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# Gender differences in coping and anxiety in patients after coronary artery bypass graft surgery in Taiwan

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**BACKGROUND:** Greater use of coping strategies and lower anxiety levels may be related to positive outcomes after coronary artery bypass graft surgery; however, the relationship between them, including by gender, has not been examined in Taiwan.

**METHODS:** Cross-sectional survey research design and purposive sampling were used in this study, for which 50 men and 50 women were recruited from a medical center in northern Taiwan.

**RESULTS:** After coronary artery bypass graft surgery, both male and female patients used more problem-focused coping strategies than emotion-focused coping strategies. In comparison with men, women tended to use more blaming of self and had slightly higher scores on both state and trait anxiety.

**CONCLUSION:** Clinicians need to be aware that the use of appropriate coping strategies can reduce patient anxiety, a finding that needs to be considered when designing effective interventions for these patients. (Heart Lung® 2009;38:469–479.)

During the past 2 decades, coronary heart disease (CHD) has become the second leading cause of death in Taiwan. Related to this, the number of coronary artery bypass grafting (CABG) procedures performed each year in Taiwan has increased 3-fold, from approximately 100 in 1988 to 356 in 1999.<sup>1,2</sup> Historically, CHD has been associated with men, but there has been an increasing number of women with CHD, and the mortality rate for women with the disease is greater than that for men.<sup>3</sup> One reason for the higher mortality rate of women is suggested by Higginson,<sup>4</sup> who reported that women tend to delay the seeking of help for reasons, such as not recognizing symptoms or preferring to self-medicate. In Taiwan, 4323 women died of CHD in 2003, and the mortality rate for women is 2 to 3 times greater than for any kind of cancer.<sup>5</sup> Thus, it is important to recruit women for

cardiac-related research, particularly for the purpose of determining whether there are gender differences.

Because recovery from CABG is a stressful experience, coping strategies are required to achieve adaptation.<sup>6,7</sup> According to Lazarus and Folkman's<sup>8</sup> adaptation theory, there are 2 forms of coping: problem focused and emotion focused. Problem-focused coping involves finding a solution to a problem.<sup>8</sup> When individuals believe that nothing can be done to solve a problem, however, they use emotion-focused coping, such as avoidance or wishful thinking to alleviate stress.<sup>8,9</sup> Recent research has demonstrated that Lazarus and Folkman's adaptation theory is compatible with Chinese culture. The Chinese Yin-Yang perspective, which includes the notion of allowing fate to take its course, can be understood as similar to emotion-focused coping because, in the Yin-Yang perspective, a threat is reduced by having faith and achieving a sense of peace. Although Chinese cultural beliefs remain important to the Chinese people, they are not the only concepts that guide an individual's thoughts and behavior. Because of the industrialization and Westernization seen in recent decades, the Chinese have learned to take an active role in expressing their

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individual needs, which can be understood as a form of problem-focused coping. Moreover, research has shown that problem-focused and emotion-focused coping strategies, as categorized by Lazarus and Folkman, were used by Taiwanese patients with cardiac disease.<sup>10-13</sup>

In regard to gender differences in coping after CABG surgery, research has revealed that men, compared with women, used more problem-focused coping and less emotion-focused coping to manage the stress of a cardiac event.<sup>10-13</sup> Kristofferzon et al<sup>14</sup> reported no statistically significant changes in coping over time in either men or women at 1, 4, and 12 months after myocardial infarction, except for fatalistic coping, which diminished over time in men. They also found that women used more evasive coping than did men at 4 and 12 months after the cardiac event. In addition, confrontational coping was shown to have positive outcomes over the long term. The current investigation not only determined whether there are gender differences in coping but also examined the relationship between coping and anxiety across demographics and role function.

The mechanism of choosing problem-focused or emotion-focused coping may depend on stress appraisal, for which anxiety is an emotional response.<sup>8</sup> Anxiety has been identified as a common concern in patients both before and after cardiac surgery.<sup>9</sup> Ben-Zur et al<sup>15</sup> investigated 171 patients, from 2 to 20 months after CABG, and found that their anxiety level was higher than that measured in a community sample. In addition, post-CABG high anxiety levels were associated with the use of emotion-focused coping strategies.<sup>16</sup> Finally, Grady et al<sup>17</sup> found that psychosocial problems, such as anxiety and inadequate coping, predict the length of hospital stay after heart transplantation.

Gender role function is another important mediator of adaptation outcomes after a cardiac event.<sup>18,19</sup> Social role, particularly in regard to women, has been reported to mediate the effects of physical health on psychologic well-being. Regardless of the extent of their physical health problems, women with greater social responsibilities had a higher level of psychosocial health.<sup>19</sup> Specifically, household activities were important for women after myocardial infarction and helped them to cope during their recovery.<sup>20</sup> Research also has shown, however, that female patients had less participation in a post-cardiac surgery rehabilitation program, compared with men, because of their return to household responsibilities sooner than was recommended by health care providers.<sup>21-23</sup>

Lee<sup>13</sup> reported that greater use of coping strategies, and the associated perception of less stress, has been associated with positive outcomes in cardiac patients. Little research, however, has focused on the coping methods and anxiety level of men and women post-CABG in Taiwan. In addition, no research has examined the relationship between coping and anxiety across demographics and role function. To help close this gap, the purposes of this study were to (1) investigate gender differences in coping strategies and anxiety in patients after CABG in Taiwan and (2) explore the effect of demographics and role function on coping strategies and anxiety.

## MATERIALS AND METHODS

The study used a cross-sectional survey research design with purposive sampling to recruit a total of 100 patients post-CABG (50 male and 50 female) from a medical center in Taipei, Taiwan. The inclusion criteria were as follows: (1) CABG surgery in the past 5 years, (2) ability to read Chinese, and (3) willingness to participate in the research. Patients with psychiatric diagnoses were excluded.

Approval from the institutional review board at the hospital was obtained. Permission to use the instruments was obtained from the respective copyright holders. Potential participants were invited in person at the doctor's office, and the researchers discussed the risks versus benefits of the study with each patient. Patients who agreed to participate in the study were given a research packet that included a consent form and 3 questionnaires (coping, anxiety, and demographics) and were asked to complete the questionnaires within 1 week. In addition, a stamped, preaddressed envelope for their convenience in returning the questionnaires was included in the research package. Confidentiality, anonymity, and the right of participants to withdraw from the study were presented. The surgeon who performed the operation on the participants is a member of the research team. Taiwanese patients usually have great respect for their physicians, and he explained to the patients that the study would help health care providers understand patients' anxiety and coping after CABG. Thus, the return rate was 100%.

## Instruments

**Demographic questionnaire.** Information regarding age, gender, educational status, post-operation time, income, gender role function, and other variables was collected by the demographic questionnaire. On the basis of the literature and the perspective of Chinese culture, the major gender-role

functions for men and women can be categorized as childcare, care for the elderly, housework, money management, and income earning.<sup>24,25</sup>

**Revised Ways of Coping Checklist (RWCC).** Coping was measured by the RWCC, which was initially developed by Lazarus and Folkman<sup>8</sup> and later revised by Vitaliano et al.<sup>26</sup> The instrument is a 42-item measure, using a 4-point Likert scale format, with responses ranging from 0 ("not appropriate") to 4 ("regularly used"). The scale contains 5 subscales, with each one categorized as either problem-focused or emotion-focused coping, as described below.

Problem-focused coping consists of 2 strategies: problem-focused thinking (15 items) and seeking social support (6 items). Emotion-focus coping consists of 3 strategies: wishful thinking (9 items), blaming self (3 items), and avoidance (10 items). Relative scores were obtained for each of the 5 subscales and are expressed as a percentage. A high relative score refers to using a certain coping behavior more often than other coping mechanisms.<sup>7</sup>

The RWCC has been widely used to assess coping in patients with chest pain, chronic illness, functional disability, and heart surgery.<sup>7,13,26</sup> Cronbach alphas range from .64 to .88 for the total score, with the reliability of subscales ranging from .69 to .91.<sup>7,13</sup> The Chinese version of the RWCC has good psychometric properties and has been used in cardiac populations in Taiwan.<sup>16,27</sup> Hsu<sup>27</sup> reported a content validity index of .90 and an internal reliability of .80 (problem-focused coping = .79, emotion-focused coping = .67).

**State Trait Anxiety Inventory (STAI).** Participants' level of anxiety was measured using the STAI. The STAI uses a 4-point Likert format and contains 40 items, including 20 state anxiety items and 20 trait anxiety items.<sup>28</sup> State anxiety measures temporal feelings of fear or worry, whereas trait anxiety measures the tendency of an individual to be anxious. The total score range is 20 to 80, with higher scores indicating greater anxiety. Alpha coefficient values for internal consistency range from .83 to .92 for state anxiety and .86 to .92 for trait anxiety. The STAI has been successfully used with the elderly and in medical surgical populations.

The Chinese version of the State Trait Anxiety Inventory (C-STAI) has good reliability and validity. Taylor-Piliae and Molassotis<sup>29</sup> used the C-STAI to measure anxiety in Chinese men with CHD and found high reliability (state anxiety  $\alpha = .93$ , trait-anxiety  $\alpha = .88$ ). Sheu<sup>16</sup> found that the A-State and A-Trait scores were significantly correlated ( $r = .71$ ), whereas the Anxiety-Trait and Anxiety-State scores

were differentially sensitive to chronic mental health attributes and acute symptoms. Sheu noted that both scales of the C-STAI correlated significantly with other measures of psychological well-being, including the Chinese Beck Depression Inventory and the Chinese Somatic Scale. These findings provided evidence of concurrent validity.<sup>16</sup>

## Data analysis

SPSS Version 11 software (SPSS Inc, Chicago, IL) was used to analyze the data. Descriptive statistics were used for the demographic data. Chi-square, a nonparametric statistic, was used to determine whether there was a significant difference between men and women for the noncontinuous demographic variables. In addition, an independent *t* test was used to determine whether there was a significant difference in post-operation time and scores on the role responsibility index. Multivariate analysis of variance, specifically a post hoc Scheffe test, was chosen to assess the effects of demographic variables and to compare the mean scores of coping and anxiety across demographics. Pearson correlations were used to analyze the relationship between variables.

## RESULTS

### Demographic findings

More than two thirds of both men and women (64% and 74%, respectively) were aged more than 60 years, and a majority (90% of men and 76% of women) were married. Two percent of male participants and 18% of female participants were widows. In regard to educational level, 62% of men had at least a high school education, whereas 58% of women had completed only an elementary school education. Buddhism was the predominant religion, with 58% of men and 68% of women identifying themselves as Buddhists. A majority of participants (52% of men and 88% of women) did not currently hold jobs. Thus, the majority did not answer the income and salary questions. Their missing data were not included. Finally, the average post-CABG period was 27.1 months for men and 16.4 months for women ( $P < .05$ ).

The internal consistency for the role responsibility instrument was  $r > .80$ . The range of scores for role function was 5 to 20, with a mean of 11.0 for men and 15.4 for women. A majority of participants had little or no responsibility for taking care of children (men = 80%, women = 84%;  $P < .05$ ), taking care of elderly (men = 88%, women = 92%;  $P > .05$ ), doing housework (men = 72%, women =

**Table I**

Demographic differences in ways of coping and anxiety (N = 100)

Variable	Problem-focused coping		Emotion-focused coping	
	M (SD)	t/F	M (SD)	t/F
Sex		$t = .14$		$t = .09$
Male	29.0 (8.5)		24.4 (8.6)	
Female	19.2 (10.5)		24.1 (8.4)	
Employed		$t = 2.34^a$		$t = 1.38$
Yes	33.6 (8.7)		26.4 (8.1)	
No	28.2 (9.5)		23.7 (7.5)	
Age		1.7		.38
30–40 y	35		25.0	
41–50 y	29.5 (8.1)		26.3 (9.4)	
51–60 y	33.5 (10.8)		25.4 (7.4)	
>60 y	27.7 (9.0)		24.6 (7.5)	
Postoperative		.13		.06
0–6 mo	29.8 (12.0)		24.0 (8.3)	
7–12 mo	28.4 (10.0)		23.8 (10.0)	
13–36 mo	30.1 (9.1)		24.3 (6.2)	
36–60 mo	27.2 (5.8)		24.9 (7.0)	
Education		.40		.7
Less than elementary school	28 (7.2)		24.3 (6.9)	
Elementary	28.8 (8.2)		25.0 (8.0)	
Junior high	29.9 (10.0)		20.8 (9.2)	
Senior high	27.5 (12.2)		25.0 (7.9)	
College/university	30.7 (6.7)		24.1 (6.3)	
Marital status		.23		.47
Not married	31.5 (8.9)		28.3 (14.1)	
Married	29.2 (9.2)		24.1 (7.4)	
Widowed	27.1 (13.3)		23 (7.4)	
Divorced/separated	28.7 (4.7)		24.7 (4.2)	
Role responsibility		.99		3.14 <sup>a</sup>
Scores 5–10	28.4 (10.1)		23.2 (7.2)	
Scores 11–15	31.8 (7.6)		27.7 (8.2)	
Scores 16–20	30.7 (5.5)		27.3 (8.3)	

<sup>a</sup> $P < .05$ .

78%;  $P > .05$ ), managing money (men = 66%, women = 72%;  $P > .05$ ), or earning money (men = 62%, women = 90%;  $P < .05$ ).

### Demographic differences in coping and anxiety

Independent  $t$  tests were used to examine the differences in coping and anxiety between gender and employment status. Multivariate analysis of variance was used to compare the means of coping and anxiety by age group, post-operation time, education level, marital status, and role responsibility.

To conduct a multivariate analysis of variance of the means across coping and anxiety by age group, post-operation time, education level, marital status, and role responsibility, data were clustered into groups for role responsibility and post-operation time. The role responsibility score was divided into 3 groups, with group 1 comprising scores ranging from 5 to 10, group 2 comprising scores ranging from 11 to 15, and group 3 comprising scores ranging from 16 to 20. The post-operation time was divided into 4 groups, with post-operation time ranging from 1 to 6 months for group 1, 7 to 12

**Table I**  
Continued

State-anxiety		Trait-anxiety	
M (SD)	t/F	M (SD)	t/F
44.3 (8.8)	$t = -.69$	41.2 (12.4)	$t = -.88$
45.6 (8.4)		43.6 (4.4)	
44.1 (9.1)	$t = -3.72$	38.1 (12.6)	$t = -1.42$
45.0 (9.3)		43.2 (14.0)	
55.0	.35	49	.26
45.8 (10.7)		40.3 (17.4)	
45.3 (9.2)		44.4 (15.0)	
44.6 (9.4)		42.0 (13.1)	
44.2 (10.1)	.17	44.4 (13.7)	.17
45.9 (9.5)		43.1 (15.0)	
45.2 (9.7)		41.4 (14.4)	
44.1 (7.8)		40.4 (11.4)	
45.7 (4.9)	1.0	38.2 (10.4)	.96
44.8 (9.5)		40.8 (12.8)	
40.1 (6.9)		44.4 (12.2)	
47.0 (13.1)		46.9 (19.1)	
45.3 (7.7)		41.8 (11.6)	
38.8 (3.95)	.96	36.0 (5.6)	.31
45.6 (9.6)		42.7 (14.5)	
43.2 (8.8)		43.0 (11.0)	
41.7 (2.9)		41.0 (6.1)	
44.9 (8.9)	.04	43.1 (13.1)	.5
45.2 (10.5)		40.8 (16.1)	
43.7 (3.2)		37.0 (7.8)	

months for group 2, 13 to 36 months for group 3, and 36 to 60 months for group 4.

As presented in Table I, participants who were employed used problem-focused coping behavior more frequently, compared with participants who were not employed. The moderate (role score 11–15) role and the more role (role score 16–20) function group used more emotion-focused coping strategies than did the less (role score 5–10) role function. Overall, the results showed that there were no differences in coping and anxiety across gender, age, post-operation time, educational level, or marital status.

### Role function differences in coping and anxiety

To better examine the effects of demographics and role function on coping behaviors and anxiety level, separate coping and anxiety indexes were formed. Problem-focused and emotion-focused coping behaviors were combined into the coping index, and state and trait anxiety were combined into the anxiety index. Higher scores on the coping index indicated more frequent use of coping strategies, whereas higher scores on the anxiety index indicated higher levels of anxiety. A multivariate

**Table II**  
Role function difference in coping and anxiety (N = 100)

Variable	n	Coping index			Anxiety index				
		M	SD	F	Post hoc	M	SD	F	Post hoc
Taking care of children				.41				.34	
None	62	52.6	15.5			43.3	10.5		
Little	20	53.5	10.9			46.2	11.6		
Some	11	57.4	11.2			42.2	11.6		
A lot	5	47.0	8.3			41.5	10.0		
Taking care of elderly				.53				.70	
None	80	52.6	14.3			43.7	11.03		
Little	10	57.3	11.8			40.6	8.6		
Some	8	56.9	11.3			45.5	13.1		
A lot	1	43.0				39.0			
Housework				6.53 <sup>a</sup>				1041	
①None	45	49.90	12.1		④<①	43.9	11.5		
②Little	30	53.2	13.7		④<②	46.1	10.0		
③Some	19	55.1	12.7		④<③	42.3	12.8		
④A lot	5	73.5	14.2			36.2	6.2		
Managing Money				3.12 <sup>a</sup>				1.9	
①None	54	50.2	13.3		④<①	42.5	10.5		
②Little	15	53.7	8.7			48.9	11.6		
③Some	15	56.1	16.7			40.4	9.1		
④A lot	15	61.6	14.3			44.9	12.3		
Earning money					.45			.81	
None	68	52.7	14.0			43.0	10.9		
Little	8	50.8	18.4			44.9	12.2		
Some	12	57.9	13.8			42.1	7.2		
A lot	11	54.3	9.7			47.1	13.8		

Note. Numbers may not total 100 because of missing data.

<sup>a</sup>P < .05.

analysis of variance was used to compare the means of the coping index and anxiety index for different levels of each role function. Post-CABG, patients who took greater responsibility for housework and managing money obtained higher scores on the coping index. Post hoc analyses indicated that participants who did a significant amount of housework and had a greater role function in regard to managing money used coping strategies more frequently. The results indicated that, overall, there was no difference in anxiety level for the different levels of role responsibility for each role function (Table II).

### Comparing coping and anxiety of men and women

Independent *t* tests were used to compare the means of the coping and anxiety indexes, as well as

the 5 subscales of coping and 2 subscales of anxiety. As seen in Table III, across both genders, patients post-CABG used more problem-focused coping behaviors (mean = 29.1) than emotion-focused coping behaviors (mean = 24.2). Women used statistically significantly more self-blame coping strategies than did men. The 5 subcategories in the coping checklist are rank ordered from most frequently to least frequently used as follows: problem-focused thinking, wishful thinking, avoidance, seeking social support, and blaming self. The mean for the anxiety index was 42.7 for men and 44.6 for women. Both men and women had a slightly higher state anxiety than trait anxiety score, which means that the patients experienced a sense of fearfulness, rather than a tendency to be anxious. In addition, post-surgery, women had slightly higher scores on both state and

**Table III**

Gender difference in coping and anxiety (N = 100)

Variable	Men (n = 50)		Women (n = 50)		t
	M	SD	M	SD	
Coping					
Problem focused	29.0	8.5	29.2	10.5	-.07
Problem focused	21.4	5.9	24.1	8.4	.65
Seek help	7.7	3.4	8.7	4.4	-1.24
Emotion focused	24.4	8.6	24.1	8.4	.20
Wishful	11.6	3.8	10.5	3.9	1.38
Self-blame	3.1	1.3	3.3	1.7	-2.10 <sup>a</sup>
Avoidance	9.7	3.8	10.3	4.7	-.70
Anxiety					
State	44.3	8.8	45.6	8.4	-.69
Trait	41.2	12.4	43.6	4.4	-.88

<sup>a</sup>*P* < .05.**Table IV**

Correlations between ways of coping and anxiety (N = 100)

Variable	Problem	Emotion	State	Trait
Total				
Problem	1			
Emotion	.30 <sup>a</sup>	1		
State	-.33 <sup>a</sup>	.32 <sup>a</sup>	1	
Trait	-.30 <sup>a</sup>	.06	.79 <sup>a</sup>	1
Male patients (n = 50)				
Problem	1			
Emotion	.33 <sup>a</sup>	1		
State	-.31 <sup>a</sup>	.32 <sup>a</sup>	1	
Trait	-.27	.23	.88 <sup>a</sup>	1
Female patients (n = 50)				
Problem	1			
Emotion	.27	1		
State	-.36 <sup>a</sup>	.33 <sup>a</sup>	1	
Trait	-.33 <sup>a</sup>	.04	.73 <sup>a</sup>	1

<sup>a</sup>*P* < .01.

trait anxiety than did men; however, this was not statistically significant.

### Correlation between coping and anxiety

Pearson product moment correlations were used to determine the relationship between 4 main variables: problem-focused versus emotion-focused

coping, and state versus trait anxiety. As seen in Table IV, the results indicate that problem-focused coping was negatively related to state and trait anxiety level ( $r = -.33$ ,  $P < .01$ ;  $r = -.30$ ,  $P < .01$ ), whereas emotion-focused coping was positively associated with state anxiety ( $r = .32$ ,  $P < .01$ ). As presented in Table IV, the relationship between coping and anxiety is similar in men and women, except



for problem-focused coping, which is not statistically significantly related to trait anxiety in male patients.

To examine the relationship between specific coping strategies and anxiety, 5 subscales of coping (seeking help, problem-solving, wishful thinking, self-blaming, and avoidance) and 2 subscales of anxiety were analyzed by Pearson correlations. The results indicate that self-blaming was positively associated with state and trait anxiety ( $r = .44, P < .01$ ;  $r = .28, P < .01$ ), and avoidance was positively associated with trait anxiety ( $r = .36, P < .01$ ). This means that those who use self-blaming and avoidance tend to experience higher anxiety. In addition, wishful thinking was inversely related to trait anxiety, although the result was not statistically significant.

## DISCUSSION

### Demographic findings

Concerning gender role function, the majority (80%) of men and women in this study had little or no family care or work responsibilities because the majority (70%) were elderly and under the care of their children or other family members, which is commonly seen in Chinese culture. Chinese culture is guided by the Confucian philosophy of filial piety and, as such, is composed of an extended relationship network of family. The concept of filial piety concerns the correct way to act toward one's parents and serves as a model for relationships between members of different generations. The main concepts of filial piety include loving one's parents and being respectful, polite, considerate, loyal, helpful, dutiful, and obedient.<sup>30</sup> On the basis of this concept, being a filial child, especially a son, means taking responsibility for care of the elderly,<sup>31,32</sup> who depend on the younger generation for emotional and financial support.<sup>33</sup>

### Demographics and role function affect coping and anxiety

The results revealed that there was no effect of gender, age, or education level on problem-focused or emotion-focused coping behaviors. This finding was different from that of other researchers,<sup>11,34-36</sup> who found that people who are male, older, and more highly educated used more problem-focused coping behavior than do women, those who are younger, or those with less education. In addition, a recent study conducted in Hong Kong demonstrated that Chinese older adults experienced less anger, compared with younger adults, toward severe

acute respiratory syndrome. This study found that, when reacting to a crisis, older adults may be better at emotional regulation than are younger adults.<sup>37</sup> Thus, education and gender may not be as important in developing healthy coping, as was previously believed.

The results showed no difference in anxiety level by demographics. This finding supports the research of Kim and Hur,<sup>38</sup> who found no significant relationship between anxiety and age, educational level, or gender. However, both Western and Chinese researchers found that women score higher on anxiety than do men.<sup>1,15</sup> This may be related to the greater willingness of women to admit to feelings of anxiety or because women have more serious health problems at time of diagnosis than do men. In addition, coping and anxiety may be more influenced by one's personality, world view, culture, and perceptions of stressors than by demographic factors.

In regard to each role function's effect on coping and anxiety, the results showed that taking more responsibility for housework and managing money increased the use of coping strategies to adapt, in comparison with role responsibilities such as taking care of the elderly or children and earning money. The majority of participants were aged more than 50 years with adult children, and most were not working. Therefore, taking care of the elderly and earning money were not concerns.

### Gender differences in coping and anxiety

Kwong and Kwan<sup>39</sup> stated that, based on the culturally based notion of "saving face," the Chinese elderly might prefer to manage stress on their own, rather than to seek help or social support from family, friends, or professionals. Another study, however, contradicted this notion, finding that Chinese patients with cancer took an active role in seeking information and perceived communication with health professionals as beneficial.<sup>40</sup> Similar results, identified seeking help as the most frequently used strategy, have been reported in previous research with Chinese patients with chronic heart failure,<sup>13</sup> Taiwanese patients undergoing heart surgery,<sup>12</sup> and Taiwanese patients undergoing cardiac transplant surgery.<sup>10</sup> In the present study, both Taiwanese male and female patients post-CABG used more problem-focused coping rather than emotion-focused coping to deal with their stress. Among problem-focused coping strategies, Taiwanese patients post-CABG tend to spent time focusing on problem solving instead of seeking help. This

may be explained by the fact that the patient has family caregivers or that they are trying to save face.

Redeker<sup>7</sup> found that men tend to use more problem-focused coping than do women. However, Maxwell and Siu<sup>41</sup> stated that females use more active coping and social support and that males experienced more anger during the adaptation process. The current study, however, found that there was no difference in coping behavior, except that women tended to use more blaming of self than did men. In Chinese culture, women are usually those who take care of the whole family, including parents-in-law. Thus, women could tend to feel guilty and blame themselves when they are not able to take responsibility of taking care their family members or when they cause others to worry about them.

The results revealed that participants who underwent cardiac surgery still experienced a feeling of anxiety after discharge and worried about how they would function in their daily lives. Women had slightly higher scores for both state and trait anxiety than did men after the surgery, although not statistically significant. Women were more anxious either because it was more acceptable for them to express their anxiety or because their physical state was more complicated than that of the men, increasing their sense of anxiety.<sup>22,42</sup> Similar results were found in other studies of patients post-CABG.<sup>1,15</sup>

### Correlation between coping and anxiety

The results demonstrated that the use of more emotion-focused coping might lead to a higher level of anxiety or that the patients who experienced a higher level of anxiety used more emotion-focused coping strategies to deal with their negative feelings. A study that examined the relationships among illness factors, stress, and psychologic distress in human immunodeficiency virus-infected persons in Hong Kong had results similar to those of the present study. Specifically, among human immunodeficiency virus-infected individuals, emotion-focused coping, specifically avoidance, was associated with a higher level of anxiety. Greater use of problem-focused coping was associated with lower anxiety, and positive thinking was inversely related to psychologic distress.<sup>43</sup> As can be seen, one's choice of coping strategy is related to psychologic outcomes.

There was no gender difference in the relationship between coping and anxiety, except that problem-focused coping was not statistically significantly related to trait anxiety in male patients. The

patients who used more problem-focused strategies paid more attention to their physical problems than to their emotional responses, which were expected to lead to a reduced level of anxiety after the surgery. In descriptive research to examine the relationship between copying style and trait anxiety in 69 patients undergoing cardiac catheterization, Kim and Hur<sup>38</sup> found no significant relationship between coping and trait anxiety or between the general characteristics of age, gender, and level of education and coping style or trait anxiety. In addition, the findings of the present study may be the result of the newness of CABG procedures in this age cohort in Taiwan or a general cultural trait. Further study is needed to determine the reasons for this finding.

### LIMITATIONS

The findings are important and raise relevant questions. However, the findings cannot be generalized across Taiwan, because only 100 subjects were recruited from 1 medical center in an urban area and a purposive sampling technique was used. One of the inclusion criteria was having undergone CABG in the past 5 years. The researcher set this strict criterion as a means to increase the homogeneity of the sample. On the basis of the literature, the authors developed the role function responsibility instrument; however, the psychometric properties of this instrument need further assessment. Because a cross-sectional questionnaire was conducted, the post-surgery outcome process over time may not be well understood. In addition, no causal inferences can be made, because no intervention was performed over the course of this study.

### RECOMMENDATIONS

Larger samples involving a variety of rural and urban hospitals and representing different areas of Taiwan should be used when replicating this study. A longitudinal design to gather data at different points in time would enable a better understanding of how patients adapt over time. It is also important to use integrated research methodologies to validate the instruments and to study people in areas that are culturally different than the area in which the instruments originated. The results indicated that the demographics were not a major determinant of coping behavior; future study should investigate other factors that could potentially affect adaptation. Future research exploring the factors contributing to women's anxiety and specific coping strategies is also needed. Finally, understanding the

gender-specific effectiveness of nursing interventions will help to promote optimal outcomes.

## CONCLUSIONS

The purpose of the study was to examine gender differences in coping and anxiety for patients post-CABG in Taiwan. Both genders used more problem-focused coping, which was associated with a lower anxiety level. Women expressed more anxiety after the procedure than did men. Research has shown that anxiety is an important factor related to patient outcome. Therefore, reducing anxiety level will help these patients to achieve better outcomes after surgery. As such, developing an adaptation training program that includes stress management and encourages the use of problem-focused coping strategies, such as seeking help and problem solving, as well as promoting gender roles, is a potential means to reduce anxiety and achieve optimal outcomes.

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