



Predictors of Self-Management in Patients with Coronary Artery Diseases

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ABSTRACT

Chronic diseases like coronary artery diseases need special self-care behaviors to be manageable. Self-management in chronic diseases includes the adoption of a healthy lifestyle and has a significant role in treatment. Variety of factors are identified to be related with self-management. This study was conducted to determine self-management predictors in patients with coronary artery diseases. This was a descriptive-correlation study. It is conducted on 312 patients with coronary artery disease visiting the cardiovascular Clinic of Shahid Madani Teaching hospital in Tabriz, Iran. The subjects were selected using convenience sampling. The research instrument included the self-management questionnaire, used after assuring its validity and reliability. Data was analyzed with descriptive and regression analyses in SPSS16. About half of the participants (54.7%) have good self-management. Results from regression showed that predictors of self-management variance were previous disease ($F_{(4,267)}=0.363$, p -value=0.024) and type of treatment ($F_{(4,267)}=3.249$, p -value=0.039). These variables could predict the variance of self-management to 14%. By generalization of the results to the main population, the predictive variables could explain about 6% of self-management variance. Based on the results, more efforts are needed to promote the self-management of all patients. In addition, encouraging the self-management skills before the onset of the disease and at the first stage of prevention is suggesting.

Keywords: Predictors, Self-Management, Patient, Coronary Artery Disease

INTRODUCTION

With technological advancement in all dimensions of human life and change in behavioral and lifestyle patterns, the context is established for many non-communicable and chronic illnesses, such as cardiovascular diseases. Despite significant advances in the prevention and treatment of cardiovascular diseases, they continue to remain as a serious public health problem in the majority of countries[1].

The total number of global deaths due to cardiovascular disease is 17.3 million a year. According to an estimate, the total number of deaths from cardiovascular diseases will reach almost 23.3 million in 2030, out of which 80% are from developing countries with middle and low income[2]. In Iran, as a developing country, studies suggest that cardiovascular diseases are the most common leading cause of mortality [3].

The risk factors of cardiovascular diseases, specifically the coronary artery diseases, are categorized into two groups: controllable factors, such as lifestyle, and uncontrollable factors, such as gender. According to the studies, the correctable cardiovascular risk factors, such as poor diet, lack of physical activity, tobacco use, alcohol consumption, and increased body mass are highly prevalent in community. These factors, along with other genetic, physiological, and environmental factors may affect or facilitate the incidence of cardiovascular diseases or their

long-term and short-term consequences[4]. Therefore, the significance of primary and secondary preventive measures, behavioral risk reduction[5], timely identification of risk factors, and management of them by the patients themselves is undeniable in the control of this disease.

Self-management is the responsibility and involvement of the patients in the management of diseases, making informed clinical decisions, cooperating with the caregivers, minimizing the effect of disease on their functional status, emotions, as well as interpersonal relationships, and monitoring and handling disease signs and symptoms to minimize the frequency and consequences of exacerbation. Self-management,[6] as an important component of disease control, reflects one's[7] awareness and perception and improves the understanding of the disease, as well as the awareness, perception, and skill of patients, which eventually maintains and promotes health and reduces adverse consequences of the disease[6]. Adhering to self-management behaviors is very important for cardiovascular patients. Self-management in cardiovascular disease refers to measures, such as diet and medicine management, restricted intake of sodium and liquids, daily weighing, regular exercise, monitoring disease signs and symptoms, and researching for taking appropriate therapeutic measures[8-10]. Theoretical basis of self-management lies in the theory of health-promoting behaviors. According to this theory, adherence to health-promoting behaviors depends strongly on the patient's motivation and readiness to change, existing risky behaviors, and self-efficacy[10].

The process of adhering health-promoting behavior, such as smoking cessation and physical activity, which reduces the incidence of coronary problems, includes several stages aiming to habituate the new behavior[10]. Several studies have shown that self-management is the most important form of primary care in both advanced and developing countries[11]. and can significantly reduce financial burden of treatment on the healthcare system[12]. Effective self-management is an important factor in promoting positive health outcomes and disease prevention. According to the findings of a meta-analysis, the overall rate of mortality is lower among coronary artery patients who follow an exercised-based cardiac rehabilitation program. In addition, the rate of cardiac mortality decreased at the 12th, 15th, and 24th months [26%, 26% and 30%], respectively[5]. On the other hand, ineffective self-management results in poor health outcomes. That is why recently, pointing to the high prevalence of cardiovascular diseases in society and preventability of their complications, the Ministry of Health and Medical Education of Iran has emphasized the importance of self-management and preventive health behaviors, [13]

Self-management is affected by individuals' perceptions, dominant culture of society and type of disease. According to the evidence, self-care in chronic diseases have a good and moderating effect on life-related problems of patients with chronic diseases including diabetes, asthma, and mental illnesses[14]. Several studies have investigated self-management in some chronic diseases such as diabetes and asthma[14], but there is scant evidence concerning self-management for cardiovascular diseases. Regarding the high prevalence of cardiovascular diseases in Iran as well as their direct connection with lifestyle modification, and that their risk factors are manageable, this study set out to enrich the existing evidence on self-management in cardiovascular patients, aiming to investigate self-management predictors in coronary artery patients.

MATERIALS AND METHODS

This was a descriptive-correlation study. It is conducted in cardiovascular clinic of Shahid Madani Teaching hospital in Tabriz in 2015. The sample size was obtained as at least 308 based on a coefficient of similar study (OR=1.5)(13). The Effect of Self Management, using the two-tailed test in G-Power at significance level of 95% and test power of 90%. In this study, 312 questionnaires were analyzed.

Participants were selected among the patients visiting cardiovascular clinic, by using convenience sampling. The inclusion criteria were patients aged 18-70 years with documented diagnosis of coronary artery disease. The exclusion criteria were having mental and cognitive disorders.

The used questionnaire comprised two general parts: (i) demographic questionnaire, and (ii) standard self-management questionnaire (Patient Activation Measure (PAM)). This instrument included 13 statements about self-management activities, scored based on a 5-point likertscale from 1 "absolutely disagree" to 5 "absolutely agree." The total scores ranged from 13 to 65, and interpreted as unfavorable (<39), relatively favorable (39≤ and >52), and favorable (52≤) self-management behaviors in patients with coronary artery diseases(15). Because some of the participants were illiterate, the questionnaires were completed by face to face interview for all of the patients. The validity and reliability of the questionnaire were previously confirmed(15). The questionnaire in this study was confirmed by 10 faculty members of Tabriz faculty of nursing and midwifery in terms of the accuracy of translation (English-to-Persian), as well as face and content validity. In addition, due to using interview, the equilibrium validity was measured applying two-interviewer technique to 10 subjects. Results implied acceptable level of validity (r=82%). To measure the internal consistency of the questionnaire, the Cronbach's alpha (0.71) were

calculated. In addition, the reliability of the questionnaire was determined in terms of repeatability (intergroup correlation coefficient) through applying the test-retest to 20 subjects with a two-week interval. For this questionnaire, the intergroup correlation coefficient was obtained as $r=0.86$.

Data collection was initiated after obtaining required permission from the ethics committee and coordinating with relevant authorities. The researcher introduced herself to the patients, explained the research objective to them, and assured them that their information would only be used for statistical analysis and would remain confidential. The research subjects were included after the written consent was obtained. After data collection, the normality of data was checked by kromogrovsmirnov test. Data analysis was done using parametric tests (independent Pearson correlation coefficient, t-test and ANOVA) in SPSS16(SPSS Inc., Chicago, IL, USA). To answer research questions, several multiple regression analyses were done, in a way that some variables were removed based on the regression type (stepwise) to obtain the best predictive model.

Findings:

The age range of the patients was between 23 and 91 years, with the mean of 56.46 ± 11.55 years. Most of the patients were male and married. Detailed demographic information is presented in Table 1.

Table 1. Frequency distribution of demographic information of patients

Variable	Subgroup	frequency	Percentage
Gender	Male	256	82.1
	Female	56	17.9
	Sum	312	100.0
Married	Single	32	10.3
	Married	280	89.7
	Sum	312	100.0
Educational Level	Illiterate	82	26.3
	primary school	82	26.3
	Degrees prior to diploma	69	22.1
	Diploma	43	13.8
	Academic Education	36	11.5
	Sum	312	100.0
Place of Living	Urban	224	71.8
	Rural	88	28.2
	Sum	312	100.0
Career	Unemployed/housewife	73	23.4
	Self-employed	139	44.6
	Clerical	37	11.9
	Retired	63	20.2
	Sum	312	100.0
Smoking	Yes	87	27.9
	No	225	72.1
	Sum	312	100.0
Number of cigarettes smoked per day (pack)	No	225	72.1
	Less than one pack	40	12.8
	One pack	32	10.3
	More than one pack	15	4.8
	Sum	312	100.0
Family history of heart disease	Yes	130	41.7
	No	182	58.3
	Sum	100.0	100.0
History of heart disease	negative	188	60.3
	Hypertension	70	22.4
	Diabetes	23	7.4
	hyperlipidemia	17	5.4
	Pulmonary problem	14	4.5
	Sum	100.0	100.0
Number of hospitalization	0	111	35.6
	One	136	43.6
	Two	26	8.3
	Three	39	12.5
	More than three	100.0	100.0
	Sum	111	35.6
Type of therapeutic intervention	Without treatment	80	25.6
	Stent placement	55	17.6
	Angioplasty	58	18.6
	Chemotherapy	61	19.6
	Heart surgery	58	18.6
	Sum	100.0	100.0

Mean score of self-management was 51.15 ± 8.81 . The maximum and minimum scores were 65 and 25, respectively. Classification of self-management scores is presented in Table 2.

Table 2. Distribution of self-management information of patients

Self-management activities	Frequency	Percentage
Unfavorable	30	9.8
Relatively favorable	109	35.5
Favorable	168	54.7
Sum	307	100.0

To determine demographic factors capable of predicting self-management in cardiovascular patients, demographic factors were introduced as predictive variables and self-care score as the criterion variable to the regression equation. In this study, the linear multiple regression method was used for data analysis. Results are presented in Tables 3 and 4.

Table 3. Summary of variance analysis and regression model of predictive variables and level of self-management

Source of changes	Sum of squares	Degree of freedom	Average sum of squares	Test Statistic F	Significance Level	R ²	R ² adj
Constant	97484.165	1	97484.165	1.522	**0.001>	0.142	0.059
Gender	54.895	1	54.895	1319.396	0.389		
Age	122.778	2	61.389	0.734	0.437		
Educational level	276.370	4	69.093	0.831	0.444		
Marital Status	244.447	1	244.447	0.935	0.070		
Place of Living	0.501	1	0.501	3.308	0.934		
Career	464.571	3	154.857	0.007	0.101		
Smoking	50.537	1	50.537	2.096	0.409		
Family history of heart disease	26.854	1	26.854	0.684	0.547		
Heart disease	664.726		166.182	0.363	*024/0		
Source of information	98.397	3	32.799	2.249	0.722		
Number of hospitalization	664.615	4	166.154	0.444	0.064		
Treatment	960.209	4	240.052	3.249	*039/0		
residual	19727.414	267	73.885	2.302			
Total	22989.481	297					

* $p < 0.05$ ** $p < 0.001$

Table 4. Effect of regression statistical indices of predictive variables on self-management

Variable	B	S.E	t	Sig	
Constant number	42.693	4.501	9.485	**001/0>	
Gender	Male	1.669	1.937	-0.862	0.389
	Female				reference
Age	Less than or equal to 51	1.150	1.381	0.832	0.406
	52-61	-0.531	1.293	-0.410	0.682
	Higher than or equal to 62				reference
Educational level	Illiterate	0.087	1.858	0.047	0.963
	primary school	1.366	1.863	0.733	0.464
	Degrees prior to diploma	-0.378	1.903	0.199	0.843
	Diploma	-1.941	2.130	-0.911	0.363
	Academic Education				reference
Marital Status	Single	-3.177	1.746	-0.819	0.070
	Married				reference
Place of Living	Urban	0.106	1.290	-0.082	0.934
	Rural				reference
Career	Unemployed/housewife	-3.858	2.095	-1.842	0.067
	Clerical	-3.575	1.529	-2.338	0.060
	Retired	-1.832	2.092	-0.903	0.367
	Self-employed				reference
Smoking	Yes	-0.961	1.162	-0.827	0.409
	No				reference
Family history of heart disease	Yes	-0.651	1.081	0.603	0.547
	No				reference
History of heart disease	Do not have	7.501	2.555	2.936	*0.004
	Hypertension	7.689	2.682	2.867	*0.004
	Diabetes	7.462	3.110	2.399	*0.017
	hyperlipidemia	7.144	3.374	2.118	*0.035
	Pulmonary problem				reference
Source of information	I do not use	-1.045	1.783	-0.586	0.558

Variable		B	S.E	t	Sig
	Doctor	-0.611	1.694	-0.361	0.719
	Nurse	1.318	2.450	-0.538	0.591
	Other	reference			
Number of hospitalization	Zero	4.002	1.792	1.234	0.062
	One	2.917	1.869	1.561	0.120
	Two	3.783	2.057	1.811	0.051
	Three	4.382	2.283	1.919	0.056
	More than or equal to four	reference			
Type of treatment	Without treatment	3.971	1.638	2.425	*0.016
	Stent placement	1.654	1.724	0.959	0.338
	Using drug	4.040	1.748	2.311	*0.022
	Heart surgery	1.159	0.758	0.659	0.511
	Angioplasty	reference			

* $p < 0.05$ ** $p < 0.001$

Results from regression indicators of predictive variables on the level of self-management showed that heart disease ($F(4,267)=0.363$, p -value=0.024) and treatment ($F(4,267)=3.249$, p -value=0.039) variables could predict self-management. In total, previous disease and treatment explained almost 0.14% of variance changes of the self-management activities ($R^2=0.142$). By generalization of the results to the main population, the predictive variables could explain about 6% of self-management variance changes ($R^2_{adj}=0.059$).

DISCUSSION

This study was conducted to determine self-management predictors in patients with coronary artery disease. Lifestyle change due to chronic diseases, such as cardiovascular problems, has a significant effect on all dimensions of the patients' life and reduces their quality of life[16].

In fact, any change in human life, either pleasant or unpleasant, requires re-adjustment[17].

Khalilzadeh et al. conducted a study to determine the "Adjustability of cardiac patients to disease complications." They found that only 10% of the subjects had good adjustment with the disease and its complications. They attributed it to the subjects' physical and psychological stresses[18].

People are not equally ready for change. In other words, some individuals may go through the same stage of adaptation several times before going to next and ultimately reaching final stage of behavioral modification[10].

Results from this study showed that about half of the participants [54.7%] were in good condition in terms of self-management activities, whereas, only 10% were not. Controversy Oksel in a study in Turkey reported poor self-management behaviors of cardiac patients[19].

A study about self-management behaviors of cardiac patients reported that 26% of patients have desirable self-management behaviors and the remaining patients were at moderate and low level of self-management[20].

.Because the coronary heart disease complications are prevalent, it is desirable to see more self-management behavior in the participants. The better condition of self management in our study in compare of similar studies could be attributed to the role of learning opportunity. In this study, the majority of patients was literate and had a history of hospitalization and therefore, they were exposed to educational materials and conditions during hospitalization. Nurses, for instance, are the main source of patient education in hospitals. In this regard, the majority of studies have proven positive effect of self-management education on life consequences of chronic patients. For example, self-management interventions dramatically improve the frequency of angina, physical limitations, as well as depression in some cases, and reduce the need for sublingual nitroglycerin[21].In Iran, the main position of nurses is caring in hospitals and not in community, therefore organizing patient education process in,at least, hospitals to promote the self management of the patients is strongly recommended.

Results from univariate analysis showed a significant difference in patients' self-management activities based on the history of disease and type of treatment. The self-management quality was higher in patients who underwent angiography than those with hyperlipidemia, diabetes, and hypertension. Since diabetic patients should frequently visit their doctors and other care providers, their self-management quality was expected to be higher; while patients, who underwent angiography, showed more desirable self-management behaviors. This finding indicates that people undergoing invasive procedures show better self-management behaviors. According to the evidence, the main cause of stress among patients is invasive procedures[22]makes patients to learn and follow disease management principles.

Limitations of Study:

Among the limitations of the present study was data collection through interview. According to studies, self-reporting methods are not always reliable[20].

In this study, we assessed the relationship of total score of self-management behaviors with aforementioned variables. Future studies are recommended to assess the relationship of each behavior and dimensions of self management with these variables to obtain more useful and reliable information. On the other hand, since evidence maintains that self-management behaviors vary with time, investigation into the time and progress of the disease was another limitation of the study. For example, studies demonstrate that patients with coronary artery disease were more committed to physical activity following discharge, but started to decrease 24-month post-discharge [5].

CONCLUSION

In conclusion, about half of the participants were in good conditions in term of self-management activities. Meanwhile, self-management behaviors were more desirable among patients undergoing angiography than those with high cholesterol, diabetes, and high blood pressure. Paying attentions to these constructs can be considered as a self-management improvement strategy. That means promoting self-management of the patients in primary stages is needed. Findings show that about half of the patients change their lifestyle through self-management; therefore, health specialists are expected to assist patients by providing greater support, guidance, and consultation, if required.

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