

EFFECT OF A HEALTH EDUCATION PROGRAM ON QUALITY OF LIFE IN PATIENTS UNDERGOING CORONARY ARTERY BYPASS SURGERY

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Abstract- Quality of life has emerged as an important concept and outcome in health and health care. This study was performed to evaluate the ability of the health education program to improve quality of life of patients with coronary artery bypass graft surgery (CABG). In pre operation period, 70 patients were randomized in two groups, experimental and control group (35 patients in each). The demographic information, SF-36 and Nottingham Health Profile questionnaire were administered before surgery to all patients. Patients in the experimental group received the educational intervention according to Mico's education planning model. These patients were followed up to 1-month. At result, SF-36, Nottingham Health Profile questionnaires were administered 1-month after education by patients again. Significant improvements in quality of life between two groups, as measured by the Nottingham Health Profile, were seen in energy ($P < 0.001$), pain ($P < 0.006$), emotional reaction ($P < 0.00001$), sleep ($P < 0.01$), physical mobility ($P < 0.00001$) and total average quality of life ($P < 0.00001$). Significant improvements in quality of life between two groups, as measured by the SF-36, were seen in physical function ($P < 0.00001$), role limitations resulting from emotional status ($P < 0.007$), role limitations resulting from physical status ($P < 0.05$), mental health ($P < 0.03$), vitality ($P < 0.02$) and total average quality of life ($P < 0.02$). The findings demonstrate that health education result is improved quality of life for patients with CABG.

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Key words: Mico's model, Nottingham health profile, health education, coronary artery bypass graft surgery, quality of life

INTRODUCTION

Cardiovascular disease (CVD) is the leading cause of death in the majority of countries (1). According to World Health Organization, 30% of all deaths (15.3 million deaths) as well as 10.3% of the total disability adjusted life year (DALY) lost in 1998 were attributable to CAD (2). WHO estimated that

CVDs accounted for 28.5% of all deaths in the developing countries (2).

Each year, approximately 150000 Iranian dies of cardiovascular disease (3). CVD accounts for 40% of Iranian deaths in 1999 (4). Future increases in CVDs are expected in the near future in the developing countries. According to the Global Burden of Disease Study, a 55% rise would occur in CVD attributable loss, between 1990 and 2020, in the developing countries (5).

Quality of life has emerged as an important concept and outcome in health and health care (6). In public health and in medicine, the concept of health-

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related quality of life refers to a person or groups perceived physical and mental health over time. Physicians have often used health-related quality of life to measure the effect of chronic illness in their patients in order to better understand how an illness interferes with a person's day-to-day life. Similarly, public health professionals use health-related quality of life to measure the effects of numerous disorders, short and long-term disabilities, and disease in different populations. Tracking health-related quality of life in different populations can identify subgroups with poor physical or mental health and can help guide policies or interventions to improve their health (7).

Coronary artery bypass graft surgery (CABG) is performed to restore blood flow to the heart. This relieves chest pain and ischemia, improves the patient's quality of life, and in some cases, prolongs the patient's life. The goals of the procedure are to enable the patient to resume a normal lifestyle and to lower the risk of a heart attack (8). The number of CABG procedures performed each year in the United States has risen from approximately 150000 in 1979 to 598000 in 1990, a 425% increase (9). In Iran, 60% of total open-heart surgery was CABG (10). Increasing attention has been given to monitoring health-related quality of life variables in relation to the outcome of surgery (11).

Considering increase in atherosclerosis and CABG surgery and with regard to importance of quality of life in these patients, this study was conducted to evaluate effect of a health education program on quality of life in bypass surgery patients.

MATERIALS AND METHODS

This study is a clinical trial with experimental design. All participants attended the Shahid Ragaee Heart Hospital in Tehran (a major heart center in Iran) from April to August 2002. Selection criteria were being 40-65 years of age and having atherosclerosis diagnosis by angiography. Patients planned to undergo CABG surgery were considered eligible to enter the study.

After receiving Ethics Committee approval, 80 male patients were selected and allocated in experimental and control group. To limit any

possible bias we matched two groups. Nine patients were lost to follow-up and one patient died; the remaining 70 patients participated in the study.

These patients were interviewed 3-5 days before operation and at an average time of 4 weeks after operation. A face-to-face structure questionnaire was administered to all participants. The questionnaire consisted of up to 118 questions which could generally be administered in 20-25 minutes. It examined demographic information (18 questions), knowledge, attitude and practice (26 questions), SF-36 questionnaire (36 questions) and Nottingham Health Profile (38 questions).

At the stage one, 35 patients in experimental group received the questionnaires at 3-5 days before operation. Then, they received an educational planning according to Mico's Health Education Planning Model. Mico's model for health education planning (also applicable to health promotion) is designed in two dimensions. The model is divided into six phases, including: 1) initiation of the planning activity, 2) need assessment, 3) goal setting, 4) planning or programming the activity, 5) implementing the activity, and 6) evaluating the activity's effectiveness (12).

According to this model, success or failure of the activity often depends upon what happens in phase 1 (initiation). The key elements are understanding the client's problems and the client's system, devising an entry strategy, making an initial contract, and making the clients aware that a problem exists so they are ready to change. Obviously, the health educator's credibility is pivotal to initial success of the project. Phase 2 of the model is need assessment. Mico pointed out that the technology for needs assessment can be simple and inexpensive or highly refined and costly, depending on the purpose. In this study, for phase two of the model, we measured knowledge, attitude and function in patients. Knowledge questionnaire included 6 questions that measured knowledge of patients about nature of atherosclerosis and bypass surgery, risk factors, diet, exercise, procedures in prevention of pain, activity for pain control and control of disease. Attitude questionnaire included 13 questions that measured attitude of patients. Motivation refers to a process that is directed toward the future goal and an

integrative process of goal setting and self-evaluated reaction. Function or behavior questionnaire included 8 questions that measured function of patients in domains of healthy diet, use of fruit and vegetable, physical activity and walking, blood examination, giving up smoking and consuming alcohol, sleep, rest interval activities and healthy sexual function. All data analyzed by SPSS software and education needs was assessed in patients.

Phase 3 of the model is goal setting. Mico defined goal as a future event toward which a committee endeavor is directed. He defined objectives as steps to be taken in pursuit of a goal. Objectives often carry built-in indicators of success. In this study, for phase 3, goals were assessed in three domains of cognitive, affection and motion-mental. Examples for cognitive goals included: what is atherosclerosis? What are major signs of disease? and what are risk factors of atherosclerosis? Examples for affection goals included correctly perceiving control of atherosclerosis, believing positive affect of surgery, correctly perceiving control and prevention of disease. Examples for motion-mental goals included using healthy diet for control of disease, and performing blood tests regularly.

In phase 4 of the Mico model, planning/programming, an implementation plan is established, system and tools for managing the activity are designed, and commitment from those involved is negotiated. In this study, for phase 4, we planed 3 education meetings for experimental patients group. The average length of the educational intervention in each meeting was only 20-25 min. Educational method was face-to-face. The experimental group received a booklet focused in exercise, diet, healthy sexual function, deep breathing, anatomy and physiology of heart, procedure of bypass surgery, importance of lipid in atherosclerosis formation, healthy travel and use of drug regularly.

Phase 5 of the Mico model is implementation. In this study, for phase 5 of model, educational meetings were performed in 3 meetings (20-20 min in each meeting) for experimental group.

Phase 6, evaluation, is a four-step procedure that is crucial to success of the new program: 1) clarify the evaluation measures, 2) collect and analyze data,

3) report the evaluation so participants will have feedback on the extent of success of the activity, and 4) use what was learned in evaluation to redefine the problem, and refine measures and standards to determine its nature and extent. In this study, for phase 6, evaluation was performed 1 month post operation by measurement of knowledge, attitude, function and quality of life in patients with similar questionnaires used previously.

After educational intervention for experimental group and discharging patients, 35 patients were selected as control group and the questionnaires were administered before and 1 month after operation.

SF-36 questionnaire: the SF-36 is a validated (9), concise, 36 item health status questionnaire measuring 8 dimensions: physical function (10 items); role limitation caused by physical problems (4 items); bodily pain (2 items); mental health (5 items); role limitations caused by emotional problems (3 items); vitality-energy/fatigue (4 items); and general health perception (5 items).

Nottingham Health Profile questionnaire: the NHP is in two parts. In this study, put to used part I of NHP questionnaire for measurement quality of life. Part I contains 38 questions in the six dimensions of physical mobility, pain, energy, social isolation, and emotional reactions. A score from 0 to 100 is calculated for each dimension, with higher scores indicating higher levels of dysfunction or distress.

The association between quantity demographic information and quality of life were analyzed with Pearson correlation analysis and association between demographic information and quality of life were analyzed with Chi square test. Mean and interaction effect of education on knowledge, attitude, function and quality of life in each group (in pre and 1 month post education) were analyzed with paired *t* test. Comparison of knowledge, attitude, function and quality of life between two groups in the pre and 1 month post education stages were analyzed with independent sample *t* test. A *P* value less than 0.05 was considered to be statistically significant. Analyses of data were performed using SPSS (version 9.0).

RESULTS

Of the 80 patients, 9 were lost to follow-up; 1 patient had died. Completed questionnaire were returned by 70 patients in two experimental and control groups.

The mean age of patients in experimental and control group were 53.5 and 52.8 years, respectively. Majority of patients in two groups were retired and had primary education. There was no significant difference in mean of age, level of education and job status. In each group, 60% of patients had positive history of smoking. There was no significant difference between experimental and control groups in history of smokeing (62% vs. 58%), diabetic mellitus (17.1% vs. 20%), history of high blood pressure (31.4% vs. 37.1%), high blood lipid (68.6%

vs. 71.4%) and history of bypass surgery (2.9% vs. 5.7%).

Table 1 shows significant difference between two groups in knowledge and attitude after education. The standard deviation of quality of life in pre education stage was 82.79 and 70.45 in post education stage.

Two groups had no significant difference in total mean quality of life before education but there was a significant difference in total mean QOL 1 month post education (by Nottingham Health Profile and SF-36 questionnaires) (Table 1). Table 2 show results of correlation analysis between age, number of children, salary and quality of life in experimental and control group before and post education by SF-36 and NHP questionnaires.

Table 1. Mean comparison of KAP, QOL and SF-36 in experimental (n = 35) and control group (n = 35) at pre-educational and 1 month post-educational intervention

	Pre-education		P Value	Post-education		P Value
	experimental group	control group		experimental group	control group	
KAP						
Knowledge	18.40	17.68	NS	23.14	19.97	< 0.00001
Attitude	26.51	32.63	< 0.009	42.77	39.31	< 0.01
Function	14.11	13.91	NS	17.06	16.66	NS
Quality of life						
Energy	4.43	4.5	NS	11.05	7.2	<0.001
Pain	21.54	22.03	NS	33.63	29.1	<0.006
Emotional reaction	27.37	21.7	<0.02	38.57	29.4	<0.00001
Sleep	12.26	13.3	NS	19.02	14.9	<0.01
Physical mobility	25.57	21.2	<0.004	32.97	26.1	<0.00001
Social isolation	18.03	17.09	NS	20.9	18.8	NS
Total mean QOL	108.9	99.9	NS	154.83	125.5	<0.00001
SF-36 construct						
Physical function	19.6	14.4	<0.00001	25.3	21.8	<0.00001
Role limitation (physical)	5.5	4.8	<0.004	5.8	5.2	<0.05
Role limitation (emotional)	4.5	4	<0.02	4.7	4.3	<0.007
Vitality	11.8	12.1	NS	11.3	12.9	<0.02
Mental health	18	17.3	NS	20.4	18.9	<0.03
Social function	6.1	6.2	NS	6	6.1	NS
Pain	6.8	7.3	NS	7.03	6.6	NS
General health	17.4	20.3	<0.00001	17.6	18.2	NS
Total mean QOL	89.5	86.2	NS	98.4	94.4	<0.02

Abbreviation: QOL, quality of life; NS, not significant.

Table 2. Correlation of between age, number of children, salary and quality of life in experimental group

	QOL before education (NHP)	QOL 1-month post education (NHP)	QOL before education (SF-36)	QOL 1-month post education (SF-36)
Experimental Group				
Age of patients	r=0.04, P=0.8	r=0.26, P=0.1	r=0.18, P=0.2	r=0.07, P=0.6
Number of children	r=-0.22, P=0.1	r=0.8, P=0.6	r=-0.05, P=0.7	r=-0.29, P=0.009
Salary	r=0.07, P=0.6	r=0.04, P=0.7	r=0.12, P=0.4	r=0.008, P=0.9
Control Group				
Age	r=0.02 P=0.8	r=0.5 P=0.6	r=-0.05 P=0.7	r=0.1 P=0.5
Number of children	r=-0.08 P=0.6	r=0.25 P=0.1	r=0.02 P=0.8	r=0.07 P=0.6
Salary	r=0.4 P=0.005	r=0.2 P=0.1	r=0.13 P=0.4	r=0.05 P=0.7

Abbreviation: QOL, quality of life.

DISCUSSION

The results showed that knowledge and attitude had significant difference between two groups 1 month after educational intervention. Comparisons of two groups showed that function had no significant difference in two groups 1 month after education. Probably, cause of this result is high intensive perception of disease in patients. Patients in two groups would try to attach function (behavior) soon. The results of study show positive effect of health education on knowledge and attitude in bypass surgery patients. Attention to results shows significant difference in quality of life between experimental and control group 1 month post educational intervention.

Significant improvements in quality of life between two groups, as measured by the Nottingham Health Profile, were seen in energy, pain, emotional reaction, sleep, physical mobility and total average quality of life. Significant improvements in quality of life between two groups, as measured by the SF-36, were seen in physical function, role limitations resulting from emotional status, role limitations resulting from physical status, mental health, vitality and total average quality of life. The findings demonstrate that health education results in improved quality of life for patients with CABG.

Study of Shuldham *et al.* demonstrated the benefit that pre-operative education exerts on postoperative recovery of patients having cardiac surgery. The results of this study showed significant difference in length of hospital stay in experimental group compared to control group (13).

Christopherson and Pfeiffer selected 41 patients in experimental and control group. Experimental patients receive a booklet 1-2 days before bypass operation. The booklet contained information on tests and procedures, actions that would be expected of patients post-operatively, *e.g.* deep breathing and coughing, sensations that might be experienced such as pain, and facts about the heart, atherosclerosis and the operation. The findings suggested that, although there were differences in knowledge and anxiety within groups between the two measurement points, with significant increased in knowledge in those who read the booklet, there were no significant difference between two groups. Length of stay in ICU was reduced for people in the experimental arm (14).

Bagheri showed that group-counseling had positive effect on quality of life in patients with myocardial infarction (MI). In this study, 62 patients (35-65 years) with MI were divided to experimental and control groups and patients in experimental group counseled in the 6-8 meetings. Analysis the data 1 month post counseling showed that quality of life had significantly improved pre and post counseling in experimental group but no improvement was found in control group (15).

Ahmadzadeh demonstrated the positive effect of health education on reducing anxiety in bypass surgery patients. She selected 80 patients in experimental and control group. Experimental group received the education intervention (face to face and booklet) before operation. Data showed significant difference in anxiety between two groups after operation (16).

Quality life in coronary artery bypass surgery

Cupples in a study showed that pre-operation education had positive effect in knowledge of patients (17). Stromberg evaluated the effect of education of patients with heart failure. Results showed patient education is an important component in the care of patients with heart failure and can improve quality of life in these patients (18).

Devine and Cook's meta-analysis showed a positive effect in respect of pain and psychological well being and satisfaction (19). In 1992, Davine reported a sequel meta-analysis and demonstrated that with respect to recovery, pain and psychological distress in patients receiving psycho-educational interventions benefited more than those in the control group (20).

Patient education includes all educational activities directed at patients, including aspects of therapeutic education, health education and clinical health promotion (21) and can improve the knowledge and skills (18). Education of patients with a chronic disease and improving quality of life of these patients gets a growing attention (22). According to our study assessment of quality of life and health education can improve health and quality of life in patients with CABG.

Conflict of interests

We have no conflict of interests.

REFERENCES

1. Haidari M, Moghadam M, Chinicar M, Ahmadiéh A, Doosti M. Apolipoprotein B as the best predictor of coronary artery disease in Iranian normolipidemic patients. *Clin Biochem*. 2001 Mar; 34(2):149-155.
2. The World Health Report 1999. Geneva: World Health Organization, 1999.
3. Safari. The effect of nursing education with group discussion method on the quality nursing care. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science (M.S) in nursing. Iran, Tarbiat Modarres University, 2002.
4. Kiaveh-Faragi F. Satisfaction patients, length of stay in CCU in general hospital in Tehran. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science (M.S) in nursing. Iran, Tarbiat Modarres University, 2002.
5. Murray CJ, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global Burden of Disease Study. *Lancet*. 1997 May 24; 349(9064):1498-1504.
6. Harrison MB, Juniper EF, Mitchell-DiCenso A. Quality of life as an outcome measure in nursing research. "May you have a long and healthy life". *Can J Nurs Res*. 1996 Fall; 28(3):49-68.
7. Health-Related quality of life? www.cdc.gov/nccdphp/hrqol, 2002.
8. Coronary artery bypass graft surgery. www.ehendrick.org/healthy/0004399.htm.
9. Hunt JO, Hendrata MV, Myles PS. Quality of life 12 months after coronary artery bypass graft surgery. *Heart Lung*. 2000 Nov-Dec; 29(6):401-11.
10. Yosefnia MA, Sabzi F. Coronary artery surgery. 3rd edition. Tehran: University Press; 1999.
11. Kiebzak GM, Pierson LM, Campbell M, Cook JW. Use of the SF36 general health status survey to document health-related quality of life in patients with coronary artery disease: effect of disease and response to coronary artery bypass graft surgery. *Heart Lung*. 2002 May-Jun; 31(3):207-213.
12. Butler JT. Principles of health education and health promotion. 3th edition. New York: Delauare state University. 2000; P. 276-279.
13. Shuldham CM, Fleming S, Goodman H. The impact of pre-operative education on recovery following coronary artery bypass surgery. A randomized controlled clinical trial. *Eur Heart J*. 2002 Apr; 23(8):666-674.
14. Christopherson B, Pfeiffer C. Varying the timing of information to alter preoperative anxiety and postoperative recovery in cardiac surgery patients. *Heart Lung*. 1980 Sep-Oct; 9(5):854-861.
15. Baghery, H. Survey effect of Counseling on quality of life in MI patients in Tehran 2002. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science (M.S) in nursing. Iran, Tarbiat Modarres University, School of Medical Science, 2001.
16. Ahmadzadeh, M. The effect of health education on anxiety in CABG patients. A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science (M.S) in health education. Iran, Tarbiat Modarres University, School of Medical Science, 2000.

17. Cupples SA. Effects of timing and reinforcement of preoperative education on knowledge and recovery of patients having coronary artery bypass graft surgery. *Heart Lung*. 1991 Nov; 20(6):654-660.
18. Stromberg A. Educating nurses and patients to manage heart failure. *Eur J Cardiovasc Nurs*. 2002 Feb; 1(1):33-40.
19. Devine EC, Cook TD. A meta-analytic analysis of effects of psychoeducational interventions on length of postsurgical hospital stay. *Nurs Res*. 1983 Sep-Oct; 32(5):267-274.
20. Devine EC. Effects of psychoeducational care for adult surgical patients: a meta-analysis of 191 studies. *Patient Educ Couns*. 1992 Apr; 19(2):129-142.
21. Visser A, Deccache A, Bensing J. Patient education in Europe: united differences. *Patient Educ Couns*. 2001 Jul; 44(1):1-5.
22. Visser A. Chronic diseases, aging and dementia: implications for patient education and counseling. *Patient Educ Couns*. 2000 Feb; 39(2): 293-302.