

Timing of preoperative patient teaching

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Accepted for publication 26 April 1989

LEPCZYK M, HUNT RALEIGH E & ROWLEY C (1990) *Journal of Advanced Nursing* 15, 300–306

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With the increasing cost of health care and the growing constraints made by third party payers, in-hospital time for preoperative teaching is quickly being reduced. Seventy-two patients attended preoperative instruction either as an inpatient the day before surgery or as an outpatient 4–8 days before surgery. Anxiety and knowledge levels were measured before and after class and the evening before surgery. No differences were found between the groups on a measure of anxiety levels. Both groups demonstrated a moderate anxiety level with no significant change over the testing period. Using the knowledge pretest as a covariate, repeated measures analysis of variance suggested the knowledge gained with the class was significantly greater for the outpatient group than the inpatient group ($P=0.018$). There was also a significant positive relationship between the knowledge score and knowing someone who had cardiac surgery ($t=2.34$, $df=66$, $P=0.022$). The results suggest that it makes little difference whether patients receive information up to a week before surgery or just the day before, therefore, the more economical preadmission teaching may be the path of choice.

INTRODUCTION

The soaring cost of health care has become the focus of national attention. It is timely, therefore, that nurses evaluate their role in the delivery of nursing services to assure that care is provided in a safe, professional and cost-effective manner. This includes examining the standard of practice of a structured preoperative teaching programme for surgical patients.

Some hospitals offer a teaching programme to patients before admission to the hospital and others offer it after

admission, during the period of the preoperative work-up. The in-hospital preoperative period is becoming increasingly shorter because of the changing nature of third party reimbursement. Therefore, most institutions admit the patient the afternoon prior to surgery (often as late as 16.00), or in some elective cases, on the morning of surgery. Because it is often difficult for the nurse to arrange a preoperative class in the limited time available, more hospitals may begin to provide preoperative teaching prior to admission. With the current emphasis on shortening both the pre- and postoperative hospital stay, it is timely for nursing departments to review their preoperative teaching methods and institute changes as needed.

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Patients who attend preoperative teaching classes are usually those who have decided they need and want the information offered (Johnson *et al* 1978). Studies have demonstrated that these patients do better postoperatively (Hartfield & Cason 1981, Divine & Cook 1983, Rice & Johnson 1984), however, the issue of the best time for learning this information has not been adequately studied (King & Tarsitano 1982). Does the time at which patients receive the instruction (before or after admission) affect their anxiety level? Does it affect retention of information? The purpose of this study was to explore these questions using a sample of patients scheduled for cardiac surgery.

REVIEW OF LITERATURE AND CONCEPTUAL FRAMEWORK

The cardiac surgery patient attending preoperative classes is an adult learner. Malcolm Knowles (1973) proposes characteristics of the adult learner that are pertinent to patient teaching: (1) the adult is self-directed, (2) the adult has accumulated a reservoir of experiences that serve as a resource for learning, (3) the adult's readiness to learn is oriented to the developmental tasks of social roles, and (4) the adult desires immediate application of learning. Adults may resist learning under conditions incongruent with their self-concept as autonomous individuals. They are motivated to learn when they recognize a gap between what they know and what they want to know.

These principles suggest several applications for patient teaching. Patients should be allowed to articulate their own learning needs and make choices. The adult's reservoir of accumulated knowledge supports the wisdom of group learning settings where adults can teach each other. In addition, subject matter should be related to the learner's ability to succeed in his/her social roles. The principle of immediate application suggests that adults are especially motivated to learn at times of crises.

Other educational principles suggest methodologies that affect the retention of information by the adult learner in times of illness. Combining written and verbal instructions has been demonstrated to be superior to using either alone in producing retention (Green 1979). Supplementing oral instructions with written communication is an application of the education principle that information which is repeated will be retained and recalled more readily than information that is not repeated. Written instructions can be referred to repeatedly by the patient. The task for nurses and other health care professionals is to make available relevant, comprehensible and useful information at the time and place where it is more likely to motivate, enable or

reinforce health behaviour. A time of immediate threat may not be conducive to retention.

Cardiac surgery

Cardiac surgery may be classified as a crisis or threatening event for most patients, producing anxiety in response. When faced with a potentially threatening event, the individual cognitively appraises the situation, weighing resources against the attributes of the stimulus. If the situation is seen as threatening, anxiety is aroused and a second appraisal is made to determine the best way to cope with the threat. The coping strategy used depends upon the results of the secondary appraisal. Individuals who seek information about their surgery are coping by attempting to gain some control of the situation through knowledge which assists in another appraisal of the threat (Lazarus & Folkman 1984).

Choice of a coping process depends in part on one's resources, which include health, energy, beliefs about God or control, commitments, problem-solving skills, social skills, social support, and material resources (Lazarus & Folkman 1984). To assist patients in their coping behaviour, preoperative classes are offered to provide the information they seek. Janis (1958) reported that providing information about the surgical event facilitates a process of mental 'rehearsal', enabling the individual to develop reality-based expectations and plans for coping with the perceived danger.

Rakoczy (1977) found that cardiac surgery patients frequently described feelings of helplessness, fear of impairment, and fear of dying when initially confronted with the need for cardiac surgery. Lazarus & Averill (1972) described three factors which give rise to the feeling of helplessness, a major component of anxiety: (1) the inability to interpret or give meaning to a situation, (2) the inability to anticipate events, and (3) uncertainty.

During this period of uncertainty, the nurse may best help patients by allowing them time to vent their concerns. According to Rakoczy (1977), when these patients become resolved to the need for cardiac surgery, they seemed ready for structured preoperative education. Although she identified the psychological phases that patients go through prior to surgery, she did not elaborate on the time frame for each of the phases.

Timing of teaching

It has been suggested that the time period between learning of the need for surgery and the actual surgery is a

Table 1 Sample background questions

1	In what year did the doctor first tell you that you had heart disease?
2	When were you told you needed coronary artery bypass surgery?
3	Do you know anyone who has had heart surgery? If yes, what is their relationship to you?
4	After the doctor told you that you needed heart surgery, did you seek additional information about heart surgery? If yes, from who and/or where? _____ physician _____ nurse _____ person who had the surgery _____ book, describe _____ _____ newspaper _____ other, describe _____
5	Have you ever had surgery before?

significant factor in determining preoperative anxiety level (Dumas & Johnson 1972) Patients who learned that surgery was advisable a month or less before hospital admission had higher anxiety levels than those who knew of the need for surgery for more than a month A time period to assimilate information may be as important as the actual information Levesque *et al* (1984) compared preadmission preoperative teaching to postadmission preoperative teaching in a sample of 82 elective cholecystectomy patients The researchers were interested in the effect which timing of teaching had on anxiety and postoperative recovery Three groups were studied (1) preadmission instruction, (2) postadmission instruction and (3) no instruction (control) Groups were established over 2-week periods using a randomly chosen rotating schedule which was repeated 13 times Subjects were assigned to the current group as they were admitted There were no significant differences in anxiety scores and postoperative recovery between the two experimental groups

Christopherson & Pfeiffer (1980) addressed the timing issue in their study of the relationship between timing of information, level of knowledge, and self-reported anxiety Their sample of 41 patients was randomly assigned to two groups, initially Group 1 ($n = 11$) read the preoperative teaching booklet 1–2 days prior to surgery Group 2 ($n = 18$) read the booklet anywhere from 3 to 35 days preoperatively There were additional patients ($n = 12$) in each group who chose not to read the booklet These individuals were put in a third group retrospectively for analysis The resulting data indicated that whether the patient read the booklet 1–2 days preoperatively or 3–35 days preoperatively made little difference in the information recalled postoperatively Additionally, patients who received the teaching booklet 1–2 days preoperatively (group 1) experienced less anxiety postoperatively

In summary, the literature suggests that sufficient time to assimilate information is important for the adult learner To date, the few studies which examined timing of preoperative instruction have been inconclusive, suggesting the need for further investigation For the purposes of this study, it was hypothesized that cardiac surgery patients who received a preoperative teaching programme prior to admission would have less anxiety and greater knowledge preoperatively than patients who received preoperative teaching after admission

METHODS

Sample

The convenience sample was selected from a population of patients who presented themselves for preoperative classes before coronary artery bypass surgery at two large metropolitan hospitals Groups 1 (from one hospital, $n = 32$) received teaching 2–7 days prior to hospital admission Group 2 (from the other hospital, $n = 42$) received teaching on the afternoon of hospital admission Seventy-four patients consented to participate Data were collected over 8 months Patients were excluded from the study based on the following criteria (1) previous heart surgery, (2) other surgery in combination with the bypass surgery, (3) not fluent in written English, and (4) emergency surgery

Measures

Background questionnaire

This questionnaire was developed by the investigators to gather demographic data as well as data on the patient's sources of information regarding the surgery Sample questions are displayed in Table 1

Heart surgery questionnaire

This questionnaire, also developed by the investigators, was used in three forms for the pretest and post-tests. It consisted of 14 multiple choice questions in the following categories: anatomy and physiology, procedures and policies, activity, and sensations. Scores (the sum of correct responses) may range from 0 to 14. The questions remained the same in all three forms of the questionnaire, but their order was randomly changed. Content validity was established by a panel of clinical nurse specialists with expertise in cardiovascular nursing using the class objectives. There was 100% agreement among panel members. Test-retest reliability in a pilot of the pretest and post-test of the instruments using preoperative cardiac surgery patients ($n = 20$) yielded a correlation coefficient of 0.68. The test for internal consistency yielded Cronbach's alpha of 0.76.

State-Trait Anxiety Inventory (STAI)

This inventory consists of 20 short statements regarding present feelings in a Likert format. It has two forms: state and trait. The state form was used in this study. Scores may range from 20 to 80. Original reliability of the STAI was tested with undergraduate college students. Internal consistency coefficients of greater than 0.85 were reported by the authors (Spielberger *et al.* 1970). In this study the Cronbach's alpha coefficient for internal consistency was 0.90.

Procedure

Potential subjects were identified from scheduled admissions lists. Patients in both groups were contacted by phone prior to class. The study was explained and verbal consent obtained. The patients who agreed to participate were asked to come early to class to complete the questionnaires.

When they arrived, the study was explained once again, and written consent was obtained. Prior to the class, the patients completed the background questionnaire and the first heart surgery questionnaire and STAI. They attended the class and afterward completed the second heart surgery questionnaire and STAI. The evening of the preoperative day, all patients completed the third heart surgery questionnaire and STAI.

Preoperative class content

The classes at the two hospitals were identical in content and teaching methods. The class covered anatomy and physiology, pathology, the surgical procedure, preoperative and postoperative procedures, the intensive care unit

environment, and sensation information as well as emotional and psychological reactions to surgery. Patients and family members were encouraged to ask questions and express feelings and concerns. Patients were given a booklet containing basic preoperative information and instructions for exercises. The preadmission class was held 1 day each week and the postadmission class was held in the early afternoon of the admission day.

RESULTS

The level of significance was preset at 0.05. The age of the subjects ranged from 32 to 75 years with a mean age of 59.1 years and a standard deviation of 9.31. There was a statistically significant difference in age between the preadmission ($\bar{X} = 61.7$) and postadmission ($\bar{X} = 57.2$) teaching groups (Table 2). Demographic characteristics of the participants are displayed in Table 2. The two groups were also compared on pretests of knowledge and anxiety. Using chi-square or *t*-test analysis as appropriate, the two groups did not differ significantly on any demographic variable, other than age, nor did they differ on anxiety level as determined by STAI. However, there were significant differences on the knowledge pretest (group 1, $\bar{X} = 10.45$, group 2, $\bar{X} = 12.03$, $t = -2.83$, $df = 71$, $P = 0.006$).

Anxiety

It was proposed that the preadmission group would have less anxiety than the postadmission group. Using repeated measures analysis of variance, this hypothesis was not supported. The means of the two groups did not differ on any of the anxiety questionnaires, with means ranging from 40.3 to 44.2 on a scale of 20 to 80 (Table 3). This moderate level of anxiety was demonstrated by both groups at the start of preoperative teaching, and it did not change significantly after teaching or prior to surgery. In addition, there was no significant relationship between the amount of anxiety and the length of time between learning of the need for surgery and the actual surgery. Females had significantly higher anxiety scores than males ($t = -2.16$, $df = 56$, $P = 0.035$).

Knowledge

It was also hypothesized that patients who received preoperative teaching prior to admission would have greater knowledge than patients who received preoperative teaching after admission, and that the preadmission group would retain more knowledge than the postadmission group. Because there was a significant difference between

Table 2 Demographic characteristics of the participants

Characteristic	Category	Preadm Group 1	Postadm Group 2	Total
Age*		$\bar{X} = 61.7$ s d = 7.0	$\bar{X} = 57.2$ s d = 10.4	
Gender**	Male	28	31	59
	Female	4	11	15
Ethnicity**	Black	2	5	7
	White	29	37	66
	Latino	1	0	1
Education**	8th grade or less	5	5	10
	9–11 grade	3	11	14
	High school graduate	11	13	24
	1–3 years post-HS	10	10	20
	College degree(s)	3	3	6
Occupation**	Professional	4	5	9
	Managerial	4	3	7
	Clerical	1	3	4
	Skilled worker	11	12	23
	Semi-skilled	1	8	9
	Labourer	1	0	1
	Homemaker	1	6	7
	Other	9	5	14

* $t = 2.12$, $df = 72$, $P = 0.037$

**No significant differences using chi-square analysis

Table 3 Mean anxiety scores by groups

		Group		P level
		1	2	
Mean	Test 1	40.3 (10.3)*	44.2 (10.6)	0.375
Anxiety	Test 2	42.2 (11.4)	43.9 (12.2)	0.856
Scores	Test 3	41.5 (10.7)	43.4 (10.5)	0.604

*Standard deviations are given in parentheses

the two groups on the knowledge pretest, the pretest was used as a covariate. Using repeated measures analysis of variance and the pretest as a covariate, this hypothesis was supported at the 0.018 level of significance. The knowledge gained with class was significantly greater for the preadmission group than the postadmission group, however, this was a small practical difference (Figure 1)

Also there was a significant relationship between the pretest knowledge score and knowing someone who had cardiac surgery ($t = 2.34$, $df = 66$, $P = 0.022$). The 58 patients who reported knowing someone who had cardiac surgery scored higher in knowledge than those who did not, however, knowing someone with cardiac surgery was not related to the anxiety scores. Additionally, 50 patients (81%) reported seeking knowledge when told of the need for surgery.

DISCUSSION

There was no relationship found between the time chosen for the preoperative teaching and the anxiety level of the patients. Based on the STAI scores, the patients exhibited a moderate level of anxiety before and after teaching and on the evening before surgery. Considering the seriousness of the surgery, it may be unrealistic to expect the anxiety level to be reduced.

Anxiety is characterized by the individual's inability to specify the source of threat or the object that is threatened (May 1977). It is often manifested by general restlessness,

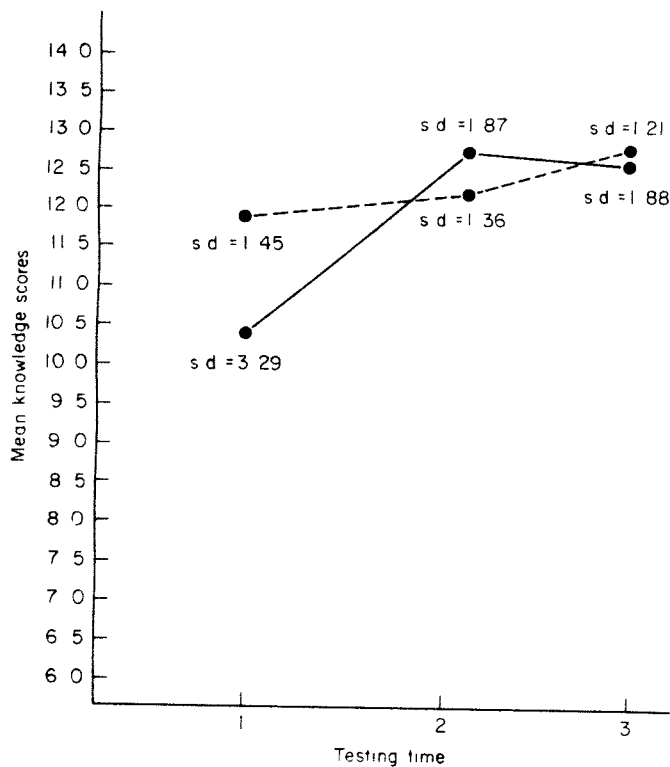


Figure 1 Heart surgery questionnaire scores by group over time
 — = preadmission group 1, - - - = postadmission group 2,
 s d = standard deviation

sleep disturbances, and purposeless movements (Yocum 1984). Conversely, the major characteristic of fear is the ability of the individual to identify the specific source and object of the threat (May 1977). Behavioural manifestations of fear (i.e. increased alertness and concentration) subside shortly after the threat has been removed. The patients in our study sample did have a specific threat (coronary artery surgery) that could have been identified as the source of their fear. It may be fear is a more appropriate variable than anxiety for study.

Another point to consider is that the participants may have been largely 'knowledge-seekers' as indicated by the 81% who sought information after learning of the need for surgery. This may explain the moderate level of anxiety demonstrated on the pretest and the lack of significant changes in the anxiety levels. As discussed in the literature review, knowledge-seekers cope by obtaining information. If they had been denied information, perhaps a significant change in anxiety scores would have occurred.

The study lacks significant results, a situation which is similar to other studies in this area which have also been inconsistent in their findings. Levesque *et al* (1984) found significant differences in preoperative anxiety between preadmission and postadmission teaching groups while

Christopherson & Pfeiffer (1980) found no significant differences. Lindeman & Van Aernam (1971) demonstrated positive effects of preoperative teaching while Rice & Johnson (1984) found no significant differences between groups receiving written preadmission preparation or eve-of-admission preparation.

The preadmission group in this study did gain more knowledge by attending class, however, the postadmission teaching group came to class with more information. The difference in level of knowledge before class may be explained by the quasi-experimental design, the patients at one hospital may have had access to more information prior to class than the patients at the other hospital.

However, the gain in knowledge by the preadmission group may not be of practical significance because both groups scored well on the pretest. Retention was high in both groups. This is especially important since the preadmission group had up to a week to forget or assimilate information and the postadmission group had almost no time to assimilate information. Additionally, the postadmission group was faced with the immediate threat, which is thought not to be conducive to retention.

The principle of written and verbal information for adult learning may be pertinent here. Those in the preadmission group had up to a week to read the materials given to them and assimilate the information. Those in the postadmission group may have received similar written material from their physicians. This could account for their high level of knowledge on the pretest. A limitation of this study was that specific data regarding the type and amount of information given by the physicians were not obtained.

It may be that former cardiac surgery patients are an important source of information for preoperative heart surgery patients. They seemed to have been significant in increasing knowledge scores of patients in both groups. This may be because of prolonged contact with a previous patient through social interaction or work, or it may be that hearing the information from a peer has significant impact on memory.

These results suggest that it makes no difference whether patients receive information up to a week before surgery or just the day before. Yet, teaching patients prior to admission is fast becoming an economic necessity. Another study (Rice & Johnson 1984) has demonstrated that patients can learn expected behaviours, such as post-operative exercises, prior to admission. If patients are not adversely affected by receiving the surgical information up to a week before admission and if they retain almost 100% of the information learned, this would seem to be a prudent and beneficial direction to take. Not only is it more cost-effective in terms of patient hospital days, but it is more

cost-effective when scheduling nursing time for patient instruction. Less nursing time is required for a single weekly class than for five a week. Based on the findings of this study, it may be concluded that nurses and patients may select a mutually convenient time for the preoperative class.

CONCLUSION

This study did not demonstrate the expected results regarding the timing of the preoperative teaching programme. The two groups had similar preoperative anxiety and knowledge levels, therefore, no conclusion can be drawn about the timing of preoperative teaching. Based on current knowledge, there are no guidelines to help establish the best time for the preoperative instruction class. While there will always be some patients who have difficulty attending an outpatient class, the outpatient class may be the only option for the nurse and patient because of the reduced time in the hospital before surgery. Another option to consider is mailing preoperative information to the patient's home. This may be even more cost-effective and enable the patients to learn at their own pace. The information could be briefly reviewed after the patient is admitted. Further research is needed to evaluate this option.

Formalizing the role of former cardiac surgery patients as peer support givers for preoperative cardiac surgery patients may provide an important adjunct to preoperative teaching in this group. This option also requires further research.

Acknowledgements

The order of authorship was arbitrary. The authors would like to acknowledge the assistance of Lula Lester MSN RN, Mary Lee Van Keuren MSN RN, Kathleen West MSN RN and Kathleen Zimmnick MSN RN, for their assistance in data collection.

This study was supported in part by a grant from the American Heart Association of Michigan, Professional Nurses Research Grand Award.

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