	5.6

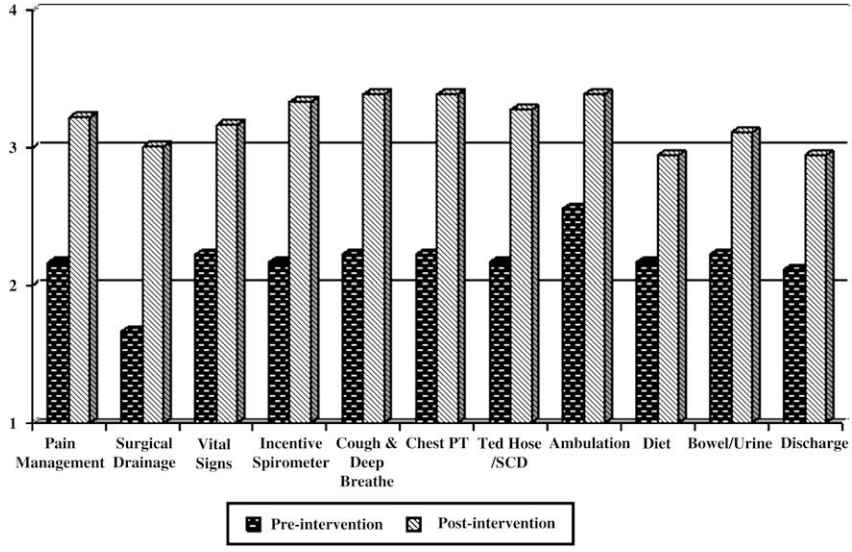

Fig. 1. Mean level of patients' knowledge of postoperative care activities reported by nurses surveyed before and after the intervention. Asterisks indicate significant difference (P<.004) from before to after the intervention. PT, physiotherapy.

each of the following important aspects of postoperative care?'' indicated a significantly higher level of understanding after the intervention for aspects of IS, cough and deep breathing, and TED hose/SCDs ($z = -3.411$, -3.255, and -2.804, respectively; $P \leq .007$; **Fig. 2**). Nurses reported a significant increase in overall knowledge of patients and engagement of patients and their families ($P \leq .004$).

Nurses were provided with the opportunity to respond with comments at the end of the survey. **Box 1** and **2** cite a few of the nurses' anecdotal comments before the intervention and after the intervention respectively. Responses are best summed up by the response of one nurse who stated that ''Giving patients/family members information regarding what to expect of them in regards to postoperation activities will empower them to be in control of their care.''

Patients Undergoing Thoracic Surgery

After a review of the DVD, patients were surveyed for their knowledge and perceived ability to participate in postoperative care activities. Patients (n = 15) who participated in this project were predominantly older than 60 years of age (n = 12 [80%]) and English-speaking (n = 14 [93%]). Fifty-three percent were female (n = 8), and 47% were male (n = 7). Most patients had undergone lung surgery (**Table 3**).

Based on the Likert scale (1 = I do not understand to 4 = I understand very well), on the postintervention survey, patients' response to the question ''How much do you understand about each of the following after viewing the preoperative DVD?'' indicated

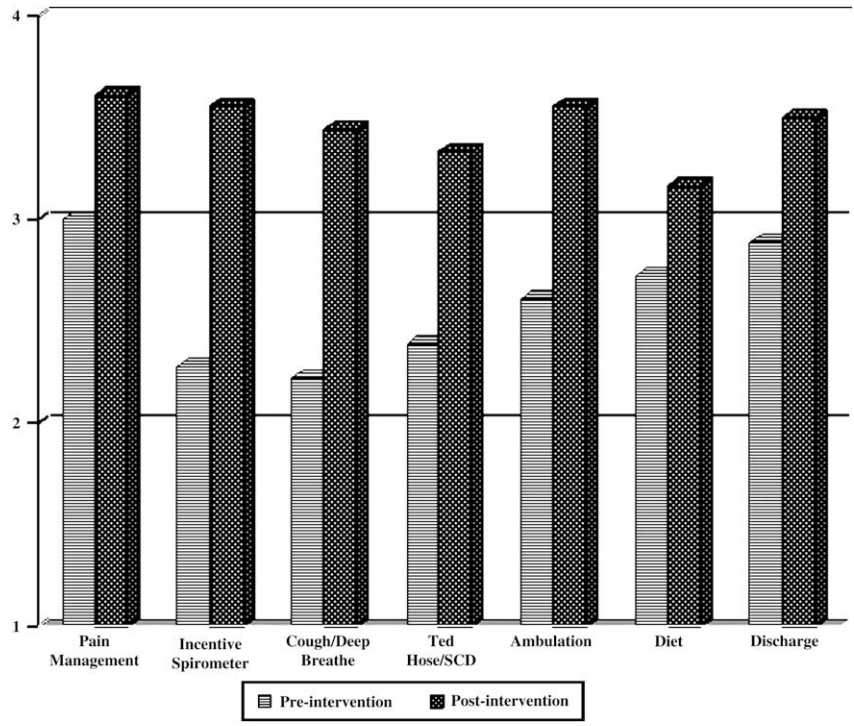

Fig. 2. Mean engagement levels of patients in postoperative care activities reported by nurses surveyed before and after the intervention. Asterisks indicate significant difference ($P<.007$) from before to after the intervention.

Table 3
Demographic characteristics of the patients undergoing thoracic surgery who completed surveys after the intervention

Variable	No. (N = 15)	%
Age, years		
18–30	1	6.7
31–40	1	6.7
41–60	1	6.7
>60	12	80.0
Gender		
Male	7	46.7
Female	8	53.3
Primary language		
English	14	93.3
Other	1	6.7
Type of surgery		
Esophageal	1	6.7
Lung	10	66.7
Other	3	20.0

Box 1
Comments by nurses before the intervention

- "We need to properly evaluate whether the thoracic patient and family have fully understood the concepts and components of postoperative care. It's not enough for the person giving the instructions to hand out pamphlets as reading materials to patients and assume that they'll follow them postoperatively."
- "Patients usually do not expect to walk three times daily and are surprised as to how much work we want them to do. Teaching them preoperatively about the post-op activities would be beneficial. The whiteboards marking their progress with ambulation, CPT, and IS (like a scoreboard) also help to remind them of these activities. Letting them know that the family can help also assists in getting activity done. Most times, the family is unsure of where they can help. Specifically telling them they can assist with CPT and IS engages them more in patient care. Visual demos—most helpful in telling patients, for example, to inflate lungs with the IS."
- "Patients…post-op 3 or 2…still do not know much of any of their post-op therapies or if they did not know, they did not know why they were doing what they were doing. They were sort of knowledgeable of the purposes of the SCDs and TEDs, but the incentive spirometer, they would just breathe in real fast and they said they were exercising their lungs but when demonstrating how to do it, they were just breathing in and out really fast. When I did chest PT, I asked if they know why I was doing it and they all said they did not know. But after instruction that it is to loosen up secretions, they were more enthusiastic to do it."
- "Educated in the medicating…This is not to intimidate the patient/family but to empower them from the very beginning."
- "Patients and their families need reinforcement when it comes to teaching. Although they are somewhat knowledgeable overall, they need to be reminded to follow through with post-op care."

Box 2
Comments by nurses after the intervention

- "The instructional DVD was very useful in educating thoracic patients with regards to their role and expectations after surgery."
- "Patients as well as family were very knowledgeable about pain medication, CPT, IS, Ambulation . . . . Relatives were very involved in patients' care."
- "This DVD was very helpful in preparing patients in becoming familiar with what to expect after surgery. When the nurses did their teaching it was nice when the patient and/or family members were not hearing things for the first time. It is really hard for a patient to hear things for the first time during the overwhelming period post op."
- "I believe that patients and patients' families are more knowledgeable regarding on what they need to do and what they expect during hospitalization post operatively."

high mean scores for all areas of postoperative care (**Fig. 3**). When asked about their ability to participate in postoperative care after viewing the preoperative DVD, scores indicated patients thought that they were able to participate or able to participate a great deal in all areas (**Fig. 4**). Patients reported that the preoperative DVD was effective overall in preparing them and their family members for postoperative care activities. One patient commented that "it was extremely helpful to be able to take the DVD home." Another patient reportedly "had one long surgery at UCLA in January of 2007" and further stated, "this DVD was not available at the time…I have another longer surgery in September of 2007, and this has been helpful."

DISCUSSION

Elevated scores for knowledge, engagement, and understanding may be attributable to the incorporation of the DVD in the preoperative teaching. A quality instructional media product was developed, implemented, and found to be effective in increasing preoperative knowledge and preparedness of patients and their families. Nurses

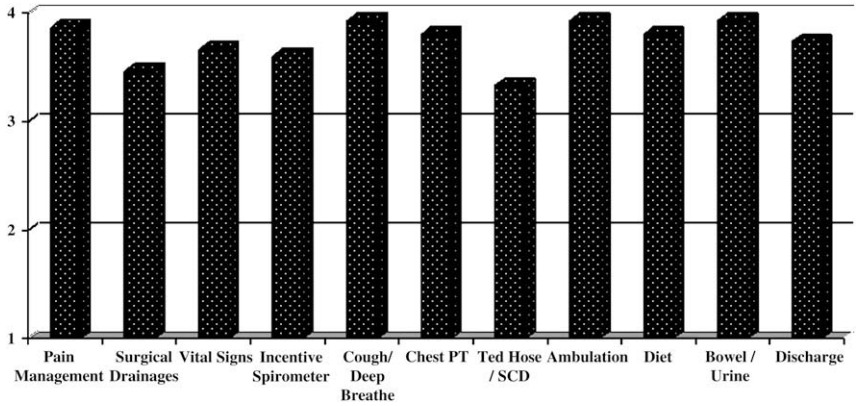

Fig. 3. Mean levels of understanding of postoperative care activities reported by patients surveyed after the intervention. PT, physiotherapy.

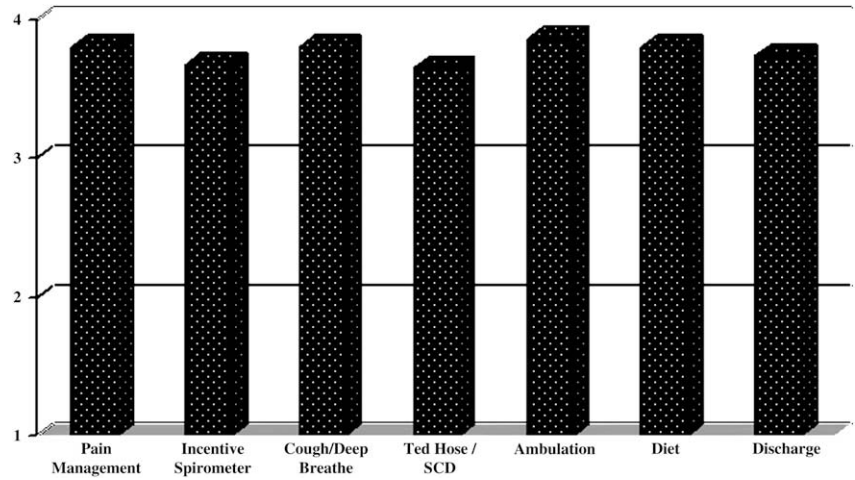

Fig. 4. Mean levels of ability to participate in postoperative care activities reported by patients surveyed after the intervention.

reported higher levels of knowledge and engagement of patients and their families related to postoperative activities. The supposition is that use of the DVD would increase knowledge and provide useful information to enhance the level of involvement of patients in their postoperative activities. The accessibility of information about postoperative care provided opportunities for viewing by the patient and family members. This format enabled patients to review the information numerous times at their own pace. It is not known whether this format influenced outcomes, such as length of stay. It is assumed, however, that the more active patients are in their own care, the more likely they are to progress toward short-term and long-term goals.

This important evidence-based practice project emphasized the value of incorporating DVDs as a part of the preoperative teaching process. The findings delineate the necessity for providing patient-specific postoperative care instruction before patients undergo thoracic surgery. "The goal of patient teaching is to improve patients' understanding of their disease process and the operation that they are about to experience, with the goal of enlisting their active participation in the healing process."[2] This goal is best reached through the collaborative efforts of the health care providers involved in the patients' care. In turn, an eager and well-informed patient can become a participating member of the health care team.[2]

The development of the preoperative DVD was based on existing evidence-based literature and the needs of patients after thoracic surgery. As a result, the findings of this project and the DVD may be limited in generalizability to a small sample of patients and nurses in acute thoracic surgical settings. The magnitude of the effect of the intervention may be too small to detect. Replication of this study with a larger sample size is warranted. A potential effect of time is related to the nurse and patient survey assessments after the DVD intervention. Changing the system was a challenge. The clinic, which is located offsite, lacks an infrastructure to ensure the distribution of preoperative teaching and educational materials. The outcomes of this project clearly delineate the benefits of implementing a preoperative DVD in an effort to meet postoperative care goals, however. This project enhanced thoracic surgical patients' knowledge of, engagement in, and understanding of their postoperative care activities.

SUMMARY

Patients' outcomes were improved by changing the system so that patients were consistently provided with a preoperative instructional DVD. The connection between the patient's postoperative experience and preoperative teaching is intimately linked. This evidence-based project clearly demonstrates that for patients who have had thoracic surgery, and perhaps patients in other acute surgical settings, the need for information about their postoperative care and potential complications obligates health care providers to ensure that patients receive the information they need to engage in their care. Health care practitioners should consider providing this information in a DVD format to supplement verbal and written instruction. A DVD provides an effective and efficient method of distributing important postoperative care information and may enhance patients' ability to recall key aspects of their preoperative instruction. In turn, patients are well equipped to exert confidence and empowered control over their performance of clinically relevant activities after surgery. Perhaps the greatest advantage is the patient's ability to access and view the instructional DVD easily within the confines of his or her home as opposed to a medical office or hospital room.

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