

Factors Affecting the Performance of Health Behaviors in Patients Undergoing Percutaneous Coronary Intervention

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Abstract : Background/Objectives: This study was a descriptive survey study to identify correlations between the knowledge of disease, self-efficacy, family support, and performance of health behaviors of the patients undergoing percutaneous coronary intervention (PCI). **Methods/Statistical analysis:** The subjects were 111 patients who underwent percutaneous coronary intervention and who were hospitalized for follow-up examination within 3 years after undergoing percutaneous coronary intervention in M hospital in G city From September 1, 2017 to January 30, 2017 and analyzed using SPSS 18.0 version program.

Findings: According to the study result, the subjects' mean score of the knowledge of disease, self-efficacy, family support, and Performance of Health Behaviors were 0.73 ± 0.16 , 3.62 ± 0.71 , 2.39 ± 0.96 , and 2.92 ± 0.42 , respectively. Factors that showed significant difference in health behaviors according to general characteristics of the subjects were sex ($t=4.61$, $p=.034$), presence of metabolic syndrome ($t=6.90$, $p=.010$). Knowledge of disease related knowledge, self-efficacy, family support, and health behaviors were correlated. Knowledge of disease ($r=.275$, $p<.01$) and self-efficacy ($r=.429$, $p<.01$) showed a positive correlation. However, family Support ($r=-.108$, $p=.261$) showed no correlation. Stepwise regression analysis showed that factors affecting health behaviors were disease related knowledge ($\beta=.672$, $p=.002$), self-efficacy ($\beta=.218$, $p<.001$), gender ($\beta=.171$, $p=.009$) and metabolic syndrome ($\beta=-.225$, $p=.014$) were independently significant. That is, the higher the knowledge related to disease, the higher the self-efficacy, the higher the performance of health behavior. The F statistic for the fit of the estimated regression model was $F=16.98$ ($p<.001$), and the corrected explanatory power was 36.7 percent. The results of this study confirmed disease-related knowledge, self-efficacy, gender and metabolic syndrome as factors influencing health behaviors of patients undergoing percutaneous coronary intervention.

Improvements/Applications: Based on the results, systematic education needs to be offered and infrastructure should be built to enhance the performance of health behaviors of the patients undergoing PCI. In addition, program development for self-efficacy enhancement would be required.

Keywords: Family support, knowledge of Disease, Percutaneous Coronary Intervention (PCI), Performance of Health Behaviors, Self-efficacy.

I. INTRODUCTION

Despite Korea's rapid medical development, cardiovascular disorders were the second most common illness after cancers in terms of Koreans' main death-causing

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diseases. The number of people who died of cardiovascular disorders in 2016 was 58.2 people per 100,000 population, up by 4.6%, compared with 2015[1].

Coronary heart disease was a chronic disease with high risks of heart attack and recurrence. After the disease occurrence, lifestyle should be improved by correcting coronary risk factors (CRF) including steady treatment, dietary control[2], and exercise amount control. The main CRF of coronary heart disease included high blood pressure, diabetes, lipid abnormality, smoking, lack of exercise, male, age, coronary heart disease, and psychological and social factors[3]. If a patient has two and more CRF, the possibility of recurrence is 4 to 8 times higher than others[4]. Treatment methods of coronary heart disease were drug therapy and percutaneous coronary intervention (PCI). PCI increased the flow of blood by maintaining blood vessels that become narrow through inserting a stent inside of the blood vessel[2]. However, the fundamental causes of the disease cannot be removed, and thus drug treatment such as antithrombotic, antiplatelet drug, and cholesterol depressant should be simultaneously used for 1 year[4]. Of the patients that underwent PCI, the ratio of recurrence or death from 6 months to 3 years, after treatment, was 19-42%, despite proper PCI or drug treatment[5]. Patients received PCI should conduct active secondary preventive actions simultaneously to prevent complications including cardiac infarction and sudden death. However, more than 70% of the patients were reported not to actively implement the health behaviors presented as a recommendation[6].

Many PCI patients did not properly perform health behaviors due to the lack of knowledge of diseases. Although most patients were highly committed to self-control upon hospitalization, they easily return to their previous lifestyle, thinking that their problems of the disease were solved after they experienced rapid symptom relief by which cardiac pain disappears after PCI[7]. If the patients had sufficient knowledge of the disease, it became the guideline of behaviors motivating to improve their lifestyle and properly manage health[8]. Therefore, effective education and infrastructure, required for the prevention of disease recurrence, recovery, and health retention, need to be offered and built for the patients[9].

Self-efficacy, a factor that could bring about a patient's behavior change was recently gaining attention[7].



The strategy to improved self-efficacy helps various problem improvement, including drug administration to patients, exercise, dietary therapy, and stress control[10,11]. The subjects with higher self-efficacy set specific goals and planned to solved problematic lifestyle, and strove to practice therapeutic health behaviors[12]. The family supported of the subjects is reported to effectively affect their change of lifestyle[13]. Already formed habits are the family’s problem, rather than a personal problem, and therefore the support of a family living together is more effective for lifestyle change and proper health behaviors[14]. Family support affected the prognosis of the patients undergoing PCI, enables the patients to adapt to daily life well, and positively affected personal health retention and recovery by changing the subjects’ activities[15]. Consequently, this study was carried out to identify factors affecting subjects’ performance of health behaviors, and to be used as baseline data for nursing intervention and educational programs to prevent diseases and complications.

II. MATERIALS AND METHODS

2.1 Purpose and Design

This study was a study of the correlations aiming to identifying the factors affected the performance of health behaviors targeting the patients undergoing PCI and to use the study results as baseline data.

2.2 Subjects

This study used convenience sampling by targeting the patients regularly visiting (outward patients) the circulatory internal medicine after the PCI therapy (myocardial infarction and angina) from the M Hospital in G City. The data collection period was from Sep. 1 to Oct. 30, 2017. The copies of the questionnaire were distributed to the subjects who voluntarily agreed to participate in this study after they were explained about the questionnaire content, as well as study purpose, through the hospital’s approval.

2.3 Tools

Concerning the knowledge of coronary heart disease, the tool revised and supplemented by Choi & Cho[16] was used on the basis of the disease-measuring tool developed by Rahe, Scalzi & Shine[17]. This tool was comprised of 32 questions. Kuder-Richardson was .86 in a study of Choi & Cho[16], while Kuder-Richardson was .89 in this study.

For self-efficacy, the tool revised and supplemented by Kim & Lee[18] based on the general self-efficacy tool developed by Sherer and Maddux[19] and the specific self-efficacy tool developed by Song[20] was used. The tool consisted of 12 questions. Cronbach’s α was .89 in a study of Kim & Lee[18] and it was .89 in this study.

For family support, the family support tool developed by Cohen& Wills[21] was used to measure family support level. This tool comprises 16 questions, and Cronbach’s α was .95 in the study of Cohen& Wills[21], and it was .96 in this study.

For the performance of health behaviors of the coronary heart disease patients, a tool developed by Han& Kim[22] suitable for the patients was used. The tool was comprised of 30 questions, with Cronbach’s α being .85 in a study of Han& Kim[22] and .90 in this study.

2.4 Data Analysis

Percentage was calculated for subjects’ general characteristics, whereas the mean and standard deviation (SD) of variables were calculated. The score difference of health behaviors according to subjects’ general characteristics was analyzed using t-test and ANOVA, while the post hoc test was carried out using Scheffe’s test. The correlations between variables were analyzed using Pearson correlation coefficient, and the factors affecting subjects’ health behaviors performance were analyzed using a stepwise multiple regression analysis. This study was a study of the correlations aiming to identify the factors affecting the performance of health behaviors targeting the patients undergoing PCI and to use the study results as baseline data.

III. RESULTS AND DISCUSSION

Table 1 shows the general characteristics of the subjects. As a result of the analysis, the mean age was 61.79 years old. The subjects having metabolic syndrome were 85.6%, those not having metabolic syndrome were 14.4%, and those drinking alcohol and not drinking alcohol were 33.3% and 66.7%, respectively.

TABLE 1. General Characteristic (n=111)

Characteristic	Categories	(n)
Age	< 50 years old	21
	50-59 years old	30
	60-69 years old	35
	>70 years old	25
Sex	Male	64
	Female	47
Job	None	40
	Office job and service sector	23
	Self employed and other job	48
Marital Status	no	8
	Yes	103
Family history	No	60
	Yes	51
Metabolic Syndrome	No	16
	Yes	95
Alcohol Drinking	No	74
	Yes	37

The mean and SD of the subjects’ knowledge of disease was 0.73±0.16 point. The scores of self-efficacy, family support, and performance of health behaviors were 3.62±0.71, 2.39±0.96, and 2.92±0.42, respectively in table 2.

TABLE 2. Disease-related characteristics (N=111)

Variables	Min	Max
Disease knowledge	0.03	0.94
Self-efficacy	1.08	5.00
Family support	1.00	4.00
Health behavior compliance	1.20	4.00

Sex (t=4.61, p=.034) and metabolic syndrome (t=6.90, p=.010) showed statistically significant differences in the subjects’ performance of health behaviors according to general characteristics in table 3.



TABLE 3. Performance of health behaviors and self-efficacy according to general characteristics (N=111)

Characteristic	Categories	M±SD	F/t
Age	< 50 years old	3.02±0.44	1.14
	50-59 years old	2.92±0.38	
	60-69 years old	2.95±0.32	
	>70 years old	2.80±0.42	
Sex	Male	2.85±0.45	4.61
	Female	3.02±0.35	
Job	None	2.95±0.37	0.12
	Office job and service sector	2.92±0.31	
	Self employed and other job	2.90±0.50	
Marital Status	no	2.94±0.40	0.01
	Yes	2.92±0.42	
Family History	No	2.90±0.46	0.26
	Yes	2.94±0.37	
Metabolic Syndrome	No	3.17±0.39	6.90
	Yes	2.88±0.41	
Alcohol Drinking	No	2.95±0.42	0.96
	Yes	2.87±0.40	

*p<.05, **p<.01

Concerning the subjects' performance of health behaviors, the knowledge of disease (r=.275, p<.001) and self-efficacy (r=.429, p<.001) showed statistically significant and positive

TABLE 5. Factors Affecting Subjects' Performance of Health Behaviors

Variable	B	SE	β	t	p	Tolerance	VIF
(Constant)	1.817	.276		6.573	.001**	-	-
Self-efficacy	.218	.049	.373	4.421	.001**	.807	1.239
Disease knowledge	.672	.214	.267	3.148	.002**	.803	1.245
Gender	.171	.064	.203	2.674	.009**	.994	1.006
Metabolic syndrome	-.225	.090	-.191	-2.505	.014	.987	1.013

Based on these results, it was necessary to provide a systematic education and infrastructure to improve health behaviors of patients with percutaneous coronary intervention, and to develop programs to improve self-efficacy. Therefore, this study will be useful as a basic data for the development of nursing intervention program to find various ways to improve the health behavior of patients with percutaneous coronary intervention. The rate of sex of the subjects in this study was 57.7% (male) and 42.3% (female), and therefore males were more than females. Coronary heart disease patients aged 65 and older, females were more at 62%. The reason was because females' survival rate became higher as aging progressed, and the prevalence of coronary heart disease among them became higher. In terms of marital status, subjects who had a spouse composed 92.8%, while those with no spouse composed 7.2%. The elderly aged 65 and older, subjects without spouse showed a more than 30% difference. The reason is because a spouse's death rate is higher in Kim's study than this study. Due to a spouse's death, a gap in nursing may occur, and therefore social and economic support, including community-centered coronary heart disease symptom management is judged necessary[16].

The knowledge of disease was surveyed as 7.3 points (perfect point: 10) in this study. The knowledge of disease

correlations; however, family support (r=.108, p=.261) did not show a correlation in table 4.

TABLE 4. Correlation between subjects' knowledge of disease, self-efficacy, family support, and performance of health behaviors (N=111)

Variables	Performance of Health Behaviors	Self-efficacy	Knowledge of Disease
Performance of Health Behaviors	1		
Self-efficacy	.429(<0.01)**	1	
Knowledge of Disease	.275(<0.01)**	.276(<0.01)**	1
Family support	.108(.261)	.074(.442)	.042(.660)

*p<.05, **p<.01

As a result of calculating tolerance limit and variance inflation factor (VIF) to find whether multicollinearity exists between independent variables, all the tolerance limits were less than 10, and thus no multicollinearity existed between the independent variables. As a result of a step-by-step regression analysis, the performance of health behaviors was higher as knowledge of behaviors and self-efficacy were higher. F statistics on the estimated regression model's fitness was significant as F=16.98 (p<.001), and the revised explanation power was 36.7% as shown in table 5.

showed differences according to studies. Therefore, as subjects became older and their education level lower, the knowledge of disease should be enhanced through repetitive education and a selection of terms easy to understand.

Self-efficacy was 3.62 points (perfect point: 5) in this study, which shows a value similar to the previous studies. However, self-efficacy became lower as repetitive hospitalization or therapy was conducted in the previous studies. The reason is because self-efficacy decreases gradually with subjects' experience of frustration [10]. Consequently it will be effective to develop a program for self-efficacy promotion in consideration of patients' characteristics which is to be applied in clinical setting.

Family support showed 2.39 points (perfect point: 3) in this study, which is similar to the value of previous studies. The previous studies asserted that subjects avoided negative answers to questions on their children and family[23]. The performance of health behaviors was 2.92 points (perfect point: 4) in this study, which shows a value similar to previous studies'.



The variables showing significant differences in the performance of health behaviors according to general characteristics were sex ($F=4.61$, $p=.034$) and metabolic syndrome ($t=6.90$, $p=.010$). Targeted coronary heart disease patients, difference was shown depending on sex, as women performed better than men in a patient's role activity[24]. The reason is that women's education level became higher and their interest in health increased. In this study, the performance of health behaviors was lower in case subjects had metabolic syndrome. It is presumed that decreased sensitivity on the disease affected the performance of health behaviors as deterioration and relief were repeated in terms of the characteristics of metabolic syndrome, which was the accompanying disease.

The performance of health behaviors and the knowledge of disease and self-efficacy showed positive correlations in this study. That is, as the knowledge of disease and self-efficacy became higher, the performance of health behaviors also became higher. The performance of health behaviors should be enhanced using an educational program suitable for a patient's knowledge level.

The knowledge of disease, self-efficacy, sex, and metabolic syndrome explained 36.7% of the performance of health behaviors in this study. Upon looking at the previous studies related to this, the family type, self-efficacy, job satisfaction, knowledge of disease, status of cerebral stroke, and age explained 56.0% patient role activity in a study that targeted coronary heart disease patients[25]. Because there are various factors affecting the performance of health behaviors, intervention to improve subjects' medical knowledge, information offering, support system consolidation, and nursing intervention according to accurate identification of various facility demand levels for the performance of health behaviors should be applied. In addition, an integrated program needs to be simultaneously offered.

IV. CONCLUSION

This study is a descriptive survey study to identify the correlations among the knowledge of disease, self-efficacy, family support, and performance of health behaviors of the patients undergoing PCI and variables, confirming the factors affecting the performance of health behaviors.

Through the results of this study, the knowledge of disease, self-efficacy, sex, and metabolic syndrome were confirmed as the factors affecting the performance of health behaviors of the patients who underwent PCI.

To enhance the performance of health behaviors of the patients undergoing PCI, systematic education and infrastructure need to be offered, as well as program development for self-efficacy promotion. The results of this study may be effectively used as baseline data for the development of nursing intervention programs seeking various means to enhance the performance of health behaviors among patients undergoing PCI.

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