Related Factors of Health Behavior Compliance among Cardiac Rehabilitation Patients

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Abstract

Cardiovascular disease(CVD) and mortality from CVD have been increased among South Korean population due to westernized lifestyle and rapid social development. This study was conducted to identify the related sociodemographic factors of health behavior compliance among cardiac rehabilitation (CR) patients. Participants included 314 CR patients of two different hospital of South Korea. Data were collected from "January, 1to February 24, 2015", and analyzed by χ²-test and ANOVA, and binary logistic regression using SPSS 18.0 program. The health behavior compliance was not significantly different at gender, education level, occupation, monthly income, and marital state. However, there were significantly difference at variables of age, disease duration, and cohabitation (p < .005). Age was only causal variable to CR compliance according to binary logistic regression, and the group of 40-64 is less desirable approximately 0.04 times than age group of less than 40 (Exp. (B) = .043). These findings support that establishment tailored and flexible CR program would be effective for patient's CR compliance than monolithic program.

Keywords: Cardiac rehabilitation(CR), Cardiovascular disease(CVD), Compliance, Health Promotion, Secondary Prevention.

1. Introduction

Cardiovascular disease(CVD) increased among South Korean population due to westernized [1]lifestyle and rapid social development. Mortality from CVD has twice times increased in South Korea in recent decades according to data of statistics Korea[1]. Cardiac rehabilitation (CR) is offered to patients after myocardial infarction(MI) or revascularization procedures to help recovery as a secondary prevention. CR programs include education for lifestyle changes such as exercise, proper diet, smoking cessation, and emotional support. CR is 'coordinated, multifaceted interventions for the optimizing a patient's physical, psychological, and social function[2]. Comprehensive CR is usually delivered as a center-based group program, supervised by a multi-disciplinary team[2]. Although CR is delivered in hospital with multidisciplinary cooperation, the core components align empowering patients to manage their own long-term conditions through education, medicine management, psychological interventions and advice and support about diet and exercise [3]. Tentative evidence suggests that CR improves quality of life, allows for an earlier return to work, aids patients to achieve target blood pressure, cholesterol and glucose levels, and reduces hospital readmission rates and cardiac events repetition[4]. It also reduces cardiac mortality by 26-36% and overall

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mortality by 13-26%[5]. Overall, the research suggest that CR helps to reduce cardiac risk factors in patients with CVD by increasing functional capacity and emotional domains[6]. Despite strong evidence for the benefits of CR, it remains under-utilized, with only 42% of referred patients attending, and many of these patients did not complete CR program [7]. In many countries, reported CR attendance is below par, with rates among patients of less than 30% reported in the America[8], 34% across Europe[9], and the statistics did not carried out in South Korea. Moreover, patients who complete CR program from the hospital do not seem to maintain healthy life style in their individual life. However, lack of adherence to prescribed regimen of diet and activity is most common cause of worsening symptoms, hospital readmission, and mortality for people with cardiac disease[10]. For instance, rate of adherence to prescribed exercise after CR have been reported 15 - 65%[11], and other researchers have reported only 15- 50% of post CR program self-report that they still exercising after six months and even fewer after a year[12]. According to these previous researches, it seems difficult to adapt to new life style and maintain changed lifestyle in lifetime for CVD patients. Comparing and analyzing the sociodemographic characteristics of patients who attend and those who do not participate in CR programs would be the key for successful CR programs. Therefore this study was conducted to investigate which variable among sociodemographic characteristics engage implementation of health behavior compliance as a fundamental data to find barriers for patients not attending CR.

2. Materials and Methods

2.1. Study Design

Exploratory design was used.

2.2. Study Sample

314 CR patients of two general hospitals located in D and G province, Korea were included for this study. IRB were approved, and participants were selected from outpatient treatment for CR. Data was collected from "January, 1 to February 24, 2015".

2.3. Measurement

2.3.1. General characteristics:

Gender, age, duration of disease, education level, occupation, monthly income, marital state, cohabitation was included to investigate participants' general characteristics.

2.3.2. Perceived health status:

Single question, "How do you think of your personal health status?" was asked to the participants, and the answers were structured on the five –point Likert scale with rate ranging from 1(very good) to 5(very bad).

2.3.3. Health Behavior compliance:

The modified Korean version of Health Promoting Lifestyle Profile (HPLP) by Song et al (2001) was used [13]. The HPLP developed by Walker, Sechrist, & Pender (1987) [14]. Modified version is consisted of 25 items of 5 dimensions: Exercise, Medication, Diet,

Smoking, and Stress Management. Each questionnaire was ranged from 0(never) to 4(very often). alpha reliability coefficient for the total HPLP scale was .922; Cronbach's α for the subscales ranged from .702 to .904, and modified Korean version was 0.86 in this study.

2.4. Data Analysis

Data were analyzed using χ^2-test, ANOVA, and binary logistic regression of SPSS 18.0 program

3. Results

3.1. Sample characteristics

One third participants were male (n=200, 63.7%), and rest of participants were female (n=114, 36.3%). Participant average age was 63.44. Approximately 60% of the participants reported they had been diagnosed more than 60 months from the start of the survey point, and average duration of disease was 62.28±82.12month Table 2.

3.2. Characteristic of health promoting behavior

The mean score of health behavior compliance of the participants was 77.36±12.39. Health behavior compliance score was divided into two category based on the center score (62.5); 25 to under 62 was named "undesirable", and 63 to 100 was named "desirable" Table 1. Table 2 indicates the means of subcategories for the health promoting lifestyle: Exercise (10.95±3.67); Medication (15.45±3.39); Diet (26.99±4.20); Quit smoking (9.43±3.00); and Stress management (14.54±3.47).

Table 1. Health promoting behavior characteristics

Variables	Categories	N(%) or M(SD)
Perceived health status	Healthy	83(26.2)
	Average	132(42.0)
	Unhealthy	99(31.5)
Health Promoting Lifestyle	Desirable	270(86.0)
	Undesirable	44(14.0)
	Mean	77.36(12.39)
Total		314(100)

Table 2. Means for the health promoting behavior lifestyle subscale

Variables	Subscale	Number of items	N(%) or M(SD)	Min	Max
Health Promoting Lifestyle	Exercise	4	10.95(3.67)	4	16
	Medication	5	15.45(3.39)	6	20
	Diet	8	26.99(4.20)	14	32
	Quit Smoking	3	9.43(3.00)	3	12
	Stress	5	14.54(3.47)	5	20
Total		25	77.36(12.39)		

3.3. Difference of health behavior compliance according to general characteristics

Health behavior compliance was significantly different at variables of age, disease duration, and cohabitation (p <0.005) Table 3.

Table 3. Difference of health promoting behavior compliance according to general characteristics

Characteristic	Categories	Desirable	Undesirable	N	χ^2(p)
Gender	Male	167(83.5)	33(16.5)	200	0.063
	Female	103(90.4)	11(9.6)	144	
Age	≦39	9(64.3)	5(35.7)	14	
	40-64	24(16.4)	122(83.6)	146	0.000
	≧65	11(7.1)	143(86.0)	154	
Disease duration (month)	≦60	170(89.9)	191(10.1)	189	
	61-119	54(80.6)	13(19.4)	67	0.045
	≧120	46(79.3)	12(20.7)	58	
Level of Education	≦Elementary School	63(91.3)	6(8.7)	69	
	Middle -High School	127(85.2)	22(14.8)	149	0.315
	≧College	79(83.2)	16(16.8)	95	
Occupation	Profession	37(84.1)	7(15.9)	44	
	Technician	20(76.5)	6(23.1)	26	
	Employee	25(75.8)	8(24.2)	33	
	Commerce	22(73.3)	8(26.7)	30	
	Agriculture	28(96.6)	1(3.4)	29	0.064
	House Wife	6(85.7)	1(14.3)	7	
	Jobless	50(87.5)	4(12.5)	54	
	Others	82(89.0)	9(11.0)	91	
Monthly Income (Unit: dollar)	≦999	84(90.3)	9(9.7)	93	
	1000-1999	65(90.8)	6(9.2)	65	
	2000-2999	54(79.6)	11(20.4)	54	0.132
	≧3000	84(82.4)	18(17.6)	102	
Marital State	Married	234(87.3)	34(12.7)	268	0.084
	Single	36(78.3)	10(21.7)	46	
Cohabitation	live alone	29(85.3)	5(14.7)	34	
	live with husband/wife	126(86.9)	19(13.1)	145	0.006
	live with parents	22(66.7)	11(33.3)	33	
	Live with children	93(91.2)	9(8.8)	102	
Total		270(86.0)	44(14.0)	314	

3.4. Influencing factors on health promoting behavior compliance

Among the age, duration of disease diagnosis, cohabitation, age had effect on health promoting behavior compliance, and 40-64 age group was less conduct health promoting behavior than below 40 age group (p<0.001) Table 4.

Table 4. Binary logistic regression of variables related to health promoting behavior compliance

Variables	Category	B	S.E.	Wald	df	*p*	Exp(B)	95.0%CI
Age	≦39						1	
	40-64	-3.144	0.726	18.742	1	0.000	0.043	0.010-0.179
	≧65	-0.780	0.467	2.789	1	0.094	0.458	0.184-1.143
Constant		2.584	0.367	49.668	1	0.000	13.250	

4. Discussion

This study was undertaken to examine which sociodemographic characteristics involve implementation of health promoting behavior compliance for the understanding of barriers for patients who do not carry out health behavior. In regards to the question on participants' subjective opinion for their health, 132(42.0%) participants have been recognized as normal level for their health, 83(26.2%) patients perceived as healthy, and 99(31.5%) patients thought they were unhealthy. According to previous research, patients' perception for their disease was investigated as a significant influence on the outcome of future cardiac rehabilitation. For example, after receiving a belief intervention designed to change illness perceptions, patients responded their illness as less threatening: participants perceived greater control over the illness and had a better understanding of their illness. Furthermore, patients felt better prepared at time of discharge from the hospital and returned to work more quickly[15]. A research proved that illness perceptions of cardiac patients changed during CR and these changes were related to changes in health related quality of life (HRQOL) [16]. These results propose that psychological support and CR implementation affect each other: CR program should include psychological support and appropriate mental supports enhance patients' voluntary CR implementation. The average score of subcategories of CR compliance shows that each items were distributed evenly; Exercise (10.95±3.67); Medication (15.45±3.39); Diet (26.99±4.20); quit smoking (9.43±3.00); and Stress management (14.54±3.47). There was no analysis for which subcategory has low performance among CR sub-items in Korea. However, Hong & Lee (1997) proved that the CR program participated group showed significantly higher at compliance of healthy behavior, diet, medicine, and stress management than control group [17]. Hypertension, hypercholesterolemia, diabetes mellitus, smoking and abdominal obesity account for more than 90% of the attributable risk of myocardial infarction (MI), regardless of ethnicity[18]. Therefore, it is difficult to ascertain whether effects are due to a single or a combination of components, because CR is a complex and multifaceted[19]. Interestingly, modeling of the determinants in the primary prevention of CVD suggests risk factors modification accounts for half of the decline in fetal coronary events[20]. For the question related to CR compliance, Health promoting behavior was significantly different due to age, disease duration, and cohabitation (p < .005). However, age is only significant variable for health promoting behavior as a result binary logistic regression; 39 years and younger

participants implement health promoting behavior slightly more (0.04 times) than 40 to 64 years group. Recent researches related to health behavior on CR patients mostly performed to identify the effect of exercise[21], the education[22] of the CR program or the physical and mental outcomes of CR in Korea[17]. However, there are overseas researches that have shown the correlation between general characteristics and health behavior compliance. Many researchers found gender is associated with CR compliance, and woman are less likely than men to enroll in CR programs, and are more likely to report fulfilling CR programs[5]. Factors contributing to low CR uptake and poor participation by women include age, physical and psychological comorbidities, marital status, employment history, and socioeconomic position[23]. Various factors are involved in CR compliance according to previous researches. Previous research has identified multiple barriers around the delivery and utilization of CR programs. These barriers can involve cognitive limitations, misconceptions, low motivation, and self-esteem[24]. Barriers can involve inadequacies of the method of information provided[25], shortage in trained nursing professionals, patients' life style and ineffective communication[26]. Other barriers include low referral rates, failure of patient inducement to attend CR than referral, transportation, lack of flexibility and non-structured CR programs[27]. Psychosocial variables like anger and depression were found that risk factors occurring heart disease and impeding the CR compliance. Anxiety and depression are common consequences of CVD, and may affect health-related behaviors, such as smoking, inappropriate diet, alcohol consumption, and low physical activity, which may influence the risk of an acute cardiac event[28]. The other way, the functional capacity improvement in CR has been shown to be influenced by depression, gender, age, and pre-functional capacity[29]. Furthermore, some studies have revealed that there was a difference in the CR program participation by culture or ethnicity. In detail, Benerjee, Gupta, & Singh (2007) reported that South Asian were significantly less likely than 'white' patients to fully complete to a 6month CR program in Canada, despite equal access and no cost barriers [30]. Kappuswamy, Jhuree, & Gupta (2004) found that the adherence of CR and the 'cultural component' program participants group was 21 % greater than the control group (70.6% vs. 49.7%: p=0.002) [31]. Webster, Thompson, & Mayou (2002) proved that Hindu participants believed their MI and recovery from CVD were tied to the fate of the 'will of God', so out of their direct control[32]. Thus, CR participation and the compliance are influenced by various factors, flexible and tailored program considered individual condition is needed. Contemporary evidence suggests preventive interventions must be flexible and tailored to individual's preference, needs, and values[33]. This study has several limitations. First, the data were collected by convenience sampling, therefore it is needed to be interpreted carefully. Second, participants' disease duration range from less than 60 month to more than 120 month. This points means present CR participating patients and voluntary care patients at home were checked with same HPLP criteria, so health behavior compliance in this paper include all stage of CR patients. In spite of these limitations, these findings support that establishment tailored and flexible CR program would be effective for patient's CR compliance than monolithic program.

5. Conclusion

Despite some limitations, findings from present study suggest that age, disease duration, cohabitation were significant variable for CR compliance and the age group of 40-64 is less desirable approximately 0.04 times than age group of less than 40 (Exp. (B) = .043). These findings provide basic data for CR program establishment and support tailored CR program is needed considering various individual factors affect CR program.

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