ORIGINAL ARTICLE

# Correlates of Health Behaviors in Patients With Coronary Artery Disease

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**Purpose** To investigate the effect of cardiac knowledge and cardiac self-efficacy on health behaviors after controlling for influences from associating factors of health behaviors in patients with coronary artery diseases (CADs).

**Methods** A descriptive correlational and cross-sectional design was used. Subjects with CADs were recruited from outpatient clinics of three academic medical centers. The cardiac knowledge, cardiac self-efficacy, and health behaviors were measured by Coronary Heart Disease Awareness and Knowledge Questionnaire, Cardiac Self-Efficacy Scale, and Health-Promoting Lifestyle Profile II respectively. The data collected were statistically analyzed by descriptive statistics, *t* test, Kruskal-Wallis test, analysis of variance, Pearson's correlation analysis, and the hierarchical multiple regression analysis.

**Results** A total of 157 subjects were recruited for this study. The mean age of subjects was 59.38 ± 10.04 years, and three-fourths (75.2%) were male. Subjects showed relatively low cardiac knowledge, moderately high cardiac self-efficacy, and moderate level of health behaviors. The overall model significantly explained 48% of variance in health behaviors ($F = 14.52$, $p < .001$). Among predictors, age, education, smoking status, experience of receiving patient education, and cardiac self-efficacy significantly affected health behaviors, and cardiac self-efficacy had the greatest effect on health behaviors ($\beta = .39$). However, cardiac knowledge had no statistically significant influence on health behaviors after controlling for the other factors.

**Conclusion** The findings suggested that cardiac self-efficacy was shown to be the most influencing factor on health behaviors but cardiac knowledge had no influence on health behaviors. The nursing interventions tailored on the patient characteristics should be developed in order to improve the health behaviors of patients with CADs. [*Asian Nursing Research* 2010;4(1):45–55]

**Key Words** coronary artery disease, knowledge, self-efficacy, health behaviors

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## BACKGROUND

Coronary artery diseases (CADs) are caused by the incomplete or complete occlusion of coronary arteries, the arteries that supply oxygenated blood to the heart itself and meet its metabolic needs. Clinically significant CADs are manifested by symptoms including chest pain, sweating, and dysrrhythmias, and may lead to the death in the extreme cases. According to the report from American Heart Association (Lloyd-Jones et al., 2009), despite of the 26.4% decrease in the number of deaths by CADs in 2005 compared with that of 1995, the mortality rate still remains high as one out of the five deaths in the United States was caused by CADs. Following economic growth and industrialization, prolonged average life span and a westernized diet and life style may result in the steady increase in the occurrence of CADs. Furthermore, the death rate per 100,000 capita in 2007 was increased by 54.9% in comparison to that of 1998, and CADs was ranked as the third leading cause of death in Korea (Statistics Korea, 2007). Thus, CADs have become a significant cause of death and this has significant influences on health care and nursing practice in Korea.

To this date, the risk factors for CADs had been well identified and CADs have been known to be preventable through healthy lifestyle modifications and consistent maintenance of chronic diseases (Redfern, Ellis, Briffa, & Freedman, 2006). Thus, health behaviors are essential for patients with CADs for preventing possible cardiac events as well as keeping their health. Unfortunately, clinically, most patients with CADs rarely recognize the importance of lifestyle and behavior changes in preventing the reoccurrence of symptoms (Lauck, Johnson, & Ratner, 2009). To facilitate health behaviors in patients with CADs, understanding the various factors that may associate with motivating, initiating, maintaining, and reinforcing health behaviors is essential. Subsequently, effective nursing intervention strategies could be developed based on this knowledge.

Based on previous studies performed in the western countries, it has been posited that disease knowledge and self-efficacy might be plausible associated factors with the health behaviors in clinical populations with CAD (Fleury & Sedikides, 2007; Lau-Walker, 2007; McKinley et al., 2009; Sol, van der Graaf, van der Bijl, Goessens, & Visseren, 2008). Disease knowledge is composed of information on pathophysiology, risk factor, treatment modality, and prevention methods related to a certain disease. It contributes to patients' precise understanding of their disease and facilitates the decision making on the lifestyle modification and its compliance, which may help slow down the disease process (Kayaniyil et al., 2009; Mosca et al., 2006). In addition, disease knowledge was known as a key element for the reduction in treatment-seeking time as well as the primary and secondary disease prevention (Buckley et al., 2007; McKinley et al.). However, most individuals with CADs have passive attitudes towards gaining knowledge on risk factors, signs and symptoms of disease. Moreover, in the present health care system, there is the limited time for nurses to educate and counsel patients due to the shortened length of hospital stay (Buckley et al.). Thus, patients hardly realize the importance and necessity of knowledge on disease and compliance to healthy lifestyle changes (Lauck et al., 2009). Therefore, empirical examination of the relationship between disease knowledge and health behaviors is needed in the population of CADs.

Self-efficacy is defined as one's confidence and will to control one's own health and has been known as the main predictor for complying with health promoting behaviors and one of the key determinants in choosing and maintaining health behaviors (Fleury & Sedikides, 2007; Han, Lee, & Kim, 2007; Sheahan & Fields, 2008). Specifically, the CADs population with high levels of self-efficacy have led to compliance of health behaviors such as adhering to medication regimen, healthy diet, and regular exercise, which might have significant influences on lowering the rate of symptom occurrence and readmission, and improving quality of life (Nakahara et al., 2006; Sheahan & Fields).

Previous studies examining the bivariate relation of health behavior focused on only one factor, either disease knowledge or self-efficacy, rather than analyzing

the concomitant effects of associated factors on health behaviors. In addition, they are mostly performed in western countries. Methodologically, most studies utilized a general scale in measuring disease knowledge and self-efficacy. This fact may interfere with the appropriate representation of the variables measured. Therefore, under the consideration of cultural characteristic, the two factors (disease knowledge and self-efficacy) should be examined in terms of their association with health behaviors in CADs patients. Additionally, in measuring disease knowledge and self-efficacy, cardiac specific instruments should be employed such as cardiac knowledge and cardiac self-efficacy.

In the present study, therefore, the correlates of health behaviors, cardiac knowledge and cardiac self-efficacy were investigated in a Korean population with CADs. Upon the exploration of correlates of health behaviors, the development of deliberate nursing strategies might be possible for the Korean population with CADs.

The present study aimed to determine the correlates of health behaviors in patient with CADs. The specific aims of the study were to explore the relationship between cardiac knowledge, cardiac self-efficacy, and health behaviors, to examine the differences in health behaviors by demographic and disease-specific characteristics, and to determine the effects of cardiac knowledge and cardiac self-efficacy on health behaviors.

## METHODS

### *Design*

The present study utilized a descriptive correlational and cross-sectional survey design using a face-to-face method.

### *Sample and setting*

Subjects were recruited among outpatients who had CADs at three academic medical centers in Seoul, Korea. The subjects were selected from outpatients who understood and agreed to participate in the study. The requirements for the patient to be selected as a subject of this study were reviewed from the electronic medical records using the following criteria:

(a) The patient had a diagnosis of angina pectoris or myocardial infarction;
(b) The patient did not have complication of severe arrhythmia or congestive heart failure;
(c) The patient was an adult over 20 years of age and was able to communicate in Korean.

### *Measures*

Coronary Heart Disease Awareness and Knowledge Questionnaire (Kayaniyil et al., 2009) was used to measure the cardiac knowledge; it was revised from the Cardiac Knowledge Questionnaire (Maeland & Havik, 1987) and the Coronary Heart Disease Knowledge (Smith, Hicks, & Heyward, 1991). Originally, this instrument consisted of 23 items measuring knowledge on pathophysiology, causes, risk factors, symptoms and treatment of CADs, and main cause of death in the United States. For this study, 20 items were utilized excluding the 3 items on the statistics of the main cause of death and experience on treatment modality, which were not congruent with the purpose of this study. Each correct answer scored one point and each incorrect answer scored zero point. A higher score indicates greater cardiac knowledge. The psychometric characteristics of this scale were established (Kayaniyil et al.).

Cardiac self-efficacy was measured by Cardiac Self-Efficacy Scale (Sullivan, LaCroix, Russo, & Katon, 1998). This instrument was developed to measure self-efficacy associated with heart disease. It was a 16-item scale with 2 sub-dimensions including the control of symptoms (8 items) and the maintenance of function (5 items), and an additional 3 items measuring obesity, smoking and dietary habit only for applicable subjects. Items were scored on a Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). In this study, the scoring was conducted with the sum of items except for the 3 specific items (obesity, smoking, and dietary habit). Scores ranged from 0 to 52 with higher score indicating a greater level of cardiac self-efficacy. In the previous study,

Cronbach's alpha of the Cardiac Self Efficacy Scale was .87–.90 (Sullivan et al.). In the present study, Cronbach's alpha was .80.

Health behaviors was measured by the Health-Promoting Lifestyle Profile II (HPLP II; Walker, Kerr, Pender, & Sechrist, 1990; Walker, Sechrist, & Pender, 1987; Walker, Volkan, Sechrist, & Pender, 1988). The HPLP II instrument consists of 52 items on six sub-dimensions: (a) Health responsibility, 9 items; (b) Physical activity, 8 items; (c) Nutrition, 9 items; (d) Spiritual growth, 9 items; (e) Interpersonal relations, 9 items; (f) Stress management, 8 items. All items were scored on a 4-point Likert scale (1—*Not at all*; 2—*Sometimes*; 3—*Often*; 4—*Always*). A score for overall health behaviors was used by calculating mean of the subject's response to all 52 items. Similarly, mean scores of sub-dimensions were obtained by calculating the subject's response. Therefore, health behaviors and each of the six sub-dimensions score could range from 1 to 4. Higher score indicates a greater level of health behaviors. Cronbach's alpha for HPLP II was .94, and the range for six sub-dimensions were from .79 to .87 (Walker & Hill-Polerecky, 1996). Cronbach's alpha was .94 in the present study.

The parameters which were collected for the demographic characteristics were age, gender, marital status and education in year of the formal schooling. Disease-specific characteristics included the diagnosis, Canadian Cardiovascular Society Angina (CCSA) classification, and period since diagnosed, body mass index, smoking status, diabetic mellitus, hyperlipidemia, comorbidity, and the experience of receiving patient education. The CCSA measures the level of functional status according to the frequency and intensity of angina (Karimi et al., 2008). CCSA ranges from class I for no symptoms, to Class IV for the worst symptoms (Class I—ordinary physical activity does not cause angina; Class II—slight limitation of ordinary activity; Class III—marked limitation or ordinary physical activity; Class IV—inability to carry on physical activity).

Comorbidity was recorded with Charlson Comorbidity Index, which was composed of 19 items (Charlson, Pompei, Ales, & MacKenzie, 1987). Each item was assigned to a weight from 1 to 6, and the Charlson score is the sum of the weights for all conditions. A higher score indicates greater disease burden.

### Data collection procedures

Subjects were recruited using a convenience sampling method from the outpatient clinics at three academic medical centers, Seoul, Korea. Data were collected from September, 2009 to February, 2010 by researcher and assistant registered nurses. After informed consent was obtained, data were obtained using face-to-face interview. Disease-specific characteristics were gathered through medical records. From a total of 180 subjects who were invited to participate, 157 subjects agreed to participate in the study with a response rate of 87.2%.

### Ethical considerations

Ethical approval was obtained from the institutional review boards of the affiliated medical centers and institutions. All study subjects were given both verbal information and written summary of the study, where a voluntary participation, guarantee of anonymity, free will of withdrawal from the participation, and no disadvantage upon withdrawal were explained. Upon both verbal and written consents from the subjects, data was collected.

### Statistical analysis

Data were analyzed with SPSS 15.0 (SPSS Inc., Chicago, IL, USA). Univariate descriptive statistics, including the frequency distribution, the central tendency, and the dispersion of the scores were examined to identify missing data, outliers and errors in data entry. In addition, *t* test, Kruskal-Wallis test, analysis of variance, Schéffe test, Pearson's correlation and hierarchical multiple regression analysis were performed. A $p$ value $\leq .05$ was considered significant. In the present study, 157 subjects provided a statistical power of .93 with a medium effect size of .15 and the level of alpha at .05 (Cohen, 1988). This level of power was high enough to detect the true relationships among variables and strongly supported the results of the study.

## RESULTS

### *Demographic and disease-specific characteristics of the subjects*

The demographic characteristics and disease-specific characteristics of the sample for the present study are shown in Tables 1 and 2 respectively, including age, gender, marital status, education, diagnosis, CCSA, period since diagnosed, body mass index, smoking status, diabetic mellitus, hyperlipidemia, comorbidity, and the experience of receiving patient education.

A total of 157 subjects were recruited for this study. Their mean age was 59.38 ± 10.04 years, and three-fourths (75.2%) were male. The majority of subjects (88.5%) was married and the average year of education of the sample was 11.61 ± 4.44.

About half of the sample (47.1%) was diagnosed with stable angina, and the rest were distributed into the diagnoses of myocardial infarction (28.7%) and unstable angina (24.2%). Seventy-three subjects (46.5%) were graded into the class II by CCSA. The period since diagnosis ranged from 1 month to 324 months with a mean of 38.95 ± 48.84 months. At the time of data collection, 21 subjects (13.4%) smoked, 47 subjects (29.9%) had diabetes mellitus, and 88 subjects (56.1%) were diagnosed with hyperlipidemia. Of the 157 subjects, 60.5% had the experience of receiving the patient education on disease from health care providers.

### *Cardiac knowledge, cardiac self-efficacy and health behaviors*

As shown in Table 3, cardiac knowledge score ranged from 6 to 18, with a mean value of 12.68 (*SD* = 2.37), signifying relatively low cardiac knowledge. The average score of cardiac self-efficacy was 38.78 (*SD* = 7.38)

**Table 1**

*General Characteristics of Subjects* (*N* = *157*)

| Characteristics | *n* | %[a] | *M* ± *SD* | Range |
|---|---|---|---|---|
| Age (yr) | | | 59.38 ± 10.04 | 34–82 |
| < 40 | 5 | 3.2 | | |
| 41–50 | 27 | 17.2 | | |
| 51–60 | 53 | 33.8 | | |
| 61–70 | 49 | 31.2 | | |
| 71–80 | 21 | 13.4 | | |
| > 81 | 2 | 1.3 | | |
| Gender | | | | |
| Male | 118 | 75.2 | | |
| Female | 39 | 24.8 | | |
| Marital status | | | | |
| Married | 139 | 88.5 | | |
| Widowed | 15 | 9.6 | | |
| Single/divorced | 3 | 1.9 | | |
| Education (yr) | | | 11.61 ± 4.44 | 0–20 |
| No schooling | 4 | 2.6 | | |
| Elementary school | 26 | 16.7 | | |
| Middle school | 28 | 17.9 | | |
| High school | 41 | 26.3 | | |
| Undergraduate school | 50 | 32.1 | | |
| Graduate school | 7 | 4.5 | | |

[a]Percentages do not add up to 100% due to rounding.

**Table 2**

*Disease-specific Characteristics of Subjects (N = 157)*

| Characteristics | *n* | %[a] | *M* ± *SD* |
|---|---|---|---|
| Diagnosis | | | |
| Stable angina | 74 | 47.1 | |
| Unstable angina | 38 | 24.2 | |
| Myocardial infarction | 45 | 28.7 | |
| CCSA classification | | | |
| I | 56 | 35.7 | |
| II | 73 | 46.5 | |
| III | 17 | 10.8 | |
| IV | 11 | 7.0 | |
| Period since diagnosed (month) | | | 38.95 ± 48.84 |
| BMI (kg/m$^2$) | | | 24.71 ± 3.05 |
| Underweight (≤ 18.4) | 1 | 0.6 | |
| Normal (18.5–24.9) | 83 | 52.9 | |
| Overweight (25–29.9) | 66 | 42.0 | |
| Obese (≥ 30) | 7 | 4.5 | |
| Smoking status | | | |
| Smoker | 21 | 13.4 | |
| Non-smoker | 68 | 43.3 | |
| Ex-smoker | 68 | 43.3 | |
| Diabetic mellitus | | | |
| Yes | 47 | 29.9 | |
| No | 110 | 70.1 | |
| Hyperlipidemia | | | |
| Yes | 88 | 56.1 | |
| No | 69 | 43.9 | |
| Comorbidity | | | 1.27 ± 1.46 |
| Experience of receiving patient education | | | |
| Yes | 95 | 60.5 | |
| No | 62 | 39.5 | |

*Note*. CCSA = Canadian cardiovascular society angina; BMI = body mass index. [a]Percentages do not add up to 100% due to rounding.

**Table 3**

*Descriptive Statistics for Cardiac Knowledge, Cardiac Self-efficacy and Health Behaviors (N = 157)*

| Variables | No. of items | Possible range | *M* | *SD* |
|---|---|---|---|---|
| Cardiac knowledge | 20 | 0–20 | 12.68 | 2.37 |
| Cardiac self-efficacy | 13 | 0–52 | 38.78 | 7.38 |
| Health behaviors | 52 | 1–4 | 2.68 | 0.49 |

**Table 4**

*Association of Health Behaviors With Demographic Characteristics (N = 157)*

| Variable | *M* | *SD* | $\chi^2/t/r$ | *p* |
|---|---|---|---|---|
| Gender | | | −1.23 | .22 |
| Male | 2.66 | 0.50 | | |
| Female | 2.77 | 0.46 | | |
| Age | | | .25 | < .001 |
| Marital status | | | .22 | .90 |
| Married | 2.68 | 0.45 | | |
| Widow | 2.75 | 0.73 | | |
| Others (divorced, single) | 2.38 | 0.85 | | |
| Education | | | .19 | .02 |

with a range from 15 to 52, signifying s moderately high cardiac self-efficacy. Subjects had moderate degree of health behaviors (2.68 ± 0.49).

### *Differences in health behaviors by demographic characteristics and disease-specific characteristics*

Table 4 shows differences in health behaviors by demographic characteristics. Subjects who are older ($r = .25$, $p < .001$) and with higher level of education ($r = .19$, $p = .02$) showed the greater health behaviors.

As demonstrated in Table 5, there was significant difference in health behaviors among the groups by diagnosis ($F = 6.12$, $p < .001$), and the group with stable angina had the highest level of health behaviors. The non-smoker group had the highest level of health behaviors among groups by smoking status ($F = 7.36$, $p < .001$). Additionally, the group that had received patient education showed significantly greater level of health behaviors than the other group without the experience ($t = 4.44$, $p < .001$).

### *Effects of cardiac knowledge and cardiac self-efficacy on health behaviors*

As shown in the above results, the statistically significant differences in health behaviors found according to age, education, diagnosis, smoking status, and experience of receiving patient education are all factors that should be controlled for in order to examine effects of cardiac knowledge and cardiac self-efficacy on health behaviors. This was done using hierarchical multiple regression (Table 6). The overall model significantly explained 48% of variance in health behaviors ($F = 14.52$, $p < .001$). Among all the predictors, age, education, smoking status, experience of receiving patient education and cardiac self-efficacy significantly affected health behaviors, while cardiac self-efficacy had the greatest effect on health behaviors ($\beta = .39$). However, cardiac knowledge did not have a significant influence on health behaviors after controlling for other factors.

## DISCUSSION

From findings of the present study, health behaviors of patients with CADs were associated with the subjects' age and education status. That is, the older and the better-educated individuals reported better health behaviors. This finding was only partially congruent with the previous findingings where younger subjects and better-educated subjects had better health behaviors (Coulson, Strang, Mariño, & Minichiello, 2004; Mosca et al., 2006). Persons with higher education were more likely to have higher cognitive function and better comprehension capability so that they might understand the necessity of lifestyle changes, be more motivated, and perform health behaviors more often. In terms of age, however, subjects' mean age in this study was younger than that of other studies, which might explain why

**Table 5**

*Association of Health Behaviors With Disease-specific Characteristics (N = 157)*

| Variables | *M* | *SD* | *t/F/r* | *p* | Post hoc |
|---|---|---|---|---|---|
| Diagnosis | | | 6.12 | < .001 | Stable > unstable = myocardial |
| Stable angina | 2.82 | 0.49 | | | |
| Unstable angina | 2.56 | 0.48 | | | |
| Myocardial infarction | 2.55 | 0.45 | | | |
| CCSA classification | | | 0.87 | .46 | |
| I | 2.72 | 0.50 | | | |
| II | 2.71 | 0.47 | | | |
| III | 2.54 | 0.52 | | | |
| IV | 2.56 | 0.48 | | | |
| Period since diagnosed | | | 0.01 | .92 | |
| BMI | | | –0.12 | .13 | |
| Smoking status | | | 7.36 | < .001 | Smoker < non-smoker |
| Smoker | 2.39 | 0.48 | | | |
| Non-smoker | 2.82 | 0.49 | | | |
| Ex-smoker | 2.64 | 0.44 | | | |
| Diabetics | | | 0.88 | .38 | |
| Yes | 2.74 | 0.46 | | | |
| No | 2.66 | 0.50 | | | |
| Hyperlipidemia | | | –0.32 | .75 | |
| Yes | 2.67 | 0.44 | | | |
| No | 2.69 | 0.54 | | | |
| Comorbidity | | | 0.041 | .61 | |
| Experience of receiving patient education | | | 4.44 | < .001 | |
| Yes | 2.82 | 0.49 | | | |
| No | 2.48 | 0.41 | | | |

*Note.* CCSA = Canadian cardiovascular society angina; BMI = body mass index.

current findings were not consistent with previous findings.

Additionally, non-smokers had higher scores in health behaviors than those of other groups including smokers and ex-smokers in this study. This result was expected because the non-smokers might be more likely to perform the good health behaviors. Persons with the experience of receiving patient education showed higher levels of health behaviors regardless of the level of cardiac knowledge in this study. Furthermore, cardiac knowledge was not significantly associated with health behaviors after controlling for other factors including age, education, diagnosis, smoking status, experience of receiving the patient education, and cardiac self-efficacy. According to findings from the previous studies, however, knowledge on disease itself showed a significant role in making patients change their health behaviors or lifestyle (Alm-Roijer, Stagmo, Udén, & Erhardt, 2004; Kayaniyil et al., 2009;

**Table 6**

*Effects of Cardiac Knowledge and Cardiac Self-efficacy on Health Behaviors (N = 157)*

| Predictors | *B* | *SE* | β | *t* | *p* |
|---|---|---|---|---|---|
| Age | .02 | .00 | .34 | 4.54 | < .001 |
| Education | .03 | .01 | .24 | 3.33 | < .001 |
| Diagnosis (unstable angina) | –.14 | .09 | –.12 | –1.64 | < .001 |
| Diagnosis (myocardial infarction) | –.06 | .08 | –.06 | –0.71 | .48 |
| Smoking status (smoker) | –.33 | .11 | –.23 | –3.05 | < .001 |
| Smoking status (ex-smoker) | –.13 | .07 | –.13 | –1.72 | .09 |
| Experience of receiving patient education | .30 | .07 | .24 | 4.16 | < .001 |
| $R^2$ | .32 | | | | |
| $F$ ($df$ = 7, 149) | 9.63 | | | | < .001 |
| Age | .02 | .00 | .31 | 4.74 | < .001 |
| Education | .02 | .01 | .17 | 2.63 | .01 |
| Diagnosis (unstable angina) | –.10 | .08 | –.09 | –1.23 | .22 |
| Diagnosis (myocardial infarction) | –.06 | .08 | –.06 | –0.84 | .40 |
| Smoking status (smoker) | –.22 | .10 | –.16 | –2.32 | .02 |
| Smoking status (ex-smoker) | –.13 | .06 | –.13 | –1.99 | .05 |
| Experience of receiving patient education | .22 | .06 | .22 | 3.35 | < .001 |
| Cardiac knowledge | .02 | .01 | .10 | 1.54 | .13 |
| Cardiac self-efficacy | .03 | .00 | .39 | 6.07 | < .001 |
| $R^2$ | .48 | | | | |
| $F$ ($df$ = 2, 147) | 14.52 | | | | < .001 |

Mosca et al., 2006). Although numerous previous studies suggested that patients' knowledge on the disease was a key factor in determining their health behaviors, it was possible that those studies did not consider the associated factors simultaneously, and simply considered the bivariate relationships among factors. Thus, regardless of the present level of cardiac knowledge, the experience of receiving patient education played an essential role in predicting the health behaviors because after receiving patient education, patients might become more determined to change their lifestyles as well as more motivated. The findings provided significant implications to clinical nursing practice. Empirically, it might be very critical for nurse to offer patient education, which might strongly impact patient motivation and their lifestyles.

Cardiac self-efficacy was shown to be the most influential predictor of health behaviors in this study. This finding was consistent with that of previous research (Beal, Stuifbergen, & Brown, 2009; Mosca et al., 2006; Stewart, Abbey, Shnek, Irvine, & Grace, 2004). In order to increase health behaviors of patients with CADs, the specific nursing strategy for enhancing the cardiac self-efficacy should be considered, including personalized counseling, regular follow-up calls, and so forth (Lau-Walker, 2007). Furthermore, nursing interventions that would aid in initiating and maintaining health behaviors for a longer period should be designed and implemented despite any unusual situations (Martin et al., 2008).

## CONCLUSION

The present study aimed to explore the correlates of health behaviors in patients with CADs. Age,

education, diagnosis, smoking status, and experience of receiving patient education were all factors shown to influence health behaviors. Contrary to previous studies, it was demonstrated that cardiac knowledge had no influence on health behaviors; the experience of receiving patient education had a significant impact on health behaviors in the present study. Additionally, in line with previous studies, cardiac self-efficacy was the most significant factor that affected on heath behaviors. Throughout the current study, the significant influencing factors found included demographic and disease specific characteristics, and cardiac self-efficacy. Based on the findings of the study, nursing interventions tailored to patient characteristics should be developed in order to improve the health behaviors of patients with CADs. Practically, clinical nurses should recognize the importance of providing patient education designed to change their lifestyle. In future research, whether subjects had received patient education or not should be considered with other factors simultaneously in determining the associating factors of health behaviors.

In the present study, there were three limitations to be recognized. First, this study utilized a convenience sampling method that limited the generalizability of the findings across population. Secondly, subjects were predominantly male, and female patients were underrepresented. This demographic characteristic of the sample also limited the ability to generalize the results of this study beyond the sample. Thus, the results of this study should be interpreted with caution because of the non-random sampling technique and the demographic characteristics of the sample. Lastly, all of the factors that may influence the health behaviors, especially those pertaining to patient education including education time, contents, and professional and family support, were not considered simultaneously in the current study. Thus, the findings of the present study are limited in representing the conclusive factors of health behaviors in patients with CADs.

The present study explored and examined the correlates of health behaviors in patients with CADs. Among the correlates of health behaviors reported from the previous studies, cardiac self-efficacy was shown as the most influential factor, while cardiac knowledge was not shown as a significant factor. In place of cardiac knowledge itself, the experience of having received patient education was significantly associated with health behaviors. Findings from the present study demonstrated the gap between patient education and knowledge in explaining the behavior change.

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