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Original Article

The role of self-efficacy beliefs in positive and negative perception of stress in coronary artery bypass patients

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Abstract

Introduction: Evaluating self-efficacy beliefs is essential to the post-operative care program in cardiovascular bypass patients. The present study aimed to investigate the role of self-efficacy beliefs in positive and negative perceptions of stress in coronary artery bypass patients.

Methods: The research method was descriptive-analytic, and its population consisted of patients with coronary artery bypass who were referred to the education and treatment specialist center of Vali-e-Asr Hospital, Birjand, Iran, in 2016. The available sampling method was applied, and 229 patients were selected. Data were collected using questionnaires of Zand's self-efficacy beliefs and Cohen's perceived stress. The data were then analyzed by SPSS (Version-23) using the Pearson correlation test, stepwise regression, and independent-sample t-test.

Results: The findings showed a significant correlation between the variables of research. Among the components of self-efficacy beliefs, physical activity predicted a positive perception of stress (R=0.274). Moreover, physical activity and psychosocial stresses could predict negative perceptions of stress. The negative perception of stress and self-efficacy beliefs were significantly different between male and female patients (P<0.05).

Conclusion: According to the findings, physical activity, as one of the dimensions of self-efficacy beliefs, has a positive effect on the perception of stress. Therefore, self-efficacy beliefs are valuable tools for health care providers and staff. Furthermore, evaluating patients' self-efficacy beliefs and improvements can increase their motivation to take care of themselves.

Keywords: Coronary Artery Bypass, Patients, Stress, Self-Efficacy

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Introduction

Nowadays, the global change in the pattern of diseases from contagious and infectious to non-communicable diseases is caused by various factors such as culture, mechanical life, nutrition, industrialization, and lifestyle changes (1). Cardiovascular diseases are non-transmissible and are among the top causes of death worldwide and in our country (2). Coronary artery bypass surgery is a therapeutic approach for cardiovascular patients (3). Each year, about 8 million open-heart surgeries are performed worldwide and 35,000 to 50,000 cardiac surgeries in Iran (4). This disease is associated with a wide range of mental and psychiatric disorders. People experience stress from the initial diagnosis of the necessity of the surgery until discharge from the hospital and return to their everyday pre-operative life (5). The dangers of surgery, the patient's complete or incomplete recovery, long-term waiting, and financial problems increase the patients' stress and anxiety (6).

Over the past years, many studies have shown that stressful events influence the emergence of physical and psychological illnesses (7). Initially, the main idea was that one of the crucial factors in the psychological explanations of disease and health is the stressful events of life. The basic presupposition was that individuals who experience more stressful events are more likely to suffer from various disorders and problems. The presence or absence of positive psychological components affects the overall quality of the human psyche. One of the general components of mental health is perceived stress, which includes our perception of life's stress levels (8). Perceived stress is a condition that reflects the overall assessment of the importance and severity of environmental and personal challenges. Therefore, these individual and environmental factors are essential in perceiving the stressors (9). Some researchers believe that different environmental and situational characteristics are effective in experiencing the amount of stress (7). Accordingly, events that create a lot of demands and requirements are imminent threats that pose much stress on the person (10). The results of various studies indicated that the reaction style of heart patients to environmental stimuli is accompanied by stress and irritability, which in turn causes more cardiovascular complications (11-13). People use adaptive strategies to deal with stressful situations (14).

One of the variables that have attracted researchers' attention in this regard is the concept of self-efficacy beliefs (15). The self-efficacy structure has a long history, which began with the writings of Bandura in different fields. In Bandura's view, self-efficacy refers to the people's judgments about their abilities to mitigate the designed performance levels (16). He believes that self-efficacy can play an essential role in the individuals' attitude and approach toward their goals, tasks, and challenges and helps them carry out their assignments with the least amount of stress, deep interest, and a sense of firm commitment (8).

Self-efficacy beliefs can positively or negatively affect mental health (17). Studies showed that self-efficacy beliefs play a pivotal role in reducing anxiety, depression, mental health, and enhancement of adaptability in individuals (18-19). As a result, self-efficacy beliefs affect how people think, deal with problems, cope with stress and depression, maintain their emotional health, and make decisions (20). Furthermore, various researchers reported a significant relationship between self-efficacy beliefs and perceived stress; the perceived stress level decreases with an increase in self-efficacy beliefs (8, 21-23).

Individuals with high self-efficacy beliefs, rather than avoiding the problems, confront them realistically through their high commitment. They also have more control over their problems using their reasonable expectations (24). Strengthening self-efficacy beliefs can be a strategy to reduce the negative attitudes and eliminate the stress and incompatibility (18). Individuals with self-efficacy better deal with stressful situations and consider them opportunities (8).

Consequently, evaluating self-efficacy beliefs is an integral part of the post-operative care program in cardiovascular bypass patients. Various studies have shown that promoting self-efficacy beliefs can be

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helpful in the correction of the lifestyle, improving the cardiovascular risk factors, appropriate consumption of drugs, and preventing re-admission of cardiac patients (25-27). Hence, self-efficacy beliefs are valuable tools for the health care workers and providers and their evaluation and promotion can increase the patients' motivation to take care of themselves (21, 27).

Considering the importance of self-efficacy beliefs in the health and motivation of patients with coronary artery bypass regarding the post-operative care, their return to the normal life, and the scarce number of studies in this field, the present study was conducted. The present study aimed to investigate the role of self-efficacy beliefs in the positive and negative perceptions of coronary artery bypass patients.

Materials and Methods

This descriptive-analytic study was carried out cross-sectionally. The statistical population consisted of the coronary artery bypass patients referred to the education and treatment specialist center of Vali-e-Asr Hospital, Birjand, Iran, in 2016. The available sampling method was applied, and 229 patients were selected. To collect the data, the researchers referred to the relevant centers, presented their introduction letter, and explained their research objectives to the center's authorities. Followed by obtaining their consent and cooperation, we started the sampling process. The inclusion criteria consisted of the ability to read and write, a history of open-heart surgery, and no history of chronic psychiatric illness. If the patients were eligible to enter the study, the research objectives were explained to them, they were asked to sign the written consent forms, and they were ensured of the confidentiality of the results. They were later asked to complete the research questionnaire carefully according to their characteristics and leave no item unanswered. This research took a year, and the participants were required to answer the questions individually.

The main research questionnaire included several parts as follows:

1. Demographic characteristics: Calendar age, gender, educational level, employment status, place of residence, lifestyle, income, smoking, and physical activity.

2. Heart self-efficacy beliefs questionnaire: The self-efficacy beliefs' scale of patients with myocardial infarction was designed by Zand and Rafiei in 2011. It evaluates the patients' confidence level and self-efficacy regarding the observance of the general care, control of symptoms, and observance of drug orders using a five-point Likert scale. Each item in this questionnaire has four points; the highest score is related to the highest degree of confidence (I am completely sure), whereas the lowest point, i.e., zero, is attributed to the lowest level of confidence (I am not completely sure). This scale has 60 questions in 5 sections of nutritional status, physical activity, drug diet, psychological stress, smoking, and drug use. The total score of this questionnaire is in the range of 0-240, and higher scores indicate better-perceived self-efficacy. The reliability of this questionnaire was reported at 99.19 by the designer using the Cronbach's alpha (28). In the current study, the reliability of this tool was equal to 29% using Cronbach's Alpha (79%).

3. Perceived Stress Questionnaire: Cohen et al. designed this scale in 1983 to evaluate the thoughts and feelings about stressful events, as well as to control, overcome, and cope with the experienced mental pressures and stresses. The participants' responses were graded in a five-point Likert scale that begins with "never" (with a score of 0) and ends in "many times" (with a score of 4). These scale measures two sub-scales: a) The subscale of the negative perception of stress indicates the inability to cope with mental pressure and includes items 1, 2, 3, 4, 11, 12, and 14. b) The subscale of positive perception of stress represents the person's good alignment with stressors and consists of items 5, 6, 7, 8, 9, 10, and 13. The score of positive questions should be calculated inversely. The lowest attained score is zero, whereas the maximum score is 56. The perceived stress questionnaire is a standard questionnaire, and its validity was confirmed through the content validity method. Its reliability was also verified using the internal correlation method by

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Ataollahi et al. study with the Cronbach's alpha of 0.87. The Cronbach's alpha of 0.85 was achieved in the present study (29).

In the current research, the ethical considerations were entirely maintained. Permission was obtained from the Research and Ethics Committee of Yazd University of Medical Sciences (Ethical Code No.: IR.SSU.Medicine.Rec.1395-124), and referrals were presented to local hospital officials to initiate the research. The full satisfaction of the participants was drawn, and the necessary coordination was made before the study was carried out.

Data were finally analyzed by SPSS (version-23) using descriptive statistics (mean, standard deviation) and inferential statistics, including Pearson correlation coefficient, stepwise regression tests, and independent t-test.

Results

Of the 229 patients, 134 (58.5%) participants were male. Most people were over 51 years old, married, employed, had a university education, and lived in the city. Most of them did not have any history of smoking. The research variables' means, standard deviations, and sub-scales are shown in Table 1.

Considering Table 1, we can conclude that positive perception of stress, among the components of perceived stress and physical activity among the components of self-efficacy beliefs, had the highest means. The correlation coefficients between the present study variables were analyzed using the Pearson correlation coefficient test. As indicated in Table 2, patients' self-efficacy beliefs significantly correlate with negatively perceived stress (r=-0.19, P=0.004) and positively perceived stress (r=0.20, P=0.000). This result provides the necessary authorization to conduct the regression.

The stepwise regression coefficient was used to predict the positive and negative perceptions of stress based on the self-efficacy components.

The results of Table 3 show that among the components of self-efficacy, physical activity (R=0.274, R2=0.075) had the required conditions to enter the regression and predicted the positive perception of stress. The Beta-value or the standardized regression coefficient indicates the positive impact of physical activity on the positive perception of stress.

Among the components of self-efficacy, in the first step, physical activity (R=0.298, R2= 0.089) could predict the negative perception of stress and negatively affect it. In the second step, the physical activity along with the mental and psychological stress (R=0.365, R2=0.133) could predict the negative perception of stress.

To examine the difference in the positive perception of stress, the negative perception of stress, and the self-efficacy beliefs between male and female patients, the independent sample t-test was applied (Table 4). According to Table 4, the means of positive perception of stress and self-efficacy beliefs were higher in male patients than in female participants. On the other hand, the negative perception of stress was higher among female patients. A statistically significant difference was observed between male and female participants regarding the means of the negative perception of stress (P=0.012) and self-efficacy beliefs (P=0.016).

Table 1. Means and standard deviations of the research variables and sub-scales

Variable	Sub-scale	Mean ± SD
Perceived stress	Positive perception of stress	16.98±3.33
	Negative perception of stress	15.80±4.30
Self-efficacy beliefs	Nutritional status	37.33±8.27
	Physical activity	43.48±13.13
	Drug diet	35.71±7.76
	Psychosocial stress	17.47±4.84
	Smoking	31.91±5.91
	General self-efficacy beliefs	165.92±30.08

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Table 2. Correlation coefficients of the research variables

Variable	Item	Negatively perceived stress	Positively perceived stress
Self-efficacy beliefs	Correlation	-0.191**	0.260
	Sig	0.004	0.000

(P<0.01)**

Table 3. Results of the multivariate regression test to predict the positive and negative perceptions of stress based on the self-efficacy components

Dependent	Step	Independent	Unstandardized coefficient		standardized coefficient	t	*P*-value
			B	Std. Error	β		
Positive perception	First	Physical activity	-0.070	0.016	0.274	4.295	0.000
Negative perception	First	Physical activity	-0.098	0.021	-0.298	-4.709	0.000
	Second	Physical activity	-0.136	0.023	-0.416	-5.862	0.000
		Psychological stress	0.214	0.063	0.241	0.396	0.001

Table 4. Independent sample T-test to examine the differences in the research variables among male and female patients

Variable	Gender	Number	Mean ± SD	t	df	*P*-value
Positive perception	Female	95	16.85±2.75	-0.512	227	0.609
	Male	134	17.08±3.96			
Negative perception	Female	95	16.65±3.76	2.541	227	0.012
	Male	134	15.20±4.57			
Self-efficacy beliefs	Female	95	160.51±24.72	-2.426	227	0.016
	Male	134	169.76±32.92			

Discussion

This study aimed to investigate the role of self-efficacy beliefs in the positive and negative stress perceptions of coronary artery bypass patients. The results showed a significant positive correlation between the patients' self-efficacy beliefs and the positive perception of coronary artery bypass stress. Among the components of self-efficacy beliefs, only physical activity could predict the positive perception of stress and positively affect it. This finding is consistent with many studies, in which the self-efficacy beliefs had a positive and significant relationship with the positive perception of stress and could predict it. (8, 21-23, 30).

In explaining the achieved results, it can be concluded that people with high self-efficacy are more likely to take care of their health. For instance, they care about their weight, do not smoke, exercise,

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give preventive tests, and regularly visit a doctor. Individuals with high self-efficacy try hard to collect information that gives them more control over their environment (30). Individuals with a positive perception of stress use stressful situations to advance their personal success and emphasize the principle of self-efficacy. Therefore, they try to resolve problems with their cognitive and behavioral efforts, raising their psychological well-being (31).

A significant negative correlation was found between self-efficacy beliefs and the negative perception of stress among coronary artery bypass patients. Among the components of self-efficacy beliefs, only physical activity and psychosocial stresses could predict and affect the negative perception of stress. This finding is consistent with many studies (8, 21-23, 30, 32). The results achieved from the literature showed a negative and significant relationship between self-efficacy beliefs and the negative perceptions of stress. The literature also showed that self-efficacy beliefs are predictive of negative perceptions. In this regard, we can explain that although the negative perception of stress negatively affects physical activity, it positively impacts psychosocial stresses. If individuals have a negative perception of stress, they feel unpleasant about it and look at it negatively. Consequently, they try to protect themselves from stress by avoiding stressful situations through an avoidant and emotional coping style. This behavior may also put the person at the risk of psychological turmoil (31).

Male and female participants with cardiovascular disease were not significantly different regarding the positive perceptions of stress. However, the negative perception of stress was higher in women than in men with cardiovascular diseases. These findings of the present study were consistent with results by Leung et al., in which women had significantly higher mean scores in total perceived stress and negative stress and lower scores in positive stress (33). Our results were also in the same vein with those reported by Glei et al., who indicated that women were more stressed than men in the three countries of Moscow, Taiwan, and the United States (34).

Self-efficacy beliefs were higher in men than women with cardiovascular diseases, and the observed differences between males and females were significant. This finding is consistent with one study (35) but mismatches some other research (36, 37). In this regard, we can explain that some psychosocial features of men, such as their better control of stress and emotional adjustment after the onset of a cardiac event (38), are due to their more favorable self-efficacy beliefs than women.

The present study has some barriers and limitations, such as its cross-sectional nature and the limitations of selecting the sample of patients after bypass surgery. Accordingly, we suggest conducting a similar study on other patients to compare the results. In future studies, other variables that can minimize the vulnerability of these patients and promote rehabilitation programs should be investigated.

Conclusion

Based on the findings of the present study, an increase in the physical activity, as one of the dimensions of self-efficacy beliefs, leads to a positive perception of stress. On the other hand, with decreasing physical activity and increased psychological stress, patients' perception of stress changes to negative. Therefore, an increase in self-efficacy beliefs in the coronary artery bypass patients affects their perception of stress. As a result, self-efficacy beliefs are valuable tools for health care workers and providers. Furthermore, evaluation and promotion of self-efficacy beliefs in patients after coronary artery bypass surgery can increase their motivation to take care of themselves. Finally, using psychological therapies along with the medical treatments and working on the dimensions of self-efficacy can improve the patients' quality of life and help them return to normal pre-operative life.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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