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Preoperative patient education for open-heart patients: A source of anxiety?

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Abstract

Objective: The purpose of this study was to assess the impact of preoperative patient education on anxiety and recovery of the Lebanese patients undergoing open-heart surgery.

Methods: This quasi-experimental study was conducted at a large hospital in Beirut, which is a university hospital. All patients who were admitted to the cardiac surgery unit and who met the inclusion criteria were randomly assigned to as experimental or a control group. The patients in the experimental group ($n = 57$) received a special educational session on their admission day and had a tour of the cardiac surgery unit. The control group ($n = 53$) followed the routine hospital protocol, which encompassed almost no preoperative education or a tour. Anxiety was assessed using the Beck Anxiety Inventory while recovery was measured by physiological outcomes, days of hospital stay, and presence of complications. A Multivariate Analysis of Covariance (MANCOVA) was performed with adjustment for potential confounding variables.

Results: Borderline statistical significance was noted for the experimental group in terms of preoperative and postoperative anxiety. The experimental group had a shorter time from awakening to extubation.

Conclusion: Unlike most studies published previously, which noted the benefits of preoperative patient education, this study with the Lebanese clients, failed to support earlier findings.

Practice implications: The results suggest that patient education should not be initiated before assessing the patient's cultural and social background.

Keywords: Preoperative patient education; Open-heart patients; Postoperative anxiety

1. Introduction

Although several studies have documented the efficacy of education in the rehabilitation and recovery of the patient undergoing surgery, this important aspect of care is often ignored in Lebanon. Patient education has a low priority when compared to other clinical duties, and if it does exist, it tends to be unplanned and haphazard. Patient education is frequently ignored due to cultural explanations, such as, ''patients prefer not to know'' or ''they become more anxious with knowledge.'' Lack of time and heavy workload are often cited as obstacles to patient education. Moreover, patients have assumed passive-recipient roles due to the existing medical paternalism. Another reason for overlooking this aspect of care is lack in financial and human resources.

This study aimed at investigating whether patient education has a positive impact on recovery in the Lebanese population who are undergoing open-heart surgeries. Recovery was assessed in terms of psychological variables, which included scores of Anxiety Inventory and observer rating of agitation, and physiological variables, which included increased heart rate, increased blood pressure, use of sedatives, time of extubation, hospital stay, and postoperative complications.

Lebanon has 4.4 million inhabitants, 60–70% of whom reside in urban areas; the majority of those residing in urban

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areas live in the ''Greater Beirut''; the area in and around Beirut. Lebanon is a small country with a surface area of 10,452 km^2, population growth (1980–2002) is 1.8%, and life expectancy (2002) is 71 years. The expenditure on health as a percentage of gross domestic product is at 12.4% [1]. The educational system in Lebanon consists of 4 preschool years, 6 elementary years, and 6 secondary years; so with 16 years of education a person graduates from high school. Primary level completion rate is 92%, and progression into secondary level is 86%. Adult literacy rate is 69%. All secondary-schooled Lebanese are fluent in either French and/or English [2].

Coronary artery disease is one of the main causes of death in most countries [3,4]. Patients unresponsive to medical treatment are often required to consider coronary artery bypass graft surgery (CABG). The number of patients undergoing cardiac surgery has increased both internationally and locally. In the United States, there has been a four-fold increase in the number of open-heart surgeries between 1979 and 1996 (American Heart Association, 1998), and more than 350,000 such operations are performed annually [5]. This operation prolongs and improves patient's quality of life [6]. In Lebanon, 2558 cases of open-heart surgeries are performed annually of which 1192 cases are coronary bypass graft surgeries [7].

Few studies have been conducted in Lebanon investigating the load of cardiovascular diseases. A study conducted by Nuwayhid et al. reported that cardiovascular diseases were the leading cause of death in Beirut [8]. Moreover, the National Household Health Expenditure and Utilization Survey (NHHEUS) conducted by the Ministry of Public Health in 1999 reported that 3.5% of a weighted sample of 32,838 persons from all over Lebanon reported cardiac problems (3.8% males; 3.3% females) [9].

Cardiac surgery is perceived as a crisis or a life-threatening event for most patients. When an individual faces a threatening event, the situation is appraised cognitively, and if found threatening, anxiety is aroused. Patients who seek information about their surgery are attempting to cope by trying to have some control of the situation through knowledge. The coping mechanism one chooses depends on one's resources, which include health, energy, beliefs about God or control, commitments, problem-solving skills, social skills, social support, and material resources [10].

The impact of patient education has been studied extensively worldwide. It has been proven that obtaining information about an upcoming event is considered a significant mode of coping. It enables a person to modify, avoid or minimize the impact of the situation, thereby reducing the degree to which it is appraised as stressful [11]. In addition, preoperative patient education provides that knowledge which may decrease stress and enhance feeling of control. Close refers to patient education as ''a two way process-that of teaching by the nurse, and learning by the patient, with the purpose of achieving a specific goal, that is optimum health'' [12]. Redman in her overview of patient education over 25 years, states that patient education, which best fits the unique experiences, needs, and aspirations of a particular patient, is a challenge to health providers [13]. Research over the past three decades has provided evidence for the importance of patient education. Positive effects of preoperative health care information on indices of post-operative pain, distress, and recovery are well documented [14,15].

Hathaway presented a meta-analysis of 68 studies, which indicated that patients who receive preoperative education have postoperative outcomes that are favorable by 20% compared with the patients who did not receive such preparation. Outcomes included physiological variables, such as length of stay, sedatives used, recovery, complications; psychological variables included observer ratings of cooperation, scores of self-reported anxiety inventories, etc [16].

Much has been revealed about the impact of patient education on recovery in terms of psychological and physiological outcomes.

Psychophysiological responses, related to autonomic nervous system arousal of cardiac patients, were studied as indicators for anxiety. Heart rate, incidence of arrhythmias, blood pressure and state anxiety were measured. The results provided evidence that sensory vulnerability was the most consistent predictor for arousal, and that previous caregiving experiences that were perceived as 'negative' by the patient also contributed to higher blood pressure and anxiety [17]. Another study found out the top five anxiety clinical indicators perceived by critical care nurses were agitation, increased blood pressure, increased heart rate, patients' verbalization of anxiety, and restlessness [18].

The effect of providing concrete information to open-heart patients about emotional stress and difficulty in communicating resulted in early extubation, and less anxiety [19]. Another study suggested that early extubation resulted in fewer patients displaying depressive symptoms [20].

Recovery has also been assessed through length of hospital stay (maximum of 7 days) and incidences of postoperative complications, suggesting that the nurses have a fundamental role in reducing the incidence and severity of postoperative complications through patient education [21].

Cultural influences play a significant role. One's culture often determines one's definition of health and illness, attitudes and decisions concerning health, perception and compliance with treatment regimens. Arabs maintain a value orientation that is based on fatalistic predestined belief system that is why they generally do not exercise preventive health practices [22]. Moreover, hospitalized patients in the Middle East are expected to assume the sick role, and thus totally depend on the care of the health providers [23].

A number of studies of open-heart patients in the Middle East show the following: postcoronary artery bypass Israeli patients are characterized by high psychological distress (anxiety and mood states), and low functional capacity associated with high levels of pessimism and ineffective emotion-focused coping strategies [24]. An experimental

study of open cardiac surgery patients conducted in Turkey to investigate the effect of preoperative education on anxiety levels found out that the postoperative state and trait anxiety score of the control group was slightly higher than the mean of the patients in the intervention group; there was no statistically significant difference in the postoperative state and trait anxiety scores between the groups [25]. Another study in the United Arab Emirates investigated the factors that led to perioperative anxiety. Subjects, who were educated, had family support, previous surgical experience, and better perioperative knowledge had a low anxiety and depression level [26].

In Lebanon, the impact of patient education on recovery was almost absent in the scientific research, except for one that was published locally in September 2004. This comparative study, which was conducted in Tripoli, North Lebanon, had a sample of 60 patients from the operating room. Half of the group was informed about the surgical procedure by the operating room nurses during the preparatory stage, and the other half was uninformed. Although the experimental group scored less on the Spielberger's State-Trait Anxiety Inventory, other factors, such as gender, age, marital status, education, and medical history were not related to anxiety levels [27].

A study looking at 486 Lebanese individuals, studies their cultural attitudes regarding disclosure of serious illness. The sample included 88 cancer outpatients (17.7%), 99 non-cancer patients (17.7%), and 311 ''healthy'' persons visiting or accompanying patients (62.4%). Lower preference for disclosure of cancer diagnosis was found in 41.6%. The results showed that 42% of the 498 respondents preferred non-disclosure of serious or terminal diagnosis. Preference of disclosure was associated with younger age, higher education [28]. Likewise, a study of Iranian women found that posters used for education induced anxiety in 42% of the readers [29].

The purpose of this study was to assess the impact of preoperative patient education on the anxiety levels, and physiological recovery for patients undergoing open-heart surgery in the Lebanese clients. The theory underlying the study is based on the positive impact of most educational programs, as well as on the study by Maward and Azar conducted in Lebanon, which reported the benefits of education on post-surgical anxiety [27].

The hypothesis was that preoperative patient education significantly decreases anxiety postoperatively and favors recovery in the Lebanese population.

2. Methods

This quasi-experimental study included a sample of 110 patients; it was conducted at a large university hospital.

2.1. Sample

The sample was selected from a population of patients who were admitted to the cardiac surgery unit for coronary artery grafting for the first time, who were less than 80 years old, whose spouses were not operated for coronary artery grafting, and who did not have a history of psychiatric disorder. Ninety percent of those who were asked to participate consented. Since an official IRB does not exist in the hospital, all clients were asked to give a verbal consent. Demographic data were collected from the patients and the medical records; this included age, gender, educational level (number of years in school), work status, marital status, number of children and their age (to assess dependency of the children), history of psychiatric disorders, time of last cardiac event. Detailed cardiac histories were not measured.

They were randomly assigned to the groups of comparison: patients with odd admission number were assigned to the experimental group, while patients with pair admission number were assigned to the control group. The required sample size was estimated using the STATA statistical software. It was found that each of the experimental and the control groups should have a minimum of 47 subjects. This sample size allowed us to detect a minimum of 7 points difference in the Beck Anxiety Inventory (BAI) for the two groups, with 80% power and 5% significance.

2.2. Instruments

1. The Beck Anxiety Inventory in its Arabic form (translated earlier by the Department of Psychiatry at the same hospital for research purposes) was administered to both experimental and control groups before the preoperative teaching intervention to measure anxiety. This instrument was developed by Beck et al. (1988) with internal consistency 0.92, test-pretest 0.75, and validity 0.65 (with Hars-R Hamilton anxiety rating scale revised version) [30].

   BAI is a 21-item self-report Inventory designed to measure the severity of anxiety symptoms. Each item is scored separately on a scale 0–3; 0 indicating never and 3 indicating always. The total score ranges from 0 to 63; normal anxiety level would be up to 9, 10–15 indicates light to moderate anxiety, 20–29 indicates moderate to severe anxiety, and scores greater than 30 indicates severe anxiety. The items tackle feelings of restlessness, tension, inability to breathe, inability to relax, etc.
2. The physiological measures included heart rate more than 120/min, blood pressure more than 180 mmHg systolic, sedative use, and the time (in hours) for the patients to be extubated after awakening [16–20].
3. Recovery was measured by hospital stay days, and postoperative complications, such as pulmonary problems, thrombosis formation, and psychosis [21].

2.3. Procedure

Every patient who was admitted to the Cardiac Surgery Department and agreed to join in the study was administered the Beck Anxiety Inventory upon admission. The study was

blinded; the team members who administered the Anxiety Inventory were not aware whether the patient belonged to the experimental or the control group, and neither was the statistician. A research assistant gave the educational session to the experimental subject. Nurses collected data related to measurements of heart rate, blood pressure, agitation, sedative administration, and time of extubation. The nurses were not aware whether the patient belonged to the experimental or control group. Once transferred to the regular floor, 2 days before discharge the BAI was administered once more. Data on postoperative complications, and length of stay was collected upon discharge.

2.4. Intervention

The intervention group who received an educational session was kept blinded to the actual purpose of the study. The control group followed the routine hospital protocol (no preoperative education).

The educational session included conversation as what to expect in the Cardiac Surgery Unit in terms of equipment used, such as cardiac monitors, different catheters, chest tubes, and ventilator; visiting hours for the family members. The session was followed by an explanation and demonstration of respiratory exercises, leg exercises, and possible complications. Pain management and early ambulation were also discussed. The session was concluded by reinforcement of information and answering of questions and a tour to the cardiac surgery unit. No further educational topics were discussed pertaining to risk factors of coronary artery disease, or prevention of further disease processes.

2.5. Statistical analysis

Data analysis was performed on SPSS software, release 11.5. Two-tailed statistical tests were used; Chi^2-test for dichotomous or categorical variables, Mann–Whitney for quantitative variables with non-homogeneous variances or non-normal distribution, and *t*-tests for quantitative variables of normal distribution and homogeneous variances. Odds ratios (OR) were calculated regarding dichotomous outcome variables, in addition to their 95% confidence intervals (CI). Missing values were replaced with the series means of continuous variables.

A Multivariate Analysis of Covariance (MANCOVA) was performed, to adjust for preoperative anxiety, which was higher for the experimental group albeit not a statistical significance.

3. Results

There were no statistically significant differences between the two groups of comparison regarding demographic characteristics and the mean time (in days) of the last cardiac event between two groups (Table 1).

Table 1
Characteristics of the sample

Variable	Experimental ($n = 57$) *M* (S.D.)	Control ($n = 53$) *M* (S.D.)	*p*-value
Age[a]	62.4 (8.2)	58.6 (11.9)	0.26
Number of children	4.4 (2.6)	4.2 (2.2)	0.66
Age of the last child	23.9 (8.8)	20.6 (10.4)	0.10
Years of education	16.4 (3.4)	16.3 (3.3)	0.83
Gender			
Male	43 (82.7%)	48 (84.2%)	0.83
Female	9 (17.3%)	9 (15.8%)	
Marital status			
Married	43 (82.7%)	49 (86.0%)	0.75
Other	9 (17.3%)	8 (14.0%)	
Work status			
Unemployed	17 (32.7%)	15 (26.3%)	0.66
Employed	30 (53.1%)	34 (59.6%)	
Retired	5 (9.6%)	8 (14.0%)	
Last cardiac event in days[a]	100.8 (227.1)	100.9 (307.0)	0.91
Preoperative anxiety	14.7 (11.0)	11.5 (7.0)	0.07

[a] After missing value replacement by the variable mean.

Borderline statistical significance was noted between the two groups on postoperative anxiety, and extubation time (see Tables 2 and 3). The experimental group had a higher postoperative anxiety ($p = 0.08$), and a shorter extubation time ($p = 0.07$). None of the other variables showed any significant difference.

The results of the multivariate analysis reflected borderline higher postoperative anxiety ($p = 0.05$) and a lower number of hours from awakening to extubation in the group of patients who received health education ($p = 0.05$). All other differences between dependent variables were not significant ($p > 0.05$) (see Table 3).

There were no statistically significant differences in the postoperative complications between the two groups (see Table 4).

Two covariates had a significant effect on preoperative anxiety: age and gender, higher age and female gender being more associated with anxiety.

Table 2
Outcome variables for the sample

Variable	Experimental ($n = 57$)	Control ($n = 53$)	*p*-value
Postoperative anxiety	10.5 (11.5)	7.5 (6.2)	0.08
Hours to extubation	11.7 (2.8)	15.4 (13.9)	0.07
Days of hospitalization	6.5 (1.6)	6.4 (1.7)	0.86
Mean pulse	81.6 (10.3)	84.3 (18.9)	0.36
Mean systolic blood pressure	116.8 (9.3)	117.9 (11.0)	0.59
Agitation noted by the nurses at CSU	13 (25.0%)	16 (28.1%)	0.72*
Number of patients needing sedatives	28 (53.8%)	25 (43.9%)	0.30**

* OR = 0.85; 95% CI [0.36–2.01].
** OR = 1.49; 95% CI [0.70–3.18].

Table 3
Multivariate results

Dependent variables	Experimental *M* (S.E.)	Control *M* (S.E.)	*F*	*p*-value	Observed power (%)
Preoperative anxiety[a]	14.00 (1.40)	10.93 (1.36)	2.36	0.12	33.2
Postoperative anxiety[b]	11.33 (1.53)	7.00 (1.50)	3.89	0.05	49.5
Hours to extubation	10.69 (1.68)	15.37 (1.64)	3.88	0.05	48.4
Days of hospitalization	6.73 (0.27)	6.19 (0.26)	1.99	0.16	28.6
Mean pulse	74.08 (2.12)	77.72 (2.07)	1.44	0.23	22.0
Mean systolic blood pressure	80.51 (74.45)	79.37 (2.97)	0.069	0.79	5.8
Postoperative complications	4.29% (2.90%)	2.72% (2.90%)	0.14	0.71	6.6
Agitation in the CSU	21.70% (7.0%)	27.00% (6.80%)	0.285	0.60	8.2
Patients needing sedatives	48.70% (7.70%)	42.2% (7.50%)	0.35	0.56	9.0

Independent variable is the patient health education. Covariates are: gender, age of the last child, age, marital status, work status, number of children, and time of last cardiac event.

[a] Covariates with significant effect are: age (beta = 0.032; $p = 0.08$) and gender (beta = −9.04; $p = 0.006$).

[b] All covariates had non-significant effect on postoperative anxiety.

Table 4
Postoperative complications

Variable	Received health education ($n = 57$; %)	Did not receive health education ($n = 53$; %)	OR [95% CI]	*p*-value
Pulmonary complications	0	1 (1.8%)	–	0.99
Thrombosis	0	0	–	–
Psychosis	2 (3.8%)	1 (1.8%)	2.24 [0.20–25.46]	0.47
Other complications	7 (13.2%)	8 (14.0%)	0.93 [0.31–2.78]	0.90
Any complication	13 (25%)	9 (15.8%)	1.58 [0.61–4.05]	0.34

4. Discussion and conclusion

Both the experimental and the control group had a decrease in their anxiety scores irrespective of whether they had received education or not. This could be explained by the fact that the apprehension of the upcoming surgery was no longer a cause of anxiety.

The time for extubation was significantly lower for the experimental group, which indicates that this particular physiological measure may have been affected by education. The fact that a physiological measure was influenced by preoperative education and not the psychological measures may reflect the cultural uniqueness of the Lebanese population.

4.1. Discussion

While a number of studies have found that procedural information lowers anxiety in American clients [14–16], in this study, with Lebanese clients, the results did not support earlier findings. Patients in the experimental group had a higher preoperative and postoperative anxiety level.

The research assistant providing the educational session noted that the patients became apprehensive and anxious after the conclusion of the session. Clients may have felt like they were burdened by a tremendous responsibility of receiving information; something that they were not ready for. The results of the study conducted by Adib and Hamadeh shows the same apprehension in disclosure of information in the aged Lebanese population [28]. Likewise, the Iranian women showed the same apprehension while reading educational posters [29]. It may be well that Middle-Eastern patients have different needs and perceptions in terms of being active participants in their care.

These unexpected findings raised some serious questions about patients' perception and need for the preoperative information. The Lebanese population at large faces several political and financial challenges. Unemployment rates, economic burdens, and political unrest result in daily stress, which may affect clients in such a way that they prefer to delegate healthcare to the heath team and be able to, at least, not worry about that aspect of stress.

Another explanation could be the inappropriate timing of the educational session. The immediate preoperative period may not have been conductive to learning; patients may have been too apprehensive to listen to the information provided. Compared to the patients, the spouses were noted to be more attentive to the education offered, and were the ones who raised questions and concerns. The clients scheduled for coronary artery bypass are admitted one day prior to surgery, limiting the time available for adequate presurgery education. The evening before the surgery could be an anxious time for patients having a bypass, a time which would better be left for coping with an impending cardiac surgery. The life-threatening nature of this surgery may have undermined the effectiveness of the preoperative education. It has been noted that anxiety interferes with learning [31,32].

Lepczyk et al. found out that the knowledge gained was significantly greater for the outpatient (preadmission) group than the inpatient (postadmission) group [31]. Cupples

demonstrated that patients who received preadmission preoperative education had significantly higher preoperative knowledge levels, positive postoperative mood states, and favorable physiological recoveries compared with patients who only received postadmission preoperative education [32].

Another explanation could be that the locus of control for Lebanese clients is external where the physician has the exclusive decision-making role, and the patient totally relies on the physician's application of earned and owned knowledge. Thus, ''forcing'' clients to participate in their healthcare would make them develop a coping mechanism (i.e., have an internal locus of control) that they are not accustomed to, or ready for [33,34].

Related to this, a strong belief in fatalism was apparent in our encounters (external locus of control) and is typical of the Middle-Eastern people [22]. Patients often said, ''Whatever God wills, happens. If I should live, I will; otherwise, there is nothing I can do.'' This is contrary to self-efficacy, the belief that one has mastery over the events of one's life, and can meet challenges as they come up. When mastery is not achieved, stress continues to build up.

Another point to consider is the fact that clients may not benefit from information offered to them if they have not expressed the need for such information. Affleck et al. noted in their study that offering support to mothers when they have not expressed such a need resulted in a negative impact rather than a positive one [35].

4.2. Conclusion

These speculations need to be appraised in future research to examine the patients' request for information according to their special coping and cultural styles.

Although the design was adequate to meet the aims set for the study, it had certain limitations: a bigger sample from different hospitals in the Middle East would have strengthened the significance of the results. Moreover, comparing preadmission and postadmission groups would have aided in the interpretation of the results.

Some factors were not addressed and could have influenced the results, such as illness severity factors, the length of time patients had coronary artery disease, history of previous events, number of grafts, and coping styles.

4.3. Practice Implications

The results of this study should trigger questions in the minds of the health workers in this region of the world and lead to further investigations through research.

Before patient education becomes part of patient care, both nurses and physicians need to go through some changes in their understanding of delivery of care, and in their role definitions, so that patient education becomes an integral part of patient care. The patients need to be prepared psychologically to accept the offered teaching; this will be the key determinant for the success of the offered patient education. This preparedness would be achieved through patient-centered communication skills used by the health workers, those that would empower the patients, and help them to become autonomous and active participants [34].

It has been stressed that the initial assessment should identify the patient's cultural background, language spoken, religious preference, family patterns of decision making, and health practices and beliefs about medical care, so that a culturally sensitive and acceptable plan of care can be developed that establishes trust, anticipates needs, and preserves the integrity of the patients. The caregivers are also challenged to develop understanding of their own layers of culture, which will influence their own decision making in delivering health care [36,37].

It is correctly said by Murray et al. ''Such lack of attention to individuals as whole persons within the context of their particular cultural beliefs and aspiration may seriously undermine patients' compliance with healthcare advice offered by professionals'' [38].

Therefore, there is no single method of educating all patients; what is successful in one context and culture may not be so in another. The information protocol for open-heart patients needs to be informative, empowering, and culturally sensitive.

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References

[1] WHO Health Systems, 2004.
[2] Summary Education Profile: Lebanon, 2004. Retrieved from worldbank.org.
[3] Trzcieniecka-Green A, Steptoe A. Stress management in cardiac patients, a preliminary study of the predictors of improvement in quality of life. J Psychosom Res 1994;38:267–80.
[4] Kulik JA, Mahler HIM. Emotional support as a moderator of adjustment and compliance after coronary artery bypass surgery: a longitudinal study. J Beh Med 1993;16:45–63.
[5] Passamani E, Davis KB, Gillespie MJ, Killip T. A randomized trial of coronary artery bypass surgery: survival of patients with a low ejection fraction. N Engl J Med 1985;312:1665–71.
[6] Jenkins CD, Stanton BA, Jono R. Qualifying and predicting recovery after heart surgery. Psychosom Med 1994;56:203–12.
[7] Lebanese Ministry of Health, 2004.
[8] Nuwayhid I, Sibai A, Adib S, Shaar K. Morbidity, mortality, and risk factors. In: Deeb M, editor. Beirut: a health profile 1984–1994. Beirut: American University of Beirut; 1997. p. 123–82.
[9] Ministry of Public Health (MOPH). National Household Health Expenditure and Utilization Survey (NHHEUS), 1999.

[10] Lazarus RS, Folkman S. Stress, appraisal, and coping New York: Springer; 1984.
[11] Cohen F, Lazarus RS. Coping and adaptation in health and illness. In: Handbook of health, health care and the health professions. New York: The Free Press; 1983.
[12] Close A. Patient education: a literature review. J Adv Nurs 1988;13:203–13.
[13] Redman BK. Patient education at 25 years; where we have been and where we are going. J Adv Nurs 1993;18:725–30.
[14] Devine EC. Effects of psychoeducational care for adult surgical patients: a meta-analysis of 191 studies. Patient Educ Couns 1992;19:129–42.
[15] Johnson JE. Self-regulation theory and coping with physical illness. Res Nurs Health 1999;22:435–48.
[16] Hathaway D. Effects of preoperative instruction on postoperative outcomes: a meta-analysis. Nurs Res 1986;35:269–75.
[17] Weiss SJ, Puntillo K. Predictors of cardiac patients' psychophysiological responses to caregiving. Int J Nurs Pract 2001;7:177–87.
[18] Frazier SK, Moser DK, Riegel B, McKinley S, Blankely W, Kim KA, Garvin BJ. Critical care nurses' assessment of patients' anxiety: reliance on physiological and behavioral parameters. Am J Crit Care 2002;11:57–64.
[19] Kim H, Garvin BJ, Moser DK. Stress during mechanical ventilation: benefit of having concrete objective information before cardiac surgery. Am J Crit Care 1999;8:118–26.
[20] Silbert BS, Santamaria JD, Kelly WJ, O'brien JL, Blyth CM, Wong MY, Allen NB. Fast track cardiac care team. Early extubation after cardiac surgery: emotional status in the early postoperative period. J Cardiothorac Vasc Anesth 2001;15:439–44.
[21] Naughton C, Prowroznyk A, Feneck R. Reasons for prolonged hospital stays following heart surgery. Br J Nurs 1999;8:1085–7. 1090–4.
[22] Meleis A. The Arab American in the western health care system. Am J Nurs 1981;6:1180–3.
[23] Meleis A, Hattar-Pollara M. Arab Middle Eastern American women, stereotyped, invisible but powerful. In: Adams DL, editor. Health issues for women of color: a cultural diversity perspective. Thousand Oaks, CA: Sage Publications; 1995.
[24] Ben-Zur H, Rappaport B, Ammar R, Urtetzky G. Coping strategies, life style changes, and pessimism after open-heart surgery. Health Soc Work 2000;25:202–9.
[25] Asilioglu K, Celik SS. The effect of preoperative education on anxiety of open cardiac surgery patients. Patient Educ Couns 2004;53:65–70.
[26] Kureshi J, Rocke AD, Tariq AQ. Perioperative knowledge and anxiety score of patients undergoing surgery. MEJ Anesth 1995; 13:325–33.
[27] Maward L, Azar N. Comparative study of anxiety in informed and non-informed patients in the preoperative period. Rech Soins Inf 2004;78:35–58 [French].
[28] Adib SM, Hamadeh GN. Attitudes of the Lebanese public regarding disclosure of serious illness. J Med Ethics 1999;25:399–403.
[29] Montazeri A, Sajadian A. Do women read poster displays on breast cancer in waiting rooms? J Public Health 2004;26:355–8.
[30] Beck A, Epstein N, Brown G, Steer A. An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol 1988;56:891–3.
[31] Lepczyk M, Raleigh EH, Rowley C. Timing of preoperative patient teaching. J Adv Nurs 1990;15:300–6.
[32] Cupples S. Effects of timing and reinforcement of preoperative education on knowledge and recovery of patients having coronary artery bypass graft surgery. HEART LUNG 1991;20:654–60.
[33] Katerndahl DA. Locus of control and field dependence in prediction. J Nerv Ment Dis 2001;189:335–8.
[34] Younger J, Marsh KJ, Grap MJ. The relationship of health locus of control and cardiac rehabilitation to mastery of illness-related stress. J Adv Nurs 1995;22:294–9.
[35] Affleck G, Tennen H, Rowe J, Roscher B, Walker L. Effects of formal support on mothers' adaptation to the hospital-to-home transition of high-risk infants: The benefits and costs of helping. Child Dev 1989;60:408–501.
[36] Roter D. The medical visit context of treatment decision-making and therapeutic relationship. Health Expect 2000;3:17–25.
[37] Evans CA, Cunningham BA. Caring for the ethnic elder: even when language is not a barrier, patients may be reluctant to discuss their beliefs and practices for fear of criticism or ridicule. Geriatr Nurs 1996;17:105–10.
[38] Murray SA, Manktelow K, Clifford C. The interplay between social and cultural context and perceptions of cardiovascular disease. J Adv Nurs 2000;32:1224–36.