Developing a preoperative educational program for patients undergoing percutaneous coronary intervention: a sharing of experience

Sek Ying Chair RN, MBA, PhD; Ho Ian Sun MN; Jennifer Yee Man TangPhD
The Nethersole School of Nursing, The Chinese University of Hong Kong, Shatin, New Territories, Hong Kong SAR, P.R. China

Key Words: anxiety ❖ coronary heart disease ❖ education ❖ percutaneous coronary intervention ❖ pre-operative care ❖ satisfaction ❖

Email: sychair@cuhk.edu.hk

SUMMARY

- The use of percutaneous coronary intervention (PCI) as a non-surgical treatment for coronary heart disease continues to rise.
- Patients undergoing the PCI experience heightened level of anxiety, typically at the highest immediately before the procedure. Undesirable level of anxiety increases myocardial oxygen demand and heart workload.
- Pre-operative education appears to be one of the promising interventions that reduce patient anxiety level.
- Dissemination of educational messages through video is shown to be more favorable than written materials alone.
- A 30-minute pre-operative educational program that includes a 12-minute video, a 15-minute book review, and a question-and-answer session has been developed. The program has specific aims to reduce pre-operative anxiety and enhance satisfaction with care.
- The implementation of the educational program can be conducted in group and requires simple equipment. In view of the increasing demands for quality nursing care, the educational program would enhance the positive experience of patients undergoing PCI.

INTRODUCTION

Percutaneous coronary intervention (PCI), along with coronary artery bypass graft (CABG), is the major revascularization intervention that aims to increase survival and to relieve symptoms in people with coronary artery diseases. The PCI procedure consists of coronary angiography and percutaneous balloon angioplasty of infracted artery with stent placement or other interventions to maintain vessel patency (Perrin & MacLeod, 2013). Upon a diagnosis being made by revealing the radiographic structure of coronary arteries during the process of coronary angiography, interventions such as angioplasty, stent placement, atheretomy, or thrombus aspiration can be immediately performed. The PCI procedure can be performed using either the transfemoral or transradial approach, in which the patient is conscious and provided with local anesthetic agents (Toca et al. 2010). Although CABG is the traditional treatment for coronary heart disease, accumulating evidence supports that PCI is an alternative treatment options in selected patients. For instance, PCI is considered as effective as CABG to improve survival in survivors of sudden cardiac death with presumed ischemia-mediated ventricular tachycardia caused by significant stenosis in a major coronary artery (Levine et al. 2011).

The proportion of patients treated with primary PCI continues to rise. A local study reported that the proportion of patients with acute ST elevation myocardial infarction receiving primary PCI experienced a 3-fold increase, from 25% in 2002 to 95% in 2006 (Cheung et al., 2010). The Hospital Authority in Hong Kong is progressively enhancing the primary and emergency PCI service through extending the service hours and increasing the number of beds (Hospital Authority, 2011). Past studies have shown that patients experience heightened level of anxiety before the PCI procedure. Anxiety may stem from the uncertainty about the outcome of angiography and the PCI procedure, or the pain and discomfort experienced during the procedures (Gallagher et al. 2010). Astin et al. (2005) examined the anxiety level in patients who underwent percutaneous transluminal coronary angioplasty before and after a PCI procedure. The anxiety level reached the highest before the admission and significantly decreased at 6-8 weeks after the procedure. Undesirable levels of anxiety may cause physiological consequences. Anxiety may stimulate the sympathetic system, resulting in increased myocardial oxygen demand and heart workload (Kreibig, 2010).

Various interventions have been proposed to reduce patient anxiety. Apart from provision of perioperative information, music therapy, relaxation techniques, therapeutic relationship building, and essential oils have been recommended. A systematic review (Bailey, 2010) concluded that the provision of pre-operative education for patients who are schedule to undergo the PCI procedure is one the most effective means to reduce patient anxiety.

The effectiveness of pre-operative education has been investigated in a number of studies. The mode of delivering information is a key factor in determining the effectiveness of pre-operative education. Various means such as written materials, lectures, computer-based learning, video, and informal discussion have been explored (Timmins & Kaliszer, 2003). For older patients with low literacy skills, either written materials or computer-based resources alone prevent them from gaining adequate understanding of the information (Timmins & Kaliszer, 2003). Patients in another study agreed that a pre-operative video improved their knowledge of PCI and made them more familiar with the environment of the catheterization laboratory and technical aspects of the procedures (Steffenino et al. 2007). Ruffiengo et al. (2009) conducted a cluster randomized controlled trial in which the experimental group watched an information video consisting of scripts in dialogue and description of pictures. The video provided detailed information about indications, risks, and benefits of coronary angeography as well as recommended

relaxation strategies to be performed during different stages of the procedure. Compared with the standard care group, the video care group exhibited lower level of anxiety symptoms and greater satisfaction with the received information.

Despite the benefit, the current nursing routine does not support nurses to provide structured pre-operative education to patients. A small local study found that only half of the subjects undergoing coronary angiography felt adequately informed of the procedure (Chair & Thompson, 2005). Patients in the study identified that they would like to know all routines associated with care before and after the cardiac catheterization. Several other studies suggested that the information needs included symptom management, risk f actor modifications, cardiac anatomy and physiology, medication awareness, appropriate level of physical activity, and diet instructions (Astin et al., 2005; Gentz, 2000; McLean & Timmins, 2007; Scott & Thompson, 2003; Timmins & Kaliszer, 2003).

DEVELOPMENT OF PRE-OPERATIVE MATERIALS

Setting

In the current setting, cardiologists will provide an initial explanation of the PCI procedure to patients who agree to undergo the procedure at the outpatient department. The educational program will be organized in a ward when patients are admitted for the PCI procedure. Pre-operative preparations and examinations will be performed after the educational program. A notebook computer and a video project will be required to play the video on a projection screen. A screen of at least 181 x 138 cm2 will be large enough to show the video clearly.

The program can be organized in a group of 4-5 patients, who are undergoing scheduled PCI in the same week. A group session would save nursing time and allow patients to show support to each other. A registered nurse with 5-year experience in cardiac nursing will conduct the education session. To ensure the standards and consistency of information delivery, nurses will be provided with a two-hour training course to improve their knowledge of and skills in health education.

THE INTERVENTION

Patients under the usual pre-operative care are provided a brief orientation of the hospital environment and verbal education without aided materials. This newly developed pre-operative education is developed for individuals undergoing first scheduled angiography or PCI in order to improve their knowledge and the experience of care, and to provide enhanced quality of care. The 30-minute pre-operative education program consists of 5-minute introduction, 12-minute video watching, and 15-minute booklet review with a question-and-answer session. Bastable (2008) argued that a successful educational program should keep the session brief and limit to less than 30 minutes. Following the introduction, patients will be instructed to watch a 12-minute video. The video is short enough to keep patients attentive and motivated. A nurse will then go through the key points in the booklet. The last session allows patients and their caregivers to raise questions and to express their needs during and after the session.

Validity of the educational materials

The educational materials were developed by a cardiac nurse in consultation with the cardiac team. A review panel has been formed to evaluate the content validity of educational materials. The panel consists of 2 cardiologists who are experienced in performing PCI procedure, 2 cardiac catheterization laboratory nurses, 2 cardiac nurse specialists, and 1 dietitian. Each panel member will individually rate the content validity of 6 sections on a 5-point scale (range 1 – 5). The 6 sections are: (i) introduction of coronary heart disease, (ii) coronary angiography and treatment, (iii) introduction of the catheterization laboratory, (iv) the PCI procedure, (v) advice during the PCI procedure, and (vi) advice on daily care after PCI. A higher score indicates that the content fits the defined topic area well. Any content being rated <4 would be revisited until all sections were rated at 5. An open-ended question will be added to collect individual comments about the booklet and video.

Educational video

The 12-minute video with subtitles and voice-over will be played during the educational program. The video aims to make patients familiar with the hospital environment, especially the catheterization laboratory. The content of the video covers 6 aspects (Table 1): (a) introduction of coronary heart disease and its signs and symptoms, (b) interventions (coronary angiography and PCI) and their risks and benefits, (c) introduction of the catheterization laboratory, (d) pre-operative preparation and the PCI procedure, (e) advice during the PCI procedure, and (f) immediate post-operative care and post discharge management. The video makes use of both pictures and animation to convey messages. The animation shows the medical procedure of coronary angiography and coronary stent placement. Approval of using the animation and pictures for educational purpose has been sought from the copyright owner, the Nucleus Medical Media, Inc. A real recording of a patient undergoing the PCI procedure is added and consent was obtained from that patient, whose face could not be seen clearly in the video in order to ensure patient confidentiality.

Educational booklet

The educational booklet was developed based on literature and local nursing practice. Patients are provided with the booklet as supplementary materials. As patients may not be able to absorb all the information during group session, the booklet will be useful to consolidate the information intake. Relatives and caregivers who are not able to join the educational program can also become familiar with the PCI procedure by reviewing the booklet. The 30-page booklet contains 6 sections: (a) introduction of coronary heart disease and its signs and symptoms, (b) interventions (coronary angiography and PCI) and their risks and benefits, (c) introduction of the catheterization laboratory, (d) pre-operative preparation and the PCI procedure, (e) advice during the PCI procedure, and (f) immediate post-operative care and post discharge management. The booklet is written in plain and non-judgmental language. As suggested by Bastable (2008), strategies are used to help older patients with low literacy to understand the materials. Drawings were used to illustrate the complicated medical procedure. Flow charts were used to explain the steps from admission to discharge. The booklet will help patients to mentally prepare for what is going to happen. A plentiful of illustrations and flow charts were used to make the content more understandable and attractive. Photos are taken from the actual environment so patients would quickly familiarize themselves with the setting. The texts are arranged in point form and printed in larger font size in order to enhance the readability. Key information was highlighted using color code and arrows.

DISCUSSION

Cardiac catherization lab nurses are key personnel involved in the pre-operative, intra-operative, and post-operative stages. Their regular duties include instrumental and room preparation of the procedure, monitoring of patients' vital signs and ECG, injecting medication, performing basic assessment and orientation to admitted patients, disinfecting the puncture site, and providing support to the cardiologist during the procedure, among other responsibilities

(Watson & Gorski, 2011). The addition of the educational program may be a challenge to busy nurses, especially in Hong Kong where nursing manpower shortage is a widely-recognized problem. However, the literature supports that the implementation of pre-operative education can reduce patient anxiety and enhance satisfaction. The allocation of resources for pre-operation education will be key to meeting the increasing demands for quality nursing care. It may be challenging to motivate nurses to participate because they may consider it as additional workload, however, a training session will be provided for nurses prior to the implementation of pre-operative education in order to promote the program and to enhance their effective communication skills with patients.

The administration of pre-operative education requires basic equipment: a room, a computer, and a projector. Delivery of the pre-operative education after hospital admission likely enhances the participation rate because patients do not have to take another trip to the hospital before the procedure. However, scheduling can be time-consuming as the timing and number of patient admissions may not always favor the delivery of a group program, especially in smaller hospitals. Educators may also need to compete with others for the use of rooms. This can be managed if cardiac nurses communicate with cardiologists in the outpatient department in advance with regard to the scheduling of patient admission.

The effectiveness of pre-operative education using video has received local support. Chair et al. (2012) conducted a quasi-experimental study evaluating the psychological effects of a videotape educational intervention on first-time cardiac catheterization patients in Hong Kong. Both the experimental group and the control group received usual care which included a pamphlet and brief information of cardiac catheterization. The control group was assessed one day before the procedure. Patients in the experimental group received an additional 20-minute educational session and were assessed one week before the procedure. The educational session included a 12-minute video and an individual question-and-answer session. Results of the study indicated that patients in the experimental group experienced lower level of anxiety, greater satisfaction with overall care, and greater knowledge gain. Video watching is considered a desirable medium to convey educational messages. However, the study was limited by the different assessment timepoints between the two groups. The reduced level of anxiety in experimental group may be explained by the earlier assessment time-point (i.e. one week prior to the procedure).

The current program has a major focus on reducing pre-operative anxiety and enhancing satisfaction with pre-operative care. Post-discharge care is also briefly introduced. Post-discharge care is suggested to prevent myocardial reinfarction and maintain better quality of life. If resources are allowed, further development of the educational program may comprehensively cover post-discharge care.

CONCLUSION

PCI has become a common treatment for patients with coronary heart disease. Studies show that patients undergoing PCI procedure may experience heightened level of anxiety, especially immediately before the procedure. International and local studies have indicated that pre-operative education with an informative video reduces anxiety and enhance satisfaction with care. The psychological impact of PCI has to be adequately addressed in the face of increasing demands for quality care. The present education program was developed based on local and international studies of informational needs of cardiac patients and local nursing practice. Further qualitative and quantitative investigations can be made to gather patients' feedback and objectively assess the program's effectiveness.

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